NOTICE

This manual was produced by the Yamaha Motor Taiwan Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Taiwan Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE: Designs and specifications are subject to change without notice.

IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following. The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

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

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

⚠️ CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the scooter.

NOTE: A NOTE provides key information to make procedures easier or clearer.
HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

1. The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter. Refer to “SYMBOLS”.

2. Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(s) appears.

3. Sub-section titles appear in smaller print than the section title.

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

5. Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

6. Symbols indicate parts to be lubricated or replaced. Refer to “SYMBOLS”.

7. A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

8. Jobs requiring more information (such as special tools and technical data) are described sequentially.
The following symbols are not relevant to every vehicle. Symbols 1 to 9 indicate the subject of each chapter.

1. General information
2. Specifications
3. Periodic checks and adjustments
4. Chassis
5. Engine
6. Cooling system
7. Carburetor(s)
8. Electrical system
9. Troubleshooting

Symbols 10 to 17 indicate the following.
10. Serviceable with engine mounted
11. Filling fluid
12. Lubricant
13. Special tool
14. Tightening torque
15. Wear limit, clearance
16. Engine speed
17. Electrical data

Symbols 18 to 22 in the exploded diagrams indicate the types of lubricants and lubrication points.
18. Engine oil
19. Gear oil
20. Molybdenum-disulfide oil
21. Wheel-bearing grease
22. Lithium-soap- based grease
23. Molybdenum-disulfide grease

Symbols 24 to 25 in the exploded diagrams indicate the following.
24. Apply locking agent (LOCTITE®)
25. Replace the part
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GENERAL INFORMATION

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VEHICLE IDENTIFICATION NUMBER
The vehicle identification number ① is stamped into the steering head pipe.

MODEL LABEL
The model label ① is affixed to the seat. This information will be needed to order spare parts.
PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.

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

3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.

4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.

5. Keep all parts away from any source of fire.

REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

GASKETS, OIL SEALS AND O-RINGS

1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.

2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.
EAS00023

LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.

EAS00024

BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

CAUTION:

Do not spin the bearing with compressed air because this will damage the bearing surfaces.

EAS00025

CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip, make sure the sharp-edged corner is positioned opposite the thrust that the circlip receives.
CHECKING THE CONNECTIONS

Check the leads, couplers, and connectors for stains, rust, moisture, etc.

1. Disconnect:
   - lead
   - coupler
   - connector

2. Check:
   - lead
   - coupler
   - connector
   Moisture → Dry with an air blower.
   Rust/stains → Connect and disconnect several times.

3. Check:
   - all connections
   Loose connection → Connect properly.

   **NOTE:**
   If the pin (1) on the terminal is flattened, bend it up.

4. Connect:
   - lead
   - coupler
   - connector

   **NOTE:**
   Make sure all connections are tight.

5. Check:
   - continuity
     (with the pocket tester)

   **NOTE:**
   - If there is no continuity, clean the terminals.
     When checking the wire harness, perform steps (1) to (3).
   - As a quick remedy, use a contact revitalizer available at most part stores.
SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.

When placing an order, refer to the list provided below to avoid any mistakes.

<table>
<thead>
<tr>
<th>Tool NO.</th>
<th>Tool name / Function</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>90890-01083(M6)</td>
<td>Rocker arm shaft puller bolt&lt;br&gt;Weight&lt;br&gt;These tools are used when removing or installing the rocker arm shafts.</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>YU-01083-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01085(M8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YU-01083-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01084</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YU-01083-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01235</td>
<td>Rotor holding tool&lt;br&gt;This tool is used to remove the flywheel magneto.</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>YU-01235</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01268</td>
<td>Ringnut wrench&lt;br&gt;This tool is used to loosen and tighten the exhaust and steering ring nut.</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>YU-01268</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01311</td>
<td>Valve adjusting tool&lt;br&gt;This tool is necessary for adjusting valve clearance.</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-08035-A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01312</td>
<td>Fuel level gauge&lt;br&gt;This gauge is used to measure the fuel level in the float chamber.</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-01312-A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01326</td>
<td>T-handle&lt;br&gt;Damper rod holder&lt;br&gt;These tools are used for holding the Damper rod holder when removing or installing the damper rod holder.</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-01326</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YM-01300-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01337</td>
<td>Clutch spring holder&lt;br&gt;These tools are used for removing the nut with holding the compression spring.</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-33285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YM-33285-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01348</td>
<td>Lock nut wrench&lt;br&gt;This tool is used when removing or installing the secondary sheave nut.</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-01348</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01189</td>
<td>Flywheel puller&lt;br&gt;This tool is used for removing the A.C. magneto rotor.</td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td>YM-01189</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool NO.</td>
<td>Tool name / Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>90890-01367</td>
<td>Fork seal driver weight ①</td>
<td>(1)</td>
</tr>
<tr>
<td>YM-A9409-7</td>
<td>Fork seal driver attachment(Ø30mm) ②</td>
<td>(2)</td>
</tr>
<tr>
<td>90890-01400</td>
<td>This tool is used when installing the fork seal.</td>
<td></td>
</tr>
<tr>
<td>YM-A9409-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01384</td>
<td>Oil seal guide</td>
<td></td>
</tr>
<tr>
<td>YM-33299</td>
<td>This tool is used for protecting the oil seal lip when installing the secondary sliding sheave.</td>
<td></td>
</tr>
<tr>
<td>90890-01403</td>
<td>Ring nut wrench</td>
<td></td>
</tr>
<tr>
<td>YU-33975</td>
<td>This tool is used to loosen and tighten the steering ring nut.</td>
<td></td>
</tr>
<tr>
<td>90890-01701</td>
<td>Sheave holder</td>
<td></td>
</tr>
<tr>
<td>YS-01880-A</td>
<td>This tool is used for holding the secondary sheave.</td>
<td></td>
</tr>
<tr>
<td>90890-03079</td>
<td>Thickness gauge</td>
<td></td>
</tr>
<tr>
<td>YM-34483</td>
<td>This tool is used to measure the valve clearance.</td>
<td></td>
</tr>
<tr>
<td>90890-03081</td>
<td>Compression gauge</td>
<td></td>
</tr>
<tr>
<td>YM-33223</td>
<td>These tool are used to measure the engine compression.</td>
<td></td>
</tr>
<tr>
<td>90890-03132</td>
<td>Pocket tester</td>
<td></td>
</tr>
<tr>
<td>YU-03112-C</td>
<td>This instrument is invaluable for checking the electrical system.</td>
<td></td>
</tr>
<tr>
<td>90890-03113</td>
<td>Engine tachometer</td>
<td></td>
</tr>
<tr>
<td>YU-08036-C</td>
<td>This tool is needed for detecting engine rpm.</td>
<td></td>
</tr>
<tr>
<td>90890-03141</td>
<td>Timing light</td>
<td></td>
</tr>
<tr>
<td>YU-03141</td>
<td>This tool is needed for detecting ignition timing.</td>
<td></td>
</tr>
<tr>
<td>90890-04019</td>
<td>Valve spring compressor</td>
<td></td>
</tr>
<tr>
<td>YM-04019</td>
<td>Attachment(Ø19mm)</td>
<td></td>
</tr>
<tr>
<td>90890-04108</td>
<td>These tools are used when removing or installing the valve and the valve spring.</td>
<td></td>
</tr>
<tr>
<td>YM-04108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool NO.</td>
<td>Tool name / Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>90890-06754</td>
<td>Ignition checker</td>
<td></td>
</tr>
<tr>
<td>YM-34487</td>
<td>This instrument is necessary for checking the ignition system components.</td>
<td>![Ignition checker illustration]</td>
</tr>
<tr>
<td>90890-85505</td>
<td>Yamaha bond NO.1215</td>
<td></td>
</tr>
<tr>
<td>ACC-11001-05-01</td>
<td>This sealant (bond) is used for crankcase mating surface, etc.</td>
<td>![Yamaha bond illustration]</td>
</tr>
<tr>
<td>80890-04116</td>
<td>Valve guide remover (4.5 mm)</td>
<td></td>
</tr>
<tr>
<td>YM-04116</td>
<td>This tool is used to remove or install the valve guides.</td>
<td>![Valve guide remover illustration]</td>
</tr>
<tr>
<td>90890-04117</td>
<td>Valve guide installer (4.5 mm)</td>
<td></td>
</tr>
<tr>
<td>YM-04117</td>
<td>This tool is used to install the valve guides.</td>
<td>![Valve guide installer illustration]</td>
</tr>
<tr>
<td>90890-04099</td>
<td>Valve guide reamer (5.0 mm)</td>
<td></td>
</tr>
<tr>
<td>YM-04099</td>
<td>This tool is used to rebore the new valve guides.</td>
<td>![Valve guide reamer illustration]</td>
</tr>
</tbody>
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<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model code</strong></td>
<td>5YR1 (for USA)</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>5YR2 (for CAN)</td>
<td>...</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall length</td>
<td>1755 mm (69.1 in)</td>
<td>...</td>
</tr>
<tr>
<td>Overall width</td>
<td>699 mm (27.5 in)</td>
<td>...</td>
</tr>
<tr>
<td>Overall height</td>
<td>1063 mm (41.8 in)</td>
<td>...</td>
</tr>
<tr>
<td>Seat height</td>
<td>759 mm (29.8 in)</td>
<td>...</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>1230 mm (48.4 in)</td>
<td>...</td>
</tr>
<tr>
<td>Ground clearance</td>
<td>95 mm (3.8 in)</td>
<td>...</td>
</tr>
<tr>
<td>Minimum turning radius</td>
<td>1800mm (72 in)</td>
<td>...</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet (without oil and a full fuel tank)</td>
<td>109 kg (240 lb)</td>
<td>...</td>
</tr>
<tr>
<td>Dry (without oil and fuel)</td>
<td>104kg (229 lb)</td>
<td>...</td>
</tr>
<tr>
<td>Maximum load (total of cargo, rider, passenger, and accessories)</td>
<td>253kg (558 lb)</td>
<td>...</td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine type</td>
<td>Forced Air cooled 4-stroke, SOHC</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>0.125L(125.0 cm³)</td>
<td></td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>Forward inclined single cylinder</td>
<td></td>
</tr>
<tr>
<td>Bore × stroke</td>
<td>51.5 × 60.0 mm</td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>9.8±0.4 :1</td>
<td></td>
</tr>
<tr>
<td>Engine idle speed</td>
<td>1600–1700 r/min</td>
<td></td>
</tr>
<tr>
<td>Vacuum pressure at engine idle speed</td>
<td>30.0 kpa(238.6 mmHg)</td>
<td></td>
</tr>
<tr>
<td>Standard compression pressure (at sea level)</td>
<td>950 kPa(9.5kg/cm²) / 300 r/min</td>
<td></td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended fuel</td>
<td>Regular unleaded gasoline</td>
<td></td>
</tr>
<tr>
<td>Fuel tank capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (including reserve)</td>
<td>4.5L (0.98lmp gal, 1.18 USgal)</td>
<td></td>
</tr>
<tr>
<td><strong>Engine oil</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication system</td>
<td>Wet sump</td>
<td></td>
</tr>
<tr>
<td>Recommended oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE20W40SE</td>
<td>Yamaha 4-cycle oil</td>
<td></td>
</tr>
<tr>
<td>EFERO X, Z, BX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20˚ -10˚ 0˚ 10˚ 20˚ 30˚ 40˚ 50˚</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE 10W-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE 10W-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE 20W-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE 20W-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic oil change</td>
<td>1.0L(0.92 lmp qt, 1.09 US qt)</td>
<td></td>
</tr>
<tr>
<td>With oil filter replacement</td>
<td>1.2L(1.10 lmp qt, 1.31 US qt)</td>
<td></td>
</tr>
<tr>
<td>Total amount</td>
<td>1.2L(1.10 lmp qt, 1.31 US qt)</td>
<td></td>
</tr>
<tr>
<td><strong>Final gear oil</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended oil</td>
<td>SAE85W140S Ehypoid gear oil</td>
<td></td>
</tr>
<tr>
<td>Periodic oil change</td>
<td>0.13L(0.12 lmp qt, 0.14 US qt)</td>
<td></td>
</tr>
<tr>
<td>Total amount</td>
<td>0.15L(0.14 lmp qt, 0.16 US qt)</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Oil filter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil filter type</td>
<td>Wire mesh</td>
<td>...</td>
</tr>
<tr>
<td><strong>Oil pump</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil pump type</td>
<td>Trochoid</td>
<td>...</td>
</tr>
<tr>
<td>Inner rotor to outer rotor tip clearance</td>
<td>0.15 mm</td>
<td>0.23 mm</td>
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<tr>
<td>Outer rotor to pump housing clearance</td>
<td>0.013-0.036 mm</td>
<td>0.106 mm</td>
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<tr>
<td>Oil pump housing to inner rotor and outer</td>
<td>0.06-0.10 mm</td>
<td>0.17 mm</td>
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<td>rotor clearance</td>
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<td><strong>Starting system type</strong></td>
<td>Electric and kick starter</td>
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<td>Spark plug</td>
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<td>Model (manufacturer) × quantity</td>
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<td>Spark plug gap</td>
<td>0.7~0.8mm</td>
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<td><strong>Cylinder head</strong></td>
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<tr>
<td>Volume</td>
<td>12.3~12.7cm³</td>
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<tr>
<td>Max. warpage</td>
<td>...</td>
<td>0.03 mm</td>
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## ENGINE SPECIFICATIONS

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<tr>
<td><strong>Camshaft</strong></td>
<td></td>
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<tr>
<td>Drive system</td>
<td>Chain drive (left)</td>
<td>...</td>
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<tr>
<td>Intake camshaft lobe dimensions</td>
<td></td>
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<tr>
<td>Measurement B</td>
<td>21.015–21.115 mm</td>
<td>20.915 mm</td>
</tr>
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<td>Measurement C</td>
<td>5.203 mm</td>
<td>...</td>
</tr>
<tr>
<td>Exhaust camshaft lobe dimensions</td>
<td></td>
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</tr>
<tr>
<td>Measurement B</td>
<td>21.056–21.156 mm</td>
<td>20.956 mm</td>
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<tr>
<td>Measurement C</td>
<td>5.203 mm</td>
<td>...</td>
</tr>
<tr>
<td>Max. camshaft runout</td>
<td>...</td>
<td>0.03 mm</td>
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## ENGINE SPECIFICATIONS

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<tr>
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<tr>
<td>Model/number of links</td>
<td>Morse 92RH2005 / 88</td>
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<td>Tensioning system</td>
<td>Automatic</td>
<td></td>
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<tr>
<td><strong>Valve, valve seats, valve guides</strong></td>
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<td></td>
</tr>
<tr>
<td>Valve clearance (cold)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>0.08–0.12 mm</td>
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</tr>
<tr>
<td>Exhaust</td>
<td>0.13–0.17 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Valve dimensions</strong></td>
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<tr>
<td>Head Diameter A</td>
<td>23.9–24.1 mm</td>
<td></td>
</tr>
<tr>
<td>Exhaust</td>
<td>20.9–21.1 mm</td>
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<tr>
<td>Valve face width B</td>
<td>1.69–2.40 mm</td>
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</tr>
<tr>
<td>Intake</td>
<td>1.69–2.40 mm</td>
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</tr>
<tr>
<td>Exhaust</td>
<td>1.69–2.40 mm</td>
<td></td>
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<tr>
<td>Valve seat width C</td>
<td>0.9–1.1 mm</td>
<td>1.6mm</td>
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<tr>
<td>Intake</td>
<td>0.9–1.1 mm</td>
<td>1.6mm</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.9–1.1 mm</td>
<td>1.6mm</td>
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<tr>
<td>Valve margin thickness D</td>
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<td></td>
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<tr>
<td>Intake</td>
<td>0.85–1.15 mm</td>
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<tr>
<td>Exhaust</td>
<td>0.85–1.15 mm</td>
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<tr>
<td><strong>Valve stem diameter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>4.475–4.490 mm</td>
<td>4.445 mm</td>
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<td>Exhaust</td>
<td>4.460–4.475 mm</td>
<td>4.430 mm</td>
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<td><strong>Valve guide inside diameter</strong></td>
<td></td>
<td></td>
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<tr>
<td>Intake</td>
<td>4.500–4.512 mm</td>
<td>4.550 mm</td>
</tr>
<tr>
<td>Exhaust</td>
<td>4.500–4.512 mm</td>
<td>4.550 mm</td>
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<tr>
<td><strong>Valve stem to valve guide clearance</strong></td>
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<tr>
<td>Intake</td>
<td>0.010–0.037 mm</td>
<td>0.080 mm</td>
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<tr>
<td>Exhaust</td>
<td>0.025–0.057 mm</td>
<td>0.100 mm</td>
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<tr>
<td><strong>Valve stem runout</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>...</td>
<td>0.010 mm</td>
</tr>
<tr>
<td>Exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Valve seat width</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>0.9–1.1 mm</td>
<td>1.6mm</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.9–1.1 mm</td>
<td>1.6mm</td>
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## Valve springs

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<tr>
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<tr>
<td>Free length</td>
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<tr>
<td>Intake</td>
<td>37.30 mm</td>
<td>35.40 mm</td>
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<tr>
<td>Exhaust</td>
<td>37.30 mm</td>
<td>35.40 mm</td>
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<tr>
<td>Installed length (valve closed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>25.77 mm</td>
<td>...</td>
</tr>
<tr>
<td>Exhaust</td>
<td>25.77 mm</td>
<td>...</td>
</tr>
<tr>
<td>Compressed spring force (installed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>147±11N (15.0 ± 1.1 kgf/mm)</td>
<td>...</td>
</tr>
<tr>
<td>Exhaust</td>
<td>147±11N (15.0 ± 1.1 kgf/mm)</td>
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**Spring tilt**

<table>
<thead>
<tr>
<th>Intake</th>
<th>...</th>
<th>2.5°/1.6 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust</td>
<td>...</td>
<td>2.5°/1.6 mm</td>
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**Winding direction (top view)**

<table>
<thead>
<tr>
<th>Intake</th>
<th>Clockwise</th>
<th>...</th>
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</thead>
<tbody>
<tr>
<td>Exhaust</td>
<td>Clockwise</td>
<td>...</td>
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**Valve seat reformed**

- Yes
- ...

## Cylinder

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<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Cylinder arrangement</td>
<td>Forward inclined single cylinder</td>
<td>...</td>
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<tr>
<td>Bore × stroke</td>
<td>51.5 × 60mm</td>
<td>...</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>9.8 ± 0.4:1</td>
<td>...</td>
</tr>
<tr>
<td>Bore</td>
<td>51.49–51.53 mm</td>
<td>...</td>
</tr>
<tr>
<td>Max. taper</td>
<td>...</td>
<td>0.05 mm</td>
</tr>
<tr>
<td>Max. out-of-round</td>
<td>...</td>
<td>0.05 mm</td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Piston</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston-to-cylinder clearance</td>
<td>0.010~0.030 mm</td>
<td>0.150mm</td>
</tr>
<tr>
<td>Diameter D</td>
<td>51.470~51.510 mm</td>
<td>...</td>
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<tr>
<td>Height H</td>
<td>3.5 mm</td>
<td>...</td>
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<tr>
<td>Piston pin bore (in the piston)</td>
<td></td>
<td></td>
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<tr>
<td>Diameter</td>
<td>13.002~13.013 mm</td>
<td>13.043 mm</td>
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<tr>
<td>Offset</td>
<td>0.35~0.65mm</td>
<td>...</td>
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<tr>
<td>Offset direction</td>
<td>Intake side</td>
<td>...</td>
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<tr>
<td>Piston pin</td>
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<tr>
<td>Outside diameter</td>
<td>12.996~13.000 mm</td>
<td>12.976 mm</td>
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<td>Piston rings</td>
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<td>Top ring</td>
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<tr>
<td>Ring type</td>
<td>Barrel</td>
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<tr>
<td>Dimensions (B × T)</td>
<td>1.0 × 2.1mm</td>
<td>...</td>
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<tr>
<td>End gap (installed)</td>
<td>0.10~0.20 mm</td>
<td>0.45mm</td>
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<tr>
<td>Ring side clearance</td>
<td>0.02~0.08 mm</td>
<td>0.13 mm</td>
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<tr>
<td>2nd ring</td>
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<tr>
<td>Ring type</td>
<td>Plain</td>
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<tr>
<td>Dimensions (B × T)</td>
<td>1.0 × 2.1mm</td>
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<tr>
<td>End gap (installed)</td>
<td>0.20~0.30 mm</td>
<td>0.65mm</td>
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<tr>
<td>Ring side clearance</td>
<td>0.02~0.06 mm</td>
<td>0.12mm</td>
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<td>Oil ring</td>
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<tr>
<td>Dimensions (B × T)</td>
<td>2.0 × 2.2 mm</td>
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<td>End gap (installed)</td>
<td>0.2~0.7 mm</td>
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<tr>
<td>Ring side clearance</td>
<td>0.06~0.15 mm</td>
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### ENGINE SPECIFICATIONS

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<thead>
<tr>
<th>Item</th>
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<th>Limit</th>
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<tbody>
<tr>
<td><strong>Rocker arm/rocker arm shaft</strong></td>
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<tr>
<td>Rocker arm inside diameter</td>
<td>10–10.015 mm</td>
<td>...</td>
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<tr>
<td>Rocker arm shaft outside diameter</td>
<td>9.981–9.991 mm</td>
<td>...</td>
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<tr>
<td>Arm-to-shaft clearance</td>
<td>0.009–0.034 mm</td>
<td>...</td>
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<tr>
<td><strong>Connecting rod</strong></td>
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<tr>
<td>Connecting rod length</td>
<td>97.95–98.05 mm</td>
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<tr>
<td>Small end inside diameter</td>
<td>13.015–13.028 mm</td>
<td>...</td>
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<tr>
<td><strong>Crankshaft</strong></td>
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<tr>
<td>Width A</td>
<td>45.15–45.20 mm</td>
<td>...</td>
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<tr>
<td>Max. runout C</td>
<td>...</td>
<td>0.03 mm</td>
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<tr>
<td>Big end side clearance D</td>
<td>0.10–0.40 mm</td>
<td>1.00 mm</td>
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<td>Big end radial clearance E</td>
<td>0–0.010 mm</td>
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<tr>
<td><strong>Clutch</strong></td>
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<td>Clutch shoe thickness</td>
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<td>Clutch housing inside diameter</td>
<td>120 ± 0.1 mm</td>
<td>120.3mm</td>
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<td>Compression spring free length</td>
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<td>Weight outside diameter</td>
<td>20 ± 0.1 mm</td>
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<td>Clutch-in revolution</td>
<td>3200±300 r/min</td>
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<tr>
<td>Clutch-stall revolution</td>
<td>5500±500 r/min</td>
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<td><strong>V-belt</strong></td>
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<td>19.5mm</td>
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<td>Transmission type</td>
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<td>Helical gear</td>
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<td>Primary reduction ratio</td>
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<td>Secondary reduction system</td>
<td>Spur gear</td>
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<td>Secondary reduction ratio</td>
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<td>Venturi tube bore</td>
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<td>Pilot air jet 1</td>
<td>160</td>
<td>...</td>
</tr>
<tr>
<td>Pilot outlet</td>
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<td>Pilot jet</td>
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<tr>
<td>Bypass 1</td>
<td>Ø0.8</td>
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</tr>
<tr>
<td>Bypass 2</td>
<td>Ø1.0</td>
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<tr>
<td>Bypass 3</td>
<td>Ø1.1</td>
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<td>Valve seat size</td>
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<td>Starter jet 1</td>
<td>40</td>
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<tr>
<td>Starter jet 2</td>
<td>0.8</td>
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<td>Throttle valve size</td>
<td>115</td>
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<td>Fuel level (using fuel level gauge)</td>
<td>6.5~7.5mm</td>
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<tr>
<td>Engine idle speed</td>
<td>1600~1700 r/min</td>
<td>...</td>
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<tr>
<td>CO% (air induction system ON)</td>
<td>0.2~1.4 %</td>
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<tr>
<td>CO% (air induction system OFF)</td>
<td>4.0~5.0 %</td>
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<tr>
<td>Oil temperature (°C)</td>
<td>70~80 °C</td>
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## ENGINE SPECIFICATIONS

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<thead>
<tr>
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<td><strong>Throttle bodys</strong></td>
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<td>5YR (SAFETY CONTROL CABLE) × 2</td>
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<td>Intake vacuum pressure</td>
<td>30.0kpa (238.6mmHg)</td>
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<td>...</td>
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<tr>
<td><strong>Frame</strong></td>
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<td>Frame type</td>
<td>Steel tube underbone</td>
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<td>Caster angle</td>
<td>32 °</td>
<td>...</td>
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<td>Trail</td>
<td>75 mm</td>
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<tr>
<td><strong>Front wheel</strong></td>
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<td>Wheel type</td>
<td>Cast wheel</td>
<td>...</td>
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<tr>
<td>Rim</td>
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<td>Size</td>
<td>10 × MT2.15</td>
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<td>Wheel travel</td>
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<td>Wheel runout</td>
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<tr>
<td>Max. radial wheel runout</td>
<td>...</td>
<td>1.0 mm</td>
</tr>
<tr>
<td>Max. lateral wheel runout</td>
<td>...</td>
<td>1.0 mm</td>
</tr>
<tr>
<td><strong>Rear wheel</strong></td>
<td></td>
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<tr>
<td>Wheel type</td>
<td>Cast wheel</td>
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<tr>
<td>Rim</td>
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<tr>
<td>Size</td>
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<tr>
<td>Material</td>
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<td>54mm</td>
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<tr>
<td>Max. radial wheel runout</td>
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<tr>
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<td>...</td>
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</tr>
<tr>
<td><strong>Front tire</strong></td>
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<tr>
<td>Tire type</td>
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<td>...</td>
</tr>
<tr>
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<td>3.50-10 51J</td>
<td>...</td>
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<tr>
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<td>C-922L (CHENG SHIN)</td>
<td>...</td>
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<tr>
<td>Tire pressure (cold)</td>
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<td></td>
</tr>
<tr>
<td>0–90 kg</td>
<td>150kpa (1.5 kg/cm², 22 psi)</td>
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</tr>
<tr>
<td>90–197 kg</td>
<td>150kpa (1.5 kg/cm², 22 psi)</td>
<td>...</td>
</tr>
<tr>
<td>Min. tire tread depth</td>
<td>...</td>
<td>0.8mm</td>
</tr>
<tr>
<td><strong>Rear tire</strong></td>
<td></td>
<td></td>
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<tr>
<td>Tire type</td>
<td>Tubeless</td>
<td>...</td>
</tr>
<tr>
<td>Size</td>
<td>3.50-10 51J</td>
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<td>0–90 kg</td>
<td>200kpa (2.0 kg/cm², 29 psi)</td>
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<tr>
<td>90–197 kg</td>
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<td>Item</td>
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<td>Limit</td>
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<tr>
<td>-------------------------------------------</td>
<td>---------------------------</td>
<td>----------------</td>
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<tr>
<td><strong>Front disc brake</strong></td>
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<td></td>
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<tr>
<td>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>Brake lever free play (at lever end)</td>
<td>3–5mm</td>
<td>...</td>
</tr>
<tr>
<td>Recommended fluid</td>
<td>DOT 4</td>
<td>...</td>
</tr>
<tr>
<td>Brake disc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter x thickness</td>
<td>180.0 × 4.0 mm</td>
<td>180.0 × 3.5 mm</td>
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<tr>
<td>Min. thickness</td>
<td>...</td>
<td>3.5mm</td>
</tr>
<tr>
<td>Max. deflection</td>
<td>...</td>
<td>0.10 mm</td>
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<tr>
<td>Brake pad lining thickness-inner</td>
<td>6.0 mm</td>
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<tr>
<td>Brake pad lining thickness-outer</td>
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<tr>
<td>Master cylinder inside diameter</td>
<td>11mm</td>
<td>...</td>
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<td>Caliper cylinder inside diameter</td>
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<td>---------</td>
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<td><strong>Rear drum brake</strong></td>
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<tr>
<td>Brake lever free play (at lever end)</td>
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<td>Brake drum inside diameter</td>
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<td>Lining thickness</td>
<td>4.0mm</td>
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<td><strong>Front suspension</strong></td>
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<td>Suspension type</td>
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<tr>
<td>Front fork type</td>
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<tr>
<td>Front fork travel</td>
<td>80 mm</td>
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<tr>
<td>Spring</td>
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<tr>
<td>Free length</td>
<td>257.5 mm</td>
<td>252.4mm</td>
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<td>Installed length</td>
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<tr>
<td>Spring rate (K1)</td>
<td>12.7N/mm (1.27 kg/mm)</td>
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</tr>
<tr>
<td>Spring stroke (K1)</td>
<td>0~50mm</td>
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<tr>
<td>Spring rate (K2)</td>
<td>19.6N/mm (1.96kg/mm)</td>
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<tr>
<td>Spring stroke (K2)</td>
<td>50~80mm</td>
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<tr>
<td>Fork oil</td>
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<tr>
<td>Recommended oil</td>
<td>Fork oil G10 or equivalent</td>
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</tr>
<tr>
<td>Quantity (each front fork leg)</td>
<td>126 ± 2.5cc</td>
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<td>Inner tube outer diameter</td>
<td>33 mm</td>
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<tr>
<td>Inner tube bending limit</td>
<td>...</td>
<td>0.2 mm</td>
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<tr>
<td>Steering bearing type</td>
<td>Angular bearing</td>
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<td>Lock to lock angle (left)</td>
<td>47.5 °</td>
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<tr>
<td>Lock to lock angle (Right)</td>
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<td><strong>Rear suspension</strong></td>
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<td>Suspension type</td>
<td>Swingarm</td>
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<td>Rear shock absorber assembly type</td>
<td>Coil spring/oil damper</td>
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<td>Rear shock absorber assembly travel</td>
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<td>Spring</td>
<td></td>
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<tr>
<td>Free length</td>
<td>208mm</td>
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<td>Installed length</td>
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<td>Spring rate (K1)</td>
<td>43N/mm (4.3kg/mm)</td>
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<td>Spring stroke (K1)</td>
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<td>Optional spring available</td>
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# Electrical Specifications

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<thead>
<tr>
<th>Item</th>
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<th>Limit</th>
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<tr>
<td><strong>System voltage</strong></td>
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<tr>
<td>Ignition system</td>
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<tr>
<td>Ignition system type</td>
<td>C.D.I.</td>
<td>...</td>
</tr>
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<td>Ignition timing (B.T.D.C.)</td>
<td>5 °/1650 r/min (IDL)</td>
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<tr>
<td>Advance type</td>
<td>Digital</td>
<td>...</td>
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<tr>
<td>Pickup coil resistance /color</td>
<td>304–456 Ω / WR-WL</td>
<td>...</td>
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<td>C.D.I. unit model (manufacturer)</td>
<td>5YR00(T-MORIC)</td>
<td>...</td>
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<td><strong>Ignition coil</strong></td>
<td>2JN (T-MORIC)</td>
<td>...</td>
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<td>Model (manufacturer)</td>
<td></td>
<td></td>
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<tr>
<td>Minimum ignition spark gap</td>
<td>6mm</td>
<td>...</td>
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<tr>
<td>Primary coil resistance</td>
<td>0.184–0.276 Ω at 20 ° C</td>
<td>...</td>
</tr>
<tr>
<td>Secondary coil resistance</td>
<td>6.32–9.48 kΩ at 20 ° C</td>
<td>...</td>
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<tr>
<td><strong>Spark plug cap</strong></td>
<td>Resin</td>
<td>...</td>
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<tr>
<td>Material</td>
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<td></td>
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<tr>
<td>Resistance</td>
<td>8~12 kΩ</td>
<td>...</td>
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<tr>
<td><strong>Charging system</strong></td>
<td>C.D.I. magneto</td>
<td>...</td>
</tr>
<tr>
<td>System type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model (manufacturer)</td>
<td>5NW 01 (T-MORIC)</td>
<td>...</td>
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<tr>
<td>Nominal output</td>
<td>14V 120W / 5000 r/min</td>
<td>...</td>
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<tr>
<td>Lighting coil resistance /color</td>
<td>0.28–0.42 Ω/B-YR</td>
<td>...</td>
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<tr>
<td>Secondary coil resistance</td>
<td>0.32–0.48 Ω/B-W</td>
<td>...</td>
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<td><strong>Voltage regulator</strong></td>
<td>Semiconductor, short circuit</td>
<td>...</td>
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<tr>
<td>Regulator type</td>
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<td>Model (manufacturer)</td>
<td>SH671-12 (XIN DIAN YUAN)</td>
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<td>No load regulated voltage(DC)</td>
<td>14–15 V</td>
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<td><strong>Rectifier</strong></td>
<td>SH671-12 (XIN DIAN YUAN)</td>
<td>...</td>
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<td>Model (manufacturer)</td>
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<td>Rectifier capacity(DC)</td>
<td>8A</td>
<td>...</td>
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<td>Withstand voltage</td>
<td>200V</td>
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<td><strong>Battery</strong></td>
<td>GTX7A-BS (GS)</td>
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<td>Battery type (manufacturer)</td>
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<td>Battery voltage capacity</td>
<td>12V 6AH</td>
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<td>Specific gravity</td>
<td>1.330</td>
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<td>Ten hour rate amperage</td>
<td>6 AH</td>
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<td><strong>Headlight type</strong></td>
<td>Krypton bulb</td>
<td>...</td>
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<td><strong>Indicator light</strong></td>
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<td></td>
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<tr>
<td>(voltage/wattage x quantity)</td>
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<td></td>
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<tr>
<td>Turn signal indicator light</td>
<td>12 V 1.7 W x 1</td>
<td>...</td>
</tr>
<tr>
<td>High beam indicator light</td>
<td>14 V 3W x 1</td>
<td>...</td>
</tr>
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## Electrical Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
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</thead>
<tbody>
<tr>
<td>Bulbs (voltage/wattage × quantity)</td>
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<tr>
<td>Headlight</td>
<td>12 V 60 W/55 W × 1</td>
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<tr>
<td>Tail/brake light</td>
<td>12 V 8W/27 W × 1</td>
<td>...</td>
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<tr>
<td>Front turn signal light</td>
<td>12 V 10 W × 2</td>
<td>...</td>
</tr>
<tr>
<td>Rear turn signal light</td>
<td>12 V 10 W × 2</td>
<td>...</td>
</tr>
<tr>
<td>Speedometer light</td>
<td>14 V 3 W × 1</td>
<td>...</td>
</tr>
<tr>
<td>Fuel lever meter light</td>
<td>14 V 3 W × 1</td>
<td>...</td>
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# ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
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<th>Limit</th>
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<tr>
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<tr>
<td>System type</td>
<td>Constant mesh</td>
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<tr>
<td>Starter motor</td>
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</tr>
<tr>
<td>Model (manufacturer)</td>
<td>4TE1 (T-MORIC)</td>
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<tr>
<td>Suction voltage</td>
<td>12V</td>
<td>...</td>
</tr>
<tr>
<td>Power output</td>
<td>0.3 kW</td>
<td>...</td>
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<tr>
<td>Brushes</td>
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<tr>
<td>Overall length</td>
<td>10.0 mm</td>
<td>3.5mm</td>
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<tr>
<td>Quantity</td>
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<tr>
<td>Spring force</td>
<td>5.52–8.28 N</td>
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<td>Commutator diameter</td>
<td>22 mm</td>
<td>21mm</td>
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<tr>
<td>Commutator resistance</td>
<td>0.0306–0.0374 Ω at 20 °C</td>
<td>...</td>
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<tr>
<td>Mica undercut (depth)</td>
<td>1.5 mm</td>
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<td><strong>Starter relay</strong></td>
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<tr>
<td>Model (manufacturer)</td>
<td>3UH1 (SHI LIN)</td>
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<tr>
<td>Amperage</td>
<td>100 A</td>
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<tr>
<td>Coil resistance</td>
<td>3.6–4.4 Ω</td>
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<td>Suction voltage</td>
<td>Below DC8V</td>
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<td><strong>Horn</strong></td>
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<td>Max. amperage</td>
<td>1.5 A</td>
<td>...</td>
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<td>Performance</td>
<td>95–105db/2m</td>
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<tr>
<td>Coil resistance</td>
<td>4.05–4.55 Ω</td>
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<td><strong>Turn signal relay</strong></td>
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<td>Relay type</td>
<td>Semi transistor</td>
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<tr>
<td>Model (manufacturer)</td>
<td>5CA9 (TA YOUNG)</td>
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<tr>
<td>Self-cancelling device built-in</td>
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<td>...</td>
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<tr>
<td>Turn signal blinking frequency</td>
<td>75–95 cycles/min</td>
<td>...</td>
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<tr>
<td>Wattage</td>
<td>10 W x 2 + 1.7 W+ AP</td>
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<tr>
<td><strong>Fuel sender</strong></td>
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</tr>
<tr>
<td>Model (manufacturer)</td>
<td>5YR1 (CHAO LONG)</td>
<td>...</td>
</tr>
<tr>
<td>Sender unit resistance-full</td>
<td>4-10 Ω</td>
<td>...</td>
</tr>
<tr>
<td>Sender unit resistance-empty</td>
<td>90-100 Ω</td>
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<td><strong>Starting circuit cut-off relay</strong></td>
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<td>09-N (SHI LIN)</td>
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<td>Coil resistance</td>
<td>54–66 Ω</td>
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<td><strong>Thermostat switch</strong></td>
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<td>Model (manufacturer)</td>
<td>1AJ (NATIONAL)</td>
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<td><strong>Carburetor heater</strong></td>
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<td>Manufacturer</td>
<td>MIKUNI</td>
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<tr>
<td>Coil resistance</td>
<td>30 Ω 20°C</td>
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### ELECTRICAL SPECIFICATIONS

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<thead>
<tr>
<th>Item</th>
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<th>Limit</th>
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<tbody>
<tr>
<td><strong>Fuel lever meter</strong></td>
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<td>Type (manufacturer)</td>
<td>Moving magneto (CHAO LONG)</td>
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<tr>
<td><strong>Fuse (amperage × quantity)</strong></td>
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<td>Main fuse</td>
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<tr>
<td>Reserve fuse</td>
<td>10A×1</td>
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CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.
Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

<table>
<thead>
<tr>
<th>METRIC</th>
<th>MULTIPLIER</th>
<th>IMPERIAL</th>
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<tr>
<td>** mm</td>
<td>0.03937</td>
<td>** in</td>
</tr>
<tr>
<td>2 mm</td>
<td>0.03937</td>
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CONVERSION TABLE

<table>
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<th>METRIC TO IMPERIAL</th>
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<tbody>
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<tr>
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<tr>
<td>m</td>
</tr>
<tr>
<td>m</td>
</tr>
<tr>
<td>cm</td>
</tr>
<tr>
<td>mm</td>
</tr>
<tr>
<td>cc (cm³)</td>
</tr>
<tr>
<td>cc (cm³)</td>
</tr>
<tr>
<td>lt (liter)</td>
</tr>
<tr>
<td>lt (liter)</td>
</tr>
<tr>
<td>kg/m³</td>
</tr>
<tr>
<td>kg/cm²</td>
</tr>
<tr>
<td>Centigrade (°C)</td>
</tr>
</tbody>
</table>

GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.

A: Width across flats
B: Thread diameter

<table>
<thead>
<tr>
<th>A (nut)</th>
<th>B (bolt)</th>
<th>General tightening torques</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mm</td>
<td>6 mm</td>
<td>Nm</td>
</tr>
<tr>
<td>12 mm</td>
<td>8 mm</td>
<td>15</td>
</tr>
<tr>
<td>14 mm</td>
<td>10 mm</td>
<td>30</td>
</tr>
<tr>
<td>17 mm</td>
<td>12 mm</td>
<td>55</td>
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<tr>
<td>19 mm</td>
<td>14 mm</td>
<td>85</td>
</tr>
<tr>
<td>22 mm</td>
<td>16 mm</td>
<td>130</td>
</tr>
<tr>
<td>Part to be tightened</td>
<td>Part name</td>
<td>Thread size</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder head and cylinder</td>
<td>Nut</td>
<td>M8</td>
</tr>
<tr>
<td>Spark plug</td>
<td>_</td>
<td>M10</td>
</tr>
<tr>
<td>Cylinder head (timing chain side)</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Mainfold stud bolt</td>
<td>_</td>
<td>M6</td>
</tr>
<tr>
<td>Exhaust pipe stud bolt</td>
<td>_</td>
<td>M6</td>
</tr>
<tr>
<td>Breather assembly</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Stopper plate</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Guide stopper 2</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Valve clearance adjusting screw lock nut</td>
<td>_</td>
<td>M5</td>
</tr>
<tr>
<td>Camshaft sprocket</td>
<td>Bolt</td>
<td>M8</td>
</tr>
<tr>
<td>Timing chain tensioner (body)</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Timing chain tensioner (plug)</td>
<td>plug</td>
<td>M8</td>
</tr>
<tr>
<td>Air shroud 1 and 2</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Fan</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Air shroud 1</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Oil pump assembly</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Cover element</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Cover element inside drain bolt</td>
<td>_</td>
<td>M6</td>
</tr>
<tr>
<td>Delivery pipe</td>
<td>Union bolt</td>
<td>M8</td>
</tr>
<tr>
<td>Delivery pipe</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Engine oil drain</td>
<td>plug</td>
<td>M35</td>
</tr>
<tr>
<td>Mainfold</td>
<td>Nut</td>
<td>M6</td>
</tr>
<tr>
<td>Air filter assembly</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Air filter case and air filter cap</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Element cap</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Carburetore overflow drain plug</td>
<td>plug</td>
<td>M6</td>
</tr>
<tr>
<td>Muffler</td>
<td>Nut</td>
<td>M6</td>
</tr>
<tr>
<td>Muffler</td>
<td>Bolt</td>
<td>M8</td>
</tr>
<tr>
<td>Protector</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Air induction system assembly</td>
<td>Screw</td>
<td>M5</td>
</tr>
<tr>
<td>AI bracket and muffler</td>
<td>Screw</td>
<td>M5</td>
</tr>
<tr>
<td>Al pipe</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Al pipe clamp</td>
<td>Hose clamp</td>
<td></td>
</tr>
<tr>
<td>Al filter</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Crankcase 1 and 2</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Crankcase cover 1</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Crankcase cover 2</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Cover 1 (magnetom)</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Drain bolt (transmission oil)</td>
<td>Bolt</td>
<td>M8</td>
</tr>
<tr>
<td>Part to be tightened</td>
<td>Part name</td>
<td>Thread size</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>----------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Drain bolt (engine oil)</td>
<td>_</td>
<td>M8</td>
</tr>
<tr>
<td>V-belt case air filter element holder</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Oil pipe</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>Cylinder stud bolt (case1)</td>
<td>_</td>
<td>M8</td>
</tr>
<tr>
<td>Cylinder stud bolt (case2)</td>
<td>_</td>
<td>M8</td>
</tr>
<tr>
<td>Crankcase cover3</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Plate (V-belt guide)</td>
<td>Screw</td>
<td>M6</td>
</tr>
<tr>
<td>Idle gear plate</td>
<td>Screw</td>
<td>M6</td>
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<tr>
<td>Kick crank assembly</td>
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<tr>
<td>Clutch housing</td>
<td>Nut</td>
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<tr>
<td>Clutch carrier assembly</td>
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</tr>
<tr>
<td>Primary fixed sheave</td>
<td>Nut</td>
<td>M12</td>
</tr>
<tr>
<td>Starter motor assembly</td>
<td>Bolt</td>
<td>M6</td>
</tr>
<tr>
<td>C.D.I. rotor</td>
<td>Nut</td>
<td>M12</td>
</tr>
</tbody>
</table>

**Cylinder head tightening sequence**

![Cylinder head diagram]
<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Thread size</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
<td>m•kgf</td>
</tr>
<tr>
<td>Frame and engine bracket 2</td>
<td>M10</td>
<td>42</td>
<td>4.2</td>
</tr>
<tr>
<td>Engine bracket 2 and engine bracket 3</td>
<td>M10</td>
<td>55</td>
<td>5.5</td>
</tr>
<tr>
<td>Engine bracket, engine and centerstand</td>
<td>M10</td>
<td>32</td>
<td>3.2</td>
</tr>
<tr>
<td>Rear shock absorber and frame</td>
<td>M10</td>
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<td>3.0</td>
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<tr>
<td>Rear shock absorber and engine</td>
<td>M8</td>
<td>18</td>
<td>1.8</td>
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<tr>
<td>Rear arm</td>
<td>M8</td>
<td>28</td>
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<tr>
<td>Sidestand (bolt)</td>
<td>M8</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Sidestand (nut)</td>
<td>M8</td>
<td>19</td>
<td>1.9</td>
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<tr>
<td>Steering shaft (upper nut)</td>
<td>M25</td>
<td>75</td>
<td>7.5</td>
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<td>Handlebar holder and steering shaft</td>
<td>M10</td>
<td>60</td>
<td>6.0</td>
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<tr>
<td>Handlebar holder and handlebar lower holder</td>
<td>M10</td>
<td>47.5</td>
<td>4.75</td>
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<tr>
<td>Handlebar lower holder and handlebar upper holder</td>
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<tr>
<td>Master cylinder assembly</td>
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<td>0.9</td>
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<td>Brake hose and master cylinder</td>
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<td>26</td>
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<tr>
<td>Fuel sender</td>
<td>M5</td>
<td>7</td>
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<tr>
<td>Rear carrier</td>
<td>M8</td>
<td>23</td>
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<tr>
<td>Rear carrier (upper)</td>
<td>M6</td>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>Front wheel shaft</td>
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<tr>
<td>Rear wheel shaft</td>
<td>M14</td>
<td>105</td>
<td>10.5</td>
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<tr>
<td>Rear brake camshaft lever</td>
<td>M6</td>
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<td>1.0</td>
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<tr>
<td>Front brake caliper pad (bolt)</td>
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<td>22</td>
<td>2.2</td>
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<tr>
<td>Front brake caliper and front fork</td>
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<td>35</td>
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<tr>
<td>Front brake disc rotor</td>
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<td>2.0</td>
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<td>Front brake hose and brake caliper</td>
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<tr>
<td>Front brake caliper and bleed screw</td>
<td>M7</td>
<td>6</td>
<td>0.6</td>
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</tbody>
</table>

**NOTE:**

1. First, tighten the ring nut (lower) approximately 28 Nm (2.8m•kg, 20.3ft•lb) by using the torque wrench, then loosen the ring nut 1/4 turn.
2. Second, tighten the ring nut (lower) approximately 9 Nm (0.9m•kg, 6.5ft•lb) by using the torque wrench.
3. Installing the rubber washer.
4. Then finger tighten the center ring nut and touch rubber washer. Align the slots both ring nut and install the lock washer.
5. Final, hold the ring nuts (lower and center) and tighten the ring nut (upper) 75Nm (7.5 m•kg, 54.2ft•lb) by using the torque wrench.

---

![Diagram of ring nut assembly](image)
### LUBRICATION POINTS AND LUBRICANT TYPES

#### ENGINE LUBRICATION POINTS AND LUBRICANT TYPES

<table>
<thead>
<tr>
<th>Lubrication Point</th>
<th>Lubricant</th>
</tr>
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<tbody>
<tr>
<td>Oil seal lips</td>
<td>LS</td>
</tr>
<tr>
<td>O-ring (Except V-belt drive unit)</td>
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<tr>
<td>Cylinder head tightening nut mounting surface</td>
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</tr>
<tr>
<td>Cylinder head stud bolt thread</td>
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</tr>
<tr>
<td>Cylinder head gasket dowel pin</td>
<td>LS</td>
</tr>
<tr>
<td>Crankshaft pin outside surface</td>
<td>M</td>
</tr>
<tr>
<td>Connecting rod</td>
<td>M</td>
</tr>
<tr>
<td>Piston outside and ring groove</td>
<td>M</td>
</tr>
<tr>
<td>Piston pin outside surface</td>
<td>M</td>
</tr>
<tr>
<td>surface and bolt thread</td>
<td>M</td>
</tr>
<tr>
<td>Crankshaft journal</td>
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<tr>
<td>Piston (balancer) outside surface</td>
<td>M</td>
</tr>
<tr>
<td>Piston pin (balancer) outside surface</td>
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</tr>
<tr>
<td>Camshaft profile journal</td>
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<tr>
<td>Valve stem (IN, EX)</td>
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<td>Valve stem seal</td>
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<td>Valve stem end (IN, EX)</td>
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<tr>
<td>Valve lifter</td>
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<tr>
<td>Oil pump assembly inside</td>
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<tr>
<td>Oil pipe union bolt thread and surface</td>
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</tr>
<tr>
<td>Gasket (Oil pump assembly)</td>
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<tr>
<td>Idle gear 1 thrust surfaces</td>
<td>LS</td>
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<tr>
<td>Idle gear 2</td>
<td>M</td>
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<tr>
<td>Drive shaft serration (Sprocket)</td>
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<tr>
<td>Drive shaft taper roller bearing</td>
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<tr>
<td>Transmission bearing</td>
<td>G</td>
</tr>
<tr>
<td>Secondary shaft bearing (right)</td>
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</tr>
<tr>
<td>Primary sheave oil seal</td>
<td>G</td>
</tr>
<tr>
<td>Lubrication Point</td>
<td>Lubricant</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Primary sheave inside, Collar, Solid bush,</td>
<td>BEL-RAY assembly lube</td>
</tr>
<tr>
<td>Secondary fixed inner surface</td>
<td>BEL-RAY assembly lube</td>
</tr>
<tr>
<td>Secondary sheave torque cam ditch</td>
<td>BEL-RAY assembly lube</td>
</tr>
<tr>
<td>Gasket (Cylinder head cover)</td>
<td>Sealant</td>
</tr>
<tr>
<td>Stopper guide (Cylinder head cover)</td>
<td>Sealant</td>
</tr>
<tr>
<td>Crankcase mating surfaces</td>
<td>Sealant</td>
</tr>
<tr>
<td>Oil pipe</td>
<td>Sealant</td>
</tr>
<tr>
<td>C.D.I. magneto lead grommet</td>
<td>Sealant</td>
</tr>
<tr>
<td>Lubrication Point</td>
<td>Lubricant</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Front wheel oil seal lips</td>
<td>LS</td>
</tr>
<tr>
<td>Frame head pipe bearing (upper and lower)</td>
<td>LS</td>
</tr>
<tr>
<td>Frame head pipe dust seal lips (lower)</td>
<td>LS</td>
</tr>
<tr>
<td>Tube guide (throttle grip) inner surface</td>
<td>LS</td>
</tr>
<tr>
<td>Brake lever and lever holder bolt sliding surface</td>
<td>LS</td>
</tr>
<tr>
<td>Sidestand and frame sliding surface</td>
<td>LS</td>
</tr>
<tr>
<td>Centerstand sliding surface and mounting bolt</td>
<td>LS</td>
</tr>
<tr>
<td>Rear footrest (pin) outside surface</td>
<td>LS</td>
</tr>
<tr>
<td>Rear shock absorber backward, bush inner surface and spacer sliding surface</td>
<td>M</td>
</tr>
<tr>
<td>Seat lock cable and cylinder inner surface</td>
<td>LS</td>
</tr>
<tr>
<td>Engine bracket and engine mound bolt sliding surface</td>
<td>LS</td>
</tr>
</tbody>
</table>
OIL FLOW DIAGRAMS

1. Oil strainer
2. Oil pump
3. Oil filter
4. Oil delivery pipe
5. Oil delivery pipe union bolt
Connecting rod big end bearing
CABLE ROUTING

1. Turn signal relay
2. Main switch assembly
3. Seat lock cable
4. Horn
5. Rectifier / regulator assembly
6. Starter motor negative lead
7. Wire (negative lead)
8. Starter motor positive lead
9. C.D.I. magneto lead
10. C.D.I. unit
11. Pipe 2
12. Al. filter assembly
13. Clamp
14. Vacuum sensing hose
15. Wire harness
16. Side cover (right)
17. Frame Comp.
18. Speedometer cable
19. Front brake hose
20. Throttle cable 1,2
21. Rear brake cable
22. Speedometer lead
23. Auto choke lead

A. Fasten the wire harness, rear brake cable and throttle cable 1,2 to the frame and cut the end to be shorter than 5mm.
B. Route the front brake hose through the under fender and inner fender right side hole.
C. Route the front brake hose through the front brake hose holder.
D. Color white mark to the outside.
E. The seat lock cable pass the frame right side hole into frame inside, protector part to the hole position.
F. Clamp the wire harness, wire positive lead and wire negative lead to the frame, clamp position to the white mark and press to tighten.
G. Fasten the wire harness, wire positive lead and starter motor negative lead to the frame with a plastic locking tie, point the band tip to forward.
H. Fasten the C.D.I. magneto lead and wire harness to the frame with a plastic locking tie, point the band tip to upper and the trunk surface.
I. Secure the ground lead and the ignition coil base to the ignition coil stay.
**CABLE ROUTING**

[J] Fasten the C.D.I. unit lead and wire harness to the frame with a plastic locking tie, point the band tip to upper and the trunk surface.

[K] Fasten the wire harness to the frame and cut the end to be shorter than 5mm.

[L] Pass the seat lock cable along the outside of the reinforced tail.

[M] Installing the bend hose 5 to the Air Filter assembly, into the frame inside.

[N] Route the trail light lead and rear turn signal light lead through the rear cover hole.

[O] The tail light through the base hole.
1. Lever holder assembly (left side)
2. Rear brake cable
3. Throttle cable 1 (left turn side)
4. Throttle cable 2 (right turn side)
5. Breather hose
6. Carburetor air vent hose
7. Spacer
8. Fuel overflow pipe
9. Crankcase cover 3
10. Starter air vent hose
11. Head light unit
12. Front turn signal light
13. Turn signal relay
14. Fuel lever meter
15. Main switch assembly
16. Horn

A. Pass the speedometer cable left side the inner fender and front fender hole.
B. Pass the speedometer cable through the speedometer cable holder.
C. Pass the rear brake cable through the rear brake cable holder.
D. Pass the rear brake cable over the engine bracket cross tube bar.
E. Route the vacuum sensing hose between throttle cable 1 and throttle cable 2.
F. Clamp the canister pipe, breather hose and fuel cock vacuum hose, the end of down.
G. Clamp the canister pipe, fuel hose and fuel cock vacuum hose.
H. The filler cover and fuel overflow hose into the spacer.
I. Pass the fuel overflow hose outside the rear bracket.
J. Pass the fuel overflow hose through license bracket holder.
K. Pass the carburetor overflow hose through shroud and crankcase cover 3 breach.
L. The fuel lever meter lead terminal through the leg shield 2.
M. Clamp the wire harness and head light lead to the turn signal bracket.
① Seat lock cable
② Carburetor heater lead
③ Carburetor autochoke lead
④ Starter switch lead
⑤ Starter motor positive lead
⑥ Starter motor negative lead
⑦ High tension cord
⑧ Clamp
⑨ C.D.I. magneto lead
⑩ Vacuum sensing hose
⑪ Joint
⑫ Carburetor air vent hose
⑬ Starter air vent hose
⑭ Wire (positive lead)

A Pass the sidestand switch lead under the rear brake cable and throttle cable 1,2.
B Pass the sidestand switch lead under the frame.
C Pass the throttle cable, wire harness and rear brake cable under the frame cross tube.
D Pass the thermo switch lead under the frame.
E Pass the positive and negative battery leads through the slot in the footrest board.
F Fasten the autochoke lead and heater lead to the cross tube and cut the end to be shorter than 5mm.
G Fasten the vacuum sensing hose, starter motor positive lead, C.D.I. magneto lead and high tension cord, and the vacuum sensing hose to the over position and cut the end.
H Clamp the starter motor lead and C.D.I. magneto lead.
I Pass the fuel overflow hose along the left side of the fuel tank.
J Route the autochoke lead and heater lead between vacuum sensing hose and fuel cock vacuum hose.
K Pass the breather hose right side the throttle cable.
L Fasten the breather hose, autochoke lead, heater lead and throttle cable 1, 2. Breather hose to the over position and cut the end.
M Pass the throttle cable, wire harness and rear brake cable outside the inner fender rib.

CABLE ROUTING

A B C D E F G H I J K L M

1 2 3 4 5 6 7 8 9 10 11 12 13 14
CHAPTER 3
PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

Periodic maintenance chart for the emission control system

GENERAL MAINTENANCE AND LUBRICATION CHART

General maintenance and lubrication chart

COVER AND PANEL

SEAT AND SIDE COVERS
FOOTREST BOARD AND FOOTREST BOARD SIDE COVER MOLE
LEG SHIELD 1, 2

ADJUSTING THE VALVE CLEARANCE

ENGINE

ADJUSTING THE VALVE CLEARANCE

ADJUSTING THE ENGINE IDLING SPEED

ADJUSTING THE ENGINE IDLING SPEED

CHECKING THE EXHAUST GAS AT IDLE

CHECKING THE EXHAUST GAS AT IDLE

ADJUSTING THE THROTTLE CABLE FREE PLAY

ADJUSTING THE THROTTLE CABLE FREE PLAY

CHECKING THE SPARK PLUG

CHECKING THE SPARK PLUG

CHECKING THE IGNITION TIMING

CHECKING THE IGNITION TIMING

MEASURING THE COMPRESSION PRESSURE

MEASURING THE COMPRESSION PRESSURE

CHECKING THE ENGINE OIL LEVEL

CHECKING THE ENGINE OIL LEVEL

CHECKING THE ENGINE OIL

CHANGING THE ENGINE OIL

CHANGING THE ENGINE OIL FILTER ELEMENT

CHANGING THE ENGINE OIL FILTER ELEMENT

CHANGING THE TRANSMISSION OIL

CHANGING THE TRANSMISSION OIL

MEASURING THE ENGINE OIL PRESSURE

MEASURING THE ENGINE OIL PRESSURE
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PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION
This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

NOTE:
The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.
From 30,000 km, repeat the maintenance intervals starting from 6,000 km.
Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.
Periodic maintenance chart for the emission control system

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>ROUTINE</th>
<th>ODOMETER READING</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>600 mi</td>
<td>2,000 mi</td>
<td>4,000 mi</td>
<td>6,000 mi</td>
<td>8,000 mi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1,000 km) or 1</td>
<td>(4,000 km) or 6</td>
<td>(7,000 km) or 12</td>
<td>(10,000 km) or 18</td>
<td>(13,000 km) or 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>month</td>
<td>months</td>
<td>months</td>
<td>months</td>
<td>months</td>
</tr>
<tr>
<td>1</td>
<td>Fuel line</td>
<td>• Check fuel hoses and vacuum hose for cracks or damage.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Valves</td>
<td>• Check valve clearance. • Adjust if necessary.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Spark plug</td>
<td>• Check condition. • Clean and regap. • Replace.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Air filter element</td>
<td>• Clean. • Replace.</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Crankcase breather system</td>
<td>• Check breather hose for cracks or damage. • Replace if necessary.</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Carburetor</td>
<td>• Adjust engine idling speed.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>Exhaust system</td>
<td>• Check for leakage. • Tighten if necessary. • Replace gaskets if necessary.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Evaporative emission control system</td>
<td>• Check control system for damage. • Replace if necessary.</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Air induction system</td>
<td>• Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

**NOTE:**
From 10000 mi (16000 km) or 30 months, repeat the maintenance intervals starting from 2000 mi (4000 km) or 6 months.
General maintenance and lubrication chart

* Since these items require special tools, data and technical skills, have a Yamaha dealer perform the service.

NOTE:
From 12000 mi (18000 km) or 36 months, repeat the maintenance intervals starting from 4000 mi (7000 km) or 12 months.

<table>
<thead>
<tr>
<th>NO.</th>
<th>Item</th>
<th>Routine</th>
<th>Odometer Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Routine</td>
<td>600 mi (1,000 km) or 1 month</td>
</tr>
<tr>
<td>1 *</td>
<td>V-belt case air filter elements</td>
<td>• Clean.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace.</td>
<td></td>
</tr>
<tr>
<td>2 *</td>
<td>Front brake</td>
<td>• Check operation, fluid level and vehicle for fluid leakage. (See NOTE)</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace brake pads.</td>
<td></td>
</tr>
<tr>
<td>3 *</td>
<td>Rear brake</td>
<td>• Check operation and adjust brake lever free play.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace brake shoes.</td>
<td></td>
</tr>
<tr>
<td>4 *</td>
<td>Brake hose</td>
<td>• Check for cracks or damage.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace. (See NOTE)</td>
<td></td>
</tr>
<tr>
<td>5 *</td>
<td>Wheels</td>
<td>• Check runout and for damage.</td>
<td>✓</td>
</tr>
<tr>
<td>6 *</td>
<td>Tires</td>
<td>• Check tread depth and for damage.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace if necessary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check air pressure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Correct if necessary.</td>
<td></td>
</tr>
<tr>
<td>7 *</td>
<td>Wheel bearings</td>
<td>• Check bearing for looseness or damage.</td>
<td>✓</td>
</tr>
<tr>
<td>8 *</td>
<td>Steering bearings</td>
<td>• Check bearing play and steering for roughness.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lubricate with lithium-soap-based grease.</td>
<td></td>
</tr>
<tr>
<td>9 *</td>
<td>Chassis fasteners</td>
<td>• Make sure that all nuts, bolts and screws are properly tightened.</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>Sidestand, centerstand</td>
<td>• Check operation.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lubricate.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Sidestand switch</td>
<td>• Check operation.</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>Front fork</td>
<td>• Check operation and for oil leakage.</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>Shock absorber assembly</td>
<td>• Check operation and shock absorber for oil leakage.</td>
<td>✓</td>
</tr>
<tr>
<td>14</td>
<td>Engine oil</td>
<td>• Change.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check oil level and vehicle for oil leakage.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Engine oil filter element</td>
<td>• Clean.</td>
<td>✓</td>
</tr>
<tr>
<td>16</td>
<td>Engine oil strainer</td>
<td>• Clean.</td>
<td>✓</td>
</tr>
<tr>
<td>17</td>
<td>Final transmission oil</td>
<td>• Change.</td>
<td>✓</td>
</tr>
<tr>
<td>18</td>
<td>V-belt</td>
<td>• Replace.</td>
<td>✓</td>
</tr>
<tr>
<td>19</td>
<td>Front and rear brake switches</td>
<td>• Check operation.</td>
<td>✓</td>
</tr>
<tr>
<td>20</td>
<td>Moving parts and cables</td>
<td>• Lubricate.</td>
<td>✓</td>
</tr>
<tr>
<td>21</td>
<td>Throttle grip housing and cable</td>
<td>• Check operation and free play.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adjust the throttle cable free play if necessary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lubricate the throttle grip housing and cable.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Lights, signals and switches</td>
<td>• Check operation.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adjust headlight beam.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake system
  - When disassembling the master cylinder or caliper cylinder, always replace the brake fluid.
    Check the brake fluid level regularly and fill as required.
  - Replace the oil seals on the inner parts of the master cylinder and caliper cylinder every two years.
  - Replace the brake hoses every four years or if cracked or damaged.
Removing the seat and side covers

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear carrier</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Side cover( left )</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Side cover( right)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hook( left )</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hook( right )</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Front cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fuel tank cap</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rear cover</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>11</td>
<td>Tail / brake light</td>
<td>1</td>
<td>cedure.</td>
</tr>
<tr>
<td>12</td>
<td>License plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Trunk</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

23Nm(2.3mkg, 16.6 ft-lb)
### FOOTREST BOARD AND FOOTREST BOARD SIDE COVER MOLE

- **Removing the footrest board and footrest board side cover mole**
  - Side covers (left and right)
  - Mat
  - Battery cover
  - Battery negative (-) lead
  - Battery positive (+) lead
  - Battery
  - Footrest board side cover mole (left)
  - Footrest board side cover mole (right)
  - Footrest board

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mat</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to &quot;SEAT AND SIDE COVERS&quot;</td>
</tr>
<tr>
<td>2</td>
<td>Battery cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Battery negative (-) lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Battery positive (+) lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Battery</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Footrest board side cover mole (left)</td>
<td>1</td>
<td><strong>CAUTION:</strong> First, disconnect the negative battery lead, and then the positive battery lead.</td>
</tr>
<tr>
<td>7</td>
<td>Footrest board side cover mole (right)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Footrest board</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
### LEG SHIELD 1, 2

**Removing the leg shield 1,2**
Footrest board

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Headlight cover</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “FOOTREST BOARD AND FOOTREST BOARD SIDE COVER MOLE”</td>
</tr>
<tr>
<td>2</td>
<td>Headlight assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Front turn signal light bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Leg shield 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Main switch cover</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>6</td>
<td>Fuel lever meter</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Leg shield 2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
ADJUSTING THE VALVE CLEARANCE

ENGINE

ADJUSTING THE VALVE CLEARANCE
The following procedure applies to all of the valves.

NOTE:

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Remove:
   - cover
   - rear carrier
   - side cover (right,left )
   - hook
   - front cover
   - spark plug cap
   Refer to “COVER AND PANEL”.

2. Remove:
   - spark plug
   - engine oil cap
   - valve cover (exhaust )
   - cap①

3. Measure:
   - valve clearance
   Out of specification → Adjust.

   **Valve clearance (cold)**
   Intake valve
   0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
   Exhaust valve
   0.13 ~ 0.17 mm (0.005 ~ 0.007 in)
ADJUSTING THE VALVE CLEARANCE

a. Turn the crankshaft counterclockwise.
b. When the piston is at TDC on the compression stroke, align the punch mark in the camshaft sprocket with the stationary on the cylinder head.
c. Align the TDC mark 1 on the magneto rotor with the stationary pointer 2 on the crankcase.
d. Measure the valve clearance with a thickness gauge.
   Out of specification → Adjust.

4. Adjust:
   • valve clearance

a. Loosen the locknut 1.
b. Insert a thickness gauge 2 between the end of the adjusting screw and the valve tip.
c. Turn the adjusting screw 3 in direction a or b until the specified valve clearance is obtained.

<table>
<thead>
<tr>
<th>Direction</th>
<th>Valve clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Increased</td>
</tr>
<tr>
<td>b</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

Tappet adjusting tool
90890-01311 (YM-08035-A)

d. Hold the adjusting screw to prevent it from moving and tighten the locknut to specification.
   • locknut

\[ 7 \text{ Nm (0.7 m·kg, 5.1 ft·lb)} \]

e. Measure the valve clearance again.
f. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

******************************************************************************
5. Install:
• cap
• spark plug

\[12.5 \text{Nm (1.25 m \cdot kg, 9 ft \cdot lb)}\]

• valve cover (exhaust)
• engine oil cap

6. Install:
• spark plug cap
• front cover
• hook
• side cover (right, left)
• rear carrier
• cover
Refer to “COVER AND PANEL”.
ADJUSTING THE ENGINE IDLING SPEED

NOTE: 
Prior to adjusting the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.

2. Connect:
   - engine tachometer
   (onto the spark plug lead of cylinder)

   ![Engine tachometer](90890-03113 (YU-08036-C))

3. Check:
   - engine idling speed
     Out of specification → Adjust

   ![Engine idling speed](1600 ~ 1700 r/min)

4. Adjust:
   - engine idling speed

   ****************************************************
   a. Turn the throttle stop screw in direction a or b until the specified engine idling speed is obtained.

<table>
<thead>
<tr>
<th>Direction</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Engine idling speed is increased.</td>
</tr>
<tr>
<td>b</td>
<td>Engine idling speed is decreased.</td>
</tr>
</tbody>
</table>

   ****************************************************

5. Adjust:
   - throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY”.

   ![Throttle cable free play](3 ~ 5 mm (0.12 ~ 0.20 in))
CHECKING THE EXHAUST GAS AT IDLE  
(Measuring the exhaust gas at idle[when air induction system is operation])

1. Stand the scooter on a level surface.

**NOTE:**
- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Install:
   - pocket tester (onto the engine oil drain bolt)
   - engine tachometer (onto the spark plug lead)

   **Pocket tester**
   90890-03132 (YU-03112-C)

   **Engine tachometer**
   90890-03113 (YU-08036-C)

3. Start the engine and warm it up until the specified oil temperature is reached.

   **Oil temperature**
   70–80°C

4. Measure:
   - engine idling speed
     Out of specification → Adjust.
     Refer to "ADJUSTING THE ENGINE IDLING SPEED"

   **Engine idling speed**
   1600 ~ 1700 r/min

5. Install:
   - carbon monoxide and hydrocarbon tester (onto the engine oil drain bolt)
   - sampling probe (onto the spark plug lead)
   - engine tachometer (onto the spark plug lead)
CHECKING THE EXHAUST GAS AT IDLE

NOTE:
- Since it is necessary to insert the sampling probe 600mm into the exhaust pipe, be sure to use a heat-resistant rubber tube as shown in the illustration.
- Be sure to set the heat-resistant rubber tube so that exhaust gas does not leak out.
- Before using the carbon monoxide and hydrocarbon tester, be sure to read the user’s manual.

6. Measure:
- carbon monoxide density
- hydrocarbon density

<table>
<thead>
<tr>
<th>Carbon monoxide density (when air induction system is operating)</th>
<th>0.2%~1.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocarbon density (when air induction system is operating)</td>
<td>1000ppm below</td>
</tr>
</tbody>
</table>

Out of specification → Check air induction system.
Refer to “AIR INDUCTION SYSTEM” in chapter 6.
ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:
Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted properly.

1. Check:
   - throttle cable free play
     Out of specification → Adjust.

   Throttle cable free play (at the flange of the throttle grip)
   3 ~ 5 mm (0.12 ~ 0.20 in)

2. Remove:
   - cover
   - rear carrier
   - side cover (right)
     Refer to "COVER AND PANEL".

3. Adjust:
   - throttle cable free play

****************************************************
Carburetor side
a. Loosen the locknut ①.
b. Turn the adjusting nut ② in direction ③ or ④ until the specified throttle cable free play is obtained.

<table>
<thead>
<tr>
<th>Direction ③</th>
<th>Throttle cable free play is increased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction ④</td>
<td>Throttle cable free play is decreased.</td>
</tr>
</tbody>
</table>

c. Tighten the locknuts.

NOTE:
If the specified throttle cable free play cannot be obtained on the carburetor side of the cable, use the adjusting nut on the handlebar side.
Handlebar side
a. Loosen the locknut ①.
b. Turn the adjusting nut ② in direction ③ or ④ until the specified throttle cable free play is obtained.

c. Tighten the locknut.

**WARNING**

After adjusting the throttle cable free play, start the engine and turn the handlebar to the right and to the left to ensure that this does not cause the engine idling speed to change.

---

4. Install:
   - side cover (right)
   - rear carrier
   - cover

Refer to “COVER AND PANEL”.

---
CHECKING THE SPARK PLUG

1. Remove:
   • cover
   Refer to “COVER AND PANEL”.
2. Disconnect:
   • spark plug cap
3. Remove:
   • spark plug

CAUTION:
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

4. Check:
   • spark plug type
     Incorrect → Change.

5. Check:
   • electrode
     Damage/wear → Replace the spark plug.
   • insulator
     Abnormal color → Replace the spark plug.
     Normal color is medium-to-light tan.

6. Clean:
   • spark plug
     (with a spark plug cleaner or wire brush)

7. Measure:
   • spark plug gap
     (with a wire Thickness gauge)
     Out of specification → Regap.

8. Install:
   • spark plug
     \[12.5 \text{ Nm (1.25 m} \cdot \text{kg, 9 ft} \cdot \text{lb)}\]

NOTE:
Before installing the spark plug, clean the spark plug and gasket surface.

9. Connect:
   • spark plug cap
10. Install:
    • cover
    Refer to “COVER AND PANEL”.

Spark plug type (manufacturer)
CR7E (NGK)

Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.032 in)
NOTE: Prior to checking the ignition timing, check the wiring connections of the entire ignition system. Make sure all connections are tight and free of corrosion.

1. Remove:
   - cap ①
2. Attach:
   - timing light
   - engine tachometer
   (onto the spark plug lead of cylinder)

3. Check:
   - ignition timing

a. Start the engine, warm it up for several minutes, and then let it run at the specified engine idling speed.

<table>
<thead>
<tr>
<th>Oil temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>70~80°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engine idling speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600 ~ 1700 r/min</td>
</tr>
</tbody>
</table>

b. Check that the mark ① on the magneto rotor is within the firing range ② on the crankcase.
   Incorrect firing range → Check the ignition system.

NOTE:
The ignition timing is not adjustable.

4. Remove:
   - timing light
   - engine tachometer
5. Install:
   - cap
MEASURING THE COMPRESSION PRESSURE

NOTE:
Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - valve clearance
     Out of specification → Adjust
     Refer to “ADJUSTING THE VALVE CLEARANCE”.

2. Start the engine, warm it up for several minutes, and then turn it off.

3. Remove:
   - cover
   - rear carrier
   - side cover (right, left)
   - hook
   - front cover
     Refer to “COVER AND PANEL”.

4. Disconnect:
   - spark plug cap

5. Remove:
   - spark plug

CAUTION:
Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.

6. Install:
   - compression gauge ①

Compression gauge
90890-03081
YU-33223
7. Measure:
   - compression pressure
     - Out of specification → Refer to steps (c) and (d).

<table>
<thead>
<tr>
<th>Compression pressure (at sea level)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum</strong></td>
</tr>
<tr>
<td>827 kPa (8.27 kg/cm², 400r/min)</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>950 kPa (9.5 kg/cm², 400r/min)</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
</tr>
<tr>
<td>1064 kPa (10.64 kg/cm², 400r/min)</td>
</tr>
</tbody>
</table>

a. Set the main switch to “ON”.
b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

**WARNING**

To prevent sparking, ground the spark plug lead before cranking the engine.

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces, and piston crown for carbon deposits.
   Carbon deposit → Eliminate.
d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.
   Refer to the following table.

<table>
<thead>
<tr>
<th>Compression pressure (with oil applied into the cylinder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
</tr>
<tr>
<td>Diagnosis</td>
</tr>
<tr>
<td>Higher than without oil</td>
</tr>
<tr>
<td>Piston ring wear or damage → Repair.</td>
</tr>
<tr>
<td>Same as without oil</td>
</tr>
<tr>
<td>Piston, valves, cylinder head gasket or piston possibly defective → Repair.</td>
</tr>
</tbody>
</table>

8. Remove:
   - compression gauge
9. Install:
   - spark plug

12.5 Nm (1.25 m • kg, 9ft • lb)
10. Connect:
   - spark plug cap
11. Install:
- front cover
- hook
- side cover (right, left)
- rear carrier
- cover

Refer to “COVER AND PANEL”.

MEASURING THE COMPRESSION PRESSURE

chk
adj
CHECKING THE ENGINE OIL LEVEL

1. Stand the scooter on a level surface.

NOTE:
- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Start the engine, warm it up for several minutes, and then turn it off.

3. Check:
   - engine oil level (\(\text{\textbullet}\) engine oil level 1)
     The engine oil level should be between the minimum level mark (a) and maximum level mark (b).
     Below the minimum level mark → Add the recommended engine oil to the proper level.

4. Start the engine, warm it up for several minutes, and then turn it off.

5. Check the engine oil level again.

NOTE:
Before checking the engine oil level, wait a few minutes until the oil has settled.

- Do not allow foreign materials to enter the crankcase.

Recommended oil
Refer to the chart for the engine oil grade which is best suited for certain atmospheric temperatures.
API standard
SE or higher grade

CAUTION:

Before checking the engine oil level, wait a few minutes until the oil has settled.
CHANGING THE ENGINE OIL

1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.
3. Remove:
   - engine oil filler cap [1]
   - engine oil drain bolt [2]
     (along with the gasket)
4. Drain:
   - engine oil
     (completely from the crankcase)
5. If the oil filter element is also to be cleaned, perform the following procedure.
   a. Remove the oil strainer cover [1] and oil filter element [2].
   b. Replace the O-ring [3]
   c. Install the oil strainer cover.

<table>
<thead>
<tr>
<th>Oil strainer cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 Nm (3.2 m • kg, 23.1 ft • lb)</td>
</tr>
</tbody>
</table>

6. Install:
   - engine oil drain bolt
     (along with the gasket)

   23 Nm (2.3 m • kg, 16.6 ft • lb)

7. Fill:
   - crankcase
     (with the specified amount of the recommended engine oil)

<table>
<thead>
<tr>
<th>Periodic oil change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 L (0.92 imp qt, 1.09 US qt)</td>
</tr>
</tbody>
</table>

8. Install:
   - engine oil filler cap
9. Start the engine, warm it up for several minutes, and then turn it off.
10. Check:
    - engine
      (for engine oil leaks)
11. Check:
- engine oil level
  Refer to “CHECKING THE ENGINE OIL LEVEL”.

12. Check:
- engine oil pressure
  Refer to “CHECKING THE ENGINE OIL PRESSURE”.

CHANGING THE ENGINE OIL FILTER ELEMENT

1. Drain:
- engine oil

2. Remove:
- oil delivery pipe bolt
- copper washers

3. Remove:
- oil filter element cover
- o-ring
- oil filter element

4. Install:

**CAUTION:**
Be careful because it causes an engine trouble when the attachment direction of the oil filter element is mistaken.

- oil filter element
- o-ring
- oil filter element cover

8 Nm (0.8 m·kg, 5.8 ft·lb)

- copper washers
- oil delivery pipe bolt

10 Nm (1.0 m·kg, 7.2 ft·lb)
Check it under the condition that a check bolt is surely loosened because oil erupts when a check bolt is removed and an engine is started.

5. Fill:
- crankcase
  Refer to “CHECKING THE ENGINE OIL”.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without oil filter element replacement</td>
<td>1.2L (1.10 Imp qt, 1.31 US qt)</td>
</tr>
<tr>
<td>Periodic oil change</td>
<td>1.0 L (0.92 Imp qt, 1.09 US qt)</td>
</tr>
</tbody>
</table>
CHANGING THE TRANSMISSION OIL

1. Stand the scooter on a level surface.

NOTE:
- Stand the scooter on a suitable stand.
- Make sure that the scooter up right.

2. Start the engine, warm it up for several minutes, and then turn it off.
3. Place a container under the transmission.

4. Remove:
   - Oil filler cap
   - Transmission oil drain bolt
   - Completely drain the transmission oil

5. Install:
   - Transmission oil drain bolt

   23 Nm (2.3 m•kg, 16.6 ft•lb)

6. Fill:
   - Transmission oil
      (with the specified amount of the recommended transmission oil)

<table>
<thead>
<tr>
<th>Total amount</th>
<th>0.15L (0.14 Imp qt, 0.16 US qt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodic oil change</td>
<td>0.13L (0.12 Imp qt, 0.14 US qt)</td>
</tr>
<tr>
<td>Recommended oil</td>
<td>SAE85W140SE</td>
</tr>
</tbody>
</table>

7. Install:
   - O-ring
   - Oil filler cap

8. Start the engine for several minutes to warm it up and check for the oil leakage.
MEASURING THE ENGINE OIL PRESSURE

1. Check:
   • engine oil level
     Below the minimum level mark → Add the recommended engine oil to the proper level.
     Refer to “CHECKING THE ENGINE OIL LEVEL”.
  2. Start the engine, warm it up for several minutes, and then turn it off.

**CAUTION:**
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.

3. Remove:
   • cover
     Refer to “COVER AND PANEL”.

4. Lossen:
   • gallery bolt ①

**WARNING**
The engine, muffler and engine oil are extremely hot.

5. Check:
   • engine oil pressure

   a. Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt.
      If no engine oil comes out after one minute, turn the engine off so that it will not seize.
   b. Check the engine oil passages, the oil filter and oil pump for damage or leakage. Refer to "OIL PUMP" in chapter 5.
   c. Start the engine after solving the problem(s) and check the engine oil pressure again.

6. Install:
   • gallery bolt
CLEANING THE AIR FILTER ELEMENT

1. Remove:
   - air filter case cover ①
   - air filter element ②

2. Check:
   - air filter element
     Damage → Replace.

CLEANING THE V-BELT CASE AIR FILTER ELEMENT

1. Remove:
   - kick starter ①
   - damper cover ②

2. Remove:
   - V-belt case air filter element holder ①
   - V-belt case air filter element ②

**NOTE:**
When assembling the element, the yellow side (the coarser side) must face the case cover side of the air cleaner. Wrong side assembling will result in failure of filtering. Moreover, the element should be tightly sealed with the case cover of the crank to prevent from air leakage.

3. Check:
   - V-belt case air filter element ①
     Damage → Replace.

4. Clean:
   - V-belt case air filter element ① (with solvent)

**WARNING**
Never use low flash point solvents, such as gasoline, to clean the air filter element. Such solvents may cause a fire or an explosion.
CLEANING THE V-BELT CASE AIR FILTER ELEMENT

NOTE: After cleaning, gently squeeze the V-belt case air filter element to remove the excess solvent.

CAUTION: Do not twist the V-belt case air filter element when squeezing it.

5. Apply the recommended oil to the entire surface of the air filter element and squeeze out the excess oil. The air filter element should be wet but not dripping.

Recommended oil
Engine oil

6. Install:
   ● element ①

7. Install:
   ● element holder ①
   \[7 \text{ Nm (0.7 m} \cdot \text{kg, 5.1 ft} \cdot \text{lb)}\]

8. Install:
   ● damper cover ①
   ● kick starter ②
   \[23 \text{ Nm (2.3 m} \cdot \text{kg, 16.6 ft} \cdot \text{lb)}\]
CHECKING THE CARBURETOR JOINT AND INTAKE MANIFOLD

1. Remove:
   ● cover
   ● rear carrier
   ● side cover (right, left)
   ● seat
   ● hook
   ● front cover
   ● fuel tank cap
   ● rear cover
   ● trunk
   Refer to “COVER AND PANEL”.

2. Check:
   ● carburetor joint ①
   ● intake manifold ②
   Cracks/damage → Replace.
   Refer to “CARBURETOR” in chapter 6.

3. Install:
   ● trunk
   ● rear cover
   ● fuel tank cap
   ● front cover
   ● hook
   ● seat
   ● side cover (right, left)
   ● rear carrier
   ● cover
   Refer to “COVER AND PANEL”.
CHECKING THE FUEL AND VACUUM HOSES

The following procedure applies to all of the fuel and vacuum hoses.

1. Remove:
   • cover
   • rear carrier
   • side cover (left)
     Refer to “COVER AND PANEL”.

2. Check:
   • vacuum hose ①
   • fuel hose ②
     Cracks/damage → Replace.
     Loose connection → Connect properly.

3. Install:
   • side cover (left)
   • rear carrier
   • cover
     Refer to “COVER AND PANEL”.

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:
   • cover
     Refer to “COVER AND PANEL”.

2. Check:
   • crankcase breather hose ①
     Cracks/damage → Replace.
     Loose connection → Connect properly.

   CAUTION: Make sure the crankcase breather hose is routed correctly.

3. Install:
   • cover
     Refer to “COVER AND PANEL”.
CHECKING THE EXHAUST SYSTEM

The following procedure applies to all of the muffler assembly and gaskets.

1. Remove:
   - hose (from air filter)
   - vacuum hose
   - hose (to cylinder head)
   - air cut-off valve assembly
   Refer to “AIR INDUCTION SYSTEM” in chapter 6.

2. Check:
   - muffler assembly
     Cracks/damage → Replace.
   - gasket
     Exhaust gas leaks → Replace.

3. Check:
   - tightening torque

   Muffler assembly nut
   10 Nm (1.0 m • kg, 7.2 ft • lb)

   Muffler and rear arm bolt
   31 Nm (3.1 m • kg, 22.4 ft • lb)

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

4. Install:
   - air cut-off valve assembly
   - hose (to cylinder head)
   - vacuum hose
   - hose (from air filter)
   Refer to “AIR INDUCTION SYSTEM” in chapter 6.
ADJUSTING THE FRONT BRAKE

1. Check:
   • brake lever free play

Brake lever free play (at the end of the brake lever)
3 ~ 5mm (0.12 ~ 0.20 in)

**WARNING**
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

ADJUSTING THE REAR BRAKE

1. Check:
   • brake lever free play

   Out of specification → Adjust.

   **Brake lever free play**
   10~20 mm (0.4~0.8 in)

2. Adjust:
   • brake lever free play

   ********************************************

Rear wheel side

a. Turn the adjusting nut ① in direction ① or ② until the specified brake lever free play is obtained.

<table>
<thead>
<tr>
<th>Direction ①</th>
<th>Brake lever free play is increased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction ②</td>
<td>Brake lever free play is decreased.</td>
</tr>
</tbody>
</table>

**CAUTION:**
After adjusting the brake lever free play, make sure there is no brake drag.

********************************************
CHECKING THE BRAKE FLUID LEVEL

1. Stand the scooter on a level surface.

NOTE:
- Place the scooter on a suitable stand.
- Make sure the scooter is upright.

2. Check:
- Brake fluid level
  Below the minimum level mark \( \rightarrow \) Add the recommended brake fluid to the proper level.

Recommended brake fluid
DOT 4

WARNING
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

CAUTION:
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

NOTE:
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.
CHECKING THE FRONT BRAKE PADS
The following procedure applies to all of the brake pads.
1. Remove:
   • cap ①
2. Operate the brake.
3. Check:
   • front brake pad
   Wear indicators ② almost touch the brake disc → Replace the brake pads as a set.
   Refer to "REPLACING THE FRONT BRAKE PADS" in chapter 4.

CHECKING THE REAR BRAKE SHOES
1. Operate the brake.
2. Check:
   • wear indicator ①
   Reaches the wear limit line ② → Replace the brake shoes as a set.
   Refer to “REAR WHEEL AND REAR BRAKE” in chapter 4.

CHECKING THE FRONT BRAKE HOSE
1. Check:
   • brake hose ①
   Cracks/damage/wear → Replace.
2. Check:
   • brake hose clamp
   Loose connection → Tighten the clamp bolt.
3. Hold the scooter upright and apply the front brake several times.
4. Check:
   • brake hose
   Brake fluid leakage → Replace the damaged hose.
   Refer to “FRONT AND REAR BRAKES” in chapter 4.
BRAKE FLUID CHANGE

WARNING
Should you feel loose when pulling Brake, it is possibly due to leaking of Brake fluid of mixing with air which led to the ineffectiveness of Brake. Since poor performance of Brake caused by mixing with air may trigger accidents, therefore inspection must be carried out prior to riding, and expel the air if necessary.

1. Place the scooter in standing position vertically on a flat floor.

NOTE:
• Use the main stand to place the scooter in upright position.
• During change, be sure the scooter is standing vertically.

2. Remove:
• reservoir cap 1
  Remove the reservoir cap of the master cylinder at horizontal condition.

• hydraulic brake system.

a. Securely connect the transparent vinyl hose 1 to the fluid screw 2.
b. Place the other end of the hose in the oil pan (receiving pan).
c. Slowing operate the brake lever for several times.
  Repeat the procedures until no more brake fluid overflows from the fluid screw.

CAUTION:
Brake fluid can cause damages to painting or plastic surfaces, so be sure to wipe clean the spilled brake fluid.

d. Tighten:
• bleed screw
  \[ \text{6Nm (0.6m•kg, 4.3 ft•lb)} \]
e. Remove the reservoir diaphragm.

f. Fill proper volume of designated brake fluid into the reservoir of the master cylinder. Refer to “CHECKING THE BRAKE FLUID LEVEL”.

g. Operate brake lever slowly for several times. Repeat the procedures until the small amount of air (air bubbles) in the reservoir tank disappears, and the brake lever feels heavy.

h. Bleed:
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM”.

**WARNING**

Following air expelling for the hydraulic brake, please verify the actuating condition of the brake.

4. Install:
   - reservoir cap
     \[ 1.6 \text{Nm} \ (0.16 \text{m} \cdot \text{kg}, \ 1.2 \text{ ft} \cdot \text{lb}) \]
BLEEDING THE HYDRAULIC BRAKE SYSTEM

BLEEDING THE HYDRAULIC BRAKE SYSTEM

WARNING

Bleed the hydraulic brake system whenever:
- the system is disassembled.
- a brake hose is loosened, disconnected or replaced.
- the brake fluid level is very low.
- brake operation is faulty.

1. Remove:
   - reservoir cap

NOTE:
- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

2. Bleed:
   - hydraulic brake system

   a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
   b. Install the brake master cylinder reservoir diaphragm.
   c. Connect a clear plastic hose 1 tightly to the bleed screw 2.
   d. Place the other end of the hose into a container.
   e. Slowly apply the brake lever several times.
   f. Fully pull the brake lever without releasing it.
   g. Loosen the bleed screw.

NOTE:
Loosening the bleed screw will release the pressure and cause the brake lever to contact the throttle grip.
h. Tighten the bleed screw and then release the brake lever.

i. Repeat steps (e) to (h) until all of the air bubbles have disappeared from the brake fluid in the plastic hose.

j. Tighten the bleed screw to specification.

<table>
<thead>
<tr>
<th>Bleed screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Nm (0.6 m • kg, 4.3 ft • lb)</td>
</tr>
</tbody>
</table>

k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid. Refer to “CHECKING THE BRAKE FLUID LEVEL”.

**WARNING**

After bleeding the hydraulic brake system, check the brake operation.

3. Install:
   reservoir cap

| 1.6 Nm (0.16 m • kg, 1.2 ft • lb) |
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the scooter on a level surface.

**WARNING**

Securely support the scooter so that there is no danger of it falling over.

**NOTE:**

Place the scooter on a suitable stand so that the front wheel is elevated.

2. Check:
   - steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Binding/looseness → Adjust the steering head.

3. Remove:
   - head light cover
   - front turn signal light bracket
   - leg shield
   Refer to “COVER AND PANEL”.

4. Adjust:
   - steering head

   a. Remove the upper ring nut ①, the lock washer ②, the center ring nut ③ and the rubber washer ④.

   b. Loosen the lower ring nut ⑤ and then tighten it to specification with the steering nut wrench ⑥.

   **NOTE:**

   Set the torque wrench at a right angle to the steering nut wrench.

---

**Steering nut wrench**

90890-01403  
YU-33975

**Lower ring nut (initial tightening torque)**

28 Nm (2.8 m • kg, 20.3 ft • lb)
c. Loosen the lower ring nut completely and then tighten it to specification with a steering nut wrench.

**WARNING**
Do not overtighten the lower ring nut.

---

**Lower ring nut (final tightening torque)**
9 Nm (0.9 m•kg, 6.5 ft•lb)

---

d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to “STEERING HEAD” in chapter 4.

e. Install the rubber washer.

f. Install the center ring nut.

g. Finger tighten the center ring nut, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the center ring nut until their slots are aligned.

h. Install the lock washer.

**NOTE:**
Make sure the lock washer tabs sit correctly in the ring nut slots.

---

i. Hold the lower and center ring nuts with a ring nut wrench and tighten the upper steering nut with a ring nut wrench.

---

**Ring nut wrench**
90890-01268
YU-01268

---

**Upper ring nut**
75 Nm (7.5 m•kg, 54.2 ft•lb)

---

5. Install:
- leg shield
- front turn signal light bracket
- head light cover
  Refer to “COVER AND PANEL”.

---
CHECKING THE FRONT FORK

1. Stand the scooter on a level surface.

**WARNING**

Securely support the scooter so that there is no danger of it falling over.

2. Check:
   - inner tube
     Damage/scratches → Replace.
   - oil seal
     Oil leakage → Replace.

3. Hold the scooter upright and apply the front brake.

4. Check:
   - front fork operation
     Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
     Rough movement → Repair.
     Refer to “FRONT FORK” in chapter 4.
CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   - tire pressure
     Out of specification → Regulate.

**WARNING**

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded scooter could cause tire damage, an accident or an injury.
- **NEVER OVERLOAD THE SCOOTER.**

<table>
<thead>
<tr>
<th>Basic weight (with oil and a full fuel tank)</th>
<th>97 kg (214 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum load*</td>
<td>253 kg (558 lb)</td>
</tr>
<tr>
<td>Cold tire pressure</td>
<td>Front</td>
</tr>
<tr>
<td>Up to 90 kg load*</td>
<td>150 kPa (1.5 kgf/cm², 22 psi)</td>
</tr>
<tr>
<td>90 kg – maximum load*</td>
<td>150 kPa (1.5 kgf/cm², 22 psi)</td>
</tr>
</tbody>
</table>

* Total weight of rider, passenger, cargo and accessories

**WARNING**

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.
2. Check:
- Tire surfaces
  Damage/wear → Replace the tire.

Minimum tire tread depth
0.8 mm (0.03 in)

1. Tire tread depth
2. Sidewall
3. Wear indicator

**WARNING**
- Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.
- When using tube tires, be sure to install the correct tube.
- Always replace a new tube tire and a new tube as a set.
- To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
- Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.

A. Tire
B. Wheel

<table>
<thead>
<tr>
<th>Tube wheel</th>
<th>Tube tire only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubeless wheel</td>
<td>Tube or tubeless tire</td>
</tr>
</tbody>
</table>

- After extensive tests, the tires listed below have been approved by Yamaha Motor Taiwan Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved by Yamaha is used on this scooter.

Front tire

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHENG SHIN</td>
<td>C-922L</td>
<td>3.50-10 51J</td>
</tr>
</tbody>
</table>

Rear tire

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHENG SHIN</td>
<td>C-6007</td>
<td>3.50-10 51J</td>
</tr>
</tbody>
</table>
New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.

**NOTE:**
For tires with a direction of rotation mark ①:
- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ② with the valve installation point.
CHECKING THE WHEELS
The following procedure applies to both of the wheels.
1. Check:
   • wheel
     Damage/out-of-round → Replace.

**WARNING**
Never attempt to make any repairs to the wheel.

**NOTE:**
After a tire or wheel has been changed or replaced, always balance the wheel.

CHECKING AND LUBRICATING THE CABLES
The following procedure applies to all of the inner and outer cables.

**WARNING**
Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
   • outer cable
     Damage → Replace.
2. Check:
   • cable operation
     Rough movement → Lubricate.

**NOTE:**
Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.
LUBRICATING THE SIDESTAND
Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.

Recommended lubricant
Lithium-soap-based grease

LUBRICATING THE CENTERSTAND
Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.

Recommended lubricant
Lithium-soap-based grease
Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT:

EXTERNAL
- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL
- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

CAUTION:

- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.
NOTE: Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - mat
   - battery cover
   Refer to “COVER AND PANEL”.

2. Disconnect:
   - battery leads (from the battery terminals)

   **CAUTION:**
   First, disconnect the negative battery lead ①, and then the positive battery lead ②.

3. Remove:
   - battery

4. Check:
   - battery charge

   **********************************************
   a. Connect a digital pocket tester ① to the battery terminals.

   **Pocket tester**
   90890-03132 (YU-03112-C)

   Positive tester probe → positive battery terminal
   Negative tester probe → negative battery terminal

   **NOTE:**
   - The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).
   - No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.
b. Check the charge of the battery, as shown in the charts and the following example.

**Example**

- c. Open-circuit voltage = 12.0 V
- d. Charging time = 6.5 hours
- e. Charge of the battery = 20 <-> 30%

---

5. **Charge:**
   - Battery
   (refer to the appropriate charging method illustration)

---

**WARNING**

Do not quick charge a battery.

---

**CAUTION:**

- Never remove the MF battery sealing caps.
- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the scooter. (If charging has to be done with the battery mounted on the scooter, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
• Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
• If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
• As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.
Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

Adjust the charging voltage to 20 ~ 25V.

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

12.8 V ~ Charging is complete.
12.0 ~ 12.7 V ~ Recharging is required.
Under 12.0 V ~ Replace the battery.

NOTE: Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

NOTE: Set the charging voltage to 16-17 V. (If the charging voltage is lower charging will be insufficient, if it is higher, the battery will be over-charged.)
This type of battery charger cannot charge an MF battery. A variable voltage charger is recommended.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

**YES**

Charge the battery until the charging voltage reaches 15 V.

**NOTE:** Set the charging time to a maximum of 20 hours.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

12.8 V ~ Charging is complete.

12.0 ~ 12.7 V ~ Recharging is required.

Under 12.0 V ~ Replace the battery.

**CAUTION:**
Constant amperage chargers are not suitable for charging MF batteries.

**NO**

This type of battery charger cannot charge an MF battery. A variable voltage charger is recommended.

**NOTE:** Leave the battery unused for more than 30 minutes before measuring its open circuit voltage.
6. Install:
   - battery
7. Connect:
   - battery leads
     (to the battery terminals)

**CAUTION:**
First, connect the positive battery lead ①, and then the negative battery lead ②.

8. Check:
   - battery terminals
     - Dirt → Clean with a wire brush.
     - Loose connection → Connect properly.

9. Lubricate:
   - battery terminals

<table>
<thead>
<tr>
<th>Recommended lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric grease</td>
</tr>
</tbody>
</table>

10. Install:
    - battery cover
    - mat
    Refer to “COVER AND PANEL”.

---

EAS00181

**CHECKING THE FUSES**
The following procedure applies to all of the fuses.

**CAUTION:**
To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Remove:
   - mat
   - battery cover
     Refer to “COVER AND PANEL”.

---

3-52
2. Check:
   ● fuse
   
   a. Connect the pocket tester to the fuse and check the continuity.

   **NOTE:**
   
   Set the pocket tester selector to “Ω × 1”.

---

**Pocket tester**

90890-03132 (YU-03112-C)

b. If the pocket tester indicates “∞”, replace the fuse.
---

3. Replace:
   ● blown fuse

---

a. Set the main switch to “OFF”.
b. Install a new fuse of the correct amperage rating.
c. Set on the switches to verify if the electrical circuit is operational.
d. If the fuse immediately blows again, check the electrical circuit.

---

<table>
<thead>
<tr>
<th>Fuses</th>
<th>Amperage rating</th>
<th>Q’ty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>10A</td>
<td>1</td>
</tr>
<tr>
<td>Reserve</td>
<td>10A</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**WARNING**

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

---

4. Install:
   ● battery cover
   ● mat

   Refer to “COVER AND PANEL”.
REPLACING THE HEADLIGHT BULB

1. Remove:
   - headlight cover

2. Disconnect:
   - headlight coupler ①

3. Remove:
   - headlight bulb holder rubber ②

4. Remove:
   - headlight bulb holder ①
   - headlight bulb ②

   **WARNING**

   Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

5. Install:
   - headlight bulb [New]

   Secure the new headlight bulb with the headlight bulb holder.

   **CAUTION:**

   Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

6. Install:
   - headlight bulb holder
   - headlight bulb holder rubber

7. Connect:
   - headlight coupler

8. Install:
   - headlight cover
ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlight.

1. Adjust:
   • headlight beam (vertically)
     a. Loosen the adjusting screw ① and press headlight in direction ④ or ⑤.
        ****************************************************
        Direction ④ Headlight beam is raised.
        Direction ⑤ Headlight beam is lowered.
        ****************************************************

2. Adjust:
   • headlight beam (horizontally)
        ****************************************************
        a. Turn the adjusting knob ① in direction ② or ③.
        Direction ② Headlight beam moves to the right.
        Direction ③ Headlight beam moves to the left.
        ****************************************************
CHAPTER 4
CHASSIS

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# FRONT WHEEL AND BRAKE DISC

## CHASSIS

### FRONT WHEEL AND BRAKE DISC

![Diagram of front wheel and brake disc](image)

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speedometer cable</td>
<td>1</td>
<td><strong>Remove the parts in the order listed.</strong></td>
</tr>
<tr>
<td>2</td>
<td>Front brake caliper assembly</td>
<td>1</td>
<td><strong>NOTE:</strong> Place the scooter on a suitable stand so that the front wheel is elevated.</td>
</tr>
<tr>
<td>3</td>
<td>Wheel axle nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Wheel axle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Front wheel</td>
<td>1</td>
<td>Refer to ”REMOVING THE FRONT WHEEL and INSTALLING THE FRONT WHEEL”</td>
</tr>
<tr>
<td>6</td>
<td>Speedometer gear unit assembly</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>7</td>
<td>Spacer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Front brake disc</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Torque Specifications:**
- 70N.m (7.0mkg, 50.6 ftlb)
- 20N.m (2.0mkg, 14.5 ftlb)
Disassembling the front wheel

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Oil seal</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>②</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Collar</td>
<td>1</td>
<td>Refer to &quot;REMOVING THE FRONT WHEEL&quot; and &quot;INSTALLING THE FRONT WHEEL&quot;</td>
</tr>
<tr>
<td>④</td>
<td>Bearing</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

For assembly, reverse the disassembly procedure.
REMOVING THE FRONT WHEEL

1. Stand the scooter on a level surface.

**WARNING**

Securely support the scooter so that there is no danger of it falling over.

**NOTE:**
Place the scooter on a suitable stand so that the front wheel is elevated.

2. Remove:
   - speedometer cable
   - brake hose holder
   Refer to "REMOVING THE FRONT WHEEL AND BRAKE DISC".

3. Remove:
   - brake caliper
   - front wheel axle
   - front wheel
   - speedometer gear unit assembly

**NOTE:**
Do not apply the brake lever when removing the brake caliper.

4. Elevate:
   - front wheel

**NOTE:**
Place the scooter on a suitable stand so that the front wheel is elevated.
CHECKING THE FRONT WHEEL

1. Check:
   - wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

   **WARNING**
   Do not attempt to straighten a bent wheel axle.

2. Check:
   - tire
   - front wheel
     Damage/wear → Replace.
     Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.

3. Measure:
   - radial wheel runout ①
   - lateral wheel runout ②
     Over the specified limits → Replace.

   **Radial wheel runout limit**
   1.0 mm (0.04 in)

   **Lateral wheel runout limit**
   1.0 mm (0.04 in)

4. Check:
   - wheel bearings
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - oil seals
     Damage/wear → Replace.

5. Replace:
   - wheel bearings New
   - oil seal New

*****************************************************
a. Clean the outside of the front wheel hub.
b. Remove the oil seals ① with a flat-head screwdriver.

**NOTE:**
To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.

c. Remove the wheel bearings ③ with a general bearing puller.
d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

---------------------------------------------------------------

**CHECKING THE BRAKE DISC**

1. **Check:**
   - brake disc
     Damage/galling → Replace.

2. **Measure:**
   - brake disc deflection ④
     Out of specification → Correct the brake disc deflection or replace the brake disc.

**Brake disc deflection limit (maximum)**

- 0.10 mm (0.04 in)

---------------------------------------------------------------

a. Place the scooter on a suitable stand so that the front wheel is elevated.
b. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
c. Remove the brake caliper.
d. Hold the dial gauge at a right angle against the brake disc surface.
e. Measure the deflection 2 ~ 3 mm (0.08 ~ 0.12 in) below the edge of the brake disc.
3. Measure:
   - brake disc thickness
     Measure the brake disc thickness at a few different locations.
     Out of specification → Replace.

   ![Brake disc thickness](image)

   **Brake disc thickness limit (minimum)**
   3.5 mm (0.14 in)

4. Adjust:
   - brake disc deflection

   ****************************
   a. Remove the brake disc.
   b. Rotate the brake disc by one bolt hole.
   c. Install the brake disc.

   **NOTE:**
   Tighten the brake disc bolts in stages and in a crisscross pattern.

   ![Brake disc bolt](image)

   **Brake disc bolt**
   20 Nm (2.0 m • kg, 14.5 ft • lb)
   LOCTITE®

   d. Measure the brake disc deflection.
   e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.
   f. If the brake disc deflection cannot be brought within specification, replace the brake disc.

   ****************************
ASSEMBLING THE FRONT WHEEL

1. Install:
   - wheel bearings
   - oil seals \textcolor{red}{\textit{New}}

*******************************************

a. Install the new wheel bearings and oil seals in the reverse order of disassembly.

\textbf{CAUTION:}

Do not contact the wheel bearing inner race \textcircled{1} or balls \textcircled{2}. Contact should be made only with the outer race \textcircled{3}.

\textbf{NOTE:}

Use a socket \textcircled{4} that matches the diameter of the wheel bearing outer race and oil seal.

*******************************************
INSTALLING THE FRONT WHEEL

1. Lubricate:
   - wheel axle
   - wheel bearings
   - oil seal lips

Recommended lubricant
Lithium-soap-based grease

2. Install:
   - speedometer gear unit

NOTE: _ Make sure the speedometer gear unit and the wheel hub are installed with the two projections meshed into the two slots respectively._

3. Install:
   - front wheel

NOTE: _ Make sure the slot in the speedometer gear unit fits over the stopper on the outer tube._

4. Tighten:
   - wheel axle
   \[ 70 \text{ Nm (7.0 m\text{\,kg}, 50.6 ft\text{\,lb})} \]

**CAUTION:**
Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

5. Install:
   - brake caliper
   - brake caliper bolts
   \[ 35 \text{ Nm (3.5 m\text{\,kg}, 25.3 ft\text{\,lb})} \]

**WARNING**
Make sure the brake hose is routed properly.
ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

1. Remove:
   - balancing weight(s)

2. Find:
   - front wheel's heavy spot

NOTE: Place the front wheel on a suitable balancing stand.

--------------------

a. Spin the front wheel.
b. When the front wheel stops, put an “X1” mark at the bottom of the wheel.
c. Turn the front wheel 90° so that the “X1” mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an “X2” mark at the bottom of the wheel.
f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
g. The spot where all the marks come to rest is the front wheel's heavy spot “X”.

--------------------
3. Adjust:
  * front wheel static balance

  a. Install a balancing weight ① onto the rim exactly opposite the heavy spot “X”.

  **NOTE:** Start with the lightest weight.

  b. Turn the front wheel 90° so that the heavy spot is positioned as shown.
  c. If the heavy spot does not stay in that position, install a heavier weight.
  d. Repeat steps (b) and (c) until the front wheel is balanced.

4. Check:
  * front wheel static balance

  a. Turn the front wheel and make sure it stays at each position shown.
  b. If the front wheel does not remain stationary at all of the positions, rebalance it.
### Removing the rear wheel and rear brake

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Muffler assembly</td>
<td></td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear arm</td>
<td>1</td>
<td>NOTE: Place the scooter on a suitable stand so that the front wheel is</td>
</tr>
<tr>
<td>3</td>
<td>Brake adjuster</td>
<td>1</td>
<td>elevated.</td>
</tr>
<tr>
<td>4</td>
<td>Brake cable</td>
<td>1</td>
<td>Refer to “MAINFOLD, AIR FILTER AND MUFFLER ASSEMBLY” in chapter 5.</td>
</tr>
<tr>
<td>5</td>
<td>Compression spring</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>6</td>
<td>Pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rear wheel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brake shoe</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tension spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Plate washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Camshaft lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Indicator plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Brake camshaft</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

105Nm (10.5m*kg, 75.9 ft*lbf)
CHECKING THE REAR WHEEL

1. Check:
   • wheel axle
   • rear wheel
     Refer to “CHECKING THE FRONT WHEEL”.

2. Check:
   • tire
   • rear wheel
     Damage/wear → Replace.
     Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.

3. Measure:
   • radial wheel runout
   • lateral wheel runout
     Refer to “CHECKING THE FRONT WHEEL”.


CHECKING THE BRAKE
The following procedure applies to all of the brake shoes.

1. Check:
   - brake shoe lining
     Glazed areas → Repair.
     Sand the glazed areas with course sandpaper.

   NOTE:
   After sanding the glazed areas, clean the brake shoe with a cloth.

2. Measure:
   - brake shoe lining thickness
     Out of specification → Replace.

   Brake shoe lining thickness limit
   (minimum)
   2.0 mm (0.08 in)

WARNING
Do not allow oil or grease to contact the brake shoes.

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

3. Measure:
   - brake drum inside diameter
     Out of specification → Replace the wheel.

   Brake drum inside diameter limit
   (maximum)
   111 mm (4.37 in)

4. Check:
   - brake drum inner surface
     Oil deposits → Clean.
     Remove the oil with a rag soaked in lacquer thinner or solvent.
     Scratches → Repair.
     Lightly and evenly polish the scratches with an emery cloth.

5. Check:
   - brake camshaft
     Damage/wear → Replace.
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

1. Adjust:
   - rear wheel static balance
     Refer to “ADJUSTING THE FRONT WHEEL STATIC BALANCE”.

ASSEMBLING THE BRAKE SHOE PLATE

1. Install:
   - brake camshaft
   - brake shoe wear indicator

2. Check:
   - rear brake level free play
     Refer to “CHECKING AND ADJUSTING THE REAR BRAKE” in chapter 3.

---

1. Install the brake camshaft so its punch mark is positioned as shown.
2. Align the projection on the brake shoe wear indicator with the notch in the brake shoe camshaft.
3. Check that the brake shoes are properly positioned.
### FRONT BRAKE PADS

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Caliper brake bracket bolt</td>
<td>2</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Caliper brake pad bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Brake pad</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake pad plate</td>
<td>1</td>
<td>Refer to “REPLACING THE FRONT BRAKE PADS”.</td>
</tr>
<tr>
<td>5</td>
<td>Brake pad spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Caliper brake bracket</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>7</td>
<td>Caliper assembly</td>
<td>1</td>
<td>cedure.</td>
</tr>
</tbody>
</table>

- **Removing the front brake pads**: 
  - Caliper brake bracket bolt: 35Nm (3.5mkg, 25.3 ftlb)
  - Caliper brake pad bolt: 22Nm (2.2mkg, 15.9 ftlb)

---

**EAS00576**

**FRONT BRAKE**

**FRONT BRAKE PADS**
Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.

**FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**

- Flush with water for 15 minutes and get immediate medical attention.

---

**REPLACING THE FRONT BRAKE PADS**

**NOTE:**

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Loosen:
   - brake pad bolt

2. Remove:
   - brake caliper ①
3. Remove:
- brake pad bolt
- brake pad spring ①
- brake pads ②
- brake pad plate ③

4. Measure:
- brake pad wear limit ③
  Out of specification → Replace the brake pads as a set.

   Brake pad wear limit
   0.8 mm (0.03 in)

5. Install:
- brake pad plate ①
- brake pads ②
- brake pad spring ③

   NOTE:
   Always install new brake pads and a new brake pad spring as a set.

a. Connect a clear plastic hose ② tightly to the bleed screw ①. Put the other end of the hose into an open container.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
c. Tighten the bleed screw.

   Bleed screw
   6 Nm (0.6 m • kg, 4.3 ft • lb)
d. Install new brake pads ③ and new brake pad springs ④.

   NOTE:
   • Make sure the brake pad spring is installed correctly as shown.
6. Lubricate:
   • brake caliper guide bar

   Recommended lubricant
   Lithium-soap-based grease

   **CAUTION:**
   • Do not allow grease to contact the brake pads.
   • Remove any excess grease.

7. Install:
   • brake pad bolt
     \[ 22 \text{ Nm (2.2 m\(\cdot\)kg, 15.9 ft\(\cdot\)lb) } \]
   • brake caliper bolt
     \[ 35 \text{ Nm (3.5 m\(\cdot\)kg, 23.5 ft\(\cdot\)lb) } \]

8. Check:
   • brake fluid level
     Below the MIN level mark \(\text{a}\) → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

9. Check:
   • brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
## Removing the front brake master cylinder

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake fluid</td>
<td>1/1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Brake lever / Compress spring</td>
<td>1</td>
<td>Drain.</td>
</tr>
<tr>
<td>3</td>
<td>Front brake light switch</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Union bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Copper washer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brake hose</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>7</td>
<td>Master cylinder bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Master cylinder assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Torque Specifications

- 1.6Nm (0.16m • kg, 1.2 ft • lb)
- 9Nm (0.9m • kg, 6.5 ft • lb)
- 26Nm (2.6m • kg, 18.8 ft • lb)
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Disassembling the front brake master cylinder</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>②</td>
<td>Reservoir diaphragm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Dust boot</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>④</td>
<td>Circlip / Washer</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>⑤</td>
<td>Master cylinder kit</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td></td>
<td>Spring</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE: Before disassembling the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Disconnect:
   - brake switch coupler (from the brake switch)

2. Remove:
   - union bolt ①
   - copper washer ②
   - brake hose ③

NOTE: To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

CHECKING THE FRONT BRAKE MASTER CYLINDER

1. Check:
   - brake master cylinder ①
   - Damage/scratches/wear → Replace.
   - brake fluid delivery passages ② (brake master cylinder body) Obstruction → Blow out with compressed air.

2. Check:
   - brake master cylinder kit ①
   - Damage/scratches/wear → Replace.
3. Check:
- brake master cylinder reservoir
  Cracks/damage → Replace.
- brake master cylinder reservoir diaphragm
  ①
  Damage/wear → Replace.

4. Check:
- brake hoses ①
  Cracks/damage/wear → Replace.
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

**WARNING**
- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components.

1. Install:
   - Spring ①
   - Install the spring with its smaller diameter to the master cylinder kit.
   - Master cylinder kit ②

2. Install:
   - Circlip ① New
   - Dust boot ②

3. Install:
   - Brake switch
   - Brake lever

4. Install:
   - Master cylinder ①
   - Master cylinder bracket ②
   - 9 Nm (0.9 m·kg, 6.5 ft·lb)

**CAUTION:**
- Install the brake master cylinder holder with the “UP” mark ③ facing up.
- Align the end of the brake master cylinder holder with the punch mark ⑤ on the handlebar.
- First, tighten the upper bolt, then the lower bolt.
5. Install:
- copper washers
- brake hose
- union bolt

\[ 26 \text{ Nm (2.6 m\( \cdot \) kg, 18.8 ft\( \cdot \) lb) } \]

**WARNING**
Proper brake hose routing is essential to insure safe scooter operation. Refer to “CABLE ROUTING”.

**NOTE:**
- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.

6. Fill:
- brake master cylinder reservoir
  (with the specified amount of the recommended brake fluid)

**Recommended brake fluid**
DOT 4

**WARNING**
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

**CAUTION:**
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
7. Bleed:
   - brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

8. Check:
   - brake fluid level
     Below the MIN level mark \( \text{MIN} \) → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

9. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
### FRONT BRAKE CALIPER

**Order** | **Job/Part** | **Q’ty** | **Remarks**
--- | --- | --- | ---
1 | Removing the front brake caliper  
   Brake fluid | 1 | Remove the parts in the order listed. Drain. |
2 | Union bolt | 2 | |
3 | Copper washer | 1 | |
4 | Brake hose | 1 | For installation, reverse the removal procedure. |
5 | Front brake caliper bracket bolt | 2 | |
6 | Front brake caliper assembly | 1 | |
## DISASSEMBLING THE FRONT BRAKE CALIPER

**Disassembling the front brake caliper**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cap</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Caliper bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Brake pad</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake pad plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Dust seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Piston seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Caliper piston</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bleed screw / Cap</td>
<td>1/1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

Torque values:
- 6Nm (0.6m•kg, 4.3 ft•lb)
- 22Nm (2.2m•kg, 15.9 ft•lb)
DISASSEMBLING THE FRONT BRAKE CALIPER

NOTE: Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③
   - brake caliper pad bolt ④
   - brake caliper bracket bolts ⑤
   - brake caliper assembly ⑥

   NOTE:
   Put the end of the brake hose into a container and pump out the brake fluid carefully.

2. Remove:
   - brake caliper piston ①
   - brake caliper piston seal ②
   - brake caliper dust seal ③

******************************************************************************

   a. Blow compressed air into the brake hose joint opening ③ to force out the pistons from the brake caliper.

   WARNING
   - Cover the brake caliper pistons with a rag. Be careful not to get injured when the piston are expelled from the brake caliper.
   - Never try to pry out the brake caliper piston.

   b. Remove the brake caliper piston seal.

******************************************************************************
CHECKING THE FRONT BRAKE CALIPER

<table>
<thead>
<tr>
<th>Recommended brake component replacement schedule</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake pads</td>
<td>If necessary</td>
</tr>
<tr>
<td>Piston seal</td>
<td>Every 2 years</td>
</tr>
<tr>
<td>Brake fluid</td>
<td>Every 2 year and whenever the brake is disassembled</td>
</tr>
</tbody>
</table>

1. Check:
   - brake caliper piston ①
     Rust/scratches/wear → Replace the brake caliper piston assembly.
   - brake caliper cylinder ②
     Scratches/wear → Replace the brake caliper assembly.
   - brake caliper body ③
     Cracks/damage → Replace the brake caliper assembly.
   - brake fluid delivery passages
     (brake caliper body)
     Obstruction → Blow out with compressed air.

**WARNING**

Whenever a brake caliper is disassembled, replace the piston seal.

2. Check:
   - brake caliper bracket
     Cracks/damage → Replace.
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER

**WARNING**
- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

---

**Recommended brake fluid DOT 4**

---

1. **Install:**
   - brake caliper piston seal 1
   - brake caliper dust seal 2

2. **Install:**
   - brake caliper piston

   **CAUTION:**
   - Do not force.
   - Use care to prevent damage on caliper piston.

3. **Install:**
   - brake pads
   - brake springs
   - brake caliper assembly
   - brake caliper bracket bolt 3

   & 35 Nm (3.5 m • kg, 25.3 ft • lb)
FRONT BRAKE

- brake caliper pad bolt (3)
  - 22 Nm (2.2 m*kg, 15.9 ft*lb)
- brake hose (4)
- copper washers (5) New
- union bolt (6)
  - 23 Nm (2.3 m*kg, 16.6 ft*lb)

**WARNING**
Proper brake hose routing is essential to insure safe scooter operation. Refer to “CABLE ROUTING”.

**CAUTION:**
When installing the brake hose onto the brake caliper (1), make sure the brake pipe (2) touches the projection (b) on the brake caliper.

4. Fill:
- brake fluid reservoir
  (with the specified amount of the recommended brake fluid)

**Recommended brake fluid**
DOT 4

**WARNING**
- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Wa-
CAUTION:
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   • brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

6. Check:
   • brake fluid level
   Below the MIN level mark [a] → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

7. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
### Removing the front fork legs

Remove the parts in the order listed. Refer to “FRONT WHEEL AND BRAKE DISC”. Refer to “COVER AND PANEL” in chapter 3.

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front wheel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Leg shield 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Front fork protect cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake hose holder 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Speedometer cable guide</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Front brake caliper assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cap bolt/O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pinch bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Front fork leg</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.
## Disassembling the Front Fork Legs

Disassembling the front fork legs

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fork oil</td>
<td></td>
<td>Remove the parts in the order listed. Drain.</td>
</tr>
<tr>
<td>2</td>
<td>Fork spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Clamp / Boot</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Damper rod bolt / Gasket</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Inner tube</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Damper rod</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rebound spring</td>
<td>1</td>
<td>Refer to “DISASSEMBLING AND INSTALLING THE FRONT FORK LEGS“</td>
</tr>
<tr>
<td>8</td>
<td>Oil flow stopper</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Oil seal clip</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>Outer tube</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

- 30Nm (3.0m • kg, 21.7 ft • lb)
REMOVING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.

1. Stand the scooter on a level surface.

**WARNING**
Securely support the scooter so that there is no danger of it falling over.

**NOTE:**
Place the scooter on a suitable stand so that the front wheel is elevated.

2. Loosen:
   - pinch bolt ①
3. Remove:
   - cap bolt ② (with a 10-mm hexagonal wrench ③)

**WARNING**
Fork spring will jump out after removing cap bolt.

**WARNING**
Before loosening the upper and lower bracket pinch bolts, support the front fork leg.

5. Remove:
   - front fork leg
DISASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Remove:
   - fork spring ①

2. Drain:
   - fork oil

3. Remove:
   - damper rod assembly bolt ①
   - damper rod assembly

   **NOTE:**
   While holding the damper rod with the damper rod holder ② and T-handle③, loosen the damper rod assembly bolt.

   **Damper rod holder**
   90890-01294 (YM-01300-1)
   **T-handle**
   90890-01326 (YM-01326)

4. Remove:
   - damper rod ①
   - spring
   - inner tube ②
5. Remove:
• oil seal clip ①
   (with a flat-head screwdriver)

**CAUTION:**
Do not scratch the inner tube.

6. Remove:
• oil seal ①

**CAUTION:**
Never reuse the oil seal.

• Rag ②
CHECKING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.

1. Check:
   - inner tube ①
   - outer tube ②
   Bends/damage/scratches → Replace.

**WARNING**
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:
   - spring free length ⑧
   Out of specification → Replace.

   **Spring free length**
   257.5 mm (10.14 in)
   <Limit> : 252.4 mm (9.94 in)

3. Check:
   - damper rod ①
     Damage/wear → Replace.
     Obstruction → Blow out all of the oil passages with compressed air.
   - oil flow stopper ②
     Damage → Replace.

4. Check:
   - cap bolt ①
     Damage/wear → Replace.
   - O-ring ② New
ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

**WARNING**
- Make sure the oil levels in both front fork legs are equal.
- Uneven oil levels can result in poor handling and a loss of stability.

**NOTE:**
- When assembling the front fork leg, be sure to replace the following parts:
  - oil seal
  - dust seal
- Before assembling the front fork leg, make sure all of the components are clean.

1. Install:
   - damper rod assembly ①
   - rebound spring ②

**CAUTION:**
Allow the damper rod assembly to slide slowly down the inner tube ③ until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

2. Lubricate:
   - inner tube’s outer surface

**Recommended lubricant**
Fork oil 10W or equivalent

3. Tighten:
   - damper rod assembly bolt ①

**NOTE:**
While holding the damper rod assembly with the damper rod holder ② and T-handle ③, tighten the damper rod assembly bolt.

30 Nm (3.0 m • kg, 21.7 ft • lb)
LOCTITE®204
4. Install:

- oil seal ① New
  (with the fork seal driver weight ② and adapter ③)

**CAUTION:**
Make sure the numbered side of the oil seal faces up.

**NOTE:**
- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ④ to protect the oil seal during installation.

5. Install:

- oil seal clip ①

**NOTE:**
Adjust the oil seal clip so that it fits into the outer tube’s groove.
6. Install:
   - fork boot ①

7. Fill:
   - front fork leg
     (with the specified amount of the recommended fork oil)

   Quantity (each front fork leg)
   0.126 L (0.11 imp qt, 0.13 US qt)
   Recommended oil
   Fork oil 10W or equivalent

   NOTE:
   - While filling the front fork leg, keep it upright.
   - After filling, slowly pump the front fork leg up and down to distribute the fork oil.

8. Install:
   - fork spring ①

   NOTE:
   - Install the spring with the smaller pitch facing up.
   - Before installing the cap bolt, lubricate its O-ring with grease.
   - Temporarily tighten the cap bolt.
INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:
   - front fork leg

   **NOTE:**
   Pull up the inner tube until it stops, then install the cap bolt.

2. Tighten:
   - cap bolt (1)
     45 Nm (4.5 m • kg, 32.5 ft • lb)
   - pinch bolt (2)
     23 Nm (2.3 m • kg, 16.6 ft • lb)
**Removing the handlebar**

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<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
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<td></td>
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<td>3</td>
<td>Brake master cylinder assembly</td>
<td>1</td>
<td></td>
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<td>4</td>
<td>Handlebar switch assembly (right)</td>
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<td></td>
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<tr>
<td>5</td>
<td>Throttle cable</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Throttle grip assembly</td>
<td>1</td>
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<td>2</td>
<td></td>
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<tr>
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<td>1</td>
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<td>1</td>
<td></td>
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<td></td>
</tr>
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For installation, reverse the removal procedure.
REMOVING THE HANDLEBAR

1. Stand the scooter on a level surface.

**WARNING**
Securely support the scooter so that there is no danger of it falling over.

2. Remove:
   - handlebar switch assembly (right)
   - throttle grip assembly
   - brake master cylinder assembly

**NOTE:**
While removing the handlebar switch assembly (right), pull back the rubber cover.

3. Remove:
   - handlebar grip

**NOTE:**
Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.

CHECKING THE HANDLEBAR

1. Stand the scooter on a level surface.

**WARNING**
Securely support the scooter so that there is no danger of it falling over.

2. Check:
   - handlebar
     Bends/cracks/damage → Replace.

**WARNING**
Do not attempt to straighten a bent handlebar as this may dangerously weaken it.
INSTALLING THE HANDLEBAR

1. Stand the scooter on a level surface.

**WARNING**

- Securely support the scooter so that there is no danger of it falling over.

2. Install:
   - handlebar
   - upper handlebar holders

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

**CAUTION:**

- Align the match marks on the handlebar with the upper surface of the lower handlebar holders.

**NOTE:**

- The upper handlebar holders should be installed with the arrow marks facing forward.
- Align the match marks on the handlebar with the upper surface of the lower handlebar holders.

3. Install:
   - handlebar grip

**NOTE:**

Before installing the handlebar grip, apply the bond.
4. Install:
- left handlebar switch ①

**NOTE:**
Align the projection ③ on the left handlebar switch with the hole ⑤ in the handlebar.

5. Install:
- throttle grip ①
- right handlebar switch ②
- throttle cables ③

**NOTE:**
- Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar ④.
- Align the projection ④ on the right handlebar switch with the hole ⑤ in the handlebar.

**WARNING**
Make sure the throttle grip operates smoothly.

6. Install:
- front brake master cylinder ①

**NOTE:**
- Align the mating surfaces of the front brake master cylinder with the punch mark ③ on the handlebar.

7. Adjust:
- throttle cable free play
  Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.

**Throttle cable free play (at the flange of the throttle grip)**
3 ~ 5 mm(0.12 ~ 0.20 in)
### STEERING HEAD

**LOWER FENDER COVER AND HANDLEBAR LOWER HOLDER**

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<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
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<td>Remove the parts in the order listed.</td>
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<td>Front wheel</td>
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<td>Refer to “COVER AND PANEL” in chapter 3.</td>
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<td></td>
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<td>Refer to “FRONT FORK”.</td>
</tr>
<tr>
<td></td>
<td>Handlebar assembly</td>
<td></td>
<td>Refer to “HANDLEBAR”.</td>
</tr>
<tr>
<td>1</td>
<td>Brake hose holder 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Brake hose holder 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lower fender bracket</td>
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</tr>
<tr>
<td>4</td>
<td>Lower fender cover (front)</td>
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<tr>
<td>5</td>
<td>Lower fender cover (inner)</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Handlebar cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Speedometer cable</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Speedometer assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Handlebar lower holder</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**47.5Nm (4.75m•kg, 34.4 ft•lb)**

For installation, reverse the removal procedure.
### Removing the lower bracket

Remove the parts in the order listed. Refer to "FRONT WHEEL AND BRAKE DISC". Refer to "LOWER FENDER COVER AND HANDLEBAR LOWER HOLDER".

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Handlebar holder bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Upper ring nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lock washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Center ring nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rubber washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Lower ring nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bearing race cover</td>
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</tr>
<tr>
<td>8</td>
<td>Upper bearing inner race</td>
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</tr>
<tr>
<td>9</td>
<td>Lower bracket</td>
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<tr>
<td>10</td>
<td>Upper bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Lower bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Upper bearing outer race</td>
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</tr>
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<td>13</td>
<td>Lower bearing outer race</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Lower bearing inner race</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- 1st: 28Nm (2.8m • kg, 20.3 ft • lb)
- 2nd: 9Nm (0.9m • kg, 6.5 ft • lb)

- 60Nm (6.0m • kg, 43.4 ft • lb)
- 75Nm (7.5m • kg, 54.2 ft • lb)
### Remarks

Order | Job/Part         | Q'ty | Remarks                          
--- | ----------------- | ---- | -------------------------------- 
15  | Rubber washer    | 1    | For installation, reverse the removal procedure. 

**Torque Specifications:**

- **1st:** 28Nm (2.8m * kg, 20.3 ft * lb)
- **2nd:** 9Nm (0.9m * kg, 6.5 ft * lb)
- **60Nm (6.0m * kg, 43.4 ft * lb)**
- **75Nm (7.5m * kg, 54.2 ft * lb)**
REMOVING THE LOWER BRACKET

1. Stand the scooter on a level surface.

**WARNING**

Securely support the scooter so that there is no danger of it falling over.

2. Remove:
   - handlebar holder bracket ①

**NOTE:**

- Remove the handlebar holder bracket by loosening the upper ring nut② gradually.

3. Remove:
   - ring nut ①
     (with the ring nut wrench ②)

**WARNING**

Securely support the lower bracket so that there is no danger of it falling.
CHECKING THE STEERING HEAD

1. Wash:
   - bearings
   - bearing races

<table>
<thead>
<tr>
<th>Recommended cleaning solvent</th>
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</thead>
<tbody>
<tr>
<td>Kerosene</td>
</tr>
</tbody>
</table>

2. Check:
   - bearings (1)
   - bearing races (2)
     Damage/pitting → Replace.

3. Replace:
   - bearings
   - bearing races

   a. Remove the bearing races from the steering head pipe with a long rod (1) and hammer.
   b. Remove the bearing race from the lower bracket with a floor chisel (2) and hammer.
   c. Install a new rubber washer and new bearing races.

   **CAUTION:**
   If the bearing race is not installed properly, the steering head pipe could be damaged.

   **NOTE:**
   - Always replace the bearings and bearing races as a set.
   - Whenever the steering head is disassembled, replace the rubber washer.

4. Check:
   - handlebar lower holder
   - lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.
INSTALLING THE STEERING HEAD

1. Lubricate:
   - upper bearing
   - lower bearing
   - bearing races

Recommended lubricant
Lithium-soap-based grease

2. Install:
   - lower ring nut ①
   - rubber washer ②
   - center ring nut ③
   - lock washer ④
   - upper ring nut ⑤

   Refer to “CHECKING THE STEERING HEAD” in chapter 3.

3. Install:
   - handlebar holder bracket ①

   \[ 60 \text{ Nm (6.0 m} \cdot \text{kg, 43.4 ft} \cdot \text{lb}) \]

NOTE: 
Align the handlebar holder bracket across rod ② on the lower bracket concave ③.
CHAS

REAR SHOCK ABSORBER

EAS00692

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the scooter on a level surface.

⚠️ WARNING

Securely support the scooter so that there is no danger of it falling over.

NOTE:
Place the scooter on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - rear carrier
   - side cover (left)
     Refer to “COVER AND PANEL” in chapter 3.

3. Remove:
   - rear shock absorber nut (upper)
   - rear shock absorber bolt (lower)

EAS00695

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
   - rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - rear shock absorber
     Oil leaks → Replace the rear shock absorber assembly.
   - spring
     Damage/wear → Replace the rear shock absorber assembly.
   - bushings
     Damage/wear → Replace.
   - dust seals
     Damage/wear → Replace.
   - bolts
     Bends/damage/wear → Replace.
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - spacer
   - bush

   Recommended lubricant
   Molybdenum disulfide grease

2. Install:
   - rear shock absorber assembly

3. Tighten:
   - rear shock absorber assembly upper nut\(^1\)
     \[\times 30 \text{ Nm (3.0 m} \cdot \text{kg, 21.7 ft} \cdot \text{lb)}\]
   - rear shock absorber assembly lower bolt\(^2\)
     \[\times 18 \text{ Nm (1.8 m} \cdot \text{kg, 13.0 ft} \cdot \text{lb)}\]

4. Install:
   - side cover (left)
   - rear carrier
   Refer to “COVER AND PANEL” in chapter 3.
CHAPTER 5
ENGINE

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<td>Removing the Crankshaft Assembly</td>
<td>5-61</td>
</tr>
<tr>
<td>Checking the Timing Chain and Timing Chain Guides</td>
<td>5-61</td>
</tr>
<tr>
<td>Checking the Crankshaft and Connecting Rod</td>
<td>5-62</td>
</tr>
<tr>
<td>Installing the Crankshaft</td>
<td>5-63</td>
</tr>
<tr>
<td>Assembling the Crankcase</td>
<td>5-64</td>
</tr>
</tbody>
</table>
ENGINE
LEADS, HOSES AND REAR BRAKE

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spark plug cap</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Starting motor lead / Earth lead</td>
<td>1/1</td>
<td>Refer to “COVER AND PANEL” in chapter 3.</td>
</tr>
<tr>
<td>3</td>
<td>Auto choke lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>C.D.I. magneto lead / Stator lead</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Carburetor heater positive lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Carburetor heater negative lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Throttle cable</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brake cable (adjuster / pin)</td>
<td>1</td>
<td><strong>CAUTION:</strong> First, disconnect the negative lead, and then the positive lead.</td>
</tr>
<tr>
<td>9</td>
<td>Air inlet hose</td>
<td>1</td>
<td>Refer to “INSTALLING THE ENGINE “.</td>
</tr>
<tr>
<td>10</td>
<td>Fuel hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Carburetor inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Fuel cock vacuum pipe</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Rear shock absorber bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Self lock nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Engine mounting bolt</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Order Job/Part Q’ty Remarks**

- Remove the parts in the order listed.
- Refer to “COVER AND PANEL” in chapter 3.
- **CAUTION:** First, disconnect the negative lead, and then the positive lead.
- Refer to “INSTALLING THE ENGINE “.
<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
NOTE: ____________________________
Make sure to reset the oil change indicator when the oil is changed.

INSTALLING THE ENGINE

1. Install:
   - engine bracket bolt ①

   NOTE: __________________________
   Do not fully tighten the bolts.

2. Tighten:
   - engine bracket bolt ①
   - Engine

   55Nm(5.5 m•kg, 39.8 ft•lb)
# MAINFOLD, AIR FILTER AND MUFFLER ASSEMBLY

## REMOVING THE MAINFOLD, AIR FILTER AND MUFFLER ASSEMBLY

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Muffler assembly</td>
<td>1</td>
<td><strong>Remove the parts in the order listed.</strong></td>
</tr>
<tr>
<td>2</td>
<td>Al pipe</td>
<td>1</td>
<td>Refer to “LEADS, HOSES AND REAR BRAKE”.</td>
</tr>
<tr>
<td>3</td>
<td>Air filter / Breather hose</td>
<td>1/1</td>
<td>Refer to “AIR INDUCTION SYSTEM” in chapter 6.</td>
</tr>
<tr>
<td>4</td>
<td>Carburetor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Mainfold / O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Joint / Gasket</td>
<td>1/1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

### Torque Specifications

- 7Nm (0.7 m·kg, 5.1 ft·lb)
- 10Nm (1.0 m·kg, 7.2 ft·lb)
- 31Nm (3.1 m·kg, 22.4 ft·lb)
### CYLINDER HEAD

#### Removing the cylinder head

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unit bolt</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “MAINFOLD, AIR FILTER AND MUFFLER ASSEMBLY”.</td>
</tr>
<tr>
<td>2</td>
<td>Cooper washer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oil delivery pipe / O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Air shroud 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Air shroud 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Spark plug</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Breather / O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Engine oil cap / O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Valve cover / O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Timing chain tensioner assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Camshaft sprocket plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Camshaft sprocket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Nut / Washer</td>
<td>4/2</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cylinder head</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Cylinder head gasket</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- **8Nm (0.8m • kg, 5.8 ft • lb)**
- **10Nm (1.0m • kg, 7.2 ft • lb)**
- **22Nm (2.2m • kg, 15.9 ft • lb)**
- **12Nm (1.2m • kg, 8.7 ft • lb)**
- **30Nm (3.0m • kg, 21.7 ft • lb)**
For installation, reverse the removal procedure.
REMOVING THE CYLINDER HEAD

1. Remove:
   - oil delivery pipe
   - engine oil cap
   - valve cover
   - Air shroud 1
   - Air shroud 2
   - breather

2. Align:
   - "I" mark ① on the magneto
     (with the stationary pointer ② on the crankcase cover)

3. Loosen:
   - timing chain tensioner bolt
   - camshaft sprocket plate bolt ①
     While holding the crank bolt with a wrench, remove the camshaft sprocket
     plate bolt ①.

4. Remove:
   - timing chain tensioner
     (along with the gasket)
   - camshaft sprocket plate ②
   - camshaft sprocket ③
   - timing chain ④
NOTE:  
- To prevent the timing chain from falling into the crankcase, fasten it with a wire.
- While holding the C.D.I. magneto bolt with a wrench, remove the camshaft sprocket plate bolt ①.

5. Remove:  
• cylinder head

NOTE:  
- Loosen the nuts in the proper sequence as shown.
- Loosen each nut 1/2 of a turn at a time. After all of the nuts are fully loosened, remove them.
CHECKING THE CYLINDER HEAD

1. Eliminate:
   - combustion chamber carbon deposits
     (with a rounded scraper)

   **NOTE:**
   Do not use a sharp instrument to avoid damaging or scratching:
   - spark plug bore thread
   - valve seats

2. Check:
   - cylinder head
     Damage/scratches → Replace.

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

   **Maximum cylinder head warpage**
   **Less than 0.05 mm (0.002 in)**

   a. Place a straightedge and a thickness gauge across the cylinder head.
   b. Measure the warpage.
   c. If the limit is exceeded, resurface the cylinder head as follows.
   d. Place a 400 ~ 600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

   **NOTE:**
   To ensure an even surface, rotate the cylinder head several times.
INSTALLING THE CYLINDER HEAD

1. Install:
   - gasket New
   - dowel pins

2. Install:
   - cylinder head

3. Tighten:
   - cylinder head nuts
     \[ 22 \text{ Nm (2.2 m \cdot \text{kg}, 15.9 \text{ ft} \cdot \text{lb})} \]
   - cylinder head bolts
     \[ 12 \text{ Nm (1.2 m \cdot \text{kg}, 8.7 \text{ ft} \cdot \text{lb})} \]

NOTE:
- Lubricate the cylinder head nuts with engine oil.
- Tighten the cylinder head nuts in the proper tightening sequence as shown and torque them in two stages.

4. Install:
   - camshaft sprocket ①
   - timing chain ②

   a. Turn the primary pulley counterclockwise.
   b. Align the “I” mark ③ on the C.D.I. magneto rotor with the stationary pointer ④ on the crankcase cover.
   c. Align the “I” mark ⑤ on the camshaft sprocket with the stationary pointer ⑥ on the cylinder head.
   d. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft.

NOTE:
- When installing the camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.
- Align the pin on the camshaft with the slot in the camshaft sprocket.
CAUTION:
Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.

e. While holding the camshaft, temporarily tighten the camshaft sprocket bolts.
f. Remove the wire from the timing chain.

5. Install
   • camshaft sprocket plate ①
   • camshaft sprocket plate bolt ②

6. Install:
   • timing chain tensioner gasket New
   • timing chain tensioner

   a. Remove the cap bolt ① and spring ②.
   b. Release the timing chain tensioner one-way cam ③ and push the timing chain tensioner rod ④ all the way into the timing chain tensioner housing.
   c. Install the timing chain tensioner and gasket ⑤ onto the cylinder.

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

d. Install the springs ② and cap bolt ①.

   Cap bolt
   8 Nm (0.8 m • kg, 5.8 ft • lb)
7. Turn:
   • crankshaft
     (several turns counterclockwise)

8. Check:
   • "I" mark  
     Align the "I" mark on the C.D.I. magneto rotor with the stationary pointer on the crankcase cover.
   • "I" mark  
     Align the "I" mark on the camshaft sprocket with the stationary pointer on the cylinder head.
     Out of alignment → Correct.
     Refer to the installation steps above.

9. Tighten:
   • camshaft sprocket bolt

\[ 30 \text{ Nm (3.0 m\( \cdot \) kg, 21.7 ft\( \cdot \) lb) } \]

**CAUTION:**
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

10. Measure:
    • valve clearance
      Out of specification → Adjust.
      Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.
**THE ROCKER ARMS AND CAMSHAFT**

**THE ROCKER ARMS AND CAMSHAFT**

---

**Order** | **Job/Part** | **Q'ty** | **Remarks**
--- | --- | --- | ---
1 | Removing the rocker arms and camshaft | 1 | Remove the parts in the order listed. Refer to “CYLINDER HEAD”.
2 | Cylinder head | 1 | Refer to “REMOVING THE ROCKER ARMS AND CAMSHAFT” and “INSTALLING THE ROCKER ARMS AND CAMSHAFT.”
3 | Stopper plate | 2 | Refer to “INSTALLING THE CAMSHAFT AND ROCKER ARMS” For installation, reverse the removal procedure.
4 | Locknut | 2 |  
5 | Adjusting screw | 2 |  
6 | Rocker arm shaft | 2 |  
7 | O-ring | 2 |  
8 | Rocker arm | 2 |  
9 | Camshaft | 1 |  

**7Nm (0.7 m•kg, 5.1 ft•lb)**

---

**THE ROCKER ARMS AND CAMSHAFT**

---

**Removing the rocker arms and camshaft**

- Cylinder head
- Stopper plate
- Locknut
- Adjusting screw
- Rocker arm shaft
- O-ring
- Rocker arm
- Camshaft

---

**THE ROCKER ARMS AND CAMSHAFT**

---
REMOVING THE ROCKER ARMS AND CAMSHAFT

1. Remove:
   - locknut ①
   - stopper plate ②

2. Remove:
   - intake rocker arm shaft
   - exhaust rocker arm shaft
   - intake rocker arm
   - exhaust rocker arm

   **NOTE:**
   Remove the rocker arm shafts with the slide hammer bolt ① and weight ②.

   **Slide hammer bolt**
   90890-01083 (YU-01083-1)
   90890-01085 (YU-01083-2)
   **Weight**
   90890-01084 (YU-01083-3)

3. Remove:
   - camshaft ①

   Screw 8-mm bolt ② into the threaded end of the camshaft and then pull out the camshaft.

   **Slide hammer bolt**
   90890-01085 (YU-01083-2)
   **Weight**
   90890-01084 (YU-01083-3)
CHECKING THE ROCKER ARMS AND ROCKERS ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

1. Check:
   • rocker arm
     Damage/wear → Replace.

2. Check:
   • rocker arm shaft
     Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.

3. Check:
   • camshaft lobe
     Excessive wear → Replace the camshaft.

4. Measure:
   • rocker arm inside diameter
     Out of specification → Replace.

   **Rocker arm inside diameter**
   10 ~ 10.015 mm (0.393~0.394 in)

5. Measure:
   • rocker arm shaft outside diameter
     Out of specification → Replace.

   **Rocker arm shaft outside diameter**
   9.981 ~ 9.991 mm (0.392~0.393 in)

6. Calculate:
   • rocker-arm-to-rocker-arm-shaft clearance

   **NOTE:**
   Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

   Above 0.034 mm (0.001 in) → Replace the defective part(s).
CHECKING THE CAMSHAFT

1. Check:
   - camshaft bushings
     Damage/wear → Replace.

2. Check:
   - camshaft lobes
     Blue discoloration/pitting/scratches → Replace the camshaft.

3. Measure:
   - camshaft lobe dimensions ① and ②
     Out of specification → Replace the camshaft.

Camshaft lobe dimension limit

<table>
<thead>
<tr>
<th>Intake</th>
<th>① 26.153<del>26.253 mm (1.030</del>1.034 in)</th>
<th>&lt;Limit&gt;:26.053mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>② 21.015<del>21.115 mm (0.827</del>0.831 in)</td>
<td>&lt;Limit&gt;:20.915mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaust</th>
<th>① 26.153<del>26.253 mm (1.030</del>1.034 in)</th>
<th>&lt;Limit&gt;:26.053mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>② 21.056<del>21.156 mm (0.829</del>0.833 in)</td>
<td>&lt;Limit&gt;:20.956mm</td>
</tr>
</tbody>
</table>

4. Check:
   - camshaft oil passage
     Obstruction → Blow out with compressed air.
CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKETS, AND TIMING CHAIN GUIDES

The following procedure applies to all of the camshaft sprockets and timing chain guides.

1. Check:
   - timing chain
     Damage/stiffness → Replace the timing chain and camshaft sprockets as a set.

2. Check:
   - camshaft sprocket
     More than 1/4 tooth wear → Replace the camshaft sprockets and the timing chain as a set.

   a) 1/4 tooth
   b) Correct
   ① Timing chain roller
   ② Camshaft sprocket

3. Check:
   - timing chain guide (exhaust side)
   - timing chain guide (intake side)
   - timing chain guide (top side)
     Damage/wear → Replace the defective part(s).

CHECKING THE TIMING CHAIN TENSIONER

1. Check:
   - timing chain tensioner
     Cracks/damage → Replace.

2. Check:
   - one-way cam operation
     Rough movement → Replace the timing chain tensioner housing.

3. Check:
   - cap bolt
   - copper washer O-ring
   - spring
   - one-way cam
   - gasket
   - timing chain tensioner rod
     Damage/wear → Replace the defective part(s).
INSTALLING THE CAMSHAFT AND ROCKER ARMS

1. Lubricate:
   - camshaft

<table>
<thead>
<tr>
<th>Recommended lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camshaft</td>
</tr>
<tr>
<td>Molybdenum disulfide oil</td>
</tr>
<tr>
<td>Camshaft bearing</td>
</tr>
<tr>
<td>Engine oil</td>
</tr>
</tbody>
</table>

2. Lubricate:
   - rocker arm shafts

<table>
<thead>
<tr>
<th>Recommended lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molybdenum disulfide oil</td>
</tr>
</tbody>
</table>

3. Install:
   - exhaust rocker arm
   - exhaust rocker arm shaft

   **NOTE:**
   Make sure the exhaust rocker arm shaft is completely pushed into the cylinder head.

4. Install:
   - intake rocker arm
   - intake rocker arm shaft

   **NOTE:**
   Make sure the intake rocker arm shaft is completely pushed into the cylinder head.

   **CAUTION:**
   Make sure the threaded part of the rocker arm shaft faces out.

5. Install:
   - stopper plate
   - locknut

   $7 \text{ Nm (0.7 m} \cdot \text{kg, 5.1 ft} \cdot \text{lb})$
## Removing the valves and valve springs

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve cotter</td>
<td>4</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Valve spring retainer</td>
<td>2</td>
<td>Refer to “CYLINDER HEAD”.</td>
</tr>
<tr>
<td>3</td>
<td>Valve spring</td>
<td>2</td>
<td>Refer to “ROCKER ARMS AND ROCKER ARMS SHAFTS”.</td>
</tr>
<tr>
<td>4</td>
<td>Valve (intake)</td>
<td>2</td>
<td>Refer to “INSTALLING THE VALVES AND VALVE SPRINGS“.</td>
</tr>
<tr>
<td>5</td>
<td>Valve (exhaust)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Valve stem seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Valve stem seat</td>
<td>2</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

Cylinder head
Rocker arm and rocker arm shaft

Refer to "CYLINDER HEAD".
Refer to "ROCKER ARMS AND ROCKER ARMS SHAFTS".

For installation, reverse the removal procedure.
REMOVING THE VALVES
The following procedure applies to all of the valves and related components.

NOTE: Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.

1. Check:
   - Valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
     Refer to “CHECKING THE VALVE SEATS”.

   a. Pour a clean solvent @ into the intake and exhaust ports.
   b. Check that the valves properly seal.

   NOTE: There should be no leakage at the valve seat ①.

2. Remove:
   - Valve cotters ①

   NOTE: Remove the valve cotters by compressing the valve spring with the valve spring compressor ② and the valve spring compressor attachment ③.

Valve spring compressor
90890-04109 (YM-04109)
Valve spring compressor attachment
90890-04108 (YM-04108)
3. Remove:
- valve cotter ①
- valve spring retainer ②
- valve spring ③
- valve stem seal ④
- lower spring seat ⑤
- valve ⑥

**NOTE:**
Identify the position of each part very carefully so that it can be reinstalled in its original place.

**CHECKING THE VALVES AND VALVE GUIDES**

The following procedure applies to all of the valves and valve guides.

1. Measure:
   - valve-stem-to-valve-guide clearance

   \[
   \text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter } a - \text{Valve stem diameter } b
   \]

   Out of specification → Replace the valve guide.

   **Valve-stem-to-valve-guide clearance**
   
   **Intake**
   
   \[
   0.010 \text{ – } 0.037 \text{ mm (0.0004} \text{ – } 0.0015 \text{ in)}
   \]
   
   <Limit>: 0.08 mm (0.003 in)

   **Exhaust**
   
   \[
   0.025 \text{ – } 0.057 \text{ mm (0.001} \text{ – } 0.002 \text{ in)}
   \]
   
   <Limit>: 0.10 mm (0.004 in)

2. Replace:
   - valve guide

**NOTE:**
To ease valve guide removal and installation, and to maintain the correct fit, heat the cylinder head to 100°C (212°F) in an oven.

*a. Remove the valve guide with the valve guide remover ①.*
b. Install the new valve guide with the valve guide installer ② and valve guide remover ①.
c. After installing the valve guide, bore the valve guide with the valve guide reamer ③ to obtain the proper valve-stem-to-valve-guide clearance.*
NOTE: After replacing the valve guide, reface the valve seat.

Valve guide remover (4.5 mm)
90890-04116 (YM-04116)
Valve guide installer (4.5 mm)
90890-04117 (YM-04117)
Valve guide reamer (5.0 mm)
90890-04099

3. Eliminate:
- carbon deposits
  (from the valve face and valve seat)

4. Check:
- valve face
  Pitting/wear ⇒ Grind the valve face.
- valve stem end
  Mushroom shape or diameter larger than the body of the valve stem ⇒ Replace the valve.

5. Measure:
- valve margin thickness \( a \)
  Out of specification ⇒ Replace the valve.

Valve margin thickness
0.85~1.15 mm (0.033~0.045 in)

6. Measure:
- valve stem runout
  Out of specification ⇒ Replace the valve.

NOTE:
- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.

Valve stem runout
0.01 mm (0.0004 in)
CHECKING THE VALVE SEATS
The following procedure applies to all of the valves and valve seats.

1. Eliminate:
   - carbon deposits
     (from the valve face and valve seat)

2. Check:
   - valve seat
     Pitting/wear → Replace the cylinder head.

3. Measure:
   - valve seat width (a)
     Out of specification → Replace the cylinder head.

   **Valve seat width**
   - Intake: 0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
     <Limit>: 1.6 mm (0.063 in)
   - Exhaust: 0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
     <Limit>: 1.6 mm (0.063 in)

   a. Apply Mechanic’s blueing dye (Dykem) (b) onto the valve face.
   b. Install the valve into the cylinder head.
   c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
   d. Measure the valve seat width.

**NOTE:**
Where the valve seat and valve face contacted one another, the blueing will have been removed.

4. Lap:
   - valve face
   - valve seat

**NOTE:**
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.
a. Apply a coarse lapping compound a to the valve face.

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

b. Apply molybdenum disulfide oil onto the valve stem.

c. Install the valve into the cylinder head.

d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

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

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

f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.

g. Apply Mechanic's blueing dye (Dy kem) b onto the valve face.

h. Install the valve into the cylinder head.

i. Press the valve through the valve guide and onto the valve seat to make a clear impression.

j. Measure the valve seat width c again. If the valve seat width is out of specification, reface and lap the valve seat.

**********************************************************************************
CHECKING THE VALVE SPRINGS
The following procedure applies to all of the valve springs.

1. Measure:
   • valve spring free length \( a \)
     Out of specification → Replace the valve spring.

   Valve spring free length
   37.30 mm (1.469 in)
   <Limit>: 35.40 mm (1.394 in)

2. Measure:
   • compressed valve spring force \( a \)
     Out of specification → Replace the valve spring.

   Compressed valve spring force (installed)
   147±11N (15.0±1.1 kg) at 25.77 mm
   (33.075 ± 2.426 lb at 1.015 in)

3. Measure:
   • valve spring tilt \( a \)
     Out of specification → Replace the valve spring.

   Spring tilt limit
   1.6 mm (2.5°) (0.063 in)
INSTALLING THE VALVES

The following procedure applies to all of the valves and related components.

1. Deburr:
   - valve stem end
     (with an oil stone)

2. Lubricate:
   - valve stem
   - valve stem seal
     (with the recommended lubricant)

   Recommended lubricant
   Molybdenum disulfide oil

3. Install:
   - valve
   - valve spring seat
   - valve stem seal
   - New valve spring
   - valve spring retainer
   - valve cotter
     (into the cylinder head)

   **NOTE:**
   Install the valve spring with the larger pitch facing up.

   (b) Smaller pitch

4. Install:
   - valve cotters

   **NOTE:**
   Install the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment.
5. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

**CAUTION:**

Hitting the valve tip with excessive force could damage the valve.
**Removing the cylinder and piston**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cylinder head</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “CYLINDER HEAD”.</td>
</tr>
<tr>
<td>2</td>
<td>Clamp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pipe</td>
<td>1</td>
<td>Refer to “INSTALLING THE PISTON AND CYLINDER”</td>
</tr>
<tr>
<td>4</td>
<td>Timing chain guide (exhaust side)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cylinder</td>
<td>1</td>
<td>Refer to “REMOVING THE CYLINDER AND PISTON”</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dowel pin</td>
<td>2</td>
<td>Refer to “INSTALLING THE PISTON AND CYLINDER”</td>
</tr>
<tr>
<td>8</td>
<td>Cylinder gasket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Piston pin clip</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Piston pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Piston</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Top ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2nd ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Oil ring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expander</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** For installation, reverse the removal procedure.
REMOVING THE CYLINDER AND PISTON

1. Remove:
   • piston pin clip ①
   • piston pin ②
   • piston ③

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

   **NOTE:**
   Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.

   Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area.

2. Remove:
   • top ring
   • 2nd ring
   • oil ring

   **NOTE:**
   When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.
CHECKING THE CYLINDER AND PISTON

1. Check:
   • piston wall
   • cylinder wall
   Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.

2. Measure:
   • piston-to-cylinder clearance

*******************************************************************************

a. Please carry out the following inspections:
   • cylinder
   Measure the piston pin in both of its horizontal axis direction a and its right angle direction b at six positions of A, B, C, etc. with a cylinder gauge.
   Abrasion = Max. value - min. value as measured at those six positions
   When abrasion is beyond limit → Replace it

Standard value of cylinder inner diameter
52.40~52.41mm (2.063~2.064 in)
Service limit of cylinder inner diameter
52.5mm (2.067 in)

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

c. Measure piston skirt diameter “P” with the micrometer.
   3.5 mm (0.138 in) from the bottom edge of the piston

Piston size “P”
51.470 ~ 51.510 mm (2.026 ~ 2.028 in)

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

e. Calculate the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =
Cylinder bore “C” - Piston skirt diameter “P”

Piston-to-cylinder clearance
0.01 ~ 0.03 mm (0.0004 ~ 0.0012 in)
<Limit>: 0.15 mm (0.006 in)

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

*******************************************************************************
CHECKING THE PISTON RINGS

1. Measure:
   • piston ring side clearance
     Out of specification → Replace the piston and piston rings as a set.

   NOTE: Before measuring the piston ring side clearance, eliminate any carbon deposits from the piston ring grooves and piston rings.

   **Piston ring side clearance**
   
   **Top ring**
   0.02 ~ 0.08 mm (0.0008 ~ 0.0031 in)
   <Limit>: 0.13 mm (0.0051 in)
   
   **2nd ring**
   0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
   <Limit>: 0.12 mm (0.0047 in)

2. Install:
   • piston ring
     (into the cylinder)

   NOTE: Level the piston ring into the cylinder with the piston crown.

   ③ 20 mm (0.79 in)

3. Measure:
   • piston ring end gap
     Out of specification → Replace the piston ring.

   NOTE: The oil ring expander spacer’s end gap cannot be measured. If the oil ring rail’s gap is excessive, replace all three piston rings.

   **Piston ring end gap**
   
   **Top ring**
   0.10 ~ 0.20 mm (0.004 ~ 0.008 in)
   <Limit>: 0.45 mm (0.018 in)
   
   **2nd ring**
   0.20 ~ 0.30 mm (0.008 ~ 0.012 in)
   <Limit>: 0.65 mm (0.026 in)
   
   Oil ring
   0.06 ~ 0.15 mm (0.002 ~ 0.006 in)
CHECKING THE PISTON PIN

1. Check:
   • piston pin
   Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

2. Measure:
   • piston pin outside diameter \( a \)
     Out of specification → Replace the piston pin.

<table>
<thead>
<tr>
<th>Piston pin outside diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.996 ~ 13.000 mm</td>
</tr>
<tr>
<td>(0.5117 ~ 0.5118 in)</td>
</tr>
<tr>
<td>&lt;Limit&gt;: 12.976 mm (0.5109 in)</td>
</tr>
</tbody>
</table>

3. Measure:
   • piston pin bore diameter \( b \)
     Out of specification → Replace the piston.

<table>
<thead>
<tr>
<th>Piston pin bore diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.002 ~ 13.013 mm</td>
</tr>
<tr>
<td>(0.5119 ~ 0.5123 in)</td>
</tr>
<tr>
<td>&lt;Limit&gt;: 13.043 mm (0.5135 in)</td>
</tr>
</tbody>
</table>

4. Calculate:
   • piston-pin-to-piston-pin-bore clearance
     Out of specification → Replace the piston pin and piston as a set.

   \[
   \text{Piston-pin-to-piston-pin-bore clearance} = \text{Piston pin bore diameter} \ b - \text{Piston pin outside diameter} \ a
   \]

<table>
<thead>
<tr>
<th>Piston-pin-to-piston clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Limit&gt;: 0.067 mm (0.0026 in)</td>
</tr>
</tbody>
</table>
CHECKING THE TIMING CHAIN GUIDE

1. Check:
   - timing chain guide (exhaust side)
     Damage/wear → Replace

INSTALLING THE PISTON AND CYLINDER

1. Install:
   - oil ring expander ①
   - oil ring rail ②
   - 2nd ring ③
   - top ring ④

   **NOTE:**
   Be sure to install the piston rings so that the manufacturer's marks or numbers face up.

2. Install:
   - piston ①
   - piston pin ②
   - piston pin clip New ③

   **NOTE:**
   - Apply engine oil the piston pin.
   - Make sure the arrow mark ④ on the piston points towards the exhaust side of the cylinder.
   - Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.
3. Install:
- gasket *New* ①
- dowel pins ②

4. Lubricate:
- piston
- piston rings
- cylinder
  (with the recommended lubricant)

**Recommended lubricant**

| Engine oil |

5. Offset:
- piston ring end gaps
  a) Top ring
  b) Lower oil ring rail
  c) Upper oil ring rail
  d) 2nd ring
  A) Exhaust side

6. Install:
- cylinder ①

**NOTE:**
- While compressing the piston rings with one hand, install the cylinder with the other hand.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.
Removing the belt drive

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kickstarter</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Crankcase cover - 3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>V-belt case air filter element holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>V-belt case filter element</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Crankcase cover - 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Dowel pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Dowel pin</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
### Removing the kickstarter

**Order** | **Job/Part** | **Q’ty** | **Remarks**
---|---|---|---
1 | Crankcase cover | 1 | Remove the parts in the order listed. Refer to “CRANKCASE COVER”.
2 | Plate (V-belt guide) | 1 |  
3 | Gasket | 1 |  
4 | Kick pinion gear | 1 |  
5 | Kick pinion gear clip | 1 | Refer to “INSTALLING THE KICKSTARTER”.
6 | Circlip / Plate washer | 1/1 |  
7 | Kick shaft assembly | 1 |  
8 | Torsion spring | 1 |  
9 | Solid bush | 1 | For installation, reverse the removal procedure.

9Nm (0.9m kg, 6.5 ft lb)
INSTALLING THE KICKSTARTER

1. Install:
   • solid bush ①
   • kickstarter shaft ②
   • kickstarter spring ③

2. Hook:
   • kickstarter spring

   **NOTE:**
   Hook the spring end ④ on the kickstarter shaft ⑤ as shown, and hook the other end ⑥ on the projection ⑦.

3. Install:
   • plain washer ①
   • circlip ② New

4. Install:
   • kick pinion gear ①
   • kick pinion gear clip ②

   **NOTE:**
   Install the clip at the position shown.

5. Install:
   • gasket ① New
   • plate ②
**Removing the V-belt, clutch, primary and secondary sheave**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary sheave nut / Plate washer</td>
<td>1/1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Oneway clutch</td>
<td>1</td>
<td>Remove to &quot;REMOVING AND INSTALLING THE SECONDARY SHEAVE&quot;</td>
</tr>
<tr>
<td>3</td>
<td>Primary fixed sheave</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Secondary sheave nut</td>
<td>1</td>
<td>Refer to &quot;REMOVING AND INSTALLING THE PRIMARY SHEAVE&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Clutch housing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Secondary sheave assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>V-belt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Washer / Collar</td>
<td>1/1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>9</td>
<td>Primary sliding sheave</td>
<td>1</td>
<td>edure.</td>
</tr>
<tr>
<td>10</td>
<td>Cam / Weight</td>
<td>1/6</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Slider</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Oil seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**

- For installation, reverse the removal procedure.
- Refer to "REMOVING AND INSTALLING THE SECONDARY SHEAVE".
- Refer to "REMOVING AND INSTALLING THE PRIMARY SHEAVE".
### Disassembling the Secondary Sheave

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disassembling the secondary sheave</td>
<td></td>
<td>Disassemble the parts in the order listed.</td>
</tr>
<tr>
<td>1</td>
<td>Clutch carrier nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Clutch carrier</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Clutch shoe spring</td>
<td>3</td>
<td>Refer to “ REMOVING AND INSTALLING THE SECONDARY SHEAVE “</td>
</tr>
<tr>
<td>4</td>
<td>Compression spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spring seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Guide pin</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Secondary sliding sheave</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>O-ring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Oil seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Secondary fixed sheave</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

**Note:**
- Torque values are approximate and may vary depending on the specific application.
- LS indicates Left Side, RS indicates Right Side.
- Ensure all components are handled with care to maintain correct installation order.

**Diagram Indicators:**
- **New** indicates a new component.
- **Components with Torque Values:**
  - 90Nm (9.0m kg, 65.1 ft lb)
REMOVING THE PRIMARY SHEAVE

1. Remove:
   - primary sheave nut ①
   - plate washer
   - primary fixed sheave ②

NOTE:
While holding the primary fixed sheave with the rotor holding tool ③, loosen the primary fixed sheave nut.

Rotor holding tool: 90890-01235 (YU-01235)

REMOVING THE SECONDARY SHEAVE AND V-BELT

1. Remove:
   - secondary sheave nut ①
   - clutch housing ②

NOTE:
While holding the clutch housing with the sheave holder ③, loosen the secondary sheave nut.

Sheave holder: 90890-01701 (YS-01880-A)

2. Loosen:
   - clutch carrier nut ①

CAUTION:
Do not remove the clutch carrier nut at this stage.

NOTE:
While holding the clutch carrier with the rotor holding tool ②, loosen the clutch carrier nut one full turn with the locknut wrench ③.

Rotor holding tool: 90890-01235 (YU-01235)
Locknut wrench: 90890-01348 (YM-01348)
3. Remove:
- secondary sheave assembly \( \text{①} \)
- V-belt \( \text{②} \)

**NOTE:**
Remove the V-belt and clutch assembly from the primary sheave side.

![Diagram of secondary sheave assembly](image1)

**DISASSEMBLING THE SECONDARY SHEAVE**

1. Remove:
   - clutch carrier nut \( \text{①} \)

**NOTE:**
Install the clutch spring holder \( \text{②} \) and clutch spring holder arm \( \text{③} \) onto the secondary sheave as shown. Then, compress the spring, and remove the clutch carrier nut \( \text{①} \).

![Diagram of clutch components](image2)

**CHECKING THE CLUTCH SHOE**

1. Measure:
   - Clutch shoe
     - Scratches → Glaze using coarse sandpaper.
     - Damage/wear → Replace

**NOTE:**
- Inspect clutch shoes \( \text{①} \).
- After removing the clutch weight spring, do not use them again.
- Replace the all three as a set.

![Diagram of clutch shoe](image3)
CHECKING THE V-BELT

1. Check:
   - V-belt
     Cracks/damage/wear → Replace.
     Grease/oil → Clean the primary and secondary sheave.

2. Measure:
   - V-belt width
     Out of specification → Replace.
     V-belt width
     21.6 mm (0.0850 in)
     <Limit>: 19.5 mm (0.768 in)

CHECKING THE PRIMARY SHEAVE

1. Check:
   - Primary sliding sheave
   - Primary fixed sheave
     Cracks/damage/wear → Replace the primary sliding sheave, primary fixed sheave and V-belt.

CHECKING THE PRIMARY SHEAVE WEIGHTS

The following procedure applies to all of the primary sheave weights.
1. Check:
   - Primary sheave weight
     Cracks/damage/wear → Replace.

2. Measure:
   - Primary sheave weight outside diameter
     Out of specification → Replace.
     Primary sheave weight outside diameter
     19.9~20.1 mm (0.783~0.791 in)
CHECKING THE SLIDER
1. Check:
   • slider (1)
   Damage/wear → Replace

EAS00322
CHECKING THE SECONDARY SHEAVE
1. Check:
   • secondary fixed sheave
   • secondary sliding sheave
   Cracks/damage/wear → Replace the secondary fixed and sliding sheaves as a set.

2. Check:
   • torque cam groove (1)
   Damage/wear → Replace the secondary fixed and sliding sheaves as a set.

3. Check:
   • guide pin (2)
   Damage/wear → Replace the secondary fixed and sliding sheaves as a set.

EAS00323
ASSEMBLING THE PRIMARY SHEAVE
1. Clean:
   • primary fixed sheave (1)
   • primary sliding sheave (2)
   • collar (3)
   • primary sheave weights (4)

   NOTE:
   Use thinner to clean up grease, dirt on the primary sliding sheave cam side (5).

2. Install:
   • primary sheave weights (1)
   • collar (2)
3. Install:
- slider 1
- primary sliding sheave 2
- cam 3
ASSEMBLING THE SECONDARY SHEAVE

1. Lubricate:
   - secondary fixed sheave’s inner surface
   - secondary sliding sheave’s inner surface
   - torque cam groove
   - oil seals
   - bearings
   (with the recommended lubricant)

   **Recommended lubricant**
   BEL-RAY assembly lube

2. Install:
   - secondary sliding sheave

   **NOTE:**
   Install the secondary sliding sheave onto the secondary fixed sheave with the oil seal guide.

   **Oil seal guide**
   90890-01384 (YM-33299)

3. Install:
   - guide pin

4. Lubricate:
   - guide pin groove
   - o-ring
   (with the recommended lubricant)

   **Recommended lubricant**
   BEL-RAY assembly lube
5. Install:
- secondary sheave ①
- spring
- clutch carrier ②

NOTE:
Attach the clutch spring holder ③ and clutch spring holder arm ④ onto the secondary sheave as shown. Then, compress the spring, and tighten the clutch carrier nut ⑤.

Clutch spring holder
90890-01337 (YM-33285)
(YM-33285-6)

EAS00325
INSTALLING THE BELT DRIVE
1. Install:
- V-belt ①
- clutch assembly ②

CAUTION:
Do not allow grease to contact the V-belt, secondary sheave assembly.

NOTE:
Install the V-belt onto the primary sheave side.
2. Install:
- clutch carrier nut ①

\[ 90 \text{ Nm (9.0 m·kg, 65.1 ft·lb)} \]

**NOTE:**
While holding the clutch carrier with the rotor holding tool ②, tighten the clutch carrier nut with the locknut wrench ③.

---

Rotor holding tool
90890-01235

Locknut wrench
90890-01348 (YM-01348)

---

3. Install:
- clutch housing ①
- secondary sheave nut ②

\[ 60 \text{ Nm (6.0 m·kg, 43.4 ft·lb)} \]

**NOTE:**
Tighten the secondary sheave nut with the sheave holder ③.

---

Sheave holder
90890-01701 (YS-01880-A)

---

4. Position:
- V-belt ①

**NOTE:**
Position the V-belt in the primary sheave ② (when the pulley is at its widest position) and in the secondary sheave ③ (when the pulley is at its narrowest position), and make sure the V-belt is tight.
Disassemble the parts in the order listed.

Refer to “REMOVING THE PRIMARY SHEAVE”

For installation, reverse the removal procedure.
CHECKING THE STARTER WHEEL GEAR

1. Check:
   - starter wheel gear ①
   - idle gear ②

   Burrs/chips/roughness/wear → Replace

2. Check:
   - starter clutch operation

   ****************************************************
   a. Install the starter clutch gear ① onto the starter clutch ② and hold the starter clutch.
   b. When turning the starter wheel gear clockwise [A], the starter clutch and the starter wheel gear should engage, otherwise the starter clutch is faulty and must be replaced.
   c. When turning the starter wheel gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.
   ****************************************************
### Removing the C.D.I. magneto

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air shroud 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Fan</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C.D.I. magneto rotor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Woodruff key</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Stator coil assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**
- Disassemble the parts in the order listed.
- Refer to “CYLINDER HEAD” in chapter 3.

**CAUTION:**
- Disconnect the C.D.I. magneto lead coupler.

For installation, reverse the removal procedure.
REMOVING THE C.D.I. MAGNETO

1. Remove:
   - nut ①
   - plate washer

**NOTE:**
- While holding the C.D.I. magneto rotor with the holding tool ②, loosen the C.D.I. magneto nut①.
- Do not allow the sheave holder to touch the projection on the C.D.I. magneto rotor.

Rotor holding tool
90890-01235 (YU-01235)

2. Remove:
   - C.D.I. magneto rotor①
   - (with flywheel puller ②)

Flywheel puller
90890-01189 (YM-01189)
1. Install:
   - C.D.I. magneto rotor

   **NOTE:**
   - Clean the tapered portion of the crankshaft and the magneto rotor hub.
   - When installing the magneto rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.

2. Tighten:
   - nut
     - 70 Nm (7.0 m•kg, 50.6 ft•lb)

   **NOTE:**
   - While holding the C.D.I. magneto with the holding tool, tighten the C.D.I. magneto rotor nut.
   - Do not allow the sheave holder to touch the projection on the C.D.I. magneto rotor.

*Rotator holding tool*
90890-01235 (YU-01235)
### Disassembling the oil pump

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C.D.I. magneto</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>1</td>
<td>Refer to “C.D.I. MAGNETO”</td>
</tr>
<tr>
<td>3</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Oil seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Dowel pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Circlip / Plate washer</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Oil pump driven gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Dowel pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Outer rotor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Inner rotor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Oil pump body</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Oil pump shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Oil pump housing cover</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>15</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks**

- Remove the parts in the order listed.
- Refer to “C.D.I. MAGNETO”
- For assembly, reverse the disassembly procedure.
CHECKING THE OIL PUMP

1. Check:
   - Oil pump driven gear ①
     Cracks/damage/wear → Replace the defective part(s).

2. Measure:
   - Inner-rotor-to-outer-rotor-tip clearance ③
   - Outer-rotor-to-oil-pump-housing clearance ③
   - Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance ③
     Out of specification → Replace the oil pump.

① Inner rotor
② Outer rotor
③ Oil pump housing

**Inner-rotor-to-outer-rotor-tip clearance**
0.15 mm (0.006 in)
<Limit>: 0.23 mm (0.009 in)

**Outer-rotor-to-oil-pump-housing clearance**
0.013 ~ 0.036 mm
(0.0005~0.0014 in)
<Limit>: 0.106 mm (0.0042 in)

**Oil-pump-housing-to-inner-rotor-and-outer-rotor clearance**
0.06 ~ 0.10 mm (0.002~0.004 in)
<Limit>: 0.17 mm (0.0067 in)
3. Check:

- oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

3. Check:

- oil pump operation

Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

**CAUTION:**

After tightening the bolts, make sure the oil pump turns smoothly.
Removing the transmission, shift drum assembly, and shift forks

Transmission oil
Rear wheel
Crankcase cover
Belt drive
Secondary sheave
1. Crankcase cover- 2
2. Crankcase cover gasket- 2
3. Dowel pin
4. Primary drive gear shaft
5. Plate washer
6. Main axle
7. Drive axle

Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
1 | Crankcase cover- 2 | 1 | Remove the parts in the order listed.
2 | Crankcase cover gasket- 2 | 1 | Drain.
3 | Dowel pin | 2 | Refer to “REAR WHEEL AND REAR BRAKE” in chapter 4.
4 | Primary drive gear shaft | 1 | Refer to “BELT DRIVE”.
5 | Plate washer | 1 | Refer to “V-BELT, CLUTCH, PRIMARY AND SECONDARY SHEAVE”.
6 | Main axle | 1 | For installation, reverse the removal procedure.
7 | Drive axle | 1 |
CHECKING THE TRANSMISSION

1. Measure:
   - main axle runout
     (with a centering device and dial gauge)
     Out of specification → Replace the main axle.

   **Main axle runout limit**
   0.02 mm (0.0008 in)

2. Measure:
   - primary drive gear shaft runout
     (with a centering device and dial gauge)
     Out of specification → Replace the drive axle.

   **Primary drive gear shaft runout limit**
   0.02 mm (0.0008 in)

3. Measure:
   - drive axle runout
     (with a centering device and dial gauge)
     Out of specification → Replace the drive axle.

   **Drive axle runout limit**
   0.02 mm (0.0008 in)

4. Check:
   - transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - transmission gear dogs
     Cracks/damage/rounded edges → Replace the defective gear(s).

5. Check:
   - transmission gear engagement
     (each pinion gear to its respective wheel gear)
     Incorrect → Reassemble the transmission axle assemblies.

6. Check:
   - transmission gear movement
     Rough movement → Replace the defective part(s).
## CRANKCASE AND CRANKSHAFT

### Remarks

- Remove the parts in the order listed.
- Refer to “ENGINE”
- Refer to “CYLINDER HEAD”
- Refer to “CYLINDER PISTON”
- Refer to “V-BELT, CLUTCH, PRIMARY AND SECONDARY SKEAVE”
- Refer to “STARTER CLUTCH AND STARTER MOTOR”
- Refer to “C.D.I. MAGNETO”
- Refer to “OIL PUMP”
- Refer to “REAR WHEEL”

### Removing the crankshaft assembly

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bolt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Collar</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Plate washer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Centerstand</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Engine bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Oil element cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Oil element</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Crankcase (right)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Torque Specifications

- 12Nm (1.2m • kg, 8.7 ft • lb)
- 8Nm (0.8m • kg, 5.8 ft • lb)
- 32Nm (3.2m • kg, 23.1 ft • lb)
- 12Nm (1.2m • kg, 8.7 ft • lb)
### CRANKCASE AND CRANKSHAFT

**Remarks**

For installation, reverse the removal procedure.

---

**Order** | **Job/Part** | **Q’ty** | **Remarks**
--- | --- | --- | ---
11 | Dowel pin | 2 | Refer to “DISASSEMBLING THE CRANKCASE “
12 | Crankshaft | 1 | Refer to “INSTALLING THE CRANKSHAFT “
13 | Timing chain | 1 |
14 | Crankcase (left) | 1 |
15 | Bolt | 1 |
16 | O-ring | 1 |
17 | Timing chain guide | 1 |
18 | Oil pipe | 1 |
19 | O-ring | 1 |
DISASSEMBLING THE CRANKCASE

1. Remove:
   • centerstand assembly

2. Remove:
   • crankcase bolts ①

   NOTE: _______________________
   Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.

3. Remove:
   • right crankcase ①

   NOTE: _______________________
   Tap on one side of the crankcase with a soft-face hammer ②. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.
REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
   - crankshaft assembly ①
   - timing chain ②

**NOTE:**
- Before removing the crankshaft assembly, remove the timing chain from the crankshaft sprocket.
- The crankshaft assembly cannot be removed if the timing chain is attached onto the crankshaft sprocket.

CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDES

1. Check:
   - timing chain
     Damage/stiffness → Replace the timing chain.

2. Check:
   - timing chain guide
     Damage/wear → Replace the timing chain guide.
CHECKING THE CRANKSHAFT AND CONNECTING ROD

1. Measure:
   - crankshaft runout
     Out of specification → Replace the crankshaft, bearing or both.

   NOTE: Turn the crankshaft slowly.

   Maximum crankshaft runout
   0.03 mm (0.0012 in)

2. Measure:
   - big end side clearance
     Out of specification → Replace the big end bearing, crankshaft pin, or connecting rod.

   Big end side clearance
   0.10~0.40 mm (0.004~0.016 in)

3. Measure:
   - crankshaft width
     Out of specification → Replace the crankshaft.

   Crankshaft width
   45.15~45.20 mm (1.778~1.780 in)

4. Check:
   - crankshaft sprocket ①
     Damage/wear → Replace the crankshaft.
   - bearing ②
     Cracks/damage/wear → Replace the crankshaft.
   - oil pump drive gear ③
     Damage/wear → Replace the crankshaft.
5. Check:
- crankshaft journal
  Scratches/wear → Replace the crankshaft.
- crankshaft journal oil passage
  Obstruction → Blow out with compressed air.

EAS00408

INSTALLING THE CRANKSHAFT

1. Install:
   - crankshaft assembly ①
   - crankcase ②
   - timing chain ③

CAUTION:
To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

NOTE:
Put the timing chain in parallel into the crank case, then use hands to place the crank shaft Ass'y into the crank case. Manually rotate the crank shaft to check whether it is tightly engaged with the timing chain. (if not, install again)
ASSEMBLING THE CRANKCASE

1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.

2. Apply:
   - sealant
     (onto the crankcase mating surfaces)

   Yamaha bond No. 1215
   90890-85505 (ACC-11001-05-01)

NOTE:
Do not allow any sealant to come into contact with the oil gallery.

3. Install:
   - dowel pins
   - timing chain ①

NOTE:
Install the timing chain so it is not visible through the opening ③ in the left crankcase ②.

4. Install:
   - crankshaft ①
   - crankcase (right)

5. Tighten:
   - crankcase
     12 Nm (1.2 m·kg, 8.7 ft·lb)
CHAPTER 6
CARBRETOR

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<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Auto choke unit</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>Auto choke holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Throttle stop screw / Spring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>④</td>
<td>Bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑤</td>
<td>Clamp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑥</td>
<td>Vacuum chamber cover / Piston valve spring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>⑦</td>
<td>Piston valve</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑧</td>
<td>Jet needle kit</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑨</td>
<td>Float chamber</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑩</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑪</td>
<td>Accelerator pump assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑫</td>
<td>Float pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑬</td>
<td>Float</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑭</td>
<td>Needle valve</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑮</td>
<td>Needle valve seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑯</td>
<td>Main jet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑰</td>
<td>Main nozzle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑱</td>
<td>Main air jet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑲</td>
<td>Pilot jet</td>
<td>1</td>
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Remove the parts in the order listed.
<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>③</td>
<td>Carburetor heater</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>Ground terminal</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>①</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHECKING THE CARBURETOR

1. Check:
   - carburetor body
   - float chamber
     Cracks/damage → Replace.

2. Check:
   - fuel passages
     Obstruction → Clean.

   a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.
   b. Blow out all of the passages and jets with compressed air.

3. Check:
   - float chamber body ①
     Dirt → Clean.

4. Check:
   - float chamber rubber gasket ②
     Cracks/damage/wear → Replace.

5. Check:
   - float
     Damage → Replace.
6. Check:
   - needle valve
   - needle valve seat
   Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.

7. Check:
   - O-ring
   Damage/wear → Replace the needle valve, needle valve seat and O-ring as a set.

8. Check:
   - piston valve
   Damage/scratches/wear → Replace.
   - piston valve diaphragm
   Cracks/tears → Replace.

9. Check:
   - vacuum chamber cover
   - piston valve spring
   Cracks/damage → Replace.

10. Check:
    - jet needle
    - main jet
    - main nozzle
    - pilot jet
    - main air jet
    Bends/damage/wear → Replace.
    Obstruction → Clean.
    Blow out the jets with compressed air.

11. Check:
    - piston valve movement
      Insert the piston valve into the carburetor body and move it up and down.
      Tightness → Replace the piston valve.

12. Check:
    - vacuum hoses
    - fuel hoses
    Cracks/damage/wear → Replace.
    Obstruction → Clean.
    Blow out the hoses with compressed air.
ASSEMBLING THE CARBURETOR

CAUTION:
- Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.
- Always use a new gasket.

1. Install:
   - main nozzle ①
   - main jet ②
   - pilot jet ③

2. Install:
   - needle valve seat ①
   - float ②
   - needle valve ③
   - float pin ④
   - screw ⑤

3. Install:
   - accelerator pump assembly

4. Install:
   - piston valve
   - jet needle
   - piston valve spring
   - vacuum chamber cover
INSTALLING THE CARBURETOR

1. Adjust:
   • engine idling speed

<table>
<thead>
<tr>
<th>Engine idling speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,600 ~ 1,700r/min</td>
</tr>
</tbody>
</table>

Refer to “ADJUSTING THE ENGINE IDLING SPEED” in chapter 3.

2. Adjust:
   • throttle cable free play

<table>
<thead>
<tr>
<th>Throttle cable free play (at the flange of the throttle grip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ~ 5 mm (0.12 ~ 0.20 in)</td>
</tr>
</tbody>
</table>

Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.
MEASURING AND ADJUSTING THE FUEL LEVEL

1. Measure:
   • fuel level \( a \)
     Out of specification → Adjust.

   Fuel level (below the float chamber mating surface)
   6.5 ~ 7.5 mm (0.26 ~ 0.30 in)

a. Stand the motorcycle on a level surface.
b. Place the motorcycle on a suitable stand to ensure that the motorcycle is standing straight up.
c. Install the fuel level gauge ① onto the fuel drain pipe ②
d. Loosen the fuel drain screw
e. Hold the fuel level gauge vertically next to the float chamber ③.
f. Measure the fuel level \( a \).

2. Adjust:
   • fuel level

a. Remove the carburetor.
b. Check the needle valve seat and needle valve.
c. If either is worn, replace them as a set.
d. If both are fine, adjust the float level by slightly bending the float tang ①.
e. Install the carburetor.
f. Measure the fuel level \( a \) again.
g. Repeat steps (a) to (f) until the fuel level is within specification.
CHECKING THE FUEL COCK

1. Check:
   - fuel cock
     Cracks/damage/wear → Replace.

2. Check:
   - fuel cock strainer ①
     obstruction → clean.
     Blow out the jets with compressed air.
     Damage → Replace.

CHECKING THE AUTOCHOKE UNIT

NOTE: When checking the autochoke unit, the ambient temperature must be lower than 45°C (113°F).

1. Remove:
   - carburetor

2. Check:
   - autochoke unit

   a. Connect a 3.3-mm hose ① to the starter air passage ② and blow into the hose.

   NOTE: When the starter plunger is open, air should come out of the other side of the starter air passage.

   Starter plunger opens
   Perform step (3).
   Starter plunger closes
   Replace the autochoke unit.
3. Check:
- autochoke unit

a. Connect the autochoke unit leads to a 12.0-V battery for five minutes.

<table>
<thead>
<tr>
<th>Positive battery lead 1 → black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative battery lead 2 → black</td>
</tr>
</tbody>
</table>

b. Connect a 3.3-mm hose 3 to the starter air passage 4 and blow into the hose.

<table>
<thead>
<tr>
<th>Starter plunger opens.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the autochoke unit.</td>
</tr>
<tr>
<td>Starter plunger closes.</td>
</tr>
<tr>
<td>Autochoke is OK.</td>
</tr>
</tbody>
</table>
## AIR INDUCTION SYSTEM

### Removing the Air Induction System

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hose (from Al air filter)</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Vacuum hose (from mainfold)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hose (to cylinder head)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Muffler assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Air cut-off valve bracket</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>7</td>
<td>Air cut-off valve assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- **4Nm**: 0.4 m * kg, 2.9 ft * lb
- **31Nm**: 3.1 m * kg, 22.4 ft * lb
CHECKING THE AIR INDUCTION SYSTEM

1. Check:
   • hoses
     Loose connection → Connect properly.
     Cracks/damage → Replace.
   • pipe
     Cracks/damage → Replace.

2. Check:
   • air cut-off valve
     Cracks/damage → Replace.

NOTE:
When the negative pressure is applied to the part (1), check that the continuity in the direction of arrow mark is completely lost. If the negative pressure is not loaded, the continuity can be obtained.
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ELECTRICAL COMPONENTS

1. Wire harness
2. Battery
3. C.D.I. unit
4. Carburetor heater
5. Sidestand switch
6. Horn
7. Rectifier/Regulator
8. Ignition coil
9. Rear brake light switch
10. Main switch
11. Thermo switch
12. Fuel sender
13. Starter relay
14. Turn signal relay
15. Front brake light switch
16. Starting circuit cut-off relay
1. Main switch
2. C.D.I. magneto
3. Rectifier/Regulator
4. Battery
5. Main fuse
6. Battery (+) lead
7. Battery (-) lead
8. Wire lead
9. Starter relay
10. Starter motor
11. C.D.I. unit
12. Ignition coil
13. Auto choke unit
14. Front brake light switch
15. Rear brake light switch
16. Start switch
17. Engine stop switch
18. Starting circuit cut-off relay
19. Sidestand switch
20. Horn
21. Horn switch
22. Turn signal switch
23. Turn signal relay
24. Speedometer light
25. Tail/brake light
26. Dimmer switch
27. High beam indicator light
28. Turn signal indicator light
29. Fuel lever meter
30. Fuel sender
31. Headlight
32. Front turn signal light (left)
33. Front turn signal light (right)
34. Rear turn signal light (left)
35. Rear turn signal light (right)
36. Thermo switch
37. Carburetor heater

Color Code:
- B Black
- Br Brown
- Ch Chocolate
- Dg Dark green
- G Green
- L Blue
- Or Orange
- P Pink
- R Red
- Sb Sky blue
- W White
- Y Yellow
- B/W Black/White
- B/R Black/Red
- Br/W Brown/White
- G/Y Green/Yellow
- G/W Green/White
- L/Y Blue/Yellow
- L/W Blue/White
- W/R White/Red
- R/W Red/White
- W/L White/Blue
- Y/R Yellow/Red
CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

**CAUTION:**

Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

**NOTE:**

- Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left. The switch positions are shown in the far left column and the switch lead colors are shown in the top row in the switch illustration.

**NOTE:**

“Ω-Ω” indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that: There is continuity between red and brown when the switch is set to “ON”.

Pocket tester

90890-03132 (YU-03112-C)
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.

Damage/wear → Repair or replace.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.
CHECKING THE BULBS AND BULB SOCKETS

CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

- Damage/wear → Repair or replace the bulb, bulb socket or both.
- Improperly connected → Properly connect.
- No continuity → Repair or replace the bulb, bulb socket or both.

TYPES OF BULBS

The bulbs used on this scooter are shown in the illustration on the left.

- Bulbs A and B are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.

- Bulbs C is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.

- Bulbs D and E are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.
CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

1. Remove:
   • bulb

**WARNING**
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

**CAUTION:**
- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

2. Check:
   • bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

**Pocket tester**
90890-03132 (YU-03112-C)

**NOTE:**
Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.

a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.

b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.

c. If either of the readings indicate no continuity, replace the bulb.
CHECKING THE CONDITION OF THE BULB SOCKETS
The following procedure applies to all of the bulb sockets.

1. Check:
   • bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

Pocket tester
90890-03132 (YU-03112-C)

NOTE:
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

******************************************************************************
a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.
******************************************************************************
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. Main Fuse
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. Engine stop switch
9. Sidestand switch
10. Pickup coil resistance
11. Wiring connections (of the entire ignition system)

NOTE:
- Before troubleshooting, remove the following part(s):
  1. Head light cover
  2. Front turn signal light bracket
  3. Leg shield 1
  4. Rear carrier
  5. Side cover (right)
  6. Cover
  7. Battery cover
- Troubleshoot with the following special tool(s).

Ignition checker
90890-06754 (YM-34487)
Pocket tester
90890-03132 (YU-03112-C)

1. Main Fuse
   - Check the fuse for continuity.
   - Refer to “CHECKING THE FUSE” in chapter 3.
   - Is the fuse OK?
     
     YES
     NO

     Replace the fuse.

2. Battery
   - Check the condition of the battery.
   - Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   - Minimum open-circuit voltage
     12.8 V or more at 20°C
   - Is the battery OK?
     
     YES
     NO

     Clean the battery terminals.
     Recharge or replace the battery.

3. Spark plug
   - Check the condition of the spark plug.
   - Check the spark plug type.
   - Measure the spark plug gap.
   - Refer to “CHECKING THE SPARK PLUG” in chapter 3.
   - Standard spark plug
     CR7E (NGK)
     Spark plug gap
     0.7 ~ 0.8 mm (0.028 ~ 0.032 in)
   - Is the spark plug in good condition, is it of the correct type, and is its gap within specification?
     
     YES
     NO

     Re-gap or replace the spark plug.
4. Ignition spark gap
   - Disconnect the spark plug cap from the spark plug.
   - Connect the ignition checker ① as shown.
   ② Spark plug cap
   - Set the main switch to “ON”.
   - Measure the ignition spark gap ③.
   - Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.

   Minimum ignition spark gap
   6 mm(0.24 in)
   - Is there a spark and is the spark gap within specification?

   YES  NO
   The ignition system is OK.

5. Spark plug cap resistance
   - Remove the spark plug cap from the spark plug lead.
   - Connect the pocket tester (“Ω x 1k” range) to the spark plug cap as shown.
   - Measure the spark plug cap resistance.

   Spark plug cap resistance
   8~12 kΩ at 20°C
   - Is the spark plug cap OK?

   YES  NO
   Replace the spark plug cap.

6. Ignition coil resistance
   - Disconnect the ignition coil connectors from the ignition coil terminals.
   - Connect the pocket tester (Ω x 1) to the ignition coil as shown.

   Positive tester probe ➔ orange
   Negative tester probe ➔ black
Measure the primary coil resistance.

**Primary coil resistance**

0.184 ~ 0.276 Ω at 20°C

Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

- Negative tester probe → spark plug lead ②
- Positive tester probe → spark plug lead ①

Is the ignition coil OK?

Replace the ignition coil.

---

Replace the main switch.

---

Replace the right handlebar switch.

---

Replace the sidestand switch.

---

Measure the secondary coil resistance.

**Secondary coil resistance**

6.32 ~ 9.48 kΩ at 20°C
### 10. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal as shown.

**Positive tester probe → white/red** ①  
**Negative tester probe → white/blue** ②

![](image)

- Measure the pickup coil resistance.

<table>
<thead>
<tr>
<th>Pickup coil resistance</th>
<th>304 ~ 456Ω at 20°C</th>
</tr>
</thead>
</table>

- Is the pickup coil OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Replace the pickup coil.

### 11. Wiring

- Check the entire ignition system’s wiring.Refer to “CIRCUIT DIAGRAM”.
- Is the ignition system’s wiring properly connected and without defects?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Replace the C.D.I. unit.  
Properly connect or repair the ignition system’s wiring.
STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is set to “ON” (switch is closed), the starter motor can only operate if at least one of the following conditions is met:
- The sidestand switch is up (the side stand switch is closed), and the brake lever (front or rear) is pulled to the handlebar (the brake light switch is closed)

① Battery  
② Main fuse  
③ Main switch  
④ Front brake light switch  
⑤ Rear brake light switch  
⑥ Engine stop switch  
⑦ Starting circuit cut-off relay  
⑧ Sidestand switch  
⑨ Start switch  
⑩ Starter relay  
⑪ Starter motor  
⑫ C.D.I. unit
TROUBLESHOOTING

The starter motor fails to turn.

Check:
1. Main fuse
2. Battery
3. Starter motor
4. Starting circuit cut-off relay
5. Starter relay
6. Main switch
7. Brake light switch (front, rear)
8. Engine stop switch
9. Sidestand switch
10. Start switch
11. Wiring connections (of the entire starting system)

NOTE:
- Before troubleshooting, remove the following part(s):
  1. Head light cover
  2. Front turn signal light bracket
  3. Leg shield
  4. Rear carrier
  5. Side cover (right)
  6. Cover
  7. Battery cover
  - Troubleshoot with the following special tool(s).

Pocket tester
90890-03132 (YU-03112-C)

1. Main fuse
   • Check the fuse for continuity.
   Refer to “CHECKING THE FUSE” in chapter 3.
   • Is the fuse OK?

   YES  NO

Replace the fuse.

2. Battery
   • Check the condition of the battery.
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   Minimum open-circuit voltage
   12.8 V or more at 20°C

   YES  NO

   • Clean the battery terminals.
   • Recharge or replace the battery.
3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead③.

**WARNING**

- A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

- Does the starter motor turn?

  - YES
  - NO

  Repair or replace the starter motor.

4. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

**Positive battery terminal → red/white ①**
**Negative battery terminal → blue/white ②**
**Positive tester probe → green/yellow ③**
**Negative tester probe → sky blue ④**

- Does the starting circuit cut-off relay have continuity between green/yellow③ and sky blue④?

  - YES
  - NO

  Replace the starting circuit cut-off relay.
5. Starter relay
- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starter
- relay coupler as shown.

Positive battery terminal → red/white ①
Negative battery terminal → blue/white ②
Positive tester probe → red ③
Negative tester probe → red ④

- Does the starter relay have continuity between red ③ and red ④?

YES  NO

Replace the starter relay.

7. Brake light switch(front and rear)
- Check the brake light switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the brake light switch OK?

YES  NO

Replace the brake light switch.

8. Engine stop switch
- Check the engine stop switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES  NO

Replace the right handlebar switch.

9. Sidestand switch
- Check the sidestand switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES  NO

Replace the sidestand switch.

10. Start switch
- Check the start switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the start switch OK?

YES  NO

Replace the right handlebar switch.

6. Main switch
- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES  NO

Replace the main switch.
## 11. Wiring

- Check the entire starting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>The starting system circuit is OK.</td>
<td>Properly connect or repair the starting system’s wiring or replace the C.D.I. unit.</td>
</tr>
</tbody>
</table>
### Starter Motor

#### Starter Motor Removal
- Air filter case
- Starter motor lead
- starter motor

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Starter motor removal</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to &quot;LEADS, HOSES AND REAR BRAKE&quot; in chapter 5.</td>
</tr>
<tr>
<td>2</td>
<td>Starter motor lead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>starter motor</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### Starter Motor Disassembly
- O-ring
- Rear bracket
- Gasket
- Stator assembly
- Armature coil
- Circlip
- Brush
- Brush spring
- Brush seat
- Plate washer
- Front bracket

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O-ring</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Stator assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Armature coil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Brush</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brush spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Brush seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Plate washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Front bracket</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

3.5Nm (0.35m • kg, 2.5 ft • lb)

New
CHECKING THE STARTER MOTOR

1. Check:
   - commutator
     Dirt → Clean with 600-grit sandpaper.

2. Measure:
   - commutator diameter \( \text{b} \)
     Out of specification → Replace the starter motor.

   \[ \text{Commutator wear limit} \]
   \[ 21 \text{ mm (0.83 in)} \]

3. Measure:
   - mica undercut \( \text{a} \)
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

   \[ \text{Mica undercut} \]
   \[ 1.5 \text{ mm (0.06 in)} \]

   **NOTE:**
   The mica of the commutator must be undercut to ensure proper operation of the commutator.

4. Measure:
   - armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

   \[ \text{a. Measure the armature assembly resistances with the pocket tester.} \]

   \[ \text{Pocket tester} \]
   \[ 90890-03132 (YU-03112-C) \]

   \[ \text{Armature coil} \]
   \[ \text{Commutator resistance} \ (\text{1}) \]
   \[ 0.0306 \sim 0.0374 \ \Omega \text{ at 20°C} \]
   \[ \text{Insulation resistance} \ (\text{2}) \]
   \[ \text{Above 1 MΩ at 20°C} \]

   \[ \text{b. If any resistance is out of specification, replace the starter motor.} \]

---

**ELECTRIC STARTING SYSTEM**

---
5. Measure:
- brush length @
  Out of specification → Replace the brushes as a set.

![Brush length wear limit
3.5 mm (0.14 in)](image)

6. Measure:
- brush spring force
  Out of specification → Replace the brush springs as a set.

![Brush spring force
5.52 ~ 8.28 N](image)

7. Check:
- gear teeth
  Damage/wear → Replace the gear.
ASSEMBLING THE STARTER MOTOR

1. Install:
   - brush spring ①
   - brush ②
   - armature coil

2. Install:
   - gasket ①
   - starter motor front bracket ②
   - starter motor rear bracket ③

NOTE:
Align the match marks ④ on the starter motor yoke with the match marks ⑤ on the front and starter motor rear brackets.

3. Install:
   - O-ring New ①
   - washer
   - bolts ②
   - 3.5 Nm (0.35 m•kg, 2.5 ft•lb)
TROUBLESHOOTING

The battery is not being charged.

Check:
1. main fuse
2. battery
3. charging voltage
4. stator coil resistance
5. wiring connections
   (of the entire charging system)

NOTE:

Before troubleshooting, remove the following part(s):
1. Rear carrier
2. Side cover (right)
3. Cover
4. Battery cover
5. Troubleshoot with the following special tool(s).

Engine tachometer
90890-03113 (YU-08036-C)
Pocket tester
90890-03132 (YU-03112-C)

1. Main fuse
   ● Check the fuse for continuity.
   Refer to “CHECKING THE FUSE” in chapter 3.
   ● Is the fuse OK?

   YES  NO

   Replace the fuse.

2. Battery
   ● Check the condition of the battery.
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

   Minimum open-circuit voltage
   12.8 V or more at 20°C

   ● Is the battery OK?

   YES  NO

   ● Clean the battery terminals.
   ● Recharge or replace the battery.

3. Charging voltage
   ● Connect the engine tachometer to the spark plug lead of cylinder.
   ● Connect the pocket tester (DC 20 V) to the battery as shown.

   DC20V

   Positive tester probe ➔ positive battery terminal
   Negative tester probe ➔ negative battery terminal

   ● Start the engine and let it run at approximately 5,000 r/min.
   ● Measure the charging voltage.

   Charging voltage
   14 V at 5000r/min
**NOTE:**

Make sure the battery is fully charged.

- Is the charging voltage within specification?

    **YES**  
    **NO**

    The charging circuit is OK.

---

**EAS00754**

4. Stator coil resistance

- Remove the C.D.I magneto couplers from wireharness.
- Connect the pocket tester (Ω × 1) to the stator coils as shown.

    **Positive tester probe → green/ white**  
    **Negative tester probe → black/red**

    ![Stator coil diagram]

- Measure the stator coil resistances.

    **Stator coil resistance**  
    688 ~ 1032 Ω at 20°C

- Is the stator coil OK?

    **YES**  
    **NO**

    Replace the stator coil assembly.

---

**EAS00754**

5. Wiring

- Check the entire charging system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the charging system’s wiring properly connected and without defects?

    **YES**  
    **NO**

    Replace the unit rectifier/regulator.  
    Properly connect or repair the charging system’s wiring.
C.D.I. magneto
24 Speedometer light
25 Dimmer switch
27 High beam indicator light
28 Fuel lever meter light
31 Headlight
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, fuel level meter light or meter light.

Check:
1. main fuse
2. battery
3. main switch
4. dimmer switch
5. wiring connections
   (of the entire lighting system)

NOTE:

Before troubleshooting, remove the following part(s):
1. Headlight cover
2. Front turn signal light bracket
3. Leg shield 1
4. Rear varier
5. Side cover (right)
6. Cover
7. Battery cover
   Troubleshoot with the following special tool(s).

Pocket tester
90890-03132 (YU-03112-C)

1. Main fuse
   Check the fuses for continuity.
   Refer to “CHECKING THE FUSES” in chapter 3.
   Is the fuse OK?

   YES  NO
   Replace the fuse.

2. Battery
   Check the condition of the battery.
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C

   Is the battery OK?

   YES  NO
   Clean the battery terminals.
   Recharge or replace the battery.

3. Main switch
   Check the main switch for continuity.
   Refer to “CHECKING THE SWITCHES”.
   Is the main switch OK?

   YES  NO
   Replace the main switch.

4. Dimmer switch
   Check the dimmer switch for continuity.
   Refer to “CHECKING THE SWITCHES”.
   Is the dimmer switch OK?

   YES  NO
   The dimmer switch is faulty.
   Replace the left handlebar switch.
5. Wiring
- Check the entire lighting system's wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the lighting system's wiring properly connected and without defects?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Check the condition of each of the lighting system's circuits.
Refer to “CIRCUIT DIAGRAM”.

Properly connect or repair the lighting system's wiring.

---

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to come on.

1. Headlight bulb and socket
- Check the headlight bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the headlight bulb and socket OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Replace the headlight bulb, socket or both.

2. High beam indicator light bulb and socket
- Check the high beam indicator light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”
- Are the high beam indicator light bulb and socket OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Replace the high beam indicator light bulb, socket or both.
3. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

When the dimmer switch is set to "D"
When the dimmer switch is set to "D"
Headlight coupler (wire harness side)

Positive tester probe → green ①
Negative tester probe → black ②
Positive tester probe → yellow ③
Negative tester probe → black ④

High beam indicator light
Positive tester probe → yellow ①
Negative tester probe → black ②

- Set the main switch to “ON”.
- Start the engine
- Set the dimmer switch to “D” or “D”.
- Measure the voltage (DC 12 V) on the headlight coupler (wire harness side).
- Measure the voltage (DC 12 V) on the dimmer switch coupler (wire harness side) when the dimmer switch is set to “D”.
- Is the voltage within specification?

YES

NO

This circuit is OK

The wiring circuit from the main switch to the headlight coupler and high beam indicator light are faulty and must be repaired.

4. Wiring

- Check the entire lighting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the lighting system’s wiring properly connected and without defects?

YES

NO

Check the condition of each of the lighting system’s circuits.
Refer to “CIRCUIT DIAGRAM”.

Properly connect or repair the lighting system’s wiring.
## LIGHTING SYSTEM

### 2. The meter light fails to come on.

<table>
<thead>
<tr>
<th>1. Meter light bulb and socket</th>
</tr>
</thead>
</table>
| - Check the meter light bulb and socket for continuity.  
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”  
- Are the meter light bulb and socket OK? |
| YES | NO |
| Replace the meter light bulb, socket or both. |

<table>
<thead>
<tr>
<th>2. Voltage</th>
</tr>
</thead>
</table>
| - Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.  
  **Positive tester probe → blue (1)**  
  **Negative tester probe → black (2)** |
| YES | NO |
| ![Diagram showing meter light connection](image) |
| - Set the main switch to “ON”.  
- Measure the voltage (DC 12 V) of blue (1) on the meter light coupler (wire harness side).  
- Is the voltage within specification? |
| YES | NO |
| This circuit is OK. |

<table>
<thead>
<tr>
<th>3. Fuel level meter light</th>
</tr>
</thead>
</table>
| - Check the fuel level meter light bulb and socket for continuity.  
- Are the fuel level meter light bulb and socket OK? |
| YES | NO |
| Replace the fuel level meter light bulb, socket or both. |

*Ch* | *L* | *B* | *LDg* | *Ch* | *Y*
4. Lighting coil resistance

- Disconnect the lighting coil coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the lighting coil terminal as shown.

Positive tester probe ➔ yellow/red ①
Negative tester probe ➔ ground

- Measure the lighting coil resistance.

Lighting coil resistance
0.28 ~ 0.42 Ω at 20°C
(between yellow/red and ground)

- Connect the pocket tester (Ω × 1) to the lighting coil terminal as shown.

Positive tester probe ➔ white ①
Negative tester probe ➔ ground

- Measure the lighting coil resistance.

Lighting coil resistance
0.32 ~ 0.48 Ω at 20°C
(between white and ground)

- Is the lighting coil OK?

↓ YES  ↓ NO

Replace the lighting coil.
ELEC SIGNALING SYSTEM

SIGNALING SYSTEM
CIRCUIT DIAGRAM

1. Main switch
2. Battery
3. Main fuse
4. Battery (+) lead
5. Battery (-) lead
6. Wire lead
7. Front brake light switch
8. Rear brake light switch
9. Horn
10. Horn switch
11. Turn signal switch
12. Turn signal relay
13. Tail/brake light
14. Turn signal indicator light
15. Fuel level meter
16. Fuel sender
17. Front turn signal light (left)
18. Front turn signal light (right)
19. Rear turn signal light (left)
20. Rear turn signal light (right)
TROUBLESHOOTING

- Any of the following fail to light: turn signal light, brake light or an indicator light.
- The horn fails to sound.

Check:
1. main fuse
2. battery
3. main switch
4. wiring connections
   (of the entire signaling system)

NOTE:
- Before troubleshooting, remove the following part(s):
  1. Head light cover
  2. Front turn signal light bracket
  3. Leg shield 1
  4. Rear carrier
  5. Side cover (right )
  6. Cover
  7. Battery cover
     - Troubleshoot with the following special tool(s).

Pocket tester
90890-03132 (YU-03112-C)

---

2. Battery

- Check the condition of the battery.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C

- Is the battery OK?

   YES

   NO

   - Clean the battery terminals.
   - Recharge or replace the battery.

3. Main switch

- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

   YES

   NO

   Replace the main switch.

---

1. Main fuse

- Check the main fuse for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Is the fuse OK?

   YES

   NO

   Replace the fuse.

---

4. Wiring

- Check the entire signal system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the signaling system’s wiring properly connected and without defects?

   YES

   NO

Check the condition of each of the signaling system’s circuits.
Refer to “CHECKING THE SIGNALING SYSTEM”.

   YES

   NO

   Properly connect or repair the signaling system’s wiring.
CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

   1. Horn switch
   - Check the horn switch for continuity. Refer to “CHECKING THE SWITCHES”.
   - Is the horn switch OK?

   YES NO
   Replace the left handlebar switch.

   2. Voltage
   - Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

   Positive tester probe → brown  
   Negative tester probe → ground

   YES NO
   The wiring circuit from the main switch to the horn connector is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.

   3. Horn
   - Disconnect the pink connector at the horn terminal.
   - Connect a jumper lead 1 to the horn terminal and ground the jumper lead.
   - Set the main switch to “ON”.
   - Push the horn switch.
   - Does the horn sound?

   NO YES
   The horn is OK.

   4. Voltage
   - Connect the pocket tester (DC 20 V) to the horn connector at the pink terminal as shown.

   Positive tester probe → pink  
   Negative tester probe → ground

   YES NO
   Repair or replace the horn.
   Replace the horn.
2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket
   - Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
   - Are the tail/brake light bulb and socket OK?
     - YES
     - NO
     Replace the tail/brake light bulb, socket or both.

2. Brake light switches
   - Check the brake light switches for continuity. Refer to “CHECKING THE SWITCHES”
   - Is the brake light switch OK?
     - YES
     - NO
     The wiring circuit from the main switch to the tail/brake light bulb connector is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.
     - Replace the brake light switch.

3. Voltage
   - Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.
   - Positive tester probe → green/yellow ①
   - Negative tester probe → black ②
   - Set the main switch to “ON”.
   - Pull in the brake levers.
   - Measure the voltage (DC 12 V) of yellow green/yellow ① on the tail/brake light coupler (wire harness side).
   - Is the voltage within specification?
     - YES
     - NO
     This circuit is OK.
     - Replace the brake light switch.
     - The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.

SIGNALING SYSTEM
ELEC
3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal light and turn signal indicator light bulbs and sockets
   - Check the turn signal light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
   - Check the turn signal indicator light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”
   - Are the turn signal light bulb and socket OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the turn signal light and/or turn signal indicator light bulb, socket or both.</td>
<td></td>
</tr>
</tbody>
</table>

2. Turn signal switch
   - Check the turn signal switch for continuity. Refer to “CHECKING THE SWITCHES”.
   - Is the turn signal switch OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the left handlebar switch.</td>
<td></td>
</tr>
</tbody>
</table>

3. Voltage
   - Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

   **Positive tester probe ➔ brown**
   **Negative tester probe ➔ ground**

   - Set the main switch to “ON”.
   - Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler (wire harness side).
   - Is the voltage within specification?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired. Refer to “CIRCUIT DIAGRAM”.</td>
<td></td>
</tr>
</tbody>
</table>
4. Voltage

• Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown/white
Negative tester probe → ground

• Set the main switch to “ON”.
• Set the turn signal switch to “4” or “6”.
• Measure the voltage (DC 12 V) on brown/white at the turn signal relay coupler (wire harness side).
• Is the voltage within specification?

↓ YES  ↓ NO

The turn signal relay is faulty and must be replaced.

5. Voltage

• Connect the pocket tester (DC 20 V) to the turn signal light connector or meter assembly coupler (wire harness side) as shown.

Left turn signal light
Positive tester probe → chocolate
Negative tester probe → ground
Right turn signal light
Positive tester probe → dark green
Negative tester probe → ground

• Set the main switch to “ON”.
• Set the turn signal switch to “4” or “6”.
• Measure the voltage (DC 12 V) of the chocolate or dark green at the turn signal light connector (wire harness side).
• Is the voltage within specification?

↓ YES  ↓ NO

This circuit is OK.
The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.
4. The fuel level meter fails to operate.

1. Fuel sender
   - Remove the fuel sender from the fuel tank.
   - Connect the pocket tester (Ω x 1) to the fuel sender coupler (wire harness side) as shown.

   **Positive tester probe → green**
   **Negative tester probe → black**

   ![Diagram of fuel sender](image)

   Fuel sender resistance (up position F)(Ω x 1)
   4~10Ω at 20°C

   Fuel sender resistance (down position E)(Ω x 10)
   90~100Ω at 20°C

   **Is the fuel sender OK?**

   ![Diagram of wiring connections](image)

   ![Check the wiring connections of the entire signaling system. Refer to "CIRCUIT DIAGRAM".](image)

2. Voltage
   - Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

   **Positive tester probe → brown**
   **Negative tester probe → black**

   ![Diagram of pocket tester connections](image)

   - Set the main switch to "ON".
   - Measure the voltage (DC 12 V) of brown on the meter light coupler (wire harness side).
   - **Is the voltage within specification?**

   ![Diagram of voltage measurement](image)

   Check the wiring connections of the entire signaling system. Refer to "CIRCUIT DIAGRAM".

   Replace the fuel sender.
3. Fuel level meter

- Set the main switch to “ON”.
- Move the float up ① or down ②.

- Check that the fuel level meter needle moves to “F” or “E”.

**NOTE:**
Before reading the fuel level meter, leave the float in one position (either up or down) for at least three minutes.

- Does the fuel level meter needle move appropriately?

**YES**

This circuit is OK.

**NO**

Replace the fuel level meter.

4. Wiring

- Check the entire signaling system’s wiring
CARBURETOR HEATING SYSTEM
CIRCUIT DIAGRAM

1. Main switch
2. Battery
3. Main fuse
4. Battery (+) lead
5. Battery (-) lead
6. Wire lead
7. Thermo switch
8. Carburetor heater
The carburetor heating system fails to operate.

Check:
1. Main fuse
2. Battery
3. Main switch
4. Thermo switch
5. Carburetor heater
6. Wiring connections
   (of the entire carburetor heating system)

NOTE:
- Before troubleshooting, remove the following part(s):
  1. Head light cover
  2. Front turn signal light bracket
  3. Leg shield 1
  4. Cover
  5. Battery cover
  6. Footrest board side cover mole(right)
- Troubleshoot with the following special tool(s).

Pocket tester
90890-03132 (YU-03112-C)

1. Main fuse
   - Check the fuse for continuity.
     Refer to “CHECKING THE FUSES” in chapter 3.
   - Is the fuse OK?

YES  NO
Replace the fuse.

2. Battery
   - Check the condition of the battery.
     Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   - Minimum open-circuit voltage
     12.8 V or more at 20°C
   - Is the battery OK?

   YES  NO
   - Clean the battery terminals.
   - Recharge or replace the battery.

3. Main switch
   - Check the main switch for continuity.
     Refer to “CHECKING THE SWITCHES”.
   - Is the main switch OK?

   YES  NO
   Replace the main switch.
4. Thermo switch

- Remove the thermo switch from the thermo switch plate wire harness.
- Connect the pocket tester to the \((\Omega \times 1)\) to the thermo switch ① as shown.

**NOTE:**
Make sure that the thermo switch terminals do not get wet.

- Immerse the thermo switch in a container filled with coolant ②.
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, then let it cool down to the specified temperature.
- Check the thermo switch for continuity at the temperature indicated below.

<table>
<thead>
<tr>
<th>Test step</th>
<th>Coolant temperature</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ~ 11 ± 3 °C</td>
<td>YES</td>
</tr>
<tr>
<td>2</td>
<td>More than 16 ± 3 °C</td>
<td>NO</td>
</tr>
<tr>
<td>3*</td>
<td>16 ± 3 ~ 11 ± 3 °C</td>
<td>NO</td>
</tr>
<tr>
<td>4*</td>
<td>Less than 11 ± 3 °C</td>
<td>YES</td>
</tr>
</tbody>
</table>

Steps 1 & 2: Heating phase
Steps 3 & 4: Cooling phase

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

5. Carburetor heater

- Remove the carburetor heating element from the carburetor.
- Connect the pocket tester to the carburetor heating element as shown.

**Positive tester probe → heating element ①**
**Negative tester probe → heating element body ②**

- Measure the carburetor heater resistance.

*Carburetor heating element resistance*  
\(30 \, \Omega \) at 20°C

- Is the carburetor heating element OK?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the carburetor heating element.</td>
<td></td>
</tr>
</tbody>
</table>
6. Wiring

- Check the entire carburetor heating system's wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the carburetor heating system’s wiring properly connected and without defects?

NO

Properly connect or repair the carburetor heating system's wiring.
AUTO CHOKE SYSTEM
CIRCUIT DIAGRAM

C.D.I. magneto
Auto choke unit
TROUBLESHOOTING

The auto choke system fails to operate.

Check:
1. Lighting coil resistance
2. Auto choke unit resistance
3. Wiring connections
   (of the entire auto choke system)

NOTE: Before troubleshooting, remove the following part(s):
1. Cover
2. Rear carrier
3. Side cover (right)
   Troubleshoot with the following special tool(s).

Pocket tester 90890-03132 (YU-03112-C)

1. Lighting coil resistance
   - Disconnect the lighting coil coupler from the wire harness.
   - Connect the pocket tester (Ω × 1) to the lighting coil terminal as shown.

Positive tester probe → yellow/red
Negative tester probe → ground

- Measure the lighting coil resistance.

Lighting coil resistance 0.28 ~ 0.42 Ω at 20°C
   (between yellow/red and ground)

- Connect the pocket tester (Ω × 1) to the lighting coil terminal as shown.

Positive tester probe → white
Negative tester probe → ground

- Measure the lighting coil resistance.

Lighting coil resistance 0.32 ~ 0.48 Ω at 20°C
   (between white and ground)

- Is the lighting coil OK?

YES NO

Replace the lighting coil.
2. Auto choke unit resistance

- Disconnect the auto choke unit coupler from wire harness.
- Connect the Pocket tester (Ω x 1) to the Auto choke unit coupler as shown.

Positive tester probe ➔ black ①
Negative tester probe ➔ black ②

- Measure the auto choke unit resistance.

<table>
<thead>
<tr>
<th>Auto choke unit resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Ω at 20°C</td>
</tr>
</tbody>
</table>

- Is the auto choke unit OK?

↓ YES  ↓ NO

Replace the auto choke unit.

EAS00626

3. Wiring

- Check the entire auto choke system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the auto choke system’s wiring properly connected and without defects?

↓ YES  ↓ NO

Properly connect or repair the auto choke system’s wiring.
CHAPTER 8
TROUBLE SHOOTING

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TROUBLESHOOTING

NOTE:
The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING FAILURES

ENGINE

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Piston and piston ring
- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter
- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft
- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank
- Empty fuel tank
- Clogged fuel filter
- Clogged fuel tank cap breather hole
- Clogged or damaged fuel hose
- Deteriorated or contaminated fuel

Fuel cock
- Clogged or damaged fuel hose

Carburetor
- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Improperly installed needle valve seat
- Incorrect fuel level
- Improperly installed pilot jet
- Clogged starter jet
- Clogged emulsion tube
- Improperly adjusted pilot screw

Auto choke unit
- Faulty starter plunger
- Faulty thermo switch

ELECTRICAL SYSTEMS

Battery
- Discharged battery
- Faulty battery

Fuse
- Blown, damaged or incorrect fuse
- Improperly installed fuse

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead
STARTING FAILURES/INCORRECT ENGINE IDLING SPEED

Ignition system
- Faulty C.D.I. unit
- Faulty pickup coil
- Broken magneto rotor woodruff key

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty front and rear brake light switch
- Faulty start switch
- Faulty sidestand switch
- Improperly grounded circuit
- Loose connections

Starting system
- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

INCORRECT ENGINE IDLING SPEED

ENGINE
Cylinder and cylinder head
- Incorrect valve clearance
- Damaged valve train components

Air filter
- Clogged air filter element

FUEL SYSTEM
Carburetor
- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Improperly adjusted engine idling speed (throttle stop screw)
- Improper throttle cable free play
- Flooded carburetor

ELECTRICAL SYSTEMS
Battery
- Discharged battery
- Faulty battery

Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Cracked or broken ignition coil

Ignition system
- Faulty C.D.I. unit
- Faulty pickup coil
- Broken magneto rotor woodruff key
POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES”.

ENGINE
Air filter
- Clogged air filter element

Air intake system
- Bent, clogged or disconnected carburetor air vent hose
- Clogged or leaking air duct

FUEL SYSTEM
Carburetor
- Faulty diaphragm
- Incorrect fuel level
- Loose or clogged main jet
- Faulty accelerating pump

Fuel cock
- Faulty fuel cock

FAULTY CLUTCH

ENGINE OPERATES BUT SCOOTER WILL NOT MOVE

V-belt
- Bent, damaged or worn V-belt
- Slipping V-belt

Primary pulley cam and primary pulley slider
- Damaged or worn primary pulley cam
- Damaged or worn primary pulley slider

Clutch spring(s)
- Damaged clutch spring

Transmission gears
- Damaged transmission gear

CLUTCH SLIPS
Clutch shoe springs
- Damaged, loose or worn clutch shoe spring

Clutch shoes
- Damaged or worn clutch shoe

Primary sliding sheave
- Seized primary sliding sheave

POOR STARTING PERFORMANCE
V-belt
- V-belt slips
- Oil or grease on the V-belt

Primary sliding sheave
- Faulty operation
- Worn pin groove
- Worn pin

Clutch shoes
- Bent, damaged or worn clutch shoe
POOR SPEED PERFORMANCE

V-belt
- Oil or grease on the V-belt

Primary pulley weight(s)
- Faulty operation
- Worn primary pulley weight

Primary fixed sheave
- Worn primary fixed sheave

Primary sliding sheave
- Worn primary sliding sheave

Secondary fixed sheave
- Worn secondary fixed sheave

Secondary sliding sheave
- Worn secondary sliding sheave

POOR BRAKING PERFORMANCE

Disc brake
- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

Drum brake
- Worn brake shoe
- Worn or rusty brake drum
- Incorrect brake camshaft lever position
- Incorrect brake shoe position
- Damaged or fatigued brake shoe spring
- Oil or grease on the brake shoe
- Oil or grease on the brake drum
- Broken brake torque rod

FAULTY FRONT FORK LEGS

LEAKING OIL
- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Cracked or damaged cap bolt O-ring

MALFUNCTION
- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

OVERHEATING

ENGINE
Cylinder head and piston
- Heavy carbon buildup

Engine oil
- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

FUEL SYSTEM
Carburetor
- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

Air filter
- Clogged air filter element

CHASSIS
Brakes
- Dragging brake

ELECTRICAL SYSTEMS
Spark plug
- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system
- Faulty C.D.I. unit
UNSTABLE HANDLING

Handlebar
- Bent or improperly installed handlebar

Steering head components
- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)
- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Rear shock absorber assembly
- Faulty rear shock absorber spring
- Leaking oil

Tire(s)
- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)
- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame
- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

FAULTY LIGHTING OR SIGNALING SYSTEM

HEADLIGHT DOES NOT COME ON
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT
- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT COME ON
- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT
- Wrong tail/brake light bulb
- Faulty battery
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT COME ON
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb
- Faulty battery
TURN SIGNAL REMAINS LIT
- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND
- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness