NOTICE

This manual was written by the MBK INDUSTRIE primarily for use by YAMAHA dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on YAMAHA scooters have a basic understanding of the mechanical concepts and procedures inherent in scooter repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

MBK INDUSTRIE is continually striving to improve all models manufactured. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized YAMAHA dealers and will, where applicable, appear in future editions of this manual.

DOCUMENTATION TECHNIQUE
MBK INDUSTRIE

PARTICULARLY IMPORTANT INFORMATION
This material is distinguished by the following notation:

⚠️ 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

CONSTRUCTION OF THIS MANUAL
This manual consists of chapters for the main categories of subjects. (See illustrated symbols).
1st title ① This is a chapter with its symbol on the upper right of each page.
2nd title ② This title appears on the upper of each page on the left of the chapter symbol. (For the chapter «Periodic inspection and adjustments» the 3rd title appears.)
3rd title ③ This is a final title.

MANUAL FORMAT
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections. A set of particularly important procedure ① is placed between a line of asterisks * * * with each step preceded by " * ".

IMPORTANT FEATURES
- Data and a special tools are framed in a box preceded by a relevant symbol ⑨.
- An encircled numeral ② indicates a part name, and an encircled alphabetical letter data for an alignments mark ③, the others being indicated by an alphabetical letter in a box ⑤.
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑥.

EXPLODED DIAGRAM
Each chapter provides exploded diagrams are before each disassembly section for ease in identifying correct disassembly and assembly procedures.

ILLUSTRATED SYMBOLS
(REFER TO THE ILLUSTRATION)
Illustrated symbols ① to ③ are designed as thumb tabs to indicate the chapter’s number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Chassis
⑦ Electrical
⑧ Troubleshooting

Illustrated symbols ⑨ to ⑯ are used to identify the specifications appearing in the text.

⑨ Filling fluid
⑩ Lubricant
⑪ Special tool
⑫ Tightening
⑬ Wear limit, clearance
⑭ Engine speed
⑮, ⑰, ⑱, ⑲, ⑳, ⑳, ⑳

Illustrated symbols ⑨ to ⑯ in the exploded diagram indicate grade of lubricant and location of lubrication point.

① Apply engine oil
② Apply gear oil
③ Apply molybdenum disulfide oil
④ Apply wheel bearing grease
⑤ Apply lightweight lithium-soap base grease
⑥ Apply molybdenum disulfide grease
⑦ Apply locking agent (THREADLOCK ®)
⑧ Use new one
<table>
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<th></th>
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</thead>
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<tr>
<td>PERIODIC INSPECTION AND ADJUSTMENT</td>
<td>INSP ADJ 3</td>
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<td>ENGINE OVERHAUL</td>
<td>ENG 4</td>
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<td>CARBURETION</td>
<td>CARB 5</td>
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<td>CHASSIS</td>
<td>CHAS 6</td>
</tr>
<tr>
<td>ELECTRICAL</td>
<td>ELEC 7</td>
</tr>
<tr>
<td>TROUBLESHOOTING</td>
<td>TRBL SHTG 8</td>
</tr>
</tbody>
</table>
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GENERAL INFORMATION

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**SCOOTER IDENTIFICATION**

**GENERAL INFORMATION**

**SCOOTER IDENTIFICATION NUMBER**
The vehicle identification number (1) is stamped into the frame.

**ENGINE SERIAL NUMBER**
The engine serial number (2) is stamped into the crankcase.

**NOTE:**
The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

**Initial serial number:**
VG54RWN0*WA101301

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

**VEHICLE IDENTIFICATION NUMBER**
The vehicle identification number is used to identify your scooter and may be used to register your scooter with the licensing authority in your state.

**Initial serial number:**
4UY-200101

**NOTE:**
All lock washers/plates (3) and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.

**BEARINGS AND OIL SEALS**
1. Install the bearing(s) (4) and oil seal(s) (5) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of lightweight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

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

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

**IMPORTANT INFORMATION**

**ALL REPLACEMENT PARTS**
1. Use only genuine parts for all replacements.
Use oil and/or grease recommended by MBK/ YAMAHA for assembly and adjustment. Other brands may be similar in function and appearance, but inferior in quality.

**IMPORTANCE OF THE VEHICLE IDENTIFICATION NUMBER**

1. The vehicle identification number is used to identify your scooter and may be used to register your scooter with the licensing authority in your state.

2. The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

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

4. Designs and specifications are subject to change without notice.
CIRCLIPS
1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips once they have been removed. Replace bent circlips. When installing a circlip make sure that the sharp edge is positioned opposite to the thrust it receives. See the sectional view.

SPECIAL TOOLS
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

FOR TUNE UP
- Ignition checker 90890-06754
- Inductive tachometer 90890-03113

FOR ENGINE SERVICE
- Crankcase separating tool 90890-01135
- Crankshaft installing tool set 90890-01274 ① 90890-01275 ② 90890-01277 ③ 90890-01411 ④
- Sheave holder 90890-01701
- Clutch spring holder 90890-01337 ① 90890-01036 ②
- Oil Seal Guide 90890-01409 ①
- Oil Seal Driver 90890-01410 ②

SPECIAL TOOLS
- Flywheel magneto puller 90890-01169
- Flywheel holding tool 90890-01235
- Clutch serving nut wrench 90890-01348
FOR CHASSIS SERVICE

- Ring nut wrench
  90890-01268
  90890-01403

- Damper rod holder
  90890-01294

- T-Handle
  90890-01326

- Oil seal guide
  90890-01184

- Oil seal guide adapter
  90890-01186

- Pocket Tester
  90890-03112

FOR ELECTRICAL COMPONENT
### CHAPTER 2. SPECIFICATIONS

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**GENERAL SPECIFICATIONS**

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>CW50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions:</strong></td>
<td></td>
</tr>
<tr>
<td>Overall length</td>
<td>1,740 mm (68.5 in)</td>
</tr>
<tr>
<td>Overall width</td>
<td>665 mm (26.2 in)</td>
</tr>
<tr>
<td>Overall height</td>
<td>1,050 mm (41.3 in)</td>
</tr>
<tr>
<td>Seat height</td>
<td>745 mm (29.3 in)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>1,170 mm (46.0 in)</td>
</tr>
<tr>
<td>Minimum ground clearance</td>
<td>125 mm (4.9 in)</td>
</tr>
<tr>
<td><strong>Basic weight:</strong></td>
<td></td>
</tr>
<tr>
<td>With oil and full fuel tank</td>
<td>78 kg (172 lb)</td>
</tr>
<tr>
<td><strong>Engine:</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Air-cooled 2-stroke, gasoline torque induction.</td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>Single cylinder, Vertical</td>
</tr>
<tr>
<td>Displacement</td>
<td>49 cm³</td>
</tr>
<tr>
<td>Bore x stroke</td>
<td>40 x 39.2 mm (1.57 x 1.54 in)</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>7.01 : 1</td>
</tr>
<tr>
<td>Starting system</td>
<td>Electric and kick starter</td>
</tr>
<tr>
<td><strong>Lubrication system:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Separate lubrication (Yamaha Autolube)</td>
</tr>
<tr>
<td><strong>Oil type or grade:</strong></td>
<td></td>
</tr>
<tr>
<td>Engine oil</td>
<td>Semi-synthetic oil in accordance to the API TC TS C3 standard.</td>
</tr>
<tr>
<td>Transmission oil</td>
<td>SAE 10W30 type SE motor oil</td>
</tr>
<tr>
<td><strong>Oil capacity:</strong></td>
<td></td>
</tr>
<tr>
<td>Engine oil:</td>
<td>Total amount</td>
</tr>
<tr>
<td>Transmission oil:</td>
<td>Periodic oil change</td>
</tr>
<tr>
<td></td>
<td>Total amount</td>
</tr>
<tr>
<td><strong>Air filter:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet type element</td>
</tr>
<tr>
<td><strong>Fuel:</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Regular unleaded gasoline (RON 91 mini)</td>
</tr>
<tr>
<td>Tank capacity</td>
<td>4.6 L (1.01 Imp gal, 1.21 US gal)</td>
</tr>
<tr>
<td><strong>Carburetor:</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>PHBN 12HS</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>DELL’ORTO</td>
</tr>
<tr>
<td><strong>Spark plug:</strong></td>
<td></td>
</tr>
<tr>
<td>Type/Manufacturer</td>
<td>BR8HS/NGK</td>
</tr>
<tr>
<td>Gap</td>
<td>0.5 - 0.7 mm (0.020 - 0.028 in)</td>
</tr>
</tbody>
</table>

| Clutch type: | Dry, centrifugal automatic |
| Transmission: |                       |
| Primary reduction system | Helical gear         |
| Primary reduction ratio | 52/13 (4.000)          |
| Secondary reduction system | Spur gear            |
| Secondary reduction ratio | 43/13 (3.3077)         |
| Transmission | V-belt               |
| **Operation:** |                     |
|                | Automatic            |
| **Chassis:** |                       |
| Frame type     | Steel tube underbone |
| Caster angle   | 27°                  |
| Trail          | 90 mm (3.54 in)       |
| **Tire:**     |                       |
| Type           | Tubeless             |
| Size           | front                |
|                | 120/90 - 10          |
|                | rear                 |
|                | 130/90 -10           |
| Manufacturer   | front                |
|                | DUNLOP (TRAIL MAX)   |
|                | rear                 |
|                | MICHELIN (REGGAE TL) |
| **Oil pressure (cold tire):** |                      |
| Maximum load-except scooter | 152 kg (335 lbs)   |
| Up to 90 kg (198 lbs) load |                     |
| Front          | 100 kPa (1.00 kgf/cm², 15 psi) | |
| Rear           | 125 kPa (1.25 kgf/cm², 18 psi) | |
| 90 kg (198 lbs) ~ maximum load |                   |
| Front          | 100 kPa (1.00 kgf/cm², 15 psi) |
| Rear           | 150 kPa (1.50 kgf/cm², 21 psi) |
| **Brake:**    |                       |
| Front brake type | Disc brake          |
| Operation      | Right hand operation|
| Rear brake type | Drum brake          |
| Operation      | Left hand operation |
| Suspension:    |                       |
| Front          | Telescopic fork      |
| Rear           | Unit swing           |
| **Shock absorber:** |                     |
| Front          | Coil spring/Oil damper |
| Rear           | Coil spring/Oil damper |
| **Wheel travel:** |                     |
| Front wheel travel | 82 mm (2.44 in)    |
| Rear wheel travel | 60 mm (2.36 in)  |
### General Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>CW50</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Electrical:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition system</td>
<td>CDI</td>
</tr>
<tr>
<td>Charging system</td>
<td>Flywheel magneto</td>
</tr>
<tr>
<td>Battery type/model</td>
<td>GM4-3S/YB4L-B/FB4L-B</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>12V 4AH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Headlight type:</th>
<th>Bulb</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Bulb wattage / quantity:</th>
<th>Headlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V 25W/25 W x 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taillight/brake light</th>
<th>Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V 5W/21 W x 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flasher light</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V 10W x 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meter light</th>
<th>12V 3W x 1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Warning lights wattage / quantity:</th>
<th>“OIL”</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V 3W x 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“TURN”</th>
<th>12V 3W x 1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>“HIGH BEAM”</th>
<th>12V 3W x 1</th>
</tr>
</thead>
</table>

### Maintenance Specifications

#### Engine

<table>
<thead>
<tr>
<th>Model</th>
<th>CW50</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Cylinder head:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warp limit</td>
<td>0.03 mm (0.0012 in)</td>
</tr>
</tbody>
</table>

* Lines indicate straight edge measurements.

<table>
<thead>
<tr>
<th>Cylinder:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore size</td>
<td>39.993 ~ 40.012 mm (1.574 ~ 1.575 in)</td>
</tr>
<tr>
<td>&lt;Limit&gt;</td>
<td>&lt;40.1 mm (1.579 in)&gt;</td>
</tr>
<tr>
<td>Taper limit</td>
<td>0.006 mm (0.0002 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Piston:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston size</td>
<td>39.952 ~ 39.972 mm (1.573 ~ 1.574 in)</td>
</tr>
<tr>
<td>Measuring point</td>
<td>5.0 mm (0.2 in)</td>
</tr>
</tbody>
</table>

| Piston clearance | 0.034 ~ 0.047 mm (0.0013 ~ 0.0018 in) |
| <Limit>          | <0.1 mm (0.004 in)> |
| Piston pin bore size | 10.004 ~ 10.015 mm (0.3936 ~ 0.3943 in) |

<table>
<thead>
<tr>
<th>Piston pin:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside diameter</td>
<td>9.996 ~ 10.000 mm (0.3935 ~ 0.3937 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Piston ring:</th>
<th>Sectional sketch (B x T)/Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top ring</td>
<td>1.2 ~ 1.8 mm (0.047 ~ 0.070 in)</td>
</tr>
<tr>
<td>2nd ring</td>
<td>1.2 ~ 1.8 mm (0.047 ~ 0.070 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>End gap (installed):</th>
<th>Top ring</th>
<th>0.15 ~ 0.30 mm (0.006 ~ 0.012 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd ring</td>
<td>0.15 ~ 0.30 mm (0.006 ~ 0.012 in)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side clearance (installed):</th>
<th>Top ring</th>
<th>0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd ring</td>
<td>0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>CW50</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td><strong>MAINTENANCE SPECIFICATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crankshaft:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crank width “A”</td>
<td>37.90 ~ 37.95 mm (1.492 ~ 1.494 in)</td>
<td></td>
</tr>
<tr>
<td>Runout limit “C”</td>
<td>0.03 mm (0.0012 in)</td>
<td></td>
</tr>
<tr>
<td>Connecting rod big end side clearance “D”</td>
<td>0.2 ~ 0.5 mm (0.008 ~ 0.020 in)</td>
<td></td>
</tr>
<tr>
<td>Automatic centrifugal clutch:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoe thickness</td>
<td>4.0 mm (0.16 in)</td>
<td></td>
</tr>
<tr>
<td>&lt;Wear limit&gt;</td>
<td>&lt;2.5 mm (0.10 in)&gt;</td>
<td></td>
</tr>
<tr>
<td>Clutch shoe spring free length</td>
<td>26.2 mm (1.03 in)</td>
<td></td>
</tr>
<tr>
<td>Clutch-in revolution</td>
<td>3,200 ~ 3,600 r.p.m.</td>
<td></td>
</tr>
<tr>
<td>Clutch-stall revolution</td>
<td>6,300 ~ 6,900 r.p.m.</td>
<td></td>
</tr>
<tr>
<td>V-belt:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>15 mm (0.59 in)</td>
<td></td>
</tr>
<tr>
<td>&lt;Wear limit&gt;</td>
<td>&lt;13.5 mm (0.53 in)&gt;</td>
<td></td>
</tr>
<tr>
<td>Transmission:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main axle runout limit</td>
<td>0.08 mm (0.003 in)</td>
<td></td>
</tr>
<tr>
<td>Drive axle runout limit</td>
<td>0.08 mm (0.003 in)</td>
<td></td>
</tr>
<tr>
<td>Kick starter:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Ratchet type</td>
<td></td>
</tr>
<tr>
<td>Kick clip tension</td>
<td>150 ~ 250 g (5.3 ~ 8.8 oz)</td>
<td></td>
</tr>
<tr>
<td>Carburetor:</td>
<td>PHBN12HS</td>
<td></td>
</tr>
<tr>
<td>I.D. mark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main jet</td>
<td># 93</td>
<td></td>
</tr>
<tr>
<td>Main air jet</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Jet needle</td>
<td>J.N.</td>
<td></td>
</tr>
<tr>
<td>Needle jet</td>
<td>N.J.</td>
<td></td>
</tr>
<tr>
<td>Cutaway</td>
<td>C.A.</td>
<td></td>
</tr>
<tr>
<td>Pilot jet</td>
<td>P.J.</td>
<td></td>
</tr>
<tr>
<td>Bypass</td>
<td>B.P.1</td>
<td></td>
</tr>
<tr>
<td>Pilot air screw</td>
<td>1-5/8 ± 1/4 out</td>
<td></td>
</tr>
<tr>
<td>Valve seat size</td>
<td>V.S.</td>
<td></td>
</tr>
<tr>
<td>Starter jet</td>
<td>G.S.1</td>
<td></td>
</tr>
<tr>
<td>Float height</td>
<td>F.H.</td>
<td></td>
</tr>
<tr>
<td>Fuel height</td>
<td>F.L.</td>
<td></td>
</tr>
<tr>
<td>Engine idle speed</td>
<td>1800 ± 200 rpm</td>
<td></td>
</tr>
<tr>
<td>Reed valve:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve stopper height</td>
<td>4.0 ~ 4.4 mm (0.157 ~ 0.173 in)</td>
<td></td>
</tr>
<tr>
<td>Reed valve clearance</td>
<td>0.2 mm (0.008 in)</td>
<td></td>
</tr>
<tr>
<td>Lubrication system:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autolube pump</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>2.62 mm (0.10 in)</td>
<td></td>
</tr>
<tr>
<td>Bore</td>
<td>0.5 mm (0.02 in)</td>
<td></td>
</tr>
<tr>
<td><strong>CHASSIS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>CW50</td>
<td></td>
</tr>
<tr>
<td>Steering system:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steering bearing type</td>
<td>Ball bearing</td>
<td></td>
</tr>
<tr>
<td>No/Size of steel balls:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>22 pcs (3/16 in)</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>22 pcs (3/16 in)</td>
<td></td>
</tr>
<tr>
<td>Front suspension:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front fork travel</td>
<td>70 mm (2.75 in)</td>
<td></td>
</tr>
<tr>
<td>Spring Rate (K1)</td>
<td>10.8 N/mm (1.08 kg/mm, 80.46 lb/in)</td>
<td></td>
</tr>
<tr>
<td>Stroke (K1)</td>
<td>0 ~ 40 mm (0 ~ 1.57 in)</td>
<td></td>
</tr>
<tr>
<td>Spring Rate (K2)</td>
<td>14.4 N/mm (1.44 kg/mm, 80.81 lb/mm)</td>
<td></td>
</tr>
<tr>
<td>Stroke (K2)</td>
<td>40 ~ 77 mm (1.57 in ~ 3.03 in)</td>
<td></td>
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<tr>
<td>Optional spring</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Rear suspension:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock absorber travel</td>
<td>60 mm (2.36 in)</td>
<td></td>
</tr>
<tr>
<td>Spring free length</td>
<td>202 mm (7.95 in)</td>
<td></td>
</tr>
<tr>
<td>Spring fitting length</td>
<td>187.5 mm (7.38 in)</td>
<td></td>
</tr>
<tr>
<td>Spring Rate</td>
<td>32.5 N/mm (3.25 kg/mm, 161.93 lb/mm)</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>0 ~ 44 mm (0 ~ 1.73 in)</td>
<td></td>
</tr>
<tr>
<td>Optional spring</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Wheels:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel type</td>
<td>Cast wheel</td>
<td></td>
</tr>
<tr>
<td>Rear wheel type</td>
<td>Cast wheel</td>
<td></td>
</tr>
<tr>
<td>Front wheel size</td>
<td>MT 3.50 x10</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluminium</td>
<td></td>
</tr>
<tr>
<td>Front wheel size</td>
<td>MT 3.50 x10</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluminium</td>
<td></td>
</tr>
<tr>
<td>Rim runout limit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td>2.0 mm (0.08 in)</td>
<td></td>
</tr>
<tr>
<td>Rear</td>
<td>2.0 mm (0.08 in)</td>
<td></td>
</tr>
<tr>
<td>Front disk brake:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Single disk</td>
<td></td>
</tr>
<tr>
<td>Diameter &amp; thickness</td>
<td>155 x 3.5 mm (6.102 x 0.137 in)</td>
<td></td>
</tr>
<tr>
<td>Pad thickness</td>
<td>3.25 mm (0.127 in)</td>
<td></td>
</tr>
<tr>
<td>&lt;Wear limit&gt;</td>
<td>&lt;0.8 mm (0.03 in)&gt;</td>
<td></td>
</tr>
<tr>
<td>Master cylinder inside diameter</td>
<td>11 mm (0.43 in)</td>
<td></td>
</tr>
<tr>
<td>Caliper cylinder inside diameter</td>
<td>30 mm (1.18 in)</td>
<td></td>
</tr>
<tr>
<td>Brake fluid type</td>
<td>DOT #3 or DOT #4</td>
<td></td>
</tr>
<tr>
<td>Rear drum brake:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Leading, trailing</td>
<td></td>
</tr>
<tr>
<td>Drum inside diameter</td>
<td>110 mm (4.33 in)</td>
<td></td>
</tr>
<tr>
<td>&lt;Wear limit&gt;</td>
<td>&lt;110.5 mm (4.35 in)&gt;</td>
<td></td>
</tr>
<tr>
<td>Lining thickness</td>
<td>4.0 mm (0.16 in)</td>
<td></td>
</tr>
<tr>
<td>&lt;Wear limit&gt;</td>
<td>&lt;2.0 mm (0.08 in)&gt;</td>
<td></td>
</tr>
<tr>
<td>Spring free length</td>
<td>54 mm (2.125 in)</td>
<td></td>
</tr>
<tr>
<td>Front brake lever freeplay</td>
<td>10 ~ 20 mm (0.4 ~ 0.8 in)</td>
<td></td>
</tr>
<tr>
<td>Rear brake lever freeplay</td>
<td>10 ~ 20 mm (0.4 ~ 0.8 in)</td>
<td></td>
</tr>
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</table>
### MAINTENANCE SPECIFICATIONS

#### ELECTRICAL

<table>
<thead>
<tr>
<th>Model</th>
<th>CW50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage:</strong></td>
<td>12 V</td>
</tr>
<tr>
<td><strong>Ignition system:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ignition timing (B.T.D.C.)</strong></td>
<td>14° at 5,000 r/min</td>
</tr>
<tr>
<td><strong>CDI:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Pickup coil resistance (color):</strong></td>
<td>400 ~ 600 Ω at 20°C (68°F) (White/Red-Black)</td>
</tr>
<tr>
<td><strong>Source coil resistance (color):</strong></td>
<td>640 ~ 960 Ω at 20°C (68°F) (Black/Red-Black)</td>
</tr>
<tr>
<td><strong>Ignition coil:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum spark length:</strong></td>
<td>6 mm (0.23 in)</td>
</tr>
<tr>
<td><strong>Primary coil resistance:</strong></td>
<td>0.56 ~ 0.84 Ω at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>Secondary coil resistance:</strong></td>
<td>5.68 ~ 8.52 Ωk at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>Spark plug cap:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Resistance:</strong></td>
<td>5 kΩ at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>CDI Magneto:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Lighting coil resistance:</strong></td>
<td>0.32 ~ 0.48 Ω at 20°C (68°F) (Yellow/Red-Black)</td>
</tr>
<tr>
<td><strong>Lighting coil resistance:</strong></td>
<td>0.48 ~ 0.72 Ω at 20°C (68°F) (White-Black)</td>
</tr>
<tr>
<td><strong>Voltage regulator/Rectifier:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type:</strong></td>
<td>Semi-conductor, short-circuit type</td>
</tr>
<tr>
<td><strong>No load regulated voltage:</strong></td>
<td>13 ~ 14 V</td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>8 A</td>
</tr>
<tr>
<td><strong>Withstand voltage:</strong></td>
<td>600 V</td>
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#### MAINTENANCE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>CW50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>12V, 4 Ah</td>
</tr>
<tr>
<td><strong>Specific gravity:</strong></td>
<td>1.280</td>
</tr>
<tr>
<td><strong>Starter motor:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Output:</strong></td>
<td>0.14 kW</td>
</tr>
<tr>
<td><strong>Armature coil resistance:</strong></td>
<td>0.072 Ω at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>Brush length:</strong></td>
<td>6.8 mm (0.27 in)</td>
</tr>
<tr>
<td><strong>Brush spring pressure:</strong></td>
<td>150 ~ 650 gr (5.29 ~ 22.92 oz)</td>
</tr>
<tr>
<td><strong>Commutator diameter:</strong></td>
<td>15.8 mm (0.62 in)</td>
</tr>
<tr>
<td><strong>Mica undercut:</strong></td>
<td>1.15 mm (0.045 in)</td>
</tr>
<tr>
<td><strong>Starter relay:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Amperage rating:</strong></td>
<td>20 A</td>
</tr>
<tr>
<td><strong>Coil resistance:</strong></td>
<td>54 ~ 66 Ω at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>Horn:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type/Quantity:</strong></td>
<td>Plain type/1 pc.</td>
</tr>
<tr>
<td><strong>Model/Manufacturer:</strong></td>
<td>TR9/TRANSVAL</td>
</tr>
<tr>
<td><strong>Maximum amperage:</strong></td>
<td>2.5 A</td>
</tr>
<tr>
<td><strong>Flasher relay:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type:</strong></td>
<td>Condenser type</td>
</tr>
<tr>
<td><strong>Self cancelling device:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Flasher frequency:</strong></td>
<td>70 ~ 90 cycle/min</td>
</tr>
<tr>
<td><strong>Wattage:</strong></td>
<td>2 x 10W + 4 W</td>
</tr>
<tr>
<td><strong>Circuit breaker:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type:</strong></td>
<td>Fuse</td>
</tr>
<tr>
<td><strong>Amperage for individual circuit x Quantity:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Main:</strong></td>
<td>7 A x 1</td>
</tr>
<tr>
<td><strong>Fuel sender unit:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Resistance (full):</strong></td>
<td>4 ~ 10 Ω at 20°C (68°F)</td>
</tr>
<tr>
<td><strong>(empty):</strong></td>
<td>90 ~ 100 Ω at 20°C (68°F)</td>
</tr>
</tbody>
</table>
CABLE ROUTING

1. Rim
2. Tire
3. Brake disc
4. Brake caliper
5. Brake hose guide (Lower)
6. Brake hose guide (Upper)
7. Throttle cable
8. Wire harness
9. Speedometer cable
10. Brake hose
11. Choke cable
12. Rear brake cable

A. Do not cover the frame number.
B. Attach the brake hose, starter switch cable and the brake cable together behind the horn bracket.
C. The throttle cable must have sufficient free play.
D. Clamp the brake hose into the upper holder.
E. With a band tie the choke cable, the throttle cable and the rear brake cable to the left side, the wire harness to the right side of the frame.

B-2

1. Handlebar
2. Left handle bar switch
3. Right handle bar switch
4. Handlebar wire harness holder
5. Flasher relay
6. Speedometer cable
7. Throttle cable
8. Lower handlebar cover
9. Front brake hose
10. Flasher cover

A. The right handlebar switch leads must pass along the underside of the handlebar, then behind the boss on the lower handlebar cover.
B. Pass the couplers behind the speedometer cable, and after connecting them, fit them under the right side of the speedometer.
C. The left handlebar switch leads must pass along the underside of the handlebar, then in front of the boss on the lower handlebar cover.
D. Attach the front flasher ground to the handlebar.
E. The throttle cable must pass in front of the handlebar.
F. Pass the flasher relay leads under the handlebar.
G. The brake light leads must pass along the underside of the handlebar (left and right).
H. The wire harness holder must pass over the handlebar.
I. The brake hose union bolt must touch the right side of the boss.
CABLE ROUTING

1. Choke cable
2. Throttle cable
3. Rear brake cable
4. Speedometer cable
5. Front brake hose
6. Main switch
7. Wire harness
8. Horn
9. Steering tube
10. Lower cover

A. Tie the choke cable, throttle cable, rear brake cable, and speedometer cable to the left side of the handlebar.
B. Pass the wire harness along the right side of the handlebar.
C. Clamp the front brake hose to the lower cover.
D. The speedometer cable must pass between the steering tube and the main switch bracket.
E. Attach the wire harness to the side of the main switch bracket with a band.
F. The wire harness must run straight (no loops) between the two bands.
G. Attach the wire harness with a band to the steering tube just above the wire bracket.
H. The speedometer cable must pass through the hole in the front fender.
I. The speedometer cable must pass through the hole in the lower fender.
J. The horn leads must pass behind the horn bracket and behind the wire bracket.
K. The front brake hose must pass through the wire bracket.
L. The front brake hose must pass through the hole in the fender.
# CHAPTER 3.
## PERIODIC INSPECTION AND ADJUSTMENT

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<td>REAR SHOCK ABSORBER</td>
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<td>ELECTRICAL</td>
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<tr>
<td>HEADLIGHT BEAM ADJUSTMENT</td>
<td>C-1</td>
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PERIODIC INSPECTION AND ADJUSTMENT

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

PERIODIC MAINTENANCE/LUBRICATION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUTINE</th>
<th>BREAK-IN 1,000 (000)</th>
<th>EVERY 3,000 (2,000) 8 months</th>
<th>EVERY 6,000 (4,000) 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Spark plug</td>
<td>• Check condition. Clean or replace if necessary</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2  Air filter</td>
<td>• Check. Replace if necessary</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3  Carburetor</td>
<td>• Check idle speed/throttle operation. Adjust if necessary</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4  Fuel line</td>
<td>• Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5  Transmission oil</td>
<td>• Check for oil leakage. Correct if necessary. Replace every 12,000 (8,000) or 24 months. (Warm engine before draining.)</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6  Autolube pump</td>
<td>• Check operation. Correct if necessary. Bleed the air</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7  Front brake system</td>
<td>• Check operation /fuel leakage/See NOTE. (Page 9-3). Correct if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8  Rear brake system</td>
<td>• Check operation. Adjust if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9  Wheels</td>
<td>• Check damage/nut/tightening torque. Replace/nut/tighten if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>10 Wheel bearings</td>
<td>• Check bearing assembly for looseness/damage. Replace if damaged.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>11 Steering bearing</td>
<td>• Check bearing assembly for looseness. Correct if necessary. Moderately replace every 12,000 (8,000) or 24 months.**</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>12 Rear shock absorber</td>
<td>• Check operation / leak. Replace if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>13 V-belt</td>
<td>• Check damage and wear. Replace if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>14 Fitting/Fasteners</td>
<td>• Check all chassis fittings and fasteners. Tighten if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>15 Centerstand</td>
<td>• Check operation. Repair if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>16 Battery</td>
<td>• Check specific gravity. Check breather pipe for proper operation. Correct if necessary.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

NOTE:
Brake fluid replacement:
1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses every four years, or when cracked or damaged.
8. Remove:
- Footrest board
- Bottom cover

9. Remove:
- Screws (Handlebar cover)

10. Disconnect:
- Speedometer cable
- Couplers

11. Remove:
- Handlebar cover (Upper)

**INSTALLATION:**
Reverse the "REMOVAL" procedure. Note the following points:

1. Connect:
- Speedometer cable
- Couplers

**NOTE:**
Correct routing of cables and wires is essential for a safe operation of this scooter. Refer to "CABLE ROUTING" in Chapter 2.

2. Install:
- Handlebar cover

**NOTE:**
Be careful not to pinch any wires with the covers.

3. Install:
- Bottom cover
- Footrest board

**NOTE:**
Mesh the projections of footrest board and bottom cover.

---

**4. Install:**
- Front panel
- Main switch cover

**NOTE:**
Insert the main switch cover and turn it clockwise.

**NOTE:**
Insert the projections of the front panel into the slot of the footrest board.

5. Connect:
- Headlight leads

6. Install:
- Front fender

**NOTE:**
Insert the projection "a" of side cover into the slot "b" of footrest board.

7. Install:
- Central cover

**NOTE:**
Insert the projection "a" of central cover into the slot "b" of footrest board.

8. Install:
- Rear carrier
- Helmet holder
- Seat

**NOTE:**
After connecting the tail and flasher light lead, locate the couplers inside the rear fender.

<table>
<thead>
<tr>
<th>Bolt (Rear carrier):</th>
<th>17 Nm (1.7 m.kg, 12.3 ft.lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nut (Rear carrier):</td>
<td>15.5 Nm (1.55 m.kg, 11.21 ft.lb)</td>
</tr>
<tr>
<td>Nut (Seat):</td>
<td>8 Nm (0.8 m.kg, 5.8 ft.lb)</td>
</tr>
</tbody>
</table>

**NOTE:**
When installing the covers, be careful not to damage the mounting clips.
ENGINE IDLE SPEED ADJUSTMENT

ENGINE
ENGINE IDLE SPEED ADJUSTMENT
1. Tighten:
   • Pilot air screw
     Turn the pilot air screw in until lightly seated.

2. Loosen:
   • Pilot air screw
     Back out from the lightly seated position.

Pilot air screw position:
1-5/8 turns out ± 1/4

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

WARNING
For safety reasons, place the scooter on the center stand before starting the engine.

4. Attach:
   • Inductive tachometer
     (to the spark plug lead)

Inductive tachometer:
Ref: 90890-03113

5. Check:
   • Engine idle speed
     Out of specification → Adjust.

   Engine idle speed:
   1800 ± 200 r/min

6. Adjust:
   • Engine idle speed

Adjustment steps:
• Turn the throttle stop screw in or out until specified idling speed is obtained.

<table>
<thead>
<tr>
<th>Turning left</th>
<th>Idling speed increased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning right</td>
<td>Idling speed decreased.</td>
</tr>
</tbody>
</table>

THROTTLE CABLE FREE PLAY ADJUSTMENT

1. Check:
   • Throttle cable free play @
     Out of specification → Adjust.

   Free play @:
   1.5 ~ 3.0 mm (0.06 ~ 0.12 in)

Throttle cable free play adjustment steps:

WARNING
After adjusting, turn the handlebar to the right and left, making sure that the engine idling speed does not change.

First step:
• Loosen the locknut on the throttle cable.
• Turn the adjuster in or out until the specified free play is obtained.

<table>
<thead>
<tr>
<th>Turn in</th>
<th>Free play increased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn out</td>
<td>Free play decreased.</td>
</tr>
</tbody>
</table>

• Tighten the locknut.
**SPARK PLUG INSPECTION**

1. Remove:
   - Spark plug

2. Check:
   - Spark plug type
     Incorrect → Replace

**Standard spark plug:**
BR8HS (NGK)

3. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator ②
     Abnormal color → Replace.
     Normal color is a medium-to-light tan color.

4. Measure:
   - Plug gap ③
     Out of specification → Adjust gap.
     Use a wire gauge or feeler gauge.

   **Spark plug gap ③:**
   0.5 ~ 0.7 mm (0.020 ~ 0.028 in)

5. Tighten:
   - Spark plug

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

**NOTE:**
First tighten by hand, then torque to specification.

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

---

**AUTOLUBE PUMP AIR BLEEDING**

1. Remove:
   - Fan cover ①

2. Bleed:
   - Pump housing and oil hose

**Pump bleeding steps:**
- Place a rag under the pump.
- Remove the bleed screw ④.
- Let oil run until there are no more air bubbles in it.
- When there are no more bubbles, tighten the bleed screw.

**NOTE:**
Check the condition of the bleed screw gasket. If it is damaged, replace it with a new one.

- Start the engine.
- Let the engine run two or three minutes at 2000 rpm. This will force out any air in the hose.
ENGINE OIL LEVEL INSPECTION

1. Inspect:
   • Oil level
   Oil level low → Add oil to proper level as follows.

   (1) "Oil" indicator light

OIL LEVEL AND GAUGE CHECK

Turn main switch to "*"

"Oil" indicator light.

Turn main switch to "ON".

"Oil" indicator goes

Inspect faulty electrical circuit, light bulb etc.

Engine oil level and electric circuit are OK

"Oil" indicator stays on.

Add oil.

"Oil" indicator stays on.

Recommended oil:
Semi-synthetic oil in accordance to the API TC TS C3 standard.
Capacity:
Total: 1.3 L (1.14 Imp qt, 1.37 US qt)

CAUTION:
Always use the same type of engine oil; mixing oils may result in a harmful chemical reaction and lead to poor performance.

NOTE:
Install the oil tank filler cap (1) and push it fully into the filler.

TRANSMISSION OIL REPLACEMENT

1. Remove:
   • Drain plug (1)
   • Oil filler plug (2)
   Drain the transmission oil.

2. Check:
   • Gasket (drain plug)
   • O-ring (oil filler plug)
   Damaged → Replace.

3. Install:
   • Gasket (1)
   • Drain plug (2)

Drain plug:
17.5 Nm (1.75 m.kg, 12.6 ft.lb)

4. Fill:
   • Transmission case

Transmission oil:
SAE 10W30 type SE motor oil.
Capacity:
Periodic replacement:
Total: 0.11 L (0.10 Imp qt, 0.12 US qt)
Total amount:
0.13 L (0.11 Imp qt, 0.13 US qt)

NOTE:
Wipe off any oil spill on the crankcase, tire or wheel.

5. Install:
   • Oil filler plug
AIR FILTER ELEMENT CLEANING

1. Remove:
   - Air cleaner case cover (1)
2. Remove:
   - Air filter element

**CAUTION:**
Never operate the engine with the air cleaner element removed. Unfiltered air will cause rapid wear of engine parts and possible engine damage.

3. Inspect:
   - Element (1)
   - Damage → replace.
4. Clean:
   - Air filter element

---

Cleaning steps:
- Wash the element gently but thoroughly in solvent.

**WARNING**
Never use low flashpoint solvents such as gasoline to clean the element. Such solvents may lead to fire or explosion.
- Squeeze excess solvent out of the element and let dry.

**CAUTION:**
Do not twist the element.
- Apply foam air filter oil or SAE 10W30 type SE oil on the element.
- Squeeze out the excess oil.

---

**NOTE:**
The element should be wet but not dripping.

FRONT BRAKE LEVER FREE PLAY ADJUSTMENT/REAR BRAKE LEVER FREE PLAY ADJUSTMENT/BRAKE PAD INSPECTION

**CHASSIS**

**FRONT BRAKE LEVER FREE PLAY ADJUSTMENT**

1. Check:
   - Front brake lever free play @
   - Out of specification → Adjust.

   Free play:
   - 10 ~ 20 mm (0.4 ~ 0.8 in)

**CAUTION:**
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the scooter is operated. Air in the system will reduce brake performance and can result in loss of control and an accident. Inspect and bleed the system if necessary.

**REAR BRAKE LEVER FREE PLAY ADJUSTMENT**

1. Check:
   - Rear brake lever free play @
   - Out of specification → Adjust.

   Free play:
   - 10 ~ 20 mm (0.4 ~ 0.8 in)

2. Adjust:
   - Front brake lever free play

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

---

**BRAKE PADS INSPECTION**

1. Measure:
   - Brake pads @
   - Out of specification → Replace brake pads.

**NOTE:**
Replace the brake pads and spring as a set when replacing the brake pads.

Brake pads wear limit:
- 0.8 mm (0.03 in)
BRAKE SHOE INSPECTION
1. Apply the rear brake lever.

2. Inspect:
   - Wear indicator (1)
   - Indicator reaches the wear limit line (2) → Replace brake shoes.

BRAKE FLUID LEVEL INSPECTION

NOTE:
Position the scooter straight up when inspecting the fluid level, and make sure be turning the handlebar that the top of the master cylinder is horizontal.

1. Inspect:
   - Brake fluid level
   - Brake fluid level is under "LOWER" level line (1) → Fill to proper level.

Recommended brake fluid:
DOT # 3 or DOT # 4

CAUTION:
The brake fluid may corrode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

WARNING
- Use only the designated quality fluid. Otherwise, the rubber seals may deteriorate causing leakage and poor brake performance.
- Refill with the same type of fluid. Mixing fluids may result in a harmful chemical reaction leading to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.

Air bleed:
- Brake fluid.

Air bleeding steps:
  a. Add proper brake fluid into the reservoir.
  b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
  c. Connect a clear plastic tube (1) tightly to the caliper bleed screw.
  d. Place the other end of the tube into a container.
  e. Slowly apply the brake lever several times.
  f. Pull the lever as far as possible and hold it there.
  g. Loosen the bleed screw and pull the lever all the way.
  h. When the lever is completely pulled, tighten the bleed screw, then release the lever.
  i. Repeat steps (e) to (h) until all air bubbles have been removed from the system.
  j. Add brake fluid to proper level.

WARNING
Check the operation of the brake after bleeding the brake system.
STEERING HEAD ADJUSTMENT

1. Check:
   • Steering assembly bearings
   Grasp the bottom of the forks and gently rock
   the fork assembly back and forth.
   Looseness → Adjust steering head.

   Steering head adjustment steps:
   • Remove the front fender and the front panel.
   Refer to "COVERS" section.
   • Unscrew the securing nut
   • Tighten the nut

   Steering head wrench:
   Ref: 90890-01268
   Ref: 90890-01403

   NOTE:
   Tighten the ring nut until no play can be seen.

   • Install the securing nut
   • Tighten the securing nut

   Securing nut:
   22.5 Nm (2.25 m.kg, 16.2 ft.lb)

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

   • Move the handlebar up and down, and / or
   back and forth. If the handlebar free play is
   excess, tighten the bolt (3) to the specified
   torque.

   Handlebar securing bolt:
   60 Nm (6.0 m.kg, 43.4 ft.lb)

   • Install the front panel and front fender.

   TIRE INSPECTION

   1. Measure:
      • Air pressure
      Out of specification → Adjust.

   TIRE INSPECTION/WHEEL INSPECTION

   WARNING
   Proper loading of your scooter is important
   for the handling, braking, and other perfor-
   mance and safety characteristics of your
   scooter. Do not carry loosely packed items
   that can shift.

   Securely pack your heaviest items close to
   the center of the scooter, and distribute the
   weight evenly from side to side. And check
   the condition and pressure of your tires.

   NEVER OVERLOAD YOUR SCOOTER.
   Make sure the total weight of the cargo, rider,
   passenger, and accessories (fairing, saddlebags,
   etc. if approved for this model) does not exceed the maximum load of
   the scooter. Operation of an overloaded scooter
   could cause tire damage, an accident, or
   even injury.

<table>
<thead>
<tr>
<th>Tire pressure (cold)</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 90 kg</td>
<td>100 kPa (1.00 kgf/cm², 15 psi)</td>
<td>125 kPa (1.25 kgf/cm², 18 psi)</td>
</tr>
<tr>
<td>90 kg - maximum</td>
<td>100 kPa (1.00 kgf/cm², 15 psi)</td>
<td>150 kPa (1.50 kgf/cm², 21 psi)</td>
</tr>
<tr>
<td>load *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum load:</td>
<td>152 kg (335 lb)</td>
<td></td>
</tr>
</tbody>
</table>

   * Maximum load is the total weight of cargo, rider, pas-
   senger and accessories.

   2. Inspect:
      • Tire surface
      Wear/Damage/Cracks/Road hazards → Replace.
      • Wheels
      Damage/Bends → Replace.
      Never attempt even small repairs to the wheel.

   WARNING
   Ride conservatively after installing a tire to
   allow it to seat itself properly on the rim.

      • If the tire is removed with a tire lever, use a
        suitable protection to prevent damaging the
        rim.
      • When installing the tire, make sure the
        arrow points to the front.
TIRE INSPECTION/WHEEL INSPECTION/CABLE INSPECTION AND LUBRICATION

3. Measure:
   • Tire tread depth
     Out of specification → Replace.

   Minimum tire tread depth
   (front and rear):
   0.8 mm (0.03 in)

   ① Tread depth
   ② Side wall
   ③ Wear indicator

WHEEL INSPECTION
1. Inspect:
   • Wheels
     Damage/Bends → Replace.

WARNING
Never attempt even small repairs to the wheel.

CABLE INSPECTION AND LUBRICATION

A damaged cable sheath will rapidly corrode. As a result, the cable cannot move smoothly inside the sheath. Since this situation is dangerous, replace a damaged cable immediately.

1. Check:
   • Cable sheath
   • Cable end
     Damage → Replace.

2. Check:
   • Cable movement
     Stickness → Lubricate.

   Recommended lubricant:
   Engine oil SAE 10W30

NOTE:
Hold the cable end up and pour a few drops of oil into the sheath.

3. Lubricate the throttle cable end and the cable guide notch on the throttle grip with grease.

   Recommended lubricant:
   Lithium soap based grease

CABLE INSPECTION AND LUBRICATION/REAR SHOCK ABSORBER

LEVER LUBRICATION
1. Lubricate rotating parts of the levers

   Recommended lubricant:
   Engine oil SAE 10W30

CENTERSTAND LUBRICATION
1. Lubricate rotating parts

   Recommended lubricant:
   Engine oil SAE 10W30

REAR SHOCK ABSORBER
1. Check:
   • Rear shock absorber ①
     Oil leaks/Damage → Replace.

   2. Check:
     • Tightening torque

   Upper bolt:
   31.5 Nm (3.15 m·kg, 22.8 ft·lb)
   Lower bolt:
   17.5 Nm (1.75 m·kg, 12.6 ft·lb)
ELECTRICAL

BATTERY INSPECTION

1. Inspect:
   - Battery fluid level
     Fluid level low → Add to proper level.
     Fluid level should be between upper and lower level marks.
   ① Upper level
   ② Lower level

   CAUTION:
   Refill with distilled water only. Tap water contains minerals which are harmful to a battery.

2. Inspect:
   - Breather hose
     Obstruction → Remove.

3. Inspect:
   - Battery

   Replace the battery if:
   - Battery voltage will not rise to a specific value or bubbles fail to rise during charging.
   - Sulfation of one or more cells occurs. (As indicated by the plates turning white, or an accumulation of material in the bottom of the cell.)
   - Specific gravity readings after a long, slow charge indicate that one cell is lower than the rest.
   - Warpage or buckling of plates or insulators is evident.

4. Measure:
   - Specific gravity
     Less than 1.280 → Recharge battery.

Charging Current:
0.4 amps/10 hrs
Specific Gravity:
1.280 at 20°C (68° F)

CAUTION:
Always charge a new battery before using it to ensure maximum performance.

WARNING
Battery electrolyte is dangerous. It contains sulfuric acid which is poisonous and highly caustic.
Always follow these preventive measures:
- Avoid bodily contact with electrolyte as it can cause severe burns and permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):
- SKIN – Flush with water.
- EYES – Flush with water for 15 minutes and get immediate medical attention.

Antidote (INTERNAL):
- Drink large quantities of water or milk.
  Follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.

Batteries generate explosive hydrogen gas. Always follow these preventive measures:
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)
- DO NOT SMOKE when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

FUSE INSPECTION

1. Open the seat.
2. Inspect:
   - Fuse
     Blown → Replace.
Fuse replacement steps:
- Turn off the ignition.
- Install a new fuse of the right amperage.
- Turn on the switches to verify the operation of the electric circuit.
- If the fuse immediately blows again, check the electric circuit.

**WARNING**
Never use a fuse with a rating higher than specified. An improper fuse may cause damage to the electrical circuit, and possibly cause a fire.

Fuse:
Main circuit: 7A

**HEADLIGHT BEAM ADJUSTMENT**
1. Adjust:
   - Headlight beam

<table>
<thead>
<tr>
<th>Higher</th>
<th>Turn out screw ①</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>Turn in screw ②</td>
</tr>
</tbody>
</table>
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ENGINE OVERHAUL

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ENGINE OVERHAUL

ENGINE REMOVAL

COVER REMOVAL

1. Remove:
   • Covers
   Refer to "COVERS" in CHAPTER 3.

CABILS, LEADS AND HOSES

1. Remove:
   • Oil hose (1) on oil pump side

   NOTE:
   Plug the hose to prevent oil spillage.

2. Disconnect:
   • Earth (ground lead)
   • Spark plug cap (1)
   • Starter motor lead (2)
   • CDI magneto lead (3)

3. Remove:
   • Rear brake cable (1)

4. Remove:
   • Exhaust protector
   • Air shroud (1)
   • Muffler assembly (2)

5. Loosen:
   • Rear axle nut (1)

   NOTE:
   Apply the rear brake while loosening the rear axle nut.
ENGINE REMOVAL

1. Place a suitable stand under the frame.
2. Remove:
   - Left pillion footrest
   - Rear shock absorber bolt (lower)
   - Engine mounting bolt
3. Remove:
   - Engine

NOTE:
Lift up the frame and remove the engine.

4. Place the frame on a suitable stand.

ENGINE DISASSEMBLY

REAR WHEEL

1. Remove:
   - Rear wheel nut
   - Rear wheel washer
   - Rear wheel
   - Brake shoes
   - Plate washer

CENTERSTAND

1. Remove:
   - Spring
   - Clip
   - Rubber washer
   - Axle
   - Clamp
   - Center stand

CYLINDER HEAD AND CYLINDER

1. Remove:
   - Air shroud
   - Cylinder head
   - Cylinder head gasket

NOTE:
Before loosening the cylinder head nuts, loosen the spark plug.
Loosen the cylinder head nuts crosswise 1/4 of a turn each before removing them.

2. Remove:
   - Cylinder
   - Cylinder gasket

PISTON PIN AND PISTON

1. Remove:
   - Piston pin clip

NOTE:
Before removing the piston pin clip, cover the crankcase with a clean rag, so that the clip cannot accidentally fall into the crankcase.
ENGINE DISASSEMBLY

2. Remove:
   • Piston pin ①
   • Piston ②
   • Piston pin bearing ③

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

KICKSTARTER
1. Remove:
   • Kick crank
   • Transmission cover ① (left)

2. Remove:
   • Kick pinion gear ①

NOTE:
To remove the kick pinion gear, push down the kick crank.

3. Unhook:
   • Kick return spring ②

4. Remove:
   • Circlips ①
   • Plate washer ②
   • Kick shaft ③

PRIMARY SHEAVE
1. Remove:
   • Fan
2. Remove:
   • Nut ① (primary sheave)

NOTE:
To loosen the primary sheave nut hold the CDI magneto with a flywheel holder ②.

SECONDARY SHEAVE
1. Remove:
   • Nut ① (secondary sheave)

NOTE:
Hold the secondary sheave with a sheave holder ③ to loosen the nut.

Flywheel holder: 90890-01235

Sheave holder: 90890-01701
2. Remove:
   - Clutch housing
   - Secondary sheave
   - Crankcase cover gasket
   - Dowel pins

3. Attach:
   - Sheave holder
   - Nut wrench (41 mm)

**WARNING**
Loosen the nut but do not remove it yet.

5. Attach:
   - Clutch spring holder

**NOTE:**
Compress the secondary sheave using the clutch spring holder.

6. Remove:
   - Clutch securing nut

7. Remove:
   - Clutch assembly
   - Clutch spring
   - Spring seat
   - Guide pin
   - Secondary sliding sheave
   - Secondary fixed sheave

**STATER SYSTEM**
1. Remove:
   - Starter clutch assembly
   - Plate (idle gear)
   - Idle gear
   - Starter wheel gear

**TRANSMISSION**
1. Remove:
   - Transmission case
   - Gasket
   - Dowel pins

2. Remove:
   - Main shaft
   - Drive shaft
   - Plate washer
   - Conical spring washer

3. Remove:
   - Oil seal
   - Secondary sheave axle

**CDI MAGNETO**
1. Remove:
   - Nut (rotor)
   - Plate washer

**NOTE:**
Hold the rotor using the flywheel holder to loosen the nut.

**Flywheel holder:**
90890-01235
2. Remove:
- Rotor
- Woodruff key
Use the flywheel puller

Flywheel puller: 90890-01189

- Stator assembly
- Gasket

AUTOLUBE OIL PUMP
1. Remove:
- Autolube oil pump

2. Remove:
- Circlips
- Pump drive gear
- Pin
- Circlip

CRANKCASE AND CRANKSHAFT
1. Remove:
- Oil seal stopper
- Screws (crankcase)

NOTE:
Loosen each screw one quart of a turn before beginning to remove them.

2. Attach:
- Crankcase separating tool

Crankcase separating tool: 90890-01135

NOTE:
Fully tighten the tool holding bolts. Insure that the tool body is parallel with the case. If neces-

sary, loosen one screw as much as required to level the tool body.

3. Remove:
- Crankcase (right)
As pressure is applied, keep tapping carefully on the engine mounting bosses.

CAUTION:
Use a soft hammer to tap on the case. Tap only on reinforced spots of the case. Never tap on the gasket mating surfaces. Work slowly and carefully. Make sure the cases separate evenly. If one end "hangs up" take the pressure off the push screw, realign the cases and the tool and start again. If the cases do not separate at all, check for a remaining case screw or fitting. Do not force.

4. Attach:
- Crankcase separating tool

5. Remove:
- Crankshaft
**Cylinder Head**

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

   **NOTE:**
   Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminium.

2. Inspect:
   - Cylinder head warpage
   - Out of specification → Resurface.

   **Warpage measurement and re-surfacement steps:**
   - Attach a straight edge (1) and a thickness gauge (2) to the cylinder head.
   - Measure the warpage limit.

   **Warpage limit:**
   - \[0.03 \text{ mm (0.0012 in)}\]

   - If the warpage is out of specification, re-surface the cylinder head.

   **NOTE:**
   Rotate the head several times to avoid removing too much material from one side.

**Cylinder and Piston**

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

2. Inspect:
   - Cylinder wall
   - Wear/Scratches → Replace.

3. Eliminate:
   - Carbon deposits
   - From the piston crown (1) and ring grooves (2).

4. Remove:
   - Score marks and lacquer deposits
   - From the sides of piston.

   **NOTE:**
   Sand in a crisscross pattern. Do not sand excessively.

5. Inspect:
   - Piston wall
   - Wear/Scratches/Damage → Replace.

6. Measure:
   - Piston to cylinder clearance

   **Piston to cylinder clearance measurement steps:**
   - First step:
     - Measure the cylinder bore “C” with a cylinder bore gauge.

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

<table>
<thead>
<tr>
<th>Cylinder Bore “C”</th>
<th>Standard</th>
<th>Wear limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.993 ~ 40.012mm</td>
<td>39.903 ~ 40.10 mm</td>
<td>40.10 mm</td>
</tr>
<tr>
<td>(1.574 ~ 1.575 in)</td>
<td>(1.574 in)</td>
<td>(1.579 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taper “T”</th>
<th>Standard</th>
<th>Wear limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.006 mm</td>
<td>(0.0002 in)</td>
<td></td>
</tr>
</tbody>
</table>

   \[C = \text{Maximum } D\]
   \[T = (\text{Maximum } D_1, D_2 \text{ or } D_3) - (\text{Maximum } D_3, D_4 \text{ or } D_5)\]

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

2nd step:
- Measure the piston skirt diameter “P” with a micrometer.
- \(5 \text{ mm (0.2 in)}\) from the piston bottom edge.
If out of specification, replace piston and piston rings as a set.

3rd step:
- Calculate the piston-to-cylinder clearance with the following formula:

\[
\text{Piston-to-cylinder clearance} = \frac{\text{Cylinder Bore} \times \text{Piston Skirt Diameter}}{2}
\]

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

Piston-to-cylinder clearance:
- 0.034 ~ 0.047 mm
  - (0.0013 ~ 0.0019 in)
- Wear limit: 0.1 mm (0.004 in)

PISTON RINGS

1. Measure:
   - Side clearance
     Out of specification → Replace piston and/or rings.
   - Use a feeler gauge

<table>
<thead>
<tr>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top ring</td>
<td>0.03 ~ 0.05 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0012 ~ 0.0020 in)</td>
</tr>
<tr>
<td>2nd ring</td>
<td>0.03 ~ 0.05 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0012 ~ 0.0020 in)</td>
</tr>
</tbody>
</table>

2. Install:
   - Piston ring
   - Into the cylinder
     Push the ring with the piston crown.

3. Measure:
   - End gap
     Out of specification → Replace rings as a set.
     Use a feeler gauge

4. Inspect:
   - Bearing (piston pin)
     Pitting/Damage → Replace

PISTON PIN AND PISTON PIN BEARING

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

2. Measure:
   - Outside diameter (piston pin)
     Out of specification → Replace.

3. Measure:
   - Piston pin-to-piston clearance
     Out of specification → Replace piston.

Piston pin-to-piston clearance:
- 0.004 ~ 0.019 mm
  - (0.0002 ~ 0.0008 in)
  <Limit: 0.07 mm (0.028 in)>

4. Inspect:
   - Bearing (piston pin)
     Pitting/Damage → Replace
KICK STARTER
1. Inspect:
   - Kick gear teeth (1)
   - Kick pinion gear teeth (2)
   Burrs/Chips/Roughness/Wear → Replace.

2. Inspect:
   - Mating dogs (kick pinion gear and one-way clutch)
   Rounded edges/Damage → Replace.

3. Measure:
   - Clip tension (kick pinion gear) (3)
   Out of specification → Replace.
   Use a spring balance (2).

   Standard tension: 150 ~ 250 g (5.3 ~ 8.8 oz.)

TRANSMISSION
1. Inspect:
   - Drive axle (1)
   - Main axle (2)
   - Secondary sheave axle (3)
   Burrs/Chips/Roughness/Wear → Replace.

2. Inspect:
   - Secondary sheave axle bearing (1)
   - Main axle bearing (2)
   - Drive axle bearing (3)
   Spin the bearing inner race.
   Excessive play/Roughness → Replace.
   Pitting/Damage → Replace.

CRANKSHAFT
1. Measure:
   - Crankshaft width “A”
   - Runout limit “C”
   - Connecting rod big end side clearance “D”
   Use V-blocks, dial gauge and thickness gauge.

   Crankshaft width “A”:
   37.90 ~ 37.95 mm (1.492 ~ 1.494 in)
   Runout limit “C”:
   0.03 mm (0.0012 in)
   Connecting rod big end side clearance “D”:
   0.2 ~ 0.5 mm (0.008 ~ 0.020 in)

PRIMARY SHEAVE
1. Inspect:
   - Primary sliding sheave (1)
   - Primary fixed sheave (2)
   Wear/Cracks/Scratch/Damage → Replace.

AUTOlobe PUMP
Wear or an internal malfunction may cause the pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, inspect the following:

1. Inspect:
   - Delivery line Obstructions → Blow out.
   - O-ring Wear/Damage → Replace.

2. Inspect:
   - Autolube pump drive gear teeth (1)
   - Autolube pump driven gear teeth (2)
   Pitting/Wear/Damage → Replace.
2. Check:
- Free movement
  Insert the collar ② into the primary sliding sheave ①, and check for free movement.
  Stick or excessive play → Replace the sheave and/or collar.

3. Measure:
- Outside diameter ① (weight)
  Out of specification → Replace.

SECONDARY SHEAVE
1. Inspect:
- Secondary fixed sheave ①
- Secondary sliding sheave ②
  Scratch/Crack/Damage → Replace as a set.
- Oil seal ③
  Damage → Replace.

2. Inspect:
- Torque cam groove ①
- Guide pin ②
  Wear/Damage → Replace as a set.
- O-rings ③
  Damage → Replace.

3. Measure:
- Clutch spring free length
  Out of specification → Replace.

Clutch spring free length:
121.7 mm (4.79 in)
(Wear limit): 106.5 mm (4.20 in)

4. Inspect:
- Clutch housing inner surface
  Oil/Scratches → Remove.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>Use a rag soaked in lacquer thinner or solvent.</td>
</tr>
<tr>
<td>Scratches</td>
<td>Use an emery cloth (lightly and evenly polishing).</td>
</tr>
</tbody>
</table>

5. Measure:
- Clutch housing inside diameter @
  Out of specification → Replace.

Clutch housing inside diameter:
105.0 mm (4.13 in)
(Wear limit): 105.4 mm (4.15 in)

6. Inspect:
- Clutch shoes
  Glazed parts → Sand with coarse sandpaper.

NOTE:
After using the sand paper, clean off the polished particles with a cloth.

7. Measure:
- Clutch shoe thickness @
  Out of specification → Replace.

Clutch shoe thickness:
4.0 mm (0.16 in)
(Wear limit): 2.5 mm (0.10 in)

V-BELT
1. Inspect:
- V-belt
  Crack/Wear → Replace.

NOTE: Replace the V-belt if it is greasy or oily.
2. Measure:
- V-belt width @
Out of specification → Replace.

V-Belt width:
15.0 mm (0.59 in)
<Wear Limit>:
13.5 mm (0.53 in)

STARTER CLUTCH AND GEARS
1. Inspect:
- Starter clutch
Push the dowel pin in arrow direction.
Unsmooth operation → Replace starter clutch assembly.

2. Inspect:
- Starter wheel gear teeth
- Idle gear teeth
  Burrs/Chips/Roughness/Wear → Replace.
- Bearing (starter wheel gear)
  Pitting/Damage → Replace.

ENGINE ASSEMBLY AND ADJUSTMENT
CRANKCASE AND CRANKSHAFT

1. Oil seal
2. Oil seal holder
3. Crankcase (right)
4. Dowel pin
5. Bearing
6. Crankcase (left)
7. Bearing
8. Crankshaft pin
9. Connecting rod
10. Crankshaft (left)
11. Engine mount shaft
12. Oil seal

9 Nm (0.9 m.kg, 6.5 ft.lb)
13 Nm (1.3 m.kg, 9.4 ft.lb)

CRANKSHAFT:
Crank width:
37.90 ~ 37.95 mm
(1.492 ~ 1.492 in)
Runout limit:
<0.03 mm>
(0.0012 in)
Big end side clearance:
0.2 ~ 0.5 mm
(0.008 ~ 0.020 in)
CRANKSHAFT AND CRANKCASE

**CAUTION:**
To protect the crankshaft against scratches and to facilitate the engine assembly and installation, apply grease to oil seal lips, and engine oil to bearings.

1. Attach:
   - Crankshaft installation tool (1), (2), (3), (4)

2. Install:
   - Crankshaft (to left crankcase)

**NOTE:**
Hold the connecting rod at top dead center with one hand while tightening the nut of the installation tool with the other. Tighten the installation tool until the crankshaft bottoms against the bearing.

3. Install:
   - Dowel pins (1)
   - Spacer (2)

4. Apply:
   - HEATPROOF or Yamaha Bond No.1215
   - To the mating surfaces of both case halves.

5. Attach:
   - Crankshaft installation tool (1), (2), (3), (4)

**Crankshaft installation tool:**
- 1: 90890-01274
- 2: 90890-01275
- 3: 90890-01277
- 4: 90890-01411

**NOTE:**
Hold the connecting rod at top dead center with one hand while tightening the nut of the installation tool with the other. Tighten the installation tool until the crankcase halves close with one another.

6. Install:
   - Right crankcase

7. Tighten:
   - Crankcase holding screws

**NOTE:**
Tighten the crankcase holding screws in stages, using a crisscross pattern.

**Crankcase holding screw:**
13 Nm (1.3 m.kg, 9.4 ft.lb)

8. Check:
   - Crankshaft operation
   - Unsmooth operation → Repair.

**CAUTION:**
Never hit on the crankshaft.

9. Install:
   - Oil seal stopper plate (1)

**Screw (oil seal stopper plate):**
9 Nm (0.9 m.kg, 6.5 ft.lb)
**ENGINE ASSEMBLY AND ADJUSTMENT**

**AUTOLUBE PUMP AND CDI MAGNETO**

1. Fan
2. Plain washer
3. Rotor assembly
4. Lighting coil
5. Charge coil
6. Pick up coil
7. Stator assembly
8. Oil seal
9. Gasket
10. Oil hose
11. Oil delivery hose
12. AutoLube pump
13. Pump drive gear
14. O-ring

1. Installation:
   - Fan (to oil seal @)
   - Gasket
   - Oil hose
   - Oil delivery hose
   - Rotor assembly
   - Lighting coil
   - Charge coil
   - Pick up coil
   - Stator assembly
   - Oil seal

2. Apply:
   - 6.5 Nm (0.85 m.kg, 4.7 ft.lb)

3. Insulation:
   - 37.5 Nm (3.75 m.kg, 27.1 ft.lb)

4. Installation:
   - O-ring

5. Screw (AutoLube pump):
   - 4 Nm (0.4 m.kg, 2.9 ft.lb)

6. Apply:
   - Lithium soap base grease
     (to O-ring @)

7. Insulation:
   - 8 Nm (0.8 m.kg, 5.8 ft.lb)

**CDI MAGNETO**

1. Installation:
   - Gasket

2. Apply:
   - Lithium soap base grease
     (to oil seal @)

3. Insulation:
   - 8 Nm (0.8 m.kg, 5.8 ft.lb)

4. Installation:
   - Stator assembly

- **Screw (stator assembly):**
  - 8 Nm (0.8 m.kg, 5.8 ft.lb)
5. Install:
- Woodruff key
- Magneto rotor
- Plain washer
- Nut

**NOTE:**
When installing the magneto rotor, make sure the woodruff key is properly seated in the key way of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft and.

6. Tighten:
- Nut (magneto rotor)

Use the flywheel holding tool.

**Flywheel holding tool:**
90890-01235

**Nut (Flywheel magneto):**
37.5 Nm (3.75 m.kg, 27.1 ft.lb)
TRANSMISSION

1. Apply:
   - 10W30 Type SE Motor oil
     (to transmission case cover bearing)

2. Install:
   - Bearing ①

3. Install:
   - Oil seal ②
   - Secondary sheave axle ③

   NOTE:_______________________________________
   Apply lithium soap base grease onto the oil seal lips.

4. Check:
   - Secondary sheave axle operation
     Unsmooth operation → Repair.

5. Apply:
   - 10W30 type SE Motor oil
     (to main axle bearing and drive axle bearing)

6. Install:
   - Drive axle ①
   - Main axle ②
   - Conical spring washer ③
   - Plain washer ④

   NOTE:_______________________________________
   - Apply lithium soap base grease onto the oil seal lips.
   - Always use a new gasket.

7. Install:
   - Gasket ①
   - Dowel pins ②
   - Transmission case cover ③

   Screw (case cover):
   12 Nm (1.2 m.kg, 8.7 ft.lb)

STANDER SYSTEM

① Collar ② Washer ③ Bearing ④ Starter wheel gear ⑤ Idle gear ⑥ Collar ⑦ O-ring ⑧ Starter clutch ⑨ Starter motor
1. Install:
   - Collar
   - Washer
   - Bearing
   - Starter wheel gear
   - Starter clutch

   **NOTE:**
   - Apply lithium soap base grease to the bearing.
   - Apply molybdenum disulfide oil to the shaft (starter clutch).

2. Install:
   - Plain washer
   - Idler gear
   - Plain washer
   - Plate (idler gear)

   **Screw (idle gear plate):**
   8 Nm (0.8 m.kg, 5.8 ft.lb)

   **NOTE:**
   Apply engine oil to the idle gear.

3. Install:
   - Starter motor

   **Screw (starter motor):**
   13 Nm (1.3 m.kg, 9.4 ft.lb)

   **NOTE:**
   Apply lithium soap base grease to the O-ring of the starter motor.

---

**PRIMARY AND SECONDARY SHEAVE**

1. Clutch housing
2. Conical spring
3. Cam
4. Clutch shoe spring
5. One-way clutch
6. Washer
7. Spring seat
8. Primary fixed sheave
9. Spring
10. Washer
11. Plate washer
12. Spacer
13. Secondary sliding sheave
14. Primary sliding
15. V-belt sheave
16. Guide pin
17. Clutch weights
18. Secondary fixed sheave

*Apply BEL-RAY Assembly Lube*

**ENGINE ASSEMBLY AND ADJUSTMENT**

**Springs (secondary sheave)**
- Free length limit: 106.7 mm (4.20 in)

**Clutch housing wear limit:**
- 105.4 mm (4.15 in)

**Clutch shoes wear limit:**
- 2.5 mm (0.10 in)

**V-belt wear limit:**
- 13.5 mm (0.53 in)

**Weight outside diameter limit:**
- 14.5 mm (0.57 in)
ENGINE ASSEMBLY AND ADJUSTMENT

KICK STARTER
1. Kick shaft
2. Return spring
3. Collar
4. Plain washer
5. Circlip
6. Gasket

SECONDARY SHEAVE
When assembling the secondary sheave, reverse the disassembly procedure. Note the following points.

1. Apply:
   - BEL-RAY Assembly Lube
   (to the sliding parts of the sheave)

2. Install:
   - Sliding sheave

NOTE:
Wind adhesive tape around the end of the sheave to avoid turning over the oil seal lips when installing the sheave.

3. Install:
   - Pin

4. Apply:
   - BEL-RAY Assembly Lube
   (to the torque cam grooves and O-rings)

5. Check:
   - Sliding sheave
   - Unsmooth operation → Repair.

CAUTION:
Remove excessive grease.

6. Install:
   - Clutch securing nut
   Use the clutch spring holder

Clutch spring holder: 90890-01337

7. Tighten:
   - Clutch securing nut
   Use sheave holder (41mm)

Sheave holder: 90890-01701

Clutch securing nut:
50 Nm (5.0 m.kg, 36.2 ft.lb)
8. Install:
- Dowel pin
- Gasket
- Secondary sheave assembly
- Clutch housing

9. Tighten:
- Nut (secondary sheave)
  Use sheave holder

   Sheave holder:
   P/N. 90890-01701

   Nut (secondary sheave):
   40 Nm (4.0 m.kg, 28.9 ft.lb)

**PRIMARY SHEAVE**

1. Clean:
- Primary sliding sheave face
- Primary fixed sheave face
- Collar
- Weight
- Primary sliding sheave cam surface

2. Install:
- Weight
- Cam
- Slider
- Collar

3. Check:
- Cam operation
  Unsmooth operation → Repair.

4. Install:
- Primary sheave assembly
  Collar

5. Install:
- V-belt
  Place the V-belt around the secondary sheave, and compress the secondary sheave spring hard so that the V-belt moves toward the clutch hub.

   **NOTE:**
   - The arrow on the V-belt must point to the front.
   - Make sure the V-belt is not stained with oil or grease.

6. Install:
- Shim
- Primary fixed sheave
- Washer
- One-way clutch
- Washer
- Nut

7. Tighten:
- Nut (primary sheave)

   Nut (primary sheave):
   30 Nm (3.0 m.kg, 21.7 ft.lb)

   **NOTE:**
   When tightening the nut (primary sheave), hold the magneto rotor using the flywheel holding tool.

   Flywheel holding tool:
   90890-01235

8. Adjust:
- V-belt
  Tense the V-belt by turning the primary sheave several times.
9. Install: PISTON, CYLINDER AND CYLINDER HEAD
   • Fan

   Screw (fan): 6.5 Nm (0.65 m.kg, 4.7 ft.lb)

KICK STARTER
1. Install:
   • Return spring
   • Kick shaft
   • Collar
   • Washer
   • Circlip

2. Hook:
   • Return spring
     (to the kick gear and boss)

3. Install:
   • Kick pinion gear

NOTE:
Install the spring as shown.

4. Install:
   • Transmission case

   Screw (transmission case):
   12 Nm (1.2 m.kg, 8.7 ft.lb)

5. Install:
   • Kick crank

   Bolt (kick crank):
   8.5 Nm (0.85 m.kg, 8.15 ft.lb)

PISTON, CYLINDER AND CYLINDER HEAD
1. Carburetor joint
2. Reed valve
3. Gasket
4. Cylinder head
5. Cylinder head gasket
6. Cylinder
7. Piston
8. Piston ring
9. Cylinder gasket
10. Reed valve
11. Piston pin clip
12. Piston pin
13. Piston
14. Piston clearances:
   A Piston clearance:
   0.034 – 0.047 mm (0.0013 – 0.0018 in)
   B Piston rings end gap:
   0.15 – 0.30 mm (0.006 – 0.012 in)
   C Piston rings side clearance:
   0.03 – 0.05 mm (0.0012 – 0.0020 in)
   D Spark plug:
   Type: BR8HS
   Manufacturer: NGK
1. Apply:
   - Engine oil (1)
   (to crankshaft bearing, connecting rod big end bearing, small end bearing, piston pin, piston ring grooves and piston skirt.)

2. Install:
   - Small end bearing
   - Piston (1)
   - Piston pin (3)
   - Piston pin clip (6)

NOTE:
- The arrow (2) on the piston must point to the exhaust side.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.

CAUTION:
- The ends of the piston pin clip must not come together at the slot in the piston groove.
- Always use a new piston pin clip.

CYLINDER AND CYLINDER HEAD
1. Install:
   - Cylinder gasket (new gasket)
2. Check:
   - Piston rings

NOTE:
- Make sure the ring ends (1) are properly fitted around the ring locating pins in the piston grooves.
- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.

3. Install:
   - Cylinder (1)

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

CAUTION:
- Tighten the cylinder head holding nuts in stages, and crisscross sequence.
- The arrow (3) on the cylinder head must point to the front.

4. Install:
   - Cylinder head gasket (new gasket)

5. Install:
   - Cylinder head (1)
   - Spark plug (2)

NOTE:
- Nut (cylinder head): 10 Nm (1.0 m.kg, 7.2 ft.lb)
- Spark plug: 20 Nm (2.0 m.kg, 14.0 ft.lb)

6. Install:
   - Center stand (1)
   - Shaft (2)
   - Clamp (3)
   - Rubber washer (4)
   - Clip (5)
   - Spring (6)

7. Install:
   - Brake shoes (1)
   - Plain washer (2)
   - Rear wheel
   - Plate washer
   - Nut
ENGINE ASSEMBLY AND ADJUSTMENT

8. Install:
• Air shroud
• Oil hose
• Oil delivery hose

NOTE:
Pass the oil delivery hose and oil hose as shown.

9. Air bleeding:
• Autolube pump
Refer to "AUTOLUBE PUMP AIR BLEEDING" in CHAPTER 3.

ENGINE REMOUNTING
Reverse the removal procedure.

1. Install:
• Engine mounting bolt ①
• Rear shock absorber bolt ② (lower)
These bolts should be temporarily secured.

2. Tighten:
• Engine mounting bolt
• Rear shock absorber bolt (lower)

Engine mounting bolt:
42 Nm (4.2 m.kg, 30.4 ft.lb)
Rear shock absorber bolt (lower):
17.5 Nm (1.75 m.kg, 12.6 ft.lb)

3. Install:
• Carburetor top together with throttle valve ①
• Fuel hose © / Vacuum hose ©
• Rear brake cable

NOTE:
When installing the throttle valve into the carburetor, align the groove of the throttle valve with the projection of the carburetor.

4. Connect:
• Spark plug cap ①
• Starter motor ②
• CDI magneto lead ③
• Earth (ground lead)

5. Tighten:
• Rear wheel axle nut ①

NOTE:
When tightening the rear wheel axle nut, apply the rear brake.

Rear wheel axle nut: 103.5 Nm (10.35 m.kg, 74.8 ft.lb)

6. Install:
• Protector/Muffler assembly
• Muffler assembly ①
• Air shroud ③.

Bolt (muffler):
29 Nm (2.9 m.kg, 21.0 ft.lb)
Bolt (exhaust pipe):
8.5 Nm (0.85 m.kg, 6.15 ft.lb)

7. Fill:
• Transmission oil
Refer to "TRANSMISSION OIL REPLACE-
MENT" in CHAPTER 3.

8. Adjust:
• Brake lever free play
Refer to "FRONT REAR BRAKE LEVER FREE PLAY ADJUSTMENT" in CHAPTER 3.
• Engine idle speed
• Throttle cable free play
Refer to "THROTTLE CABLE FREE PLAY AD-
JUSTMENT" and "ENGINE IDLE SPEED AD-
JUSTMENT" in CHAPTER 3.
CARBURETOR REMOVAL

1. Remove:
   - Covers and footrest board
   - Needle set (N.J.) #2.110
   - Main jet (M.J.) # 93
   - Main air jet (M.A.J.) 2.0
   - Jet needle (J.N.) A21-3/5
   - Float chamber gasket
   - Carburetor top
   - Fuel hose (1)
   - Oil hose (2)
   - Carburetor top
   - Throttle valve
   - Starter plunger top
   - Starter plunger
   - Carburetor

DISASSEMBLY

1. Remove:
   - Float chamber (1)
   - Float pin (1)
   - Float (2)
   - Needle valve (3)
   - Pilot jet (1)
   - Main jet (3)
   - Main nozzle (4)
   - Starter jet (4)
CARBURETOR

4. Remove:
   • Throttle stop screw (1)
   • Spring (throttle stop screw)
   • Air screw (2)
   • Spring (air screw)

5. Remove
   • Needle clip (1)
   • Jet needle (3)
   • Throttle valve (5)

INSPECTION

1. Check:
   • Carburetor body (1)
     Dirt → Clean.

   NOTE:
   Use a petroleum based solvent for cleaning.
   Blow out all passages and jets with compressed air.

2. Inspect:
   • Main jet (1)
   • Main nozzle (2)
   • Pilot jet (3)
   • Starter jet
     Contamination → Clean.

3. Check:
   • Needle valve (7)
     Wear/Contamination → Replace.
   • Float (2)
     Damage → Replace.
   • Gasket
     Damage → Replace.

---

CARBURETOR

4. Check:
   • Throttle valve (1)
     Wear/Damage → Replace.

5. Check:
   • Throttle valve free movement
     Unsmooth/stickiness → Replace.
     Insert the throttle valve (1) into the carburetor body (2) and check for smooth movement.

6. Check:
   • Throttle stop screw (1)
   • Air screw (2)
   • Needle (3)
   • Starter plunger (4)
     Wear/Damage → Replace.

7. Measure:
   • Float height @
     Out of specification → inspect needle valve, float, and valve seat.

   ![Float height measurement](image)
   - Float height: 15.0 ~ 17.0 mm (0.59 ~ 0.67 in)

   Float height measurement steps:
   • Install the needle valve, float and float pin into the carburetor body.
   • Hold the carburetor upside down.
   • Measure the height distance between the mating surface of the float chamber (gasket removed) and the top of the float, using a gauge.
NOTE:
The float arm should be resting on the needle valve. It should not compress the needle valve.

- If the float height is not within specification, inspect the needle valve, float and valve seat.
- If one of these parts is worn, replace the whole set.
- If both parts are in good condition, replace the float.
- Check the float height again.

NOTE:
The float height is factory-adjusted. Never try to adjust it yourself.

ASSEMBLY
Reverse the "DISASSEMBLY" procedures. Note the following points.

CAUTION:
- Before reassembling the carburetor wash all its components in clean gasoline.
- Always use new gaskets.

1. Install:
   - Needle
   - Clip
   - Throttle valve
   - Spring seat
   - Spring

Jet needle clip position: 3/5

2. Install:
   - Throttle valve
   - Starter plunger

NOTE:
Align the groove of the throttle valve with the projection of the carburetor body.

3. Install:
   - Carburetor

NOTE:
Align projection 1 with projection 2.

INSTALLATION
To install the carburetor reverse the "REMOVAL" procedures. Note the following points.
1. Install:
   - Carburetor cover
   - Air hose
   - Pass the air hose through the hole in the carburetor cover.

2. Adjust:
   - Throttle cable free play
   - Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" in CHAPTER 3.

3. Install:
   - Air filter case assembly
FUEL COCK/REED VALVE

FUEL COCK INSTRUCTION
1. Stop the engine.

2. Remove:
   • Mole
   Refer to "COVERS" in CHAPTER 3.

3. Check:
   • Fuel cock

Fuel cock inspection steps:
- Disconnect the fuel hose (1).
- Place a receptacle under the fuel hose end.
- If fuel stops flowing within a few seconds, the fuel cock is in good condition. If not clean or replace the fuel cock.
- Disconnect the vacuum hose and breathe in through the hose to create a vacuum in the fuel cock.
- If fuel flows out of the fuel hose when vacuum is applied and stops flowing when vacuum stops, the fuel cock is in good condition.
- If not, clean or replace the vacuum hose, the fuel hose and the fuel cock.

REED VALVE REMOVAL
1. Remove:
   • Side covers
   Refer to "COVERS" in CHAPTER 3.

2. Remove:
   • Carburetor
   Refer to section "CARBURETOR REMOVAL".

3. Remove:
   • Carburetor joint
   • Reed valve assembly

NOTE:
A reed valve in good condition should be completely or at least nearly flush with the valve seat.
- If in doubt, apply suction to the carburetor side of the assembly.
- Leakage should be minimal to moderate.

REED VALVE INSPECTION
1. Check:
   • Carburetor joint
     Damage/Cracks → Replace.
   • Reed valve
     Wear/Cracks/Damage → Replace.

Reed valve inspection steps:
- Visually inspect the reed valve.
- If in doubt, apply suction to the carburetor side of the assembly.
- Leakage should be minimal to moderate.

阀塞高度:
4.0 ~ 4.4 mm (0.157 - 0.173 in)

阀塞间隙:
Less than 0.2 mm (0.008 in)

2. Measure:
   • Valve stopper height (1)
   Out of specification → Replace valve stopper.

3. Measure:
   • Reed valve clearance (3)
   Out of specification → Replace reed valve.
INSTALLATION
To install the reed valve reverse the "REMOVAL" procedure. Note the following points.
1. Install:
   • Gasket (new)
2. Tighten:
   • Reed valve assembly bolts

Reed valve assembly bolts:
8.5 Nm (0.85 m.kg, 6.15 ft.lb)

NOTE:
Tighten the screws crosswise in several steps to prevent warpage of the reed valve assembly and the carburetor joint.
## CHAPTER 6. CHASSIS

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<td>Installation</td>
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</table>
FRONT WHEEL

CHASSIS

1. Axle
2. Speedometer gear
3. Bearing
4. Flange
5. Collar
6. Valve

A TIRE SIZE:
120/90-10

B RIM RUNOUT LIMIT:
RADIAL: 2.0 mm (0.08 in)
LATERAL: 2.0 mm (0.08 in)

C WHEEL AXLE RUNOUT LIMIT:
0.25 mm (0.01 in)

47 Nm (4.7 m.kg, 34 ft.lb)

NOTE:
Never depress the brake lever when the wheel is off the scooter. Otherwise the brake pads will be forced shut.

INSPECTION
1. Inspect:
   - Front axle runout
     Out of specification → Replace.

WARNING
Do not attempt to straighten a bent axle.

2. Measure:
   - Wheel runout
     Out of specification → Replace.

3. Inspect:
   - Tire
     Wear/Cracks/Warpage → Replace.

4. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

5. Check:
   - Speedometer gear
     Wear/Damage → Replace.

NOTE:

FRONT WHEEL
FRONT WHEEL

INSTALLATION
Reverse the "Removal" procedure.
Note the following points.

1. Lubricate:
   - Front wheel axle
   - Bearings
   - Oil seal (lips)
   - Drive/driven gear (speedometer)

2. Install:
   - Speedometer gear unit

NOTE:
Be sure that the two projections at the gear unit mesh with the two slots on the wheel hub.

3. Install:
   - Front wheel axle
   - Front caliper mounting bolts

NOTE:
Be sure that the slot (torque stopper) of the gear unit housing is positioned correctly.

4. Tighten:
   - Front wheel axle
   - Front caliper mounting bolts

Front wheel axle:
47 Nm (4.7 m.kg, 34 ft.lb)
Front caliper mounting bolts:
23 Nm (2.3 m.kg, 16.6 ft.lb)

WARNING
Make sure that the brake hoses are routed properly.

FRONT BRAKE

NOTE:
Be sure to install the pads correctly.

1. Disc
2. Bolt
3. Caliper
4. Piston
5. Piston seals
6. Air bleed screw
7. Pad spring
8. Pad retainer
9. Brake pads
10. O. ring

A. PADS WEAR LIMIT: 0.8 mm (0.03 in)
B. DISC WEAR LIMIT: 3.0 mm (0.12 in)

6 Nm (0.6 m.kg, 4 ft.lb)
21.5 Nm (2.15 m.kg, 16 ft.lb)
23 Nm (2.3 m.kg, 17 ft.lb)
MASTER CYLINDER DISASSEMBLY

1. Master cylinder
2. Master cylinder piston ass'y
3. Diaphragm
4. Master cylinder cap
5. Screw
6. Master cylinder bracket

NOTE: Drain completely before removing the master cylinder.

BRAKE PAD REPLACEMENT

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Remove:
   - Pin ①
   - Axle ②

2. Remove:
   - Pad spring ③
   - Brake pads ④

NOTE:
Replace the brake pads as a set when either one is worn to the limit.

3. Measure:
   - Brake pads

   Out of specification → Replace.

NOTE:
Replace the brake pad and spring as a set when replacing the brake pads.

FRONT BRAKE

WARNING

- Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection is disconnected, the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly. Do not use solvents on internal brake component.
- Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Never allow brake fluid to come in contact with the eyes. Brake fluid can damage painted surfaces and plastic parts.

BRAKE PAD WEAR LIMIT:

0.8 mm (0.03 in)
**FRONT BRAKE**

4. Install:
   - Brake pads
   - Pad spring
   - Axle
   - Pin

**NOTE:**

Be careful to install the brake pads correctly.

5. Lubricate:
   - Mounting bolt (caliper body)

**Recommended lubricant:**
Lithium soap base grease

6. Install:
   - Wheel axle
   - Mounting bolt

**Wheel axle:**
47 Nm (4.7 m.kg, 34 ft.lb)
Mounting bolt:
23 Nm (2.3 m.kg, 17 ft.lb)

---

**CALIPER DISASSEMBLY**

**NOTE:**

Before disassembling the front brake caliper, drain all brake fluid from the brake hose, master cylinder, brake caliper and tank.

1. Remove:
   - Union bolt ①
   - Copper washers ②

**NOTE:**

Place the open end of the drain hose into a container and pump out the remaining brake fluid carefully.

2. Remove:
   - Caliper body
   - Caliper bracket

3. Remove:
   - Piston ①
   - Piston seals ②

---

**FRONT BRAKE**

**Removal steps:**

- Blow compressed air into the hose joint opening to force out the piston from the caliper body.

**WARNING**

- Never try to pry out the piston.
- Cover the piston with a rag. Use care so that the piston does not cause injury as it is expelled from the cylinder.

- Remove the piston seals.

---

**MASTER CYLINDER DISASSEMBLY**

**NOTE:**

Before disassembling the front brake master cylinder, drain all brake fluid from the brake hose, master cylinder, brake caliper and reservoir tank.

1. Remove:
   - Upper handlebar cover

2. Remove:
   - Brake switch
   - Brake lever
   - Union bolt

**NOTE:**

Release the brake switch by pushing with a screwdriver into the hole on the lower side of the brake lever and pull out the brake switch.

3. Remove:
   - Master cylinder holder
   - Master cylinder
INSPECTION AND REPAIR

Recommended brake component replacement schedule:

<table>
<thead>
<tr>
<th>Component</th>
<th>Replacement Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake pads</td>
<td>As required</td>
</tr>
<tr>
<td>Piston seal, Dust seal</td>
<td>Every two years</td>
</tr>
<tr>
<td>Brake hoses</td>
<td>Every four years</td>
</tr>
<tr>
<td>Brake fluid</td>
<td>Replace only when brakes are disassembled</td>
</tr>
</tbody>
</table>

**WARNING**

All internal parts should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.

1. Inspect:
   - Caliper piston (1) Scratches/Rust/Wear → Replace caliper assembly.
   - Caliper body (2) Wear/Scratches/Cracks/Damage → Replace caliper assembly.

**WARNING**

Replace the piston seals whenever the caliper is disassembled.

2. Inspect:
   - Master cylinder Wear/Scratches → Replace the master cylinder assembly.
   - Master cylinder body/Diaphragm Cracks/Damage → Replace.
   - Master cylinder kit Scratches/Wear/Damage → Replace as a set.

**CALIPER ASSEMBLY**

**WARNING**

- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with clean brake fluid when installed.

Recommended brake fluid: DOT #3 or DOT #4

- Replace the piston seals whenever a caliper is disassembled.

1. Install:
   - Piston seals (1)
   - Caliper piston (2)

**WARNING**

Always use new piston seals.
**FRONT BRAKE**

2. Install:
   - Brake caliper

   **Bolt (brake caliper):**
   - 23 Nm (2.3 m.kg, 17 ft.lb)

3. Install:
   - Caliper body

4. Install:
   - Brake hose
   - Copper washers
   - Union bolt

   **Union Bolt (brake hose):**
   - 23 Nm (2.3 m.kg, 17 ft.lb)

**CAUTION:**
When installing the brake hose to the caliper, turn the brake pipe against the projection on the caliper.

**WARNING**
- Proper hose routing is essential to insure safe operation. Refer to "CABLE ROUTING".
- Always use new copper washers.

**MASTER CYLINDER ASSEMBLY**

**WARNING**
- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with clean brake fluid when installed.

**Recommended brake fluid:**
- DOT #3 or DOT #4

---

**FRONT BRAKE**

1. Install:
   - Master cylinder

   **CAUTION:**
   - Install the master cylinder holder with the arrow mark pointing upwards.
   - Tighten the upper bolt first, then the lower bolt.

   **Bolt (master cylinder holder):**
   - 9 Nm (0.9 m.kg, 6.5 ft.lb)

2. Install:
   - Brake lever

**NOTE:**
Apply lithium soap base grease to the brake lever pivot.

3. Install:
   - Brake hose
   - Copper washers
   - Union bolts
   - Brake switch

   **Union bolt:**
   - 23 Nm (2.3 m.kg, 17 ft.lb)

**WARNING**
- Proper hose routing is essential to insure safe operation. Refer to "CABLE ROUTING" in CHAPTER 2.
- Always use new copper washers.

4. Check that the brake hose does not touch other parts (throttle cable, wire harness, etc.) when the handlebar is turned to the left or right. Repair if necessary.
REAR WHEEL REMOVAL

1. Remove:
   - Muffler ass'y

2. Loosen:
   - Rear axle nut

NOTE:
Pull the rear brake to loosen the axle nut.

3. Remove:
   - Rear wheel

4. Remove:
   - Brake cable
   - Brake shoes
   - Plain washer

INSPECTION

1. Check:
   - Rear wheel
   - Refer to the section "FRONT WHEEL INSPECTION".

2. Measure:
   - Wheel runout
   - Refer to the section "FRONT WHEEL INSPECTION".

Rim Runout Limits:
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)
REAR WHEEL

3. Check:
- Wheel bearings
  Refer to the section "FRONT WHEEL INSPECTION".

4. Check:
- Brake lining surface
  Glazed spots → Eliminate with sandpaper.

NOTE:
After sanding the brake lining remove dust particles from the brake shoe with a clean cloth.

5. Measure:
- Brake lining thickness
Out of specification → Replace

<table>
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<th>Brake Lining Thickness:</th>
<th>4.0 mm (0.16 in)</th>
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<tr>
<td>Wear limit:</td>
<td>2.0 mm (0.08 in)</td>
</tr>
</tbody>
</table>

6. Check:
- Brake drum inner surface
  Oil/Scratches → Repair.

7. Measure:
- Brake drum inside diameter @
  Out of specification → Replace.

| Brake Drum Wear limit: | 110.5 mm (4.35 in) |

ASSEMBLY
Reverse the "REMOVAL" procedure.
Note the following points.
1. Install:
   - Brake camshaft ①

NOTE:
Apply lithium soap base grease onto the brake camshaft ① and pin ②.

CAUTION:
After installing the brake camshaft, remove the excess of grease.

REAR WHEEL

2. Install:
   - Brake shoes ①
   - Return spring ②

NOTE:
The arrow mark ③ must point outwards.

CAUTION:
When installing the springs and the brake shoes, take care not to damage the springs

3. Install:
   - Wear indicator ①
   - Camshaft lever ②

NOTE:
- Align the wear indicator tip ① with the line "A" as shown.
- Align the punch marks ③.

Camshaft Lever Bolt:
7 Nm (0.7 m.kg, 5.1 ft.lb)

4. Install:
   - Plain washer ①
   - Brake cable

INSTALLATION
Reverse the REMOVAL procedure.
Note the following points.
1. Clean:
   - Rear wheel axle

2. Install:
   - Rear wheel
   - Plain washer ①
   - Nut ②

NOTE:
Make sure the splines on the wheel hub fit onto the rear drive axle.
3. Install:
- Muffler
- Bolt (exhaust pipe): 9 Nm (0.9 m.kg, 6.5 ft.lb)
- Bolt (muffler): 26 Nm (2.6 m.kg, 19 ft.lb)

4. Adjust:
- Rear brake lever free play.
Refer to "REAR BRAKE LEVER FREE PLAY ADJUSTMENT" in CHAPTER 3.
FRONT FORK

REMOVAL

A WARNING

Securely support the scooter with a stand under the engine.

1. Place the scooter on an even surface.
2. Disconnect:
   • Speedometer cable
3. Remove:
   • Front wheel
   Refer to "FRONT WHEEL".
4. Remove:
   • Front fender
   Refer to "COVERS" in CHAPTER 3.
5. Remove:
   • Steering head
   Refer to "STEERING HEAD AND HANDLE-BAR".
6. Remove:
   • Securing nut
   • Ring nut (1)

NOTE:

Use the Ring Nut Wrench (2) to loosen the ring nut.

RIng Nut Wrench:
90790-01268

Support the steering shaft to prevent it from falling.

7. Remove:
   • Washer (1)
   • Upper bearing race (top) (2)
   • Steering column
   • Bearings

NOTE:

Take care not to lose the bearings. (Upper: 22 pieces, Lower: 22 pieces).

8. Remove:
   • Circlip (3)

9. Loosen:
   • Pinch bolt (4)

10. Remove:
    • Fork leg (complete)

FRONT FORK

DISASSEMBLY

1. Remove:
   • Rubber plug (1)
   • Circlip (3)
   • Spring seat (3)
   • Spring (4)

2. Remove:
   • Bolt (1)
   • Copper washer

NOTE:

To remove the drain bolt (1), use the T-handle (7) and the holder (3).

T-handle for front fork:
90890-01326
Holder:
90899-01294

3. Remove:
   • Inner fork tube (1)
   • Piston (5)
   • Spring (7)
   • Spring seat (8)

4. Remove:
   • Dust boot (1)
   • Retainer (2)
   • Oil seal (3)
FRONT FORK

INSPECTION
1. Check:
   • Inner fork tube and fork components
   • Outer fork tube
   Wear/Scratches/Damage → Replace.

WARNING
Never attempt to straighten a bent fork tube as this may dangerously weaken the tube.

2. Measure:
   • Fork spring free length
     Out of specification → Replace.

   Front fork spring free length:
   Right side: 206 mm (8.11 in)
   Left side: 225 mm (8.85 in)

ASSEMBLY
Reverse the “DISASSEMBLY” procedure.

NOTE:
• When reassembling the front fork, make sure you use following new parts:
  • Oil seals
  • Circlips and retainers
  • Make sure that all components are clean before reassembling.

1. Install:
   • Oil seal
   • Retainer
   • Dust boot

NOTE:
Before installing the oil seal, apply lithium soap grease onto the oil seal lips.

2. Install:
   • Inner fork tube
   • Spring seat
   • Spring
   • Piston

FRONT FORK

3. Install:
   • Copper washer (New)
   • Drain bolt

NOTE:
Tighten the drain bolt while holding the piston with the T-handle and holder.

T-handle for front fork:
90890-01326
Holder: 90890-01294

Drain Bolt:
23 Nm (2.3 m.kg, 17 ft.lb)

4. Fill:
   • Fork oil

Fork oil type:
ISO 6743/4-LHV 46
Amount (per fork tube):
48 cc (1.69 Imp oz, 1.62 US oz)

5. Install:
   • Spring
   • Spring seat
   • Circlip
   • Rubber plug

INSTALLATION
Reverse the “REMOVAL” procedure.

NOTE:
Left and right fork tube into the steering crown.

2. Install:
   • Circlips

3. Install:
   • Pinch bolts

Pinch bolt:
30 Nm (3.0 m.kg, 21.7 ft.lb)
Securely support the scooter so there is no danger of it falling over.

1. Place the scooter on an even surface.

2. Remove:
   - Front fender
   - Inner panels
   - Upper handlebar cover
   Refer to "COVERS" in CHAPTER 3.

3. Drain:
   - Front brake system
   Refer to "FRONT BRAKE".

4. Remove:
   - Front brake master cylinder
   Refer to "FRONT BRAKE".

5. Remove:
   - Front brake caliper mounting bolts

6. Remove:
   - Front wheel
   Refer to "FRONT BRAKE".

7. Remove:
   - Rear brake cable ①
   - Throttle grip

8. Disconnect:
   - Ground wire
   - All couplers
   - Wire harness band
   - Clamp

9. Remove:
   - Nut ①
   - Bolt
   - Handlebar
10. Remove:
  - Securing nut
  - Ring nut ①
  - Washer

**NOTE:**
Use the Ring Nut Wrench ② to loosen the ring nut.

[Image of Ring Nut Wrench: 90890-01268]

Support the front fork so that it may not fall down.

11. Remove:
  - Washer ①
  - Upper bearing race ②
  - Steering shaft
  - Bearing balls

**NOTE:**
Take care not to lose the bearing balls. (Upper: 22 pieces, Lower: 22 pieces).

**INSPECTION**

1. Check:
   - Handlebar ③
     Bends/Cracks/Damage → Replace.

2. Wash the bearing balls in solvent.

3. Check:
   - Bearing races ④
     Pitting/Damage → Replace.
   - Bearing balls ⑤
     Pitting/Damage → Replace.

**NOTE:**
Always replace the bearing balls and the upper and lower bearing races as a set.

**Bearing size:**
   - Upper: 3/16 in
   - Lower: 3/16 in

**Bearing quantity:**
   - Upper: 22 pcs
   - Lower: 22 pcs

**STEERING HEAD AND HANDLEBAR**

**Bearing race replacement steps:**
- Drive out the bearing race from the steering tube by hitting on it in several places.
- Remove the bearing race on the steering shaft with a hammer and a chisel Q as shown.
- Drive in the new bearing races evenly by hitting on them in several places.

**CAUTION:**
- Unless the ball race is installed evenly, it will damage the frame or steering column.
- Do not hit the face of the ball race.

4. Check:
   - Steering shaft
     Bend/Damage → Replace.

**WARNING**
Never attempt to straighten a bent steering shaft.

**ASSEMBLY AND INSTALLATION**
Reverse the "REMOVAL" and "DISASSEMBLY" procedure.
Note the following points.

**WARNING**
Proper cable and hose routing is essential to insure safe scooter operation. Refer to "CABLE ROUTING" in CHAPTER 2.

1. Install:
   - Bearing balls

2. Apply:
   - Wheel bearing grease (to upper and lower bearing).
3. Install:
- Steering shaft
- Upper bearing race (Top)
- Bearing race cover
- Washer
- Ring nut

**NOTE:**
Hold the steering column until it is secured.

4. Tighten:
- Ring nut

**NOTE:**
Refer to "STEERING HEAD ADJUSTMENT" in CHAPTER 3.

7. Install:
- Handlebar
- Bolt (New)
- Nut (New)

**NOTE:**
Fit the handlebar bridge into the steering column notcher.

**NOTE:**
Refer to "CABLE ROUTING" in CHAPTER 2 for proper cable and lead routing.

**CAUTION:**
- Before installing the handlebar, wipe the oil off the insertion portion using thinner, etc.
- Install the bolt from the left as shown.

**Handlebar Bolt:**
60 Nm (6.0 m.Kg, 43.4 ft.lb)

8. Install:
- Band

**NOTE:**
Refer to "CABLE ROUTING" in CHAPTER 2.

9. Clamp:
- Speedometer cable
- Front brake cable (to head pipe with the band)

**NOTE:**
Refer to "CABLE ROUTING" in CHAPTER 2.

10. Apply:
- Lithium soap base grease (to throttle cable end and handlebar right end).

11. Install:
- Throttle grip
- Throttle cable
- Bracket
- Front brake lever assembly
- Handlebar switch (right)

**NOTE:**
Refer to "CABLE ROUTING" in CHAPTER 2.

12. Connect:
- Rear brake cable
- Handlebar switch leads
- Brake switch lead

13. Install:
- Front fender

**NOTE:**
Refer to "COVERS" in CHAPTER 3.

13. Adjust:
- Front brake free play
- Rear brake lever free play
- Throttle free play

**Front Brake Lever Free Play:**
10 ~ 20 mm (0.4 ~ 0.8 in)

**Rear Brake Free Play:**
10 ~ 20 mm (0.4 ~ 0.8 in)

**Throttle Cable Free Play:**
1.5 ~ 3.0 mm (0.06 ~ 0.12 in)

**NOTE:**
Refer to "FRONT BRAKE ADJUSTMENT-REAR BRAKE ADJUSTMENT-THROTTLE CABLE ADJUSTMENT" in CHAPTER 3.
REAR SHOCK ABSORBER

REMOVAL
1. Place the scooter on its centerstand
2. Remove:
   - Mole
   Refer to "COVERS" in CHAPTER 3.

3. Remove:
   - Rear shock absorber

INSPECTION
1. Inspect:
   - Rear shock absorber
     Oil leaks/Damage → Replace.

INSTALLATION
When installing the rear shock absorber, reverse the removal procedure. Note the following points.
1. Install:
   - Rear shock absorber

Rear Shock Absorber Bolt (Upper):
31.5 Nm (3.15 m.kg, 22.8 ft.lb)
Rear Shock Absorber Bolt (Lower):
17.5 Nm (1.75 m.kg, 12.8 ft.lb)
ELECTRICAL COMPONENTS

1. Flasher relay
2. Wire harness
3. Oil sender
4. Starter relay
5. Ignition coil
6. CDI unit

NOTE:
- Set the pocket tester to "0" before starting the test.
- The pocket tester should be set to the "x 1"Ω range when testing the switch for continuity.
- Turn the switch on and off a few times when checking it.

SWITCH INSPECTION

SWITCH INSPECTION
Use a pocket tester to check the terminals for continuity. If the continuity is faulty at any point, replace the switch.

Pocket tester: 90890-03112

INSPECTING A SWITCH SHOWN IN THE MANUAL
The terminal connections for switches (main switch, handlebar switch, engine stop switch, light switch, etc.) are shown in a chart similar to the one on the left.
This chart shows the switch positions in the column and the switch lead colors in the top row.
For each switch position, "O—O" indicates the terminals with continuity.

The example chart shows that:
1. There is continuity between the "black and Black/White" leads when the switch is set to "OFF".
2. There is continuity between the "Red and Brown" leads when the switch is set to "ON".
SWITCH CONTINUITY INSPECTION
Refer to "SWITCH INSPECTION" and check for continuity between lead terminals.
Poor connection, no continuity → Correct or replace.
* The coupler locations are circled.

1. Horn switch
2. Dimmer switch
3. Turn switch
4. Main switch
5. Start switch
6. Engine stop switch
7. Front stop switch
8. Rear stop switch
9. Fuse
10. Oil lever gauge
11. Fuel sender
IGNITION AND STARTING SYSTEM

TROUBLESHOOTING

THE STARTING SYSTEM DOES NOT WORK
(NO SPARK OR IRREGULAR SPARKS).

NOTE:
• Remove the following parts before proceeding with the troubleshooting:
  1) Mole
• For accurate troubleshooting use the following special tools:

| Ignition checker: 90890-06754 | Pocket tester: 90890-03112 |

1. Spark plug:
• Check the spark plug type.
• Check the condition of the spark plug.
• Check the spark plug gap. Refer to "SPARK PLUG INSPECTION" in Chapter 3.
  Standard spark plug: BR8HS (NGK)
  Spark plug gap: 0.5 ~ 0.7 mm (0.020 ~ 0.027 in)

2. Spark check:
• Remove the spark plug cap.
• Connect the ignition checker ①.
  ② Spark plug cap
  ③ Spark
• Check the length of the spark gap.
• Start the engine and increase the spark length until the engine begins to misfire.
  Minimum spark gap: 6.0 mm (0.24 in)

3. Spark plug cap resistance:
• Disconnect the spark plug cap.
• Connect the pocket tester (Ω x 1 k) to the spark plug cap.
• Check the resistance of the spark plug cap.
  Spark plug cap resistance: 5 kΩ at 20°C (68°F)

4. Ignition coil resistance:
• Disconnect the ignition coil leads.
• Connect the pocket tester (Ω x 1) to the ignition coil.
  Ignition coil:
  Pocket tester (+) lead → Orange
  Pocket tester (-) lead → Ground
• Check the primary coil resistance.
  Primary coil resistance: 0.56 ~ 0.84 Ω at 20°C (68°F)
• Connect the pocket tester (Ω x 1k) to the ignition coil.
  Pocket tester (+) lead → Ground
  Pocket tester (-) lead → Spark plug lead
• Check the secondary coil resistance.
  Secondary coil resistance: 5.68 ~ 8.52 kΩ at 20°C (68°F)
IGNITION AND STARTING SYSTEM

5. Pickup coil resistance:
   - Disconnect the pickup coil coupler.
   - Connect the pocket tester (Ω x 100) to the pickup coil.

Pocket tester (+) lead ① → White / Red
Pocket tester (-) lead ② → Ground

- Check the pickup coil resistance.

Pickup coil resistance: 400 ~ 600 Ω at 20°C (68°F)

OUT OF SPECIFICATION

MEETS SPECIFICATION

Replace pickup coil.

6. Source coil resistance:
   - Disconnect the source coil coupler from the wire harness.
   - Connect the pocket tester (Ω x 100) to the source coil.

Pocket tester (+) lead ① → Black / Red
Pocket tester (-) lead ② → Ground

- Check the source coil resistance.

Source coil resistance: 640 ~ 960 Ω at 20°C (68°F)

OUT OF SPECIFICATION

MEETS SPECIFICATION

Replace source coil defect.

7. Connections:
   - Check all connections in the ignition system.
     Refer to "WIRING DIAGRAM".

GOOD CONNECTIONS

Replace CDI unit.

TROUBLESHOOTING

STATER MOTOR DOES NOT WORK

NOTE:
   - Remove the following parts before proceeding with the troubleshooting:
     1) Mole
     2) Footrest boards
     3) Front panel
     4) Handlebar cover
   - For accurate troubleshooting use the following special tools:

Pocket tester:
90890-03112

1. Fuse:
   - Refer to "SWITCH INSPECTION".

NO CONTINUITY

CONTINUITY

Replace fuse.

2. Battery:
   - Check the condition of the battery.
     Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage:
12.8 V or more at 20°C (68°F)

OUT OF SPECIFICATION

CORRECT

- Clean battery terminals.
- Charge or replace the battery.

CAUTION:
   - If the gauge of the jumper lead is smaller than that of the battery leads, the jumper lead might melt or burn.
   - This test could cause sparks. Never perform it near a gas source or near flammable products.

DOES NOT WORK

CORRECT

Repair or replace the starter motor.
4. Starter relay:
   - Disconnect the Blue/White lead from the wire harness.
   - Connect the (-) terminal of the battery to the Blue/White lead.
   - Check the starter motor operation.

   **Does Not Work**
   - Replace the starter relay.

   **Correct**

5. Main switch:
   - Refer to "SWITCH INSPECTION".

   **Correct**

6. Engine stop switch:
   - Refer to "SWITCH INSPECTION".

   **Correct**

7. Starter switch:
   - Refer to "SWITCH INSPECTION".

   **Correct**

8. Connections:
   - Check all connections in the starter system.
     Refer to "CIRCUIT DIAGRAM".

   **Poor Connections**
   - Repair.

---

**Starter Motor**

1. O-ring
2. Brush
3. Armature coil
4. O-ring

**Commutator**

- **Under Cut**: 1.15 mm (0.045 in)
- **Commutator Diameter Wear Limit**: 15.0 mm (0.60 in)
- **Brush Wear Limit**: 5.3 mm (0.21 in)

**Specifications**

- **13 Nm (1.3 m.kg, 9.4 ft.lb)**

---

**Engine Stop Switch**

- **Type**: 13 Nm (1.3 m.kg, 9.4 ft.lb)

---

**Main Switch**

- **Type**: 13 Nm (1.3 m.kg, 9.4 ft.lb)
IGNITION AND STARTING SYSTEM

**REMOVAL**

1. **Inspect:**
   - Commutator
   Dirty → Clean it with #600 grit sandpaper.

2. **Measure:**
   - Commutator diameter @
   Out of specification → Replace starter motor

**Commutator wear limit:**
15.0 mm (0.60 in)

3. **Measure:**
   - Mica under cut @
   Out of specification → To scrape the mica to proper measurement use a hacksaw blade which has been grounded to fit the commutator.

**Mica undercut @:**
1.15 mm (0.045 in)

**NOTE:**
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.

4. **Inspect:**
   - Armature coil (resistance)
   Defect → Replace starter motor

**Inspecting steps:**
- Connect the pocket tester to perform the continuity check.
- Measure the armature resistance.

**Armature coil resistance:**
0.072 Ω at 20°C

- If the resistance is incorrect, replace the starter motor.

5. **Measure:**
   - Brush length @
   Out of specification → Replace.

**Brush length limit @:**
5.30 mm (0.21 in)

6. **Measure:**
   - Brush spring force
   Fatigue/out of specification → Replace as a set.

**Brush spring force:**
150 ~ 650 gr (5.29 ~ 22.92 oz)

7. **Inspect:**
   - Bearing
   Roughness → Replace.
   - O-rings
   Wear/damage → Replace.
CHARGING SYSTEM

TROUBLESHOOTING

THE BATTERY IS NOT CHARGED

NOTE:
- Remove the following parts before proceeding with the troubleshooting:
  1) Mole.
- For accurate troubleshooting use the following special tools:

1. Fuse (Main)
   - Refer to "SWITCH INSPECTION".

2. Battery
   - Check the condition of the battery.
   - Refer to "BATTERY INSPECTION" in CHAPTER 3.

3. Charging voltage
   - Connect the engine tachometer to the spark plug lead.
   - Connect the pocket tester (DC20V) to the battery terminals.

Pocket tester (+) lead → Battery (+) terminal
Pocket tester (−) lead → Battery (−) terminal

- Start the engine and accelerate to about 5000 rpm.
- Check the charging voltage.

Charging voltage: 14 ~ 15 V at 5,000 tr/min

NOTE:
- Use a fully charged battery.

OUT OF SPECIFICATION

Charging circuit is OK.
4. Charging coil resistance

- Disconnect the CDI magneto coupler from the wire harness.
- Connect the pocket tester (Ω x 1) to the charging coil.
- Check the charging coil resistance

**Tester (+) lead → White ①**
**Tester (-) lead → Ground ②**

Charging coil resistance:
0.48 ~ 0.72 Ω at 20°C (68°F)

MEETS SPECIFICATION

Replace charging coil.

5. Connections

Check all connections in the charging system. Refer to "CIRCUIT DIAGRAM".

CORRECT

Replace the rectifier/regulator.

POOR CONNECTIONS

Repair.

OUT OF SPECIFICATION

Replace the rectifier/regulator.
TROUBLESHOOTING

THE HEADLIGHT, HEADLIGHT INDICATOR, TAIL LIGHT OR METER LIGHT DO NOT WORK

NOTE:

Remove the following parts before proceeding with the troubleshooting:
• Mole and footrest board
• Handlebar covers

For accurate troubleshooting use the following special tools:

Pocket tester: 90890-03112

1. "HI/LO" switch
Refer to "SWITCH INSPECTION".

2. Lighting coil resistance
• Disconnect the lighting coil coupler from the wire harness.
• Connect the pocket tester (Ω x 1) to the lighting coil.
• Check the lighting coil resistance

Tester (+) lead → Yellow / Red
Tester (-) lead → Ground

Lighting coil resistance: 0.32 ~ 0.48Ω (at 20°C (68°F))

3. Connections
• Check all connections in the lighting system.
Refer to "CIRCUIT DIAGRAM".

4. Check condition of each circuit for lighting system.
Refer to "LIGHTING SYSTEM CHECK".

1. Bulb and socket
• Check the bulb and socket for continuity.

Replace bulb or socket.

2. Voltage
• Connect the pocket tester (AC20V) to the headlight coupler.

Headlight:
• "LO": Pocket tester (+) lead → Green
Pocket tester (-) lead → Black
• "HI": Pocket tester (+) lead → Yellow
Pocket tester (-) lead → Black
• Headlight indicator:
Pocket tester (+) lead → Yellow
Pocket tester (-) lead → Black
• Meter:
Pocket tester (+) lead → Blue
Pocket tester (-) lead → Black

• Start the engine.
• Switch from "HI" to "LO" and back.
• Check the voltage (12V) between the headlight coupler leads.

Wiring circuit between C.D.I magneto and socket connector is faulty → Repair.

The circuit is good.
3. The tail light does not work.

1. Bulb and socket
   - Check the bulb and socket for continuity.
   - NO CONTINUITY
     - Replace bulb or socket.
   - CONTINUITY

2. Voltage
   - Connect the pocket tester (AC20V) to the taillight coupler.
   - Pocket tester (+) lead → Blue
   - Pocket tester (-) lead → Black
   - Set the main switch to "ON".
   - Start the engine.
   - Check the voltage (12V) between the headlight coupler leads "Blue" and "Black".
   - MEETS SPECIFICATION
     - Wiring circuit between C.D.I magneto and taillight coupler → Repair.
   - OUT OF SPECIFICATION

The circuit is good.
**SIGNAL SYSTEM CHECK**

1. **Horn does not sound**
   
   **INCORRECT**
   
   - 1. "HORN" switch
     
     Refer to "SWITCH INSPECTION".
   
   **CONTINUITY**
   
   - Replace left handlebar switch.
   
   **OUT OF SPECIFICATION**
   
   - Wiring circuit from main switch to horn is faulty
     
     Repair.

2. **Voltage**
   
   **INCORRECT**
   
   - Connect the pocket tester (DC20V) to the horn lead.
     
     Pocket tester (+) lead → Brown
     
     Pocket tester (-) lead → Ground
   
   **CONTINUITY**
   
   - Turn the main switch to "ON".
   
   **MEETS SPECIFICATION**
   
   - Check for voltage (12V) between "Brown" and the ground.
   
   **OUT OF SPECIFICATION**
   
   - Repair.

3. **Wiring connections**
   
   **INCORRECT**
   
   - Check all connections in the signal system.
     
     Refer to "WIRING DIAGRAM".
   
   **CONTINUITY**
   
   - Replace main switch.
   
   **POOR CONNECTIONS**
   
   - Adjust or replace the horn.

**TROUBLESHOOTING**

**Flasher lights, brake light, "Oil" warning light do not work**

**Horn does not sound**

**NOTE:**

Remove the following parts before proceeding with the troubleshooting:

- Mole and footrest board
- Handlebar cover

For accurate troubleshooting use the following special tools:

- **Pocket tester:** 90890-03112

1. **Fuse**
   
   **NO CONTINUITY**
   
   - Replace fuse.

2. **Battery**
   
   **INCORRECT**
   
   - Check the condition of the battery.
     
     Refer to "BATTERY INSPECTION" in CHAPTER 3.

   **CORRECT**
   
   - Pocket tester (+) lead → Brown
     
     Pocket tester (-) lead → Ground
   
   **CONTINUITY**
   
   - Clean battery terminals.
   
   **MEETS SPECIFICATION**
   
   - Charge or replace the battery.

3. **Main switch**
   
   **INCORRECT**
   
   - Refer to "SWITCH INSPECTION".

   **CONTINUITY**
   
   - Replace main switch.

4. **Wiring connections**
   
   **POOR CONNECTIONS**
   
   - Check all connections in the signal system.
     
     Refer to "WIRING DIAGRAM".

   **CORRECT**
   
   - Check the condition of each circuit of the signal system.
     
     Refer to the section "SIGNAL SYSTEM CHECK".
2. The tail light does not work.

1. Brake switch
Refer to "SWITCH INSPECTION".

INCORRECT

2. Voltage
- Connect the pocket tester (DC20V) to the socket.

Pocket tester (+) lead → Green / Yellow
Pocket tester (-) lead → Black

- Turn the main switch to "ON".
- Pull the brake lever.
- Check the voltage (12V) between "Green / Yellow" and "Black".

CORRECT

Replace brake switch.

OUT OF SPECIFICATION

MEETS SPECIFICATIONS

Circuit is good.

3. Flasher does not work

1. "TURN' switch
Refer to "SWITCH INSPECTION".

INCORRECT

2. Voltage
- Connect the pocket tester (DC20V) to the flasher relay.

Pocket tester (+) lead → Brown
Pocket tester (-) lead → Ground

- Turn the main switch to ON.
- Check the voltage (12V) between the "Brown" lead and the ground.

OUT OF SPECIFICATION

MEETS SPECIFICATIONS

Wiring circuit from main switch to bulb socket
connector is faulty → Repair.

3. Voltage
- Connect the pocket tester (DC20V) to the flasher relay.

Pocket tester (+) lead → Brown/White
Pocket tester (-) lead → Ground

- Turn the main switch to ON.
- Check the voltage (12V) between the "Brown/White" lead and the ground.

MEETS SPECIFICATIONS

OUT OF SPECIFICATION

Replace flasher relay.
4. Voltage

- Connect the pocket tester (DC20V) to the flasher connector.

Left flasher bulb:
- Pocket tester (+) lead → Chocolate ①
- Pocket tester (-) lead → Ground

Right flasher bulb:
- Pocket tester (+) lead → Dark green ②
- Pocket tester (-) lead → Ground

- Turn the main switch to "ON".
- Set the "TURN" switch to "L", then to "R".
- Check the voltage (12V) between "Chocolate" and the ground, then "Dark green" and the ground.

Flasher light

Turn indicator light

OUT OF SPECIFICATION

Wiring circuit from turn switch to bulb socket connector is faulty → Repair.

MEETS SPECIFICATION

This circuit is good.

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Pocket tester (+) lead → Grey ①
Pocket tester (-) lead → Ground

- Turn the main switch to "ON".
- Check the voltage (12V) between "Grey" and the ground.

MEETS SPECIFICATION

This circuit is in good condition.

OUT OF SPECIFICATION

4. Connections

- Check all connections in the signal system. Refer to "WIRING DIAGRAM".
TRBL
SHTG
CHAPTER 8.
TROUBLESHOOTING

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STARTING FAILURE/HARD STARTING

TROUBLESHOOTING

NOTE:
The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank
- Empty
- Clogged fuel filter
- Deteriorated fuel or fuel containing water or foreign material
- Clogged fuel tank cap
- Fuel cock
- Clogged fuel hose
- Air cleaner
- Clogged air filter

Carburetor
- Deteriorated fuel, fuel containing water or foreign material
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Groove-worm needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Starter plunger malfunction
- Improperly adjusted pilot air screw

ELECTRICAL SYSTEM

Spark plug
- Improper plug gap
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

CDI unit system
- Faulty CDI unit
- Faulty source coil
- Faulty pick-up coil

Switches and wiring
- Faulty main switch
- Broken or shorted wiring
- Faulty "ENGINE STOP" switch

STARTING FAILURE/HARD STARTING

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Clogged or loose pilot jet
- Clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

Crankcase and crankshaft
- Improperly seated crankcase
- Improperly sealed crankcase (damaged oil seal)
- Seized crankshaft

Reed valve
- Deformed reed valve stopper
- Improperly seated reed valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft
- Improperly seated crankcase
- Improperly sealed crankcase (damaged oil seal)
- Seized crankshaft

Reed valve
- Deformed reed valve stopper
- Improperly seated reed valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston
### COMPRESSION SYSTEM
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder
- Piston and piston rings
  - Improperly installed piston ring
  - Worn, fatigued or broken piston ring
  - Seized piston ring
  - Seized or damaged piston

### CRANKCASE AND CRANKSHAFT
- Improperly seated crankcase
- Improperly seated crankcase (damaged oil seal)
- Seized crankshaft

### REED VALVE
- Deformed reed valve stopper
- Improperly seated reed valve
- Loose intake manifold
- Broken gasket
- Broken reed valve

### ELECTRICAL SYSTEM
- Spark plug
  - Improper plug gap
  - Worn electrodes
  - Wire between terminals broken
  - Improper heat range
  - Faulty spark plug cap

### CDI UNIT SYSTEM
- Faulty CDI unit
- Faulty source coil
- Faulty pick-up coil

### FAULTY AUTOMATIC (V-BELT TYPE)
**SCOOTER DOES NOT MOVE WHILE ENGINE IS OPERATING.**
- **V-belt**
  - Worn, damaged or slipped v-belt
  - Primary sheave
  - Worn or damaged cam plate
  - Worn or damaged slider bushing

**CLUTCH-OUT FAILURE**
- **Primary sheave**
  - Seized primary sliding sheave and collar
- **Secondary sheave**
  - Broken compression spring
  - Pealed lining from clutch shoe
  - Worn spline of clutch housing

**POOR STANDING START (LOW CLIMBING ABILITY)**
- **V-belt**
  - Worn, damaged or slipped v-belt
- **Primary sheave**
  - Worn or improper operation of weight
- **Secondary sheave**
  - Broken or fatigued clutch shoe spring
  - Fatigued compression spring
  - Improper operation of secondary sliding sheave

**POOR ACCELERATION (POOR HIGH SPEED)**
- **V-belt**
  - Worn or greasy V-belt
- **Secondary sheave**
  - Worn or greasy clutch shoe
  - Improper operation of secondary sliding sheave
**IMPROPER KICKING/ FAULTY BRAKE**

**SLIPPING**
- Low tension of kick clip
- Worn kick axle
- Worn or damaged kick gear
- Damaged kick clip
- Kick clip coming off
- Damaged kick clip stopper

**HARD KICKING**
- Kick axle assembly
  - High tension of kick clip
  - Seized kick gear

**Cylinder, piston and piston ring**
- Damaged or seized cylinder
- Damaged or seized piston
- Damaged or seized piston ring

**KICK CRANK NOT RETURNING**
- Kick axle assembly
  - Damaged kick return spring
  - Kick return spring coming off
  - Kick clip coming off
  - Damaged kick return spring stopper

**FAULTY BRAKE**

**POOR BRAKING EFFECT**
- Disc brake
  - Worn brake pads
  - Worn disc
  - Air in brake fluid
  - Leaking brake fluid
  - Faulty cylinder cup kit
  - Faulty caliper seal kit
  - Loose union bolt
  - Broken brake hose
  - Oily or greasy disc brake pads
  - Improper brake fluid level

**Drum brake**
- Worn brake shoe
- Worn or rusty brake drum
- Improperly adjusted brake free play
- Improper brake cam lever position
- Improper brake shoe position
- Fatigued / Damaged return spring
- Oily or greasy brake shoe
- Oily or greasy brake drum
- Broken brake cable

**OIL LEAKAGE AND FRONT FORK MALFUNCTION**

**OIL LEAKAGE**
- Bent, damaged or rusty inner tube
- Damaged or cracked outer tube
- Damaged oil seal lip
- Improper installed oil seal
- Improper oil level (too much)
- Loose damper rod holding bolt
- Broken cap bolt o-ring

**MALFUNCTION**
- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged damper rod
- Improper oil viscosity
- Improper oil level

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**INSTABLE HANDLING/ FAULTY SIGNAL AND LIGHTING SYSTEM**

**HANDLBAR**
- Improperly installed or bent

**STEERING**
- Improperly installed steering column
- Improperly tightened ring nut
- Bent steering column
- Damaged ball bearing or bearing race

**FRONT FORKS**
- Broken spring
- Bented front forks

**TIRES**
- Uneven tire pressures on both sides
- Incorrect tire pressure
- Unevenly worn tires

**Wheels**
- Damaged bearing
- Bent or loose wheel axle
- Excessive wheel run-out

**Frame**
- Twisted
- Damaged head pipe
- Improperly installed bearing race

**Engine bracket**
- Bent or damaged

**Rear shock absorber**
- Fatigued spring
- Oil leakage

**HEADLIGHT DARK**
- Improper bulb
- Too many electric accessories
- Hard charging (broken charging coil)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expires

**Flasher does not light**
- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wire harness
- Loosely connected coupler
- Bulb burnt out
- Faulty fuse

**BULB BURNT OUT**
- Improper bulb
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expires
- Bulb burnt out

**Flasher keeps on**
- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
<table>
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<tr>
<th>FAULTY SIGNAL AND LIGHTING SYSTEM/ OVERHEATING</th>
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**OVERHEATING**

**OVERHEATING**

**Ignition system**

• Improper spark plug gap
• Improper spark plug heat range
• Improper ignition timing

**Compression system**

• Heavy carbon buildup

**Faulty system**

• Improper carburetor main jet (Improper setting)
• Clogged air cleaner element
• Lean mixture (faulty autolube pump setting)

**Cooling fan**

• Damaged cooling fan
• Damaged air shrouds

**Brake**

• Dragging brake

Horn is inoperative

• Faulty battery
• Faulty fuse
• Faulty main and/or horn switch
• Improperly adjusted horn
• Faulty horn
• Broken wire harness

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