BRIEF INTRODUCTION TO FOUR-WHEELED CROSS-COUNTRY VEHICLE MODEL ATV150-M

Four-wheeled cross-country vehicle, model ATV150-M is a full road condition vehicle which can be driven on every kinds of road conditions such as sand beach, grassland, forest, village, construction site country road. This maintenance manual of four-wheeled vehicle model ATV150-M (Hereafter called cross-country vehicle for short) compiled by Chongqing Industries Co., Ltd is specially provided for saler and technical staff of our Group. This manual mainly introduce the maintenance, removing and repairing method of cross-country vehicle and provide some relative technology and performance data. Because this manual can’t collect the whole content of cross-country vehicle, it can only help maintainer of our group and it’s saler have a basic understanding on working principle, maintenance procedure and repairing technology of cross-country vehicle. If you don’t have this knowledge, when repairing cross-country vehicle, the condition of improper assembling and danger occurs after assembling are easily happened. Proper operation and maintenance are the advance of your safely driving cross-country vehicle, it also can reduce the troubles of cross-country vehicle and keep the best performance of it. The specification, performance and explanation stated in the manual are determined according to newly design of the vehicle, which are subject to changes without notice.

In this manual, for specially important requirement, the words of “Warning” “Caution” are labelled to prompt relative maintainer to abide it.

In the manual

**Warning**  Show that if the content of “Warning” isn’t obeyed, the driver, maintainer, checker will be heavily injuried, even dead.

**Caution**  Show that you must be careful to prevent the vehicle from being damaged.

Maintenance manual of four-wheeled cross-country vehicle model ATV150-M
First edition August 2005

This manual is published by publishing factory. maintain the copyright of publishing. Without permitted, publishing is prohibited.
Content

Chapter I General description ................................................................................................................... 1
Section 1 Description ............................................................................................................................... 1
Section 2 Special tools, instruments and meters ......................................................................................... 2
  (I) Special tools ................................................................................................................................ 2
  (II) Instruments and meters .............................................................................................................. 3
Section 3 Identification code, label of model and engine No ................................................................. 4
Section 4 Points for attention in maintenance ............................................................................................. 4
Section 5 Specification ................................................................................................................................ 8
  (I) How to use conversion table of unit ........................................................................................... 8
  (II) Basic specification ...................................................................................................................... 9
  (III) ATV body ................................................................................................................................... 10
  (IV) Maintenance specification of engine ....................................................................................... 11
Section 6 Wiring diagram of ATV .............................................................................................................. 14
Section 7 Requirements for torque of fastener .......................................................................................... 15
Section 8 Lubrication ................................................................................................................................ 16
  (I) General torque specification ...................................................................................................... 16
Section 9 Lubrication point and type of lubricants ................................................................................... 17
  (I) Lubrication point and type of lubricants (ATV body) ................................................................ 17
  (II) Lubrication point and type of lubricants (Engine) ................................................................... 18

Chapter II MAINTENANCE AND ADJUSTMENT OF VEHICLE ................................................................. 19
Section 1 Periodic maintenance / lubrication ............................................................................................. 19
Section 2 Disassembly and assembly of cushion, fender and fuel tank ..................................................... 20
  (I) Cushion ..................................................................................................................................... 20
  (II) Rear fender ............................................................................................................................. 20
  (III) Fuel tank ............................................................................................................................... 22
  (IV) Fuel tank ................................................................................................................................ 23
Section 3 Maintenance and Adjustment of Vehicle Body ................................................................. 26
(I) Wear inspection of front & rear brake ....................................................................................... 26
(II) Adjustment of front brake ........................................................................................................ 26
(III) Inspection of steering system .................................................................................................. 28
(IV) Adjustment of toe-in of front wheel ....................................................................................... 29
(V) Adjustment of rear shock absorber .......................................................................................... 30
(VI) Inspection of tire ...................................................................................................................... 31
(VII) Inspection of rim .................................................................................................................... 32

Section 4 Maintenance and Adjustment of Electrical Appliance .................................................. 33
(I) Inspection of battery ................................................................................................................. 33
(II) Inspection of fuse .................................................................................................................... 34
(III) Replacement of taillight lamp ................................................................................................. 35
(IV) Replacement of headlight lamp .............................................................................................. 36

Section 5 Maintenance and Adjustment of Engine ......................................................................... 38
(I) Clean of air filter ....................................................................................................................... 38
(II) Inspection of spark plug .......................................................................................................... 39
(III) Adjustment of idle speed ....................................................................................................... 40
(IV) Adjustment of free clearance of throttle grip ......................................................................... 40
(V) Adjustment of speed limiter ..................................................................................................... 41
(VI) Adjustment of valve, clearance .............................................................................................. 41
(VII) Inspection of ignition timing .................................................................................................. 43
(VIII) Measuring of compressive force ......................................................................................... 44
(IX) Inspection of oil quantity of engine ....................................................................................... 45
(X) Replacement of engine oil and inspection of oil flow .............................................................. 46

Chapter III Repair and Maintenance of Vehicle body .................................................................. 48
Section 1 Front wheel and Front Brake .......................................................................................... 48
(I) Disassembly .............................................................................................................................. 48
(II) Inspecting procedures ............................................................................................................. 50
(III) Installation procedure ............................................................................................................ 53

Section 2 Rear wheel/rear brake/rear wheel axle ......................................................................... 56
(I) Removal steps.......................................................................................................................................................... 56
(II) Inspection steps ...................................................................................................................................................... 57
Section 3 Steering Operation System .......................................................................................................................... 59
(I) Removal steps of steering bar ............................................................................................................................... 59
(II) Removal steps of steering vertical column welding ................................................................................................. 60
(III) Inspection content ................................................................................................................................................ 61
(IV) Installation steps ................................................................................................................................................ 62
(V) Installation steps of steering bar ........................................................................................................................... 65
Section 4 Front shock absorber and Front wheel fork ................................................................................................. 66
(I) Disassembly ............................................................................................................................................................. 66
(II) Inspection step ....................................................................................................................................................... 67
(III) Installation steps ................................................................................................................................................ 68
Section 5 Rear shock absorber and Rear wheel fork ................................................................................................. 71
Chapter IV Electric Appliance ....................................................................................................................................... 72
Section 1 Inspect switch .................................................................................................................................................. 72
Section 2 Troubleshooting the ignition system failure ............................................................................................... 73
Section 3 Running of starting circuit ........................................................................................................................... 77
Section 7 Troubleshooting electric starting system .................................................................................................. 78
Section 5 Check starting Motor ..................................................................................................................................... 81
Section 6 No charging in the Battery .......................................................................................................................... 83
Section 7 Troubleshooting .......................................................................................................................................... 85
Section 8 Inspection of Lighting system ..................................................................................................................... 87
Chapter V Engine .......................................................................................................................................................... 88
Section 1 Disassembly of engine .................................................................................................................................. 88
(I) Remove the engine from finished ATV .................................................................................................................... 88
(II) Disassembly of engine ........................................................................................................................................... 90
Section 2 Inspection and Maintenance of Engine ....................................................................................................... 99
Chapter VI Vehicle Ordinary Trouble and Judgment ............................................................................................... 116
Chapter I General description

Section 1 Description

Caution:

The ATV you purchased maybe slightly differ from the pictures in the manual due to improvement or other changement.
Section 2 Special tools, instruments and meters

(I) Special tools

Special tools is the necessary tools used for accurately adjustment and assembly, it is helpful to prevent the maintenance defects and components damage caused by using improper tools.

1. Wrench for valve adjustment mainly used for adjusting valve clearance. Specification: 3mm 90890-01311
2. Puller for piston pin, mainly used of removing piston pin.
3. Remover for rotator, mainly used for pulling magneto rotator form crank.
4. Clamp for rotator, mainly used for clamping magneto rotator when removing it to prevent it’s rotation due to torque force.
5. Stop rotating meter for rotator, mainly used for removing and assembling rotator of kick starter.
6. Puller for crank, mainly used for disassembling crank from crankcase.
7. Puller for rocker shaft, mainly used for removing rocker shaft.
8. Compressing tools for spring of valve, mainly used for fixing and compressing spring when assembling valve lock clamp.
9. Assembling and disassembling tool for valve guide, mainly used for assembling and disassembling valve guide.
10. Assembling buffer, mainly used for assembling crank and balancing gear.
11. Hollow sleeve, mainly used for assembling crank and balancing gear.
12. Assembling tool for crank, mainly used for assembling crank and balancing gear.
13. Assembling and disassembling joint for universal coupling, mainly used for assembling and disassembling universal coupling.
14. Assembling and disassembling disc, mainly used for assembling and disassembling reverse gear.
15. Fixed puller for gear, mainly used for assembling and disassembling gear.

For the above tools, you can select with reference to special tools of the same type of vehicle.
(II) Instruments and meters
The following instruments and meters can be selected with reference to the same type of vehicle.

- Speedometer of engine (90890-03113)
- Multimeter
- Ignition timing meter (90890-03141)
- Spark tester of spark plug
- Barometer
- Ignition checker
- Measuring tool of gasoling (90890-01312)
- Dial indicator
Section 3 Identification code, label of model and engine N0.

**Identification code**
It is engraved in the left or right side of front supporting main take of engine of frame.

**Engine N0.**
The engine No. engrave on the Narrow Point Position

Section 4 Points for attention in maintenance

1. Preparation when disassembling
   1.1 First clean the dirt, mud and attachment on the vehicle before removing or disassembling.
   1.2 Use proper special tool cleaning device and means.
   1.3 Keep all the components away from fire source. Pay attention to the safety, Don’t be burned by the high temperation portion of engine, exhuaster and silencer etc. Be sure to take care of each other when operation with other people.
   1.4 When disassembling the ATV, put the mated components, such as gear pairs, cylinder, piston and other “mated” components by normal running in together, When assembling or replacing these components, they should be in pairs.
   1.5 When disassembling the engine, clean all the components and put in the tray in the order of disassembly, this in assembling, can not only increase the assembling speed, but also ensure the rightness of assembling.

2. Replace the components
   When replacing the components, be sure to use qualified products provided by use lubricants and grease which brand is assigned by lubricate.

3. Oil seal, shim, o-ring clip split pin, elastic washer.
   3.1 When disassembling to maintain the engine, in order to ensure that the reassembled engine have good sealing and connecting part is fixed and reliable, all the oil seal, shim, o-ring, clip, split pin and elastic washer should be replaced, be sure to keep lip of oil seal surface of shim and o-ring in cleaning condition.
   3.2 When reassembling, apply lubricants to lubricate all the mated components and bearing, apply grease for oil seal.
4. Clip

4.1 Before assembling, be sure to check all the clips carefully. Use a new one after removing the clip of piston pin. When mounting clip ring, make the sharp face on the opposite position of impacted face of clip. (see left fig)

5. Locking washer /shim and location pin

5.1 When reassembling after disassembling, be sure to replace all the locking washer /shim and location pin. After bolt or nut is fixed on the locking position, be sure to bend and fix both ends of locking shim along head of bolt or direction of nut.

6. Bearing and oil seal

6.1 When assembling bearing and oil seal put the mark or specification of manufacturer outside. When assembling oil seal apply a thin film of lithium-base grease on the lip of oil seal.

Caution:

Don’t blow to dry the inside of bearing with compressed air, this would damage the surface of bearing.
7. Check of electrical parts

7.1 Check the rust, dirt and moisture etc. of connector, if there is moisture, please blow it dry and clear the rust and dirt.

7.2 The electrolyte inside the battery is a kind of corrosive, when operation exercise shall be taken not to let the electrolyte splash on the body.

7.3 When repairing wire on electric parts, first remove the wire on the terminal of negative pole of battery (see fig.7.1). When tightening or loosening bolt of terminal of big capacity battery, don’t let the wrench contact with engine or other metal parts of vehicle body to avoid the electric shock.

7.4 When connecting the wire of battery, first connect the opositive pole wire of battery, then connect the negative pole wire. After connecting the wire, apply clean grease on the terminal to avoid the increasing of resistance due to rust.

7.5 Check the terminal of connector

Grip two terminals of connector together, check with the multimeter. (see fig.7.3, fig.7.4)
8. Use torque spanner to tighten screw and nut, and as per specified torque to tighten them. It should be tightened in steps from big ones to small ones, from inside to outside and along the direction of diagonal line to intersect. As shown in fig.8.1.

7.6 Before mounting new fuse, check if the load of fuse of components is right, especially for the portion being burned broken regularly, then mount the fuse having proper current value.

7.7 Wire connector have two kinds, one is single-head connector, another is multi-head one.

Before connecting single-head connector, check if there is broken on the housing of joints, the joint is fixed and if there is a broken phenomenon on it. When inserting the joint, it should be fixed, then put in plastic coating after inserting.

In general, multi-head connector is plastic one, and locking catch is designed. When disassembling the connector, first open locking catch when connecting again, first check if all the joint is in good condition, if there is bent or twisted on them. After connecting, align the locking catch and lock them.

b. If joint is slack, bend the plug pin upward, then connect with connector plug (see fig.7.5)
Section 5 Specification

(1) How to use conversion table of unit
(1) How to use conversion table

All the specified documents in this manual are taken SI and Metric as unit. With the following conversion table, metric unit could be conversed into imperial unit.

<table>
<thead>
<tr>
<th>METRIC</th>
<th>MULTIPLY</th>
<th>IMPERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>0.03937</td>
<td>in</td>
</tr>
<tr>
<td>2mm</td>
<td>0.07874</td>
<td>0.08in</td>
</tr>
</tbody>
</table>

Conversion table

<table>
<thead>
<tr>
<th>Known unit</th>
<th>Multiply</th>
<th>product</th>
</tr>
</thead>
<tbody>
<tr>
<td>m.kg</td>
<td>7.233</td>
<td>ft.lb</td>
</tr>
<tr>
<td>m.kg</td>
<td>86.794</td>
<td>in.lb</td>
</tr>
<tr>
<td>cm.kg</td>
<td>0.0732</td>
<td>ft.lb</td>
</tr>
<tr>
<td>cm.kg</td>
<td>0.8679</td>
<td>in.lb</td>
</tr>
<tr>
<td>kg</td>
<td>2.205</td>
<td>lb</td>
</tr>
<tr>
<td>g</td>
<td>0.03527</td>
<td>oz</td>
</tr>
<tr>
<td>km/hr</td>
<td>0.6214</td>
<td>mph</td>
</tr>
<tr>
<td>km</td>
<td>0.6214</td>
<td>mi</td>
</tr>
<tr>
<td>m</td>
<td>3.281</td>
<td>ft</td>
</tr>
<tr>
<td>m</td>
<td>1.094</td>
<td>yd</td>
</tr>
<tr>
<td>cm</td>
<td>0.3937</td>
<td>in</td>
</tr>
<tr>
<td>mm</td>
<td>0.3937</td>
<td>in</td>
</tr>
<tr>
<td>cc(cm³)</td>
<td>0.03527</td>
<td>oz(IMP liq)</td>
</tr>
<tr>
<td>cc(cm³)</td>
<td>0.06102</td>
<td>cu.in</td>
</tr>
<tr>
<td>lit(liter)</td>
<td>0.8799</td>
<td>qt(IMP liq)</td>
</tr>
<tr>
<td>lit(liter)</td>
<td>0.2199</td>
<td>gal(IMP liq)</td>
</tr>
<tr>
<td>kg/mm</td>
<td>55.997</td>
<td>lb/in</td>
</tr>
<tr>
<td>kg/cm²</td>
<td>14.2234</td>
<td>ps/(lb/in²)</td>
</tr>
<tr>
<td>Centigrade</td>
<td>9°(°F+32)</td>
<td>Fahrenheit(°F)</td>
</tr>
</tbody>
</table>

(2) Definition of unit

<table>
<thead>
<tr>
<th>Unit</th>
<th>Read</th>
<th>Definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>Millimetre</td>
<td>10⁻³ Meter</td>
<td>Length</td>
</tr>
<tr>
<td>cm</td>
<td>Centimetre</td>
<td>10⁻² Meter</td>
<td>Length</td>
</tr>
<tr>
<td>kg</td>
<td>Kilogram</td>
<td>10³ Gram</td>
<td>Weight</td>
</tr>
<tr>
<td>N</td>
<td>Newton</td>
<td>1 lilo 1/10 meter/second</td>
<td>Force</td>
</tr>
<tr>
<td>Nm</td>
<td>Newton meter</td>
<td>Newton 1/10 meter/second</td>
<td>Torque</td>
</tr>
<tr>
<td>mkg</td>
<td>Meter kilogram</td>
<td>Meter 1/10 kilo</td>
<td>Torque</td>
</tr>
<tr>
<td>Pa</td>
<td>Pascal</td>
<td>Newton/meter²</td>
<td>Pressure</td>
</tr>
<tr>
<td>N/mm</td>
<td>Newton per millimeter</td>
<td>Newton/cenimeter</td>
<td>Rigid of spring</td>
</tr>
<tr>
<td>L</td>
<td>Liter</td>
<td>Cubic centimeter</td>
<td>Volume or capacity</td>
</tr>
<tr>
<td>cm³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r/min</td>
<td>Revolutions per minute</td>
<td></td>
<td>Rotational speed</td>
</tr>
</tbody>
</table>
II. Basic specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td><strong>Frame</strong></td>
<td>Steel tube</td>
</tr>
<tr>
<td>Overall length</td>
<td>9680mm</td>
<td>Bascet angle</td>
<td>15°</td>
</tr>
<tr>
<td>Overall width</td>
<td>920mm</td>
<td>Toe-in of tire</td>
<td>0~5mm</td>
</tr>
<tr>
<td>Overall height</td>
<td>1880mm</td>
<td><strong>Tyre</strong></td>
<td>Vacuum</td>
</tr>
<tr>
<td>Height of cushion</td>
<td>800mm</td>
<td>Specification of front wheel</td>
<td>AT19×7-8</td>
</tr>
<tr>
<td>Axle base</td>
<td>1624mm</td>
<td>Specification of rear wheel</td>
<td>AT18×9.5-8</td>
</tr>
<tr>
<td>Min. ground clearance</td>
<td>180mm</td>
<td>Pressure of front wheel</td>
<td>208kPa</td>
</tr>
<tr>
<td>Min. turning radius</td>
<td>1650mm</td>
<td>Pressure of rear wheel</td>
<td>208kPa</td>
</tr>
<tr>
<td><strong>Basic weight:</strong></td>
<td></td>
<td><strong>Brake</strong></td>
<td></td>
</tr>
<tr>
<td>Engine with full tank</td>
<td>124kg</td>
<td>Type of front brake</td>
<td>Drum brake (fall-closed type)</td>
</tr>
<tr>
<td>Engine</td>
<td>Single-cylinder, side firing</td>
<td>Operation type</td>
<td>Right-hand operation to brake</td>
</tr>
<tr>
<td>Displacement</td>
<td>448.5 cm³</td>
<td>Type of rear brake</td>
<td>Disc brake</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>9.2:1</td>
<td>Operation type</td>
<td>Left-hand and right-hand to brake</td>
</tr>
<tr>
<td>Starting system</td>
<td>Electric start</td>
<td>Front suspension</td>
<td>Independent suspension device</td>
</tr>
<tr>
<td>Lubrication system</td>
<td>Pressure splash</td>
<td>Rear suspension</td>
<td>Rear trailing shock absorbing type</td>
</tr>
<tr>
<td>Engine code</td>
<td>15G/40-8G</td>
<td>Specification of shock absorber</td>
<td>Spring-oil pressure shock absorbing</td>
</tr>
<tr>
<td>Chassis model</td>
<td>Model SES/S or above model</td>
<td>Front shock absorber</td>
<td>Spring-oil pressure shock absorbing</td>
</tr>
<tr>
<td>Overall capacity</td>
<td>0.81L</td>
<td>Rear shock absorber</td>
<td>Spring-oil pressure shock absorbing</td>
</tr>
<tr>
<td><strong>Carbohydrate</strong></td>
<td></td>
<td><strong>Electric system</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Platinum plug</td>
<td>Ignition system</td>
<td>C·D·1</td>
</tr>
<tr>
<td>Type of spark plug</td>
<td>1.337</td>
<td>Magneto system</td>
<td>A.C. magneto</td>
</tr>
<tr>
<td>Clearance of spark plug</td>
<td>0.6~0.7mm</td>
<td>Battery/capacity</td>
<td>Free of maintenance, 12V·9Ah</td>
</tr>
<tr>
<td>Type of clutch</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## III. ATV body

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Spock rim, tubeless tire</td>
<td></td>
</tr>
<tr>
<td>Material of rim</td>
<td>Steel plate</td>
<td></td>
</tr>
<tr>
<td>Size of tire</td>
<td>AT 19 ½₅-8</td>
<td></td>
</tr>
<tr>
<td>Radial runout of rim</td>
<td></td>
<td>2.0mm</td>
</tr>
<tr>
<td>Lateral swing of rim</td>
<td></td>
<td>2.0mm</td>
</tr>
<tr>
<td><strong>Front brake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Drum type</td>
<td></td>
</tr>
<tr>
<td><strong>Rear wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Spoke rim, tubeless tire</td>
<td></td>
</tr>
<tr>
<td>Material of rim</td>
<td>Steel plate</td>
<td></td>
</tr>
<tr>
<td>Size of tire</td>
<td>AT 18 ½₅.5-8</td>
<td></td>
</tr>
<tr>
<td>Radial runout of rim</td>
<td></td>
<td>2.0mm</td>
</tr>
<tr>
<td>Lateral swing of rim</td>
<td></td>
<td>2.0mm</td>
</tr>
<tr>
<td><strong>Rear brake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Disc 5-7mm</td>
<td></td>
</tr>
<tr>
<td><strong>Brake lever and brake pedal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free play of brake lever (left)</td>
<td>5-7mm</td>
<td></td>
</tr>
<tr>
<td>Free play of brake lever (right)</td>
<td>5-7mm</td>
<td></td>
</tr>
<tr>
<td>Free play of throttle grip</td>
<td>3-5mm</td>
<td></td>
</tr>
</tbody>
</table>
## IV. Maintenance specification of engine

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radial clearance of internal gear</td>
<td>0.1~0.2mm</td>
<td></td>
</tr>
<tr>
<td>Radial clearance of idler gear (vertical)</td>
<td>0.1~0.2mm</td>
<td></td>
</tr>
<tr>
<td>Radial clearance of idler gear (horizontal)</td>
<td>0.10~0.25mm</td>
<td></td>
</tr>
<tr>
<td>Lubrication system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of filtering oil</td>
<td>Wire filtering net</td>
<td></td>
</tr>
<tr>
<td>Type of oil pump</td>
<td>Rear type, pressure splash type lubrication</td>
<td></td>
</tr>
<tr>
<td>Clearance of side</td>
<td>0.04~0.09mm</td>
<td></td>
</tr>
<tr>
<td>Endface clearance “A” or “B”</td>
<td>0.15mm</td>
<td>0.09mm</td>
</tr>
<tr>
<td>Relieving pressure of safety valve</td>
<td>80~120kpa</td>
<td>9.20mm</td>
</tr>
<tr>
<td>Cylinder</td>
<td>70.97~71.02mm</td>
<td>71.10mm</td>
</tr>
<tr>
<td>(Distance between measuring point and upper endface of cylinder is 40mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flatness of lower endface</td>
<td>Measure the surface warp of every portion on the lower endface of cylinder head with rule.</td>
<td>0.10mm</td>
</tr>
<tr>
<td>Timing chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of timing chain</td>
<td>Roller chain</td>
<td></td>
</tr>
<tr>
<td>Tension type of timing chain</td>
<td>Free adjustment</td>
<td></td>
</tr>
<tr>
<td>Pneumatic camshaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving method</td>
<td>Chain driving (right)</td>
<td>0.03mm</td>
</tr>
<tr>
<td>Roundness tolerance of camshaft</td>
<td>24.96~24.98mm</td>
<td></td>
</tr>
<tr>
<td>Outside diameter of camshaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cam size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust: “A”</td>
<td>36.582~36.682mm</td>
<td>36.482</td>
</tr>
<tr>
<td>“B”</td>
<td>30.252~30.352mm</td>
<td>30.152</td>
</tr>
<tr>
<td>“C”</td>
<td>6.572~6.692mm</td>
<td></td>
</tr>
<tr>
<td>Intake: “A”</td>
<td>36.537~36.637mm</td>
<td></td>
</tr>
<tr>
<td>“B”</td>
<td>30.131~30.231mm</td>
<td>30.081</td>
</tr>
<tr>
<td>“C”</td>
<td>6.527~6.647mm</td>
<td></td>
</tr>
<tr>
<td>Rocker arm/Rocker arm shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside diameter of shaft</td>
<td>11.981~11.991</td>
<td></td>
</tr>
<tr>
<td>Inside diameter of rocker arm</td>
<td>12.000~12.018</td>
<td></td>
</tr>
<tr>
<td>Clearance between arm and shaft</td>
<td>0.009~0.037</td>
<td></td>
</tr>
<tr>
<td>Valve spring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve springing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocking length</td>
<td>35.5mm</td>
<td>30.5mm</td>
</tr>
<tr>
<td>Push length</td>
<td>82.4~100.0N</td>
<td></td>
</tr>
<tr>
<td>Compressing pressure with rocke springing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limit value of stop position</td>
<td>2.5%~1.6mm</td>
<td></td>
</tr>
<tr>
<td>Rocking direction of spring</td>
<td>Counter-clockwise</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit value</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Valve spring:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside spring:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free length/intake/exhaust</td>
<td>37.2mm</td>
<td>0.5/0.4 mm</td>
</tr>
<tr>
<td>Setting length when valve is closed</td>
<td>32.0mm</td>
<td></td>
</tr>
<tr>
<td>Compensating pressure when assembling/intake/exhaust</td>
<td>162.8–200.1 N</td>
<td></td>
</tr>
<tr>
<td>Limit value of squareness/intake/exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testing direction of spring (top view) intake/exhaust</td>
<td>Clockwise</td>
<td></td>
</tr>
<tr>
<td>Valve, valve seat, valve guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve clearance (at cold) intake</td>
<td>0.05–0.09 mm</td>
<td></td>
</tr>
<tr>
<td>exhaust</td>
<td>0.11–0.15 mm</td>
<td></td>
</tr>
<tr>
<td>Size of valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;A&quot; diameter of valve head</td>
<td>28.4–28.6 mm</td>
<td>1.6 mm</td>
</tr>
<tr>
<td>exhaust</td>
<td>33.9–34.1 mm</td>
<td></td>
</tr>
<tr>
<td>intake</td>
<td>1.7–2.8 mm</td>
<td></td>
</tr>
<tr>
<td>&quot;B&quot; width of valve face</td>
<td>0.9–1.1 mm</td>
<td></td>
</tr>
<tr>
<td>intake/exhaust</td>
<td>0.8–1.0 mm</td>
<td></td>
</tr>
<tr>
<td>&quot;C&quot; width of valve seat</td>
<td>5.060–5.975 mm</td>
<td></td>
</tr>
<tr>
<td>intake/exhaust</td>
<td>5.075–5.960 mm</td>
<td></td>
</tr>
<tr>
<td>&quot;D&quot; limit thickness</td>
<td>6.000–6.012 mm</td>
<td>0.10 mm</td>
</tr>
<tr>
<td>intake/exhaust</td>
<td>6.025–6.052 mm</td>
<td>0.08 mm</td>
</tr>
<tr>
<td>Inside diameter of valve seat</td>
<td>6.10–6.087 mm</td>
<td>0.02 mm</td>
</tr>
<tr>
<td>intake/exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearance between valve stem and guide (at room temp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intake</td>
<td>1.6 mm</td>
<td></td>
</tr>
<tr>
<td>Roundness of valve stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Flat type</td>
<td></td>
</tr>
<tr>
<td>Size(BxLxT)</td>
<td>1.2×2.8 mm</td>
<td>0.15–0.20 mm</td>
</tr>
<tr>
<td>Clearance of endface (at assembling)</td>
<td>0.03–0.07 mm</td>
<td>0.12 mm</td>
</tr>
<tr>
<td>Clearance of side (at assembling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Flat type</td>
<td></td>
</tr>
<tr>
<td>Size(BxLxT)</td>
<td>0.8×2.8 mm</td>
<td>0.15–0.20 mm</td>
</tr>
<tr>
<td>Clearance of endface (at assembling)</td>
<td>0.02–0.06 mm</td>
<td>0.12 mm</td>
</tr>
<tr>
<td>Clearance of side (at assembling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size(BxLxT)</td>
<td>2.5×2.8 mm</td>
<td>0.2–0.4 mm</td>
</tr>
<tr>
<td>Clearance of endface (at assembling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearance of side (at assembling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit value</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Piston</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piston size &quot;D&quot;</td>
<td>70.95 - 75.57 mm</td>
<td></td>
</tr>
<tr>
<td>Measuring point &quot;H&quot; (from bottom line of piston's lower portion)</td>
<td>4.0 mm</td>
<td></td>
</tr>
<tr>
<td>Piston offset</td>
<td>0.5 mm</td>
<td></td>
</tr>
<tr>
<td>Direction of piston offset</td>
<td>Inward</td>
<td></td>
</tr>
<tr>
<td>Clearance between piston and Cylinder</td>
<td>0.01 - 0.06 mm</td>
<td></td>
</tr>
<tr>
<td>Outside diameter of piston pin</td>
<td>16.991 - 16.000 mm</td>
<td></td>
</tr>
<tr>
<td>Inside diameter of pin hole</td>
<td>16.002 - 16.001 mm</td>
<td></td>
</tr>
<tr>
<td>Driving method of balancing blank</td>
<td>Gear driving</td>
<td></td>
</tr>
<tr>
<td>Connecting rod of crank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torsion value of moment &quot;C1&quot;</td>
<td></td>
<td>0.03 mm</td>
</tr>
<tr>
<td>Width of crank &quot;A&quot;</td>
<td>55.35 - 56.92 mm</td>
<td>0.06 mm</td>
</tr>
<tr>
<td>Small end free play of connecting rod &quot;B&quot;</td>
<td>0.8 - 1.0 mm</td>
<td>2.0 mm</td>
</tr>
<tr>
<td>Big end free play of connecting rod &quot;D&quot;</td>
<td>0.35 - 0.45 mm</td>
<td></td>
</tr>
<tr>
<td>Big end radial clearance of connecting rod &quot;E&quot;</td>
<td>0.010 - 0.025 mm</td>
<td></td>
</tr>
<tr>
<td>Automatic centrifugal clutch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch shoe: quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>thickness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch pitch: revolution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch stall: revolution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free length of back spring of brake shoe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action method of clutch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch piece: quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>thickness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friction piece: quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>thickness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring of clutch: quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shifting mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shifting method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing limit of fork guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission device</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset limit of spindles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset limit of transmission output shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.08 mm</td>
</tr>
</tbody>
</table>
1. Front brake cable
2. Throttle cable
3. Rear brake cable
4. High voltage coils and wire
5. Wire of handle bar switch
6. Wire of starting motor
7. Rectifier
8. Cable
9. Taillight unit
Section 7 Requirements for torque of fastener

(I) General torque specification

General torque specification (standard screw)
This table is screw locking specification drawn up by International Standard Association.
In order to avoid the twist or unbalancing phenomenon when locking screw, please cross lock or londuit as per appointed orders.

*When measuring torque force, standard torque force testing spanner must be used.

<table>
<thead>
<tr>
<th>A (Nut)</th>
<th>B (Screw)</th>
<th>Specification of general torque m.kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>10mm</td>
<td>6mm</td>
<td>0.6</td>
</tr>
<tr>
<td>12mm</td>
<td>8mm</td>
<td>1.5</td>
</tr>
<tr>
<td>14mm</td>
<td>10mm</td>
<td>3.0</td>
</tr>
<tr>
<td>17mm</td>
<td>12mm</td>
<td>5.5</td>
</tr>
<tr>
<td>19mm</td>
<td>14mm</td>
<td>8.5</td>
</tr>
<tr>
<td>22mm</td>
<td>16mm</td>
<td>13.0</td>
</tr>
</tbody>
</table>

A.Size of nut
B. Size of thread
Section 8 Lubrication

<table>
<thead>
<tr>
<th>Standard</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston/cylinder</td>
<td>Piston pin</td>
</tr>
<tr>
<td>Connecting rod</td>
<td>Crank</td>
</tr>
<tr>
<td>Automatic centrifugal clutch</td>
<td>Sprocket chamber</td>
</tr>
<tr>
<td>Branch valve</td>
<td>Fine filter</td>
</tr>
<tr>
<td>Valve</td>
<td>Rocker</td>
</tr>
<tr>
<td>Camshaft</td>
<td>Bearing</td>
</tr>
<tr>
<td>Spindle</td>
<td>Driving shaft</td>
</tr>
<tr>
<td>Middle gearbox</td>
<td>Oil pump</td>
</tr>
<tr>
<td>Rough filter</td>
<td>Oil pump</td>
</tr>
</tbody>
</table>

(I) General torque specification

- Pressure
- Splashing oil
## Section 9 Lubrication point and type of lubricants

### (I) Lubrication point and type of lubricants (ATV body)

<table>
<thead>
<tr>
<th>Lubrication point</th>
<th>Type of lubricants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lip of oil seal (full)</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>O-ring (full)</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Steering shaft (upper end, lower end)</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Ball connection of steering pushing rod</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Front wheel fork (ball-shaped joint)</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Front wheel bearing</td>
<td>Grease used for bearing</td>
</tr>
<tr>
<td>Front &amp; rear brake</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>- Braking camshaft</td>
<td></td>
</tr>
<tr>
<td>- Rotating pin seat</td>
<td></td>
</tr>
<tr>
<td>- Lip of oil seal</td>
<td></td>
</tr>
<tr>
<td>Dust-proof ring of brake</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Joint of front brake cable</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Front brake lever axle and rear brake lever axle</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Adjusting nut and pin of front brake cable</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Adjusting nut and pin of rear brake cable</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Rear brake pedal pivot and brake pedal axle hole</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Throttle rotating frame shaft and end section of throttle cable</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Connection bolt of rear wheel fork and frame, rear wheel fork bearing</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Rubber sleeve and rear wheel fork</td>
<td>Seal gum</td>
</tr>
<tr>
<td>Rear shock absorber bushing</td>
<td>Light lithium-base grease</td>
</tr>
</tbody>
</table>
(II)Lubrication point and type of lubricants(Engine)

<table>
<thead>
<tr>
<th>Lubrication point(name of component)</th>
<th>Type of lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lip of oil seal</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>All bearing</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Anti-friction face of oil seal</td>
<td>Light lithium-base grease</td>
</tr>
<tr>
<td>Stem end of intake and exhaust valve</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Fastener of cylinder head</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of piston pin</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of piston, piston ring</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Clutch</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Upper cam plate guide rod</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Inner hole of upper cam plate unit</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Steel ball bracket unit</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Spindle and inside hole jointing face of right crankcase</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of short fork shaft</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of long fork shaft</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Shift gear camshaft portion, slot portion, contactor</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of shift gear shaft</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of over-wheel shaft</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Bushing inner hole of big gear of electric stater</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Electric starting clutch</td>
<td>Lubricating-oil</td>
</tr>
</tbody>
</table>
Chapter II MAINTENANCE AND ADJUSTMENT OF VEHICLE

Note:
The correct maintenance and adjustment are necessary to ensure vehicles, normal driving. The repair personnel should be familiar with the contents of this article.

Section 1 Periodic Maintenance/Lubrication

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirement</th>
<th>Every time</th>
<th>Every</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 month</td>
<td>3 month</td>
</tr>
<tr>
<td>Valve</td>
<td>Check the valve clearance. Adjust it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Check the clearance and clean the plug. Replace it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Air filter</td>
<td>Clean. Replace it if necessary.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Carburetor</td>
<td>Check the idle or starting state. Adjust it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cylinder head</td>
<td>Check if there is crack or damage in gas tube. Replace it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>Check the leakage. Tighten it again if necessary. Replace the gasket if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Spark supressor</td>
<td>Clean.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Oil circuit</td>
<td>Clean. Check the cracks or damage of oil tube. Replace it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engine oil</td>
<td>Replace. (Preheat the engine before draining the oil)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Oil filter</td>
<td>Clean.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Oil filter screen</td>
<td>Clean.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gear case oil</td>
<td>Check the oil level and leakage. Replace.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Brake</td>
<td>Check the operation. Adjust it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Clutch</td>
<td>Check the operation. Adjust it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wheel</td>
<td>Check the balance, damage, run-out etc. Replace it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wheel bearing</td>
<td>Check the looseness and damage. Replace it if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Front&amp;Rear suspension system</td>
<td>Check the operation and correct it if necessary.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Steering system</td>
<td>Check the operation and correct it if necessary.</td>
<td>1</td>
<td>a</td>
</tr>
<tr>
<td>Bearing of steering</td>
<td>Lubricate every 6 months (lithium soap grease)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>verticle column</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Connecting piece and fastener</td>
<td>Check all the connecting piece and fasteners of chassis correct them if necessary.</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

We advise that the maintenance of these items should be conducted by our saler.
Section 2 Disassembly and assembly of Cushion, Fender and Fuel tank

(1) Cushion
1. Disassembly
   (1) Place the vehicle on the horizontal ground.
   (2) Disassemble the cushion;
   Pull the cushion lock lever upward, then raise the tail part of cushion. By that, you can disassemble the cushion.

2. Installation
   Firstly insert the support lug on the front end of cushion into the spigot of frame, then press down the rear part. Pay attention to confirm if the cushion is installed firmly.

(II) Rear fender
1. Disassembly
   (1) Place the vehicle on the horizontal ground.
   (2) Disassemble the cushion
   (3) Disconnect the negative wire and positive wire of battery.
Caution

Should disconnect the negative wire fistly.

(4) Take out the battery.

(5) Disassemble the rear fender.

2. Installation
Operate according to reverse procedure of “Disassembly”. Pay attention to following points:

(1) Install:
Rear fender

(2) Install:
Battery
(3) Install the cushion

**Caution**
Insert the support lug of cushion into the plug seat on the frame, then press down the cushion.

(III) Front fender
1. Disassembly:
   (1) Place the vehicle on the horizontal ground.
   (2) Take off bolt

(3) Dismantle the connecting pipe.

(4) Disassemble the front fender.
2. Installation:
   Operate according to reverse procedures of “Disassembly”. 
(1) Install:
   Front fender

(2) Assembly of the connecting pipe

(3) Install:
   Bolt

(IV) Fuel tank
   1. Disassembly
      (1) Place the vehicle on the horizontal ground.
      (2) Disassemble the cushion
(3) Remove the front fender
(4) Remove the fuel tank bolt
(5) Pull the fuel cock lever to “OFF” position.
(6) Remove the fuel inlet pipe

Caution
Place a cloth on the engine to absorb the splashed gasoline.

Warning
The gasoline is inflammable. Avoid to splash it on the hot engine.
(7) Remove the fuel tank.

2. Installation
Operate according to reverse procedure of “Disassembly”, and pay attention to the following points:
(1) Install the fuel tank
(2) Connect
   a. Air inlet pipe and hose
(3) Install the bolt, bushing of rubber hood and washer.
(4) Install: front fender
(5) Install:
Cushion
Section 3 Maintenance and Adjustment of Vehicle Body

(I) Wear inspection of front & rear brake
1. Check the front brake
   (1) Brake the vehicle with front brake
   (2) Check:
       - Wear indication
       - If the wear indication reaches the wear limit mark,
         replace the brake shoe assy.
         Refer to section “Front wheel and front brake”

2. Check the rear brake
   (1) Thread down the rear brake pedal to brake the vehicle.
   (2) Check
       Check the disk friction pad to see if it reaches the life-span, replace it whenever necessary.

(II) Adjustment of front brake

Caution
Before adjusting, check the wear degree of front brake according to above procedures.

Caution
In order to avoid too large or too small brake force when braking, must ensure the proper free clearance of left/right brake lever and rear brake pedal:
1. Check
   If the free clearance of right lever does not conform to specification as shown in figure, adjust it according to following standard.
   Standard free clearance of right lever: 5-7mm
   Calculate from the fulcrum. ( in figure)
2. Adjustment
Adapting procedure of free clearance of right lever:
. Loosen the locking nut and rotate the cable adjusting screw clockwise to reduce the tension of front brake cable.
. Pick up the front wheel from ground, and rotate the two front wheels, and ensure the two front brake lights brake force.
. Rotate the adjusting screw clockwise or counterclockwise to gain proper free clearance.

   Clockwise: increase free clearance
   Counterclockwise: reduce free clearance
. Tighten the lock nut
(III) Inspection of steering system

1. Place the vehicle on the flat ground

2. Check:
   . Clamp seat of steering vertical column and sliding bearing on the lower end of steering vertical column, upper & lower and front & rear moving steering bar. If the clearance is too large, replace the sliding bearing.

3. Check:
   . Ball pin unit of steering tension rod.
   Rotate the steering bar leftward and/or rightward, then rotate from left to right lightly. If the ball pin unit of steering tension rod have any vertical clearance, replace it.

4. Raise up the front end of the vehicle to make the front wheel not bear any load.

5. Check:
   . Left/right front seat assy on front brake position, and/or bearing. When moving the wheel back and forth horizontally, if the clearance is too large, replace the following components:
      1) bearing
      2) left/right front seat assy
      3) split pin
      4) front fork ball connection
      5) bushing assy
(IV) Adjustment of toe-in of front wheel

1. Rest the motorcycle on the flat ground
2. Measurement:
   . Toe-in
   . Adjust if out of specification
   . Adjustment steps of toe-in.
   . Mark the centers of tire thread of two front wheel.
   . Lift the front end of motorcycle to keep the front wheel from force.
   . Faster the steering forward. Measure the width between two marks.
   . Rotate the front tire by 180° up to the marks are in reverse.
   . Measure the width B between two marks.
   . Calculate the toe-in with the following formula:
   \[ \text{toe-in} = B - A \]

Standard value of toe-in: 0.5mm
If the toe-in is not correct, please adjust.

3. Adjusting
   Adjusting steps of toe-in:
   . Mark determination marks at the end of left/right tension rod.
   . Loosen the locking nuts at the end of left/right tension rod.
   . Left/right tension rods should turn the same turns left or right up to obtain in the specified toe-in and make the left/right tension rods are the same in strength.
   . Tighten up the the locking nuts at the end of left/right tension rod.
   . Torque of locking nut: 30N.m

**Caution**
Make sure that left/right tension rods have turned the same turns. Otherwise the motorcycle will still go forward left and right even though. Operate the motorcycle to go forward straightly with steering bar, easily causing to getting out of control and accident.
After adjusting the toe-in correctly drive the motorcycle to move forward a span of distance by fastening the steering bar so as to make sure if the steering bar is normal, if not, adjust the tension rod left or right within the specification.
Inspection of front/rear shock absorber
1. Rest the motorcycle on the flat ground
2. Inspection
   (1) Front/rear shock absorber
   If scraped/damaged replace the front/rear shock absorber
   (2) Oil leakage
   If the heavy oil leakage of front/rear shock absorbers is found, replace it.

3. Inspection
   Operation:
   Shock the front/rear shock absorbers up and down two times.
   If it is not active in operation, replace the component.

(V) Adjustment of rear shock absorber
Adjustment of spring preload:
Turn the adjusting [to increase or decrease the spring preload.

Caution
The spring preload of rear shock absorber can be adjusted to be applied to needs, hobby, weight of the operator and driving conditions.
Standard Position:B
A - Softest
E - Hardest
(VI) Inspection of tire

**Warning**
This motorcycle adopted the low pressure tire, So correct filling pressure and keeping the proper pressure is very important.

.Tire characteries
1)Quality characteries of tire will affect the driving reliability of ATV. The following types of tires reliability by our company be used safely by this motorcycle. If adopt other tires it will cause the disadvantageous effect. So they are out of recommendation.

<table>
<thead>
<tr>
<th></th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>AT19 ¡Á7-8</td>
</tr>
<tr>
<td>Rear</td>
<td>AT18 ¡Á8-8</td>
</tr>
</tbody>
</table>

.Tire pressure
1) Recommended tire pressure.
Front  20Kpa(0.20kg f/cm²)
Rear  25Kpa(0.25kg f/cm²)
2) The overlow tire pressure will cause the tire came out of the rim in bad driving condition.
The Min. tire pressure
Front  17Kpa(0.17kg f/cm²)
Rear  22Kpa(0.22kg f/cm²)
3) When installing the tire to the rim, the tire pressure should be no more than.
Front  250Kpa(2.50kg f/cm²)
Rear  250Kpa(0.50kg f/cm²)

After installing the tire to the rim, the overhigh pressure will cause explosion. Filling pressure should be conducted slowly and carefully, the overfast fillig pressure will cause the tire to explosion.
1. Measurement
Tire pressure (nomal atmospheric temperature): If out of specification, adjust.

**Caution**
- The manometer of tire belongs to spare parts of the motorcycle (Never use the high pressure).
- If the foreign matters such as dust, etc are absorbed in the tire pressure manoeuer, the reading of the meter will be not correct, at the moment, the second measurement should be conducted and the second measurement reading should be adopted.

**Warning**
- Uneven and Improper tire pressure is disadvantageous to driving of the vehicle, which may cause getting out of control.
- Keep the proper tire pressure.
- The tire pressures of two front tires and two rear tires should be kept identically.

<table>
<thead>
<tr>
<th>Normal temperature tire pressure</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>20kpa(0.20kgf/cm²)</td>
<td>25kpa(0.25kgf/cm²)</td>
</tr>
<tr>
<td>Min</td>
<td>17kpa(0.17kgf/cm²)</td>
<td>22kpa(0.22kgf/cm²)</td>
</tr>
<tr>
<td>Max</td>
<td>23kpa(0.23kgf/cm²)</td>
<td>28kpa(0.28kgf/cm²)</td>
</tr>
</tbody>
</table>

2. Inspection
If wear/damage is found on the surface of tire, replace.

**Warning**
Using the overworn tire is very dangerous. If the tire is worn to the specified position, replace immediately.
Wear limit of tire: Front and rear tires: 2.0mm @

(VII) Inspection of rim
- Inspection of rim ⊗ If cracked/bent/damaged, replace it.

**Caution**
Keep the rim in balance when replacing the rim or tire.

**Warning**
Never attempt to repair the rim.
Section 4 Maintenance and Adjustment of Electrical Appliance

(I) Inspection of battery

Warning:
The electrolyte is a dangerous article, which includes sulphuric acid, so it is poisonous and corrosive.

Please operate by the following steps:
a. Avoid the body touching the electrolyte so as to protect the eye from burn or damage.
b. Wear the protective glasses when operating near the battery.

Avoiding measures (External):
a. Wash the skin with water.
b. Wash the eyes for 15 minutes with water, then conduct treatment at hospital.

Avoiding measures (Internal):
Drink a plenty of water, magnesia oxide, egg and rapeseed oil, and conduct treatment as early as possible.

The battery can produce explosive gas, so follow the following protection measures:
a. Be sure to keep the ventilation when changing the battery.
b. Keep it away from spark, flame (such as welding equipment, burning cigarette, etc).
c. Smoking is strictly prohibited when charging or operating the battery to keep the battery and electrolyte away from children.

1. Removal (Refer to the content of Section Two of this chapter.)

Cut off

Refer to "Removal of cushion" of this chapter.

Battery electrode (negative electrode, positive electrode)

Warning
First remove the negative electrode

2. Removal:
a. Battery clamp plate
b. Battery clamp plate

Caution
Before using a new battery, be sure to charge to ensure the best condition of the vehicle.

3. Inspection of battery electrode
If the dirt is found, clean off with brush.
If it is not connect well, correct it.

Caution
After cleaning the electrode, apply a film of lubrication grease.
4. Inspection of battery
   If damaged, replace it

5. Installment of battery

6. Connect
   - Battery electrode (positive electrode
     negative electrode)

   First connect the positive electrode

7. Installment:
   - Battery clamp plate
   - Cushion

(II) Inspection of fuse

**Caution**

Close the main switch when checking or replacing the fuse, otherwise, it will cause the short circuit.

1. Inspection steps
   - Remove the fuse
   - Connect the small-size test instrumentation to measure if the fuse is connected well.

**Caution**

Set the test instrumentation at the position of “52 ¡Á1”

Small size test instrumentation:

9/N.YU-03112
90890-03112

If the indicating meadle indicates toward ¡Á, the fuse has broken needing to be replaced.
(III) Replacement of taillight lamp


2. Removal. Unit of taillight.

3. Take out the lens.

4. Removal the lens seat.

   Rotate counterclockwise when taking out the lens.

   Caution:
   When removing the light tail hold the front side of the taillight with hand.

5. Removal:
   Lamp.

   The inflammables is not allowed to approach the lamp which is on, and the lamp is very hot, never touch it before cooling.

6. Installation:
   Lamp (new).

   Be sure that the projective part on the lamp is engaged with the convex groove on the light seat.

7. Connect
   Light seat.

   Caution
   Make sure that the projective part on the lamp is engaged with the comex groove on the light seat.

8. Install the lens to the light seat.

9. Installation:
   Taillight.

   Caution
   Install the rubber hole-guard ring of the tail-light connecting wire column to the taillight.

10. Connect
    Connecting wire terminal of taillight.
3. Installment of fuse cover

(IV) Replacement of headlight lamp
1. Cut off
   . Connecting wire terminal of headlight
2. Removal
   . Unit of headlight

3. Take out the lens
4. Removal of the lens seat

Rotate counterclockwise when taking out the lens.

Caution:
When removing the light head hold the front side of the headlight with hand.

5. Removal:
   . Lamp

The inflammables is not allowed to approach the lamp which is on, and the lamp is very hot, never touch it before cooling.

6. Installment
   . Lamp (new)

Caution
Be sure that the projective part on the lamp is engaged with the convex groove on the light seat.

Caution
Never touch the glass part to avoid the lamp to touch the fuel. Otherwise, the lamp will be light permeability, service life and illuminating value. If there is some oil, clean off with cloth mixed with alcohol.
7. Connect Light seat 

**Caution**

Make sure that the projective part on the lamp is engaged with the comex groove on the light seat.

8. Install the lens to the light seat.

9. Installment Headlight

**Caution**

Install the rubber hole-guard ring of the headlight connecting wire column to the headlight.

Section 5 Maintenance and Adjustment of Engine

((clean of air filter)

1. Remove
   - Cushion
   - Front fender
   - Rear fender
   - Fuel tank

2. Remove the air filter box cover, air filter components.

3. Removal
   Air filter core

   Caution
   Never start the engine without filter, otherwise the piston and cylinder will be overworn.

4. Inspection
   a. Air filter core (inspect)
      If damaged, replace it.

5. Clean of the foam filter core:
   a. Clean with water completely and slightly.
   b. Squeeze the surplus water of the foam and dry it.

   Note:
   When squeezing the water on the foam, be sure to be slight.
6. Installment:
a. Install the foam filter core to the foam supporting cylinder to combine a air filter assy.
b. Install the air filter assy.
c. Install the air filter cover.

**Caution**
Make sure that the close fit surface of air filter is engaged with the close fit surface of air filter box, and the air leakage is not allowed.

(II) Inspection of spark plug
1. Rest the vehicle on the flat ground and lean the spark plug with compressed air to avoid the dust entering the engine.
2. Remove the spark plug.

3. Inspection of spark plug
   a. Electrode
      Wear/damaged replace
   b. Insulator color
      Brown or light brown in normal condition If the color is clearly different check the engine.

4. Clean of spark plug
   Clean the spark plug with spark plug cleaner of brush.

5. Measure the spark plug clearance Measure with feeler gause. If out of specification, adjust.
   Spark plug standard clearance: 0.6-0.7mm

6. Installment of spark plug
   a. Clean the washer surface and spark plug surface before installing the spark plug.
   b. Tighten up the spark plug with hand before install it according to the specification.
   Tightening torque of spark plug: 17.5N.m
(III) Adjustment of idle speed
1. Rest the vehicle on the flat ground.
2. Start the engine and prewarm it at the speed of 1000-2000r/min, after several minutes, increase the engine speed to 4000-5000r/min.
3. Set the specified idle speed through adjusting the throttle adjusting screw. Screw in to increase the engine speed and screw out to decrease the speed.
   Specified idle speed: 1450-1550r/min
4. Measure the engine speed with measuring meter.

5. Make sure that the free clearance of throttle grip is within 3-5mm. Otherwise, readjust the idle speed.

(IV) Adjustment of free clearance of throttle grip

Caution
First adjust the engine idle speed when adjusting throttle grip.
1. Rest the vehicle on the flat ground.
2. Inspection
   Free clearance of throttle grip @, if out of specification @, adjust free clearance of throttle grip: 3-5mm
3. Adjustment
   Adjustment steps of free clearance of throttle grip.
   a. Loosen the locking nut .
   b. Turn the adjusting bolt up to the free clearance of throttle grip @ is 3-5mm.
   c. Tighten up the locking nut .

Caution
After adjusting the free clearance, move the lever forward and rearward to make sure that the engine will not lift.
(V) Adjustment of speed limitator:
The speed limitator can limit the throttle in full opening condition when the throttle grip is pulled to the Max position, screwing the adjuster inward can stop increasing the speed.
1. Adjust speed limiting length
   Adjustment steps:
   a. Loosen the locking nut
   b. Adjust the adjusting screw clockwise or counterclockwise to make @ obtain the specified length of 12mm.
   c. Lock the locking nut

**Warning**
A. For the beginner of driving, pay extra attention to screw in the speed limitator inward and screw out with improvement of driving skill, never remove the adjusting screw of speed limitator.

b. For the correct throttle grip operation, never screw out the adjuster to exceed 12mm, and adjust the free clearance of throttle grip to 3-5mm.

(VI) Adjustment of valve, clearance.
**Caution**
The valve clearance should be adjusting only after the engine is cold, the valve clearance should be adjusted when the piston is at the end point position of compress stroke.
1. Removal:
   1) Rest the vehicle on the flat ground
   2) Remove
      Front fender
   3) Remove:
      a. Timing observation hole screw
   4) Remove:
      a. Valve cap (the side of exhaust valve)
      b. Valve cap (the side of intake valve)
2. Adjustment
   1) Measure the valve clearance
   The detailed measure steps are as follows:
      a. Turn the crankshaft counterclockwise with wrench.
b. Make the mark "T" on the rotor is align with the mark on the crankcase. When it is done that is the piston ties in top dead center (TDC).

c. Inspection of top dead center in pressure stoke:
   (i) When the mark on the rotor is align with the mark on the crankcase, the two arms must have clearance.
   (ii) If there is not clearance, turn the crankcase a circle by counterclockwise to meet the above requirement.

d. Measure the valve clearance with plug gauge. Adjust the clearance if it is out of specification.
   Intake valve clearance: 0.05-0.09mm (normal temperature)
   Exhaust valve clearance: 0.11-0.15mm (normal temperature)

(2) Adjustment of valve clearance:
   a. Loosen locking nut
   b. Insert the Plug gauge spanner between the adjusting screw and valve rod.
   c. Turn the adjusting screw by clockwise with valve adjusting spanner until the right clearance is gotten to.
   Size of valve adjusting spanner: 3mm, code 90890-1311
   d. Fix the adjusting screw to avoid turning, and fasten the locking nut. Torque of locking nut is 14N.m

(3) Adjust the valve clearance again: If the clearance is not right, adjust it by repeating above adjusting steps.
3. Installation:
Carry out it according to opposite steps of “Removal”.

(1) Mount:
   a. Valve cap (Side of outlet door)
   b. Valve cap (Side of inlet door)

   **Caution**
   (i) Project of valve cap should be up when mounting.
   (ii) Check if O-ring is damaged. If any, replace it immediately.
   Torque of valve cap: 10N.m

(2) Mount:
   a. Fuel tank
   b. Front fender

(VII) Inspection of ignition timing
Notice:
Before checking the correct timed ignition adjust the engine idle speed and free clearance of throttle grip to correct position.
1. Put the vehicle on the flat ground.
2. Start the engine for pre-heating and then stop the engine.
3. Mount induction engine tachometer (90890-03113)
4. Mount correct timed ignition meter on connection line of spark plug cap (9890-00314)
5. Inspection of ignition timing.
   Inspection steps:
   a. Take off plug
   b. Start the engine, and make the engine run at 1450r/min-1550r/min idle speed.
When the engine is running, the machine, oil maybe splash out, so be careful to start the engine.

c. Check if the mark on the crankcase is in the range of ignition under the magneto rotor indication. If it is out of range, check if the rotor and pulse coil is loosen or damaged.

**Caution**

Ignition timing can’t be adjusted.

6. Mount plug
7. Take off ignition timing meter induction engine tachometer.

(VIII) Measuring of compressive force

**Caution**

Inadequate compressive force will reduce the engine performance.

Before measuring compressive force, Valve clearance should be adjusted first (refer to “Adjustment of valve clearance section). 

1. Put the vehicle on the flat ground.
2. Take off spark plug.
3. The following is steps of measuring compressive force:
   a. Install pressure gauge and change connector.
   b. Turn the throttle lever to Max point.
   Start the engine with power (battery has charged enoughly) until no increase of read pressure gauge.

**Warning**

When starting the engine, the spark plug must be connected to ground for avoiding spark.

When checking the following, the read of pressure gauge:

Compressive force on sea level:
Standard value: 9000Kpa (9.0kg/cm²)
Min. Value: 800Kpa (8.0kg/cm²)
Max. Value: 1000Kpa (10.0kg/cm²)
d. If the pressure is lower than the min. value:
(i) Drop some oil to action cylinder.
(ii) Measure the pressure again

4. Take off pressure gauge

5. Mount spark plug, Torque of mount is 175N.m

(IX). Inspection of oil quantity of engine

<table>
<thead>
<tr>
<th>Compression force (The machine oil has been filled in the cylinder)</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressure read</td>
<td>Reason</td>
</tr>
<tr>
<td>Read is higher than one before filling</td>
<td>Piston or piston ring is worn or damaged</td>
</tr>
<tr>
<td>Read is equal to one when no oil</td>
<td>Piston ring, throttle cylinder head, washer maybe be damaged.</td>
</tr>
<tr>
<td>Read is over max. value</td>
<td>Check if the cylinder head throttle surface or piston top end are carbon laydown.</td>
</tr>
</tbody>
</table>

4. Take off pressure gauge

5. Mount spark plug, Torque of mount is 175N.m

(IX). Inspection of oil quantity of engine

**Foreign**

No foreign matter in crankcase
1. Put the vehicle on the flat ground
2. Check the quantity of engine oil. If it is inadequate, fill it.

Inspection steps:
- Pre-heat engine for several minutes, and then turn off it. After waiting for more than ten minutes, return the machine oil into crankcase.
b. Turn out the dipstick entirely, and clean it, then insert it back into oil hole.

c. Take out the dipstick to check if the oil level is between the Max. value and the Min. value.

d. If the oil quantity is too small, fill some engine oil to make the oil quantity get to proper quantity. About recommended oil, see left diagram.

**Caution**

Recommended oil type:

U.S.A Petro Association offers: “SE”. “SF” type equal oil, such as: “SF-SE-CC” “SF-SE-SD” etc.

(X) Replacement of engine oil and inspection of oil flow.

**Caution**

Engine oil can be used to lubricate clutch, but don’t use any chemical additive in machine oil, because the additive can lead to clutch out of work.

Don’t permit any foreign matter into crankcase.

1. Put the vehicle on the flat ground.
2. Pre-heat the engine for several minutes, then stop it.
3. Put a container under the engine.
4. Take off oil dipstick, draining plug to drain the engine oil.

**Warning**

When taking off draining plug, compressure spring through filter and O-ring is easy to lose. So pay attention to these parts.

5. Take off fire-filter cap and O-ring.
6. Inspection
One of parts of O-ring, compressure spring, rough filter, fine filter is damaged, replace it.

7. Cleaning
Clean the compressure spring, filter, filter plug of crankcase and filter net cap with cleaner.

8. Coat the engine oil on the O-ring slightly.

9. Install the fire filter, fire filter cap with O-ring, rough filter and draining plug.

**Warning**
Before installing the draining plug, mount O-ring, compress spring and fine filter and be sure that their mounting order must be correct.
Mounting torque: fine filter cap: 10N.m, draining plug: 40N.m

10. Fill machine oil into crankcase
Refer to: “Inspection of Engine oil Quantity”
Appendix: Total: 2.2L
Periodic changing oil: 1.8L
Oil quantity when cleaning or replacing filter net: 1.7L

11. Mount dipstick
12. Pre-heat engine for 5 minutes or more, and then stop
13. Check the oil flow
Chapter III Repair and Maintenance of Vehicle body
Section 1 Front wheel and Front Brake

Technical Parameter

<table>
<thead>
<tr>
<th>Ser No.</th>
<th>Item</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tire specification</td>
<td>AT22 1.7-10</td>
</tr>
<tr>
<td>2</td>
<td>Rim dimension</td>
<td>5.5 1.10</td>
</tr>
<tr>
<td>3</td>
<td>Tire air pressure (normal temperature)</td>
<td>Standard value 20KPa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min value 17KPa(Min value)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max value 23KPa(Max value)</td>
</tr>
<tr>
<td>4</td>
<td>Run-out</td>
<td>Radia run-out 2mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End face run-act 2mm</td>
</tr>
<tr>
<td>5</td>
<td>Tire wear limit value</td>
<td>2mm</td>
</tr>
<tr>
<td>6</td>
<td>Wear limit value of friction wafer</td>
<td>2mm</td>
</tr>
<tr>
<td>7</td>
<td>Wear limit value of front brake hub</td>
<td>16mm</td>
</tr>
</tbody>
</table>

(I) Disassembly
1) Pay attention to following points when disassembling front wheels
   a: Place the vehicle on a horizontal ground, and press down the rear brake attaching clamp "
   b: Loosen the connecting nut " of front & rear wheel on the front wheel.
   c: Place a bracket under the frame to pick up the front wheels.

   Warning
   Support the vehicle firmly and avoid dropping down.

2) Disassemble the connecting nut " of front & rear wheel.
3) Disassemble split pin, slotted nut, plain washer, front brake and gasket.

4) Disassemble adjusting nut, pin, spring, circlip, spring, and circlip.

5) Remove the front brake cable and front brake air pipe.

6) Disassemble brake shoe assy and front cover assy.

7) Disassemble
   - Front brake arm
   - Wear indicating sheet
   - Front brake cam shaft
   - Front brake cam shaft seat
   - Rotating pin seat assy
   - Brake cover
II. Inspecting procedures

1. Check
Front wheel: refer to “Tire inspection” and “Hub inspection” of chapter 2.

2. Measure
Radial run-out of front wheel: If exceeding the specified limit, replace the front wheel or check the bearing clearance (in figure)

Attached: Rim run-out limit:
Radial run-out 2.0mm (in figure)
End face run-out 2.0mm (in figure)

3. Check:
Tire surface: If worn or damaged, replace it. Refer to “Tire inspection” of chapter 2.

Caution
Install the tire according to direction of “ROTATION” mark on the tire.

Warning
The tire assembly should be conducted on special equipment. After replacing the tire, conduct curvilinear motion carefully. Must ensure the tire on the correct position in rim. Otherwise may cause damage of motorcycle or driver.
4. Check
Friction wafer: polish the surface needing polishing with rough sand paper.

5. Measure
Thickness of friction wafer of brake: if it does not conform to specified thickness, replace it.
Attached:
Thickness of friction wafer of brake: 4.0mm
Wear limit: 2.0mm

Caution
If the worn thickness of any part of friction wafer exceeds the wear limit specification, it is needed to replace the brake shoe in set. (including brake shoe spring)

6. Check
Brake shoe tension spring: If worn or damaged, replace it.

7. Measure:
Inner diameter of front brake hub: If it does not conform to specification, replace it.
Attached:
Inner diameter of front brake hub: 160mm
Wear limit: 161mm

8. Check
If there is engine oil or scrape on the inner surface of brake hub, eliminate them.
Elimination of engine oil: wipe off with cloth immersed in volatile diluent or volatile solvent.
Elimination of scrape: wipe it off with carborundum cloth forcibly and evenly until it disappears.
9. Check
If the bearing of front brake hub runs out in brake hub or front wheel runs out when rotating, replace the bearing.
If the oil seal is worn or damaged, replace it.

Replacing procedures of front wheel bearing and oil seal
Wash the outer side of brake hub
Remove the oil seal with plain screwdriver.
When removing the oil seal with plain screwdriver, place a cloth on the outer edge of oil seal to avoid damage.
Disassemble the bearing with corresponding tool.
Assemble new bearing and oil seal according to reverse procedures of above replacement.

Caution
Use a holddown corresponding with outside diameter of oil seal.

Caution
Do not beat the inner circle of bearing or roller, only contact the holddown and outer circle.

10. Check
If there is crack or damage on brake cover assy, replace it.
If the dust-proof seal of brake cover is worn or damaged, replace it.
(III) Installation procedure:
The installation procedure is the reversal of “Disassembly”. But pay attention to following points:
1. Lubrication: as shown in figure:
   - Dust-proof seal
   - Bearing
   - Cam shaft
   - Rotating pin seat
   - “O” sealing ring
   Attached: use lithium base grease

Warning
When installing the cam shaft and rotating pin seat, should apply a little grease firstly. After installation, wipe off the surplus grease.

2. Install
   - Rotating pin seat
   - Cam shaft seat

3. Install:
   - Brake cam shaft
   - Indicating sheet
   - Brake cam arm

Caution
When installing the friction indicating sheet onto the brake cam shaft should make the convex part of friction indicating sheet corresponding with concave part of brake cam shaft.
Make the punching mark on brake cam shaft corresponding with punching mark of brake cam arm.
4. Install
Brake shoe assy

Do not apply lubricating grease on brake friction wafer.

5. Connect
a. front brake air pipe.
b. connect the front brake cable with brake cover.

6. Install (as shown in figure)
- Circlip
- Spring
- Circlip
- Spring
- Pin
- Adjusting nut

7. Install (as shown in figure)
- Front brake hub
- Gasket, O-ring 17 ; 1.8G
- Washer
- Slotted nut (torque: 70N.m)

8. Install
- Split pin

**Caution**
After the torque is fixed, do not loosen the slotted nut. If the concave slot of the slotted nut does not aim at pin hole of the screw column, aim them by tightening up the slotted nut.

**Warning**
Should use new and complete split pin.
9. Installment:
When installing the front wheel, the fastening torque of connecting nut of front and rear wheels is 55N.m.

The rotation direction of front wheel (A) is the arrow direction marked on the tire.

10. Adjustment
Free clearance of front brake cable
Refer to the “Adjustment of front brake” section for chapter Two.
Free clearance of front brake:
The free clearance on the center of right lever is 5.0-8.0mm.

11. Loosen the brake clip.
Section 2 Rear wheel/rear brake/rear wheel axle

(1) Removal steps
1. Rest the motorcycle on a flat ground
2. Stop up the front wheel with wood, then put a proper supporting article under the frame so as to lift the rear wheel and make the rear wheel leave the earth.
In order avoid the parts falling, which will acuse danger, during removaol process, rest the vehcile firmly.

3. Removal
(1) Connecting nut of rear wheels
(2) Rear wheels
(3) Split pin
(4) Rear wheel axle nut
(5) Washer
(6) Rear wheel connecting plate

4. Dismantle the rear brake caliper.

5. Dismantle the lock-nut of the rear axle.
6. Dismantle the rear disk brake plate

7. Dismantle of rear disk brake bracket

8. Caution
Take out the rear wheel axle from the end of rear wheel axle bushing and gear box with soft hammer
Warning
During taking out the rear wheel axle, in order to protect the thread and gear group from damage, do not beat the rear wheel axle directly with hammer

(II) Inspection steps
1. Inspection rear wheel
2. Measurement
   a. Radial runout of rim
   b. Tire surface
3. Inspection
   Rear wheel connection plate
   If cracks or damage is found, replace it.
   Involute spline on rear wheel connecting plate
   If worn or damaged, replace it.

4. Measurement
Measuring the thickness of rear disk brake pad.
Replace the pad when its thickness reaches the cimit.
5. Inspection of rear wheel axle
   a. If the rear wheel axle is heavily scraped or broken, replace it.
   b. If the thread or gear groove on the rear wheel axle is worn or damaged, replace it.

6. Measurement
   The radial runout of the position on the rear wheel axle, if out of specification, replace it.

   Attached: The radial runout limit of rear wheel axle: 1.5mm

   **Warning**
   If the axle is bent, do not straighten it forcefully.

7. Check
   (1) Rear brake support.
   (2) If there is any crack or friction in the support, replace it.

8. Inspection
   (1) Bearing
   Rotate the rear wheel axle, if the axle shakes left and right in the bearing or runout axially, it indicated that the bearing is heavily worn needing to be replaced.
   (2) Oil seal
   If the oil seal is worn or damaged, replace it.

   **Caution**
   During the installation, the pressing tool of bearing should be matched with the outer diameter of bearing outer race and that of oil seal.
   **Warning**
   Never beat the inner race and bearing ball, the pressing tool needs to touch with bearing outer race.
Section 3 Steering Operation System

(I) Removal steps of steering bar

1. Removal
   Handle bar decoration cover

2. Removal
   Front brake cable
   Throttle grip assy

3. Removal
   After stopping the vehicle, remove the rear brake cable

4. Removal
   Steering bar pipe
   Lower holder of steering bar
(II) Removal steps of steering vertical column welding

1. Plain move
   - The locking part of locking pad as shown

2. Removal
   - Bolt
   - Locking washer
   - Clip assy

3. Remocal
   Install the steering vertical column with split pin
   Nut
   Washer

4. Removal
   Split pin
   Nut
   Tension rod

   **Caution**

   When removing the tension rod end and steering ball pin from the steering vertical column welding assy and front seat assy of front brake with common bearing tension tool and other tools, pay attention to not damage the relevant parts.

5. Removal
   Remove the steering vertical column welding assy together with steering vertical column holder.

6. Removal
   - Steering vertical column holder
   - Bushing
   - Oil seal
(III) Inspection content

1. Check if the steering bar is cracks bent, is bent or damaged. If it is, replace it.

2. Inspect if the steering vertical column welding assy is bent or damaged. If it is, replace it.

   **Warning**
   In order to avoid decreasing the performance of steering vertical column, if it is bent do not straighten it forcefully.

3. Inspection
   Steering vertical column holder and seal ring. If they are worn or damaged, replace it.

4. Inspection:
   If the tension rod is bent or damaged. If they are, replace them.

5. Correcting:
   The displacement of end head of steering tension rod ball pin assy (Refer to as pin ballas shown on the drawing). If the free clearance is found on the ball pin end head, replace the ball pin. If the part around the ball pin end head is uneven, also replace it.
   If there is convex point, wear, damage on the core surface of ballpin end head, replace it.
6. Adjustment
Assembly length of tension rod
Adjustment steps of tension rod assembly length
Loosen the connecting nut (A). (B)
Adjusting the assembly length of tension rod by rotating the tension rod.
Attached: Tension rod assembly length @: 297mm
(A) Right-hand thread
(B) Left-hand thread
Connect (C) position to the steering vertical column welding assy.
Connect (D) position to the front seat assy, the front brake.

Caution
The connection nut (A)(B) can be tightened up only when the revealed thread length of two ends of tension rod are the same.
Attached: Connecting nut torque of tension rod: 30Nm

7. Inspection
If the bearing and O-seal under the steering vertical welding are worn or damaged, replace them.

(IV) Installation steps
The reversal steps of “Removal” steps “Installation” steps, pay attention to the following points during installment.
1. When installing steering vertical column welding, lubricate the bearing and seal ring under the steering vertical column welding.
2. Lubricate the steering vertical column holder and seal ring during installing the steering vertical column welding.

3. Installment
Install the seal ring to the steering vertical column welding, then install bushing finally install the steering vertical column holder. Caution: Never damage the seal ring when installing.

4. Installment
When installing the steering vertical column holder and steering vertical column welding take them as unit.

Warning
In order to ensure the correct circuit of brake cable and wire, never damage and wind the cables and wires.

5. Installation of left and right tension rod

Caution
Make sure that the ball pin at the side of scraped marking connect with the front seat assy of front brake.

6. Tighten up the nut of ball pin assy.
Attached: Nut torque: 25Nm
7. Mounting split pin

**Caution**
Don’t loosen the nut after the torque is fixed. If the nut recess is not correspondance with split pin hole on the double -screw bolt, tighten the nut to align them.

**Warning**
Always use new split pin

8. Tighting
After mounting the washer, nut, split pin under the steering vertical column.
Nut torque: 30Nm

9. Install
Clip ♂locking washer ♂bolt ♂
Attached: bolt torque: 23Nm

**Warning**
Always use new locking washer.

10. Bent showing supporting lug of locking washer to lock tightly the bolt.

11. Fill the lubrication oil at the oil cup to lubricate the bearing under the steering vertical column. Lubricating oil is Lithium base grease.
Installation steps of steering bar

1. Install the lower holding seat, steering tube, and upper holding seat.

   **Warning**
   When tightening the bolt of holding seat, make sure the even of clearance.
   Attached: bolt torque: 20Nm

2. Install the throttle grip unit

   **Caution**
   The projection of throttle grip must correspond to the sunken part on the right lever seat when installation.

   **Warning**
   Correct installation of cable and wire is very necessary for ensuring the safety operation of vehicle.
   Refer to chapter 1 “wiring diagram of vehicle”

3. Adjusting the free clearance of brake cable

4. Adjusting the toe-in of front wheel

5. Mounting front fender, bumper, front luggage carrier.
Section 4 Front shock absorber and Front wheel fork

(I) Disassembly:
1. Take off front fender front wheel.
2. Take off split pin, nut and steering rod ball pin assembly.
3. Dismantle the bolt of the front shock absorber.
4. Take off the bolt under the front shock absorber nut of front shock absorber and front shock absorber.
5. Take off split pin, nut on the left/right front seat assy and left/right front seat assy.

6. Check the free clearance of left/right front wheel fork
   Inspection step:
   a: Check the parts of left/right front wheel fork on the frame, if it is bend, crack or worn repair or replace the frame.
   b: Check the torque value of locking nut on the left/right front wheel fork
   Attached: Nut torque value: 45Nm

   c: Move the left/right front wheel fork from one side to another to check its side clearance. If the side clearance is very obvious replace bushing sub-assembly or a set of front wheel fork.
d: Move the left/right front wheel fork up and down to check its vertical clearance. If the vertical moving is tight, limited or uneven, replace the bushing sub-assembly or whole front wheel fork.

8. Take off nut, bolt, left/right front wheel fork and bushing sub-assembly.

(II) Inspection step

1. Check the front shock absorber. If it is leakage, replace it. Check the universal joint. If it is crack or damaged, replace the front shock absorber.

Check spring, if it is fatigue or damage, replace the front shock absorber. (When checking, move the spring up and down)

2. Check the front seat assy of front brake, if it is crack sunk or damaged, replace it.

Warning

If the front axle is bend don’t straighten it in order to avoid reducing the performance of front axle on the brake.

3. Check the left/right front wheel fork welding, if it is crack, bent or damaged, replace it.
If the left/right front wheel fork welding is bent, don’t straighten it seriously in order to avoid reducing its performance.

4. Check the bushing sub-assembly if it is worn or damaged, replace it.

(III) Installation steps
The opposite steps of “Disassembly” is the mounting steps. The following must be paid attention when mounting:
1. Lubricate the inner surface of bushing sub-assembly. (Lubrication oil is lithium base grease).

2. Fix nut
Nut torque: 45Nm

Caution
Must ensure the correction of bolt mounting direction of left/right front wheel fork, bolt head position is the position showing on the drawing front, behind that make the bolt head is outward.
means the vehicle is forward.
3. Mount left/right front seat assy.

4. Fix the nut of left/right front seat assy. Attached: Nut torque: 25Nm

5. Mount the split pin.

**Caution**
Don’t loosen the nut after marking the standard torque. If the recess on the nut is not correspondence with split pin hole on the bolt, correct it by tightening the nut.

**Warning**
Must use new split pin.

6. Mount:
Front shock absorber, front shock absorber nut, bolt under the front shock absorber.

**Caution**
Before fixing the front shock absorber nut, Must ensuring the side plane of universal joint of universal joint is limited by frame limited block.
In order to the head of bolt is forward, the correction of bolt mounting direction under the front shock absorber should be guaranteed.

7. Tighten the nut of bolt of front shock absorber.
Attached: Nut torque of front shock absorber: 55Nm
Botl torque: 78Nm

8. Mount steering lever ball pin assembly, nut and split pin.
Attached: Nut torque: 25Nm
Don’t loosen the nut after marking the standard torque. If the recess on the nut is not correspondence with the split pin on the bolt, correct it by fixing the nut.

**Caution**

Must use new split pin.

**Warning**

9. Mount front brake cap assy brake shoe assy front brake hub and front wheel. Refer to “installation of front wheel and front brake” of this chapter.

10. Adjust front wheel toe-in
Refer to “Adjustment of Front wheel toe-in” in champer.

11. Mount front fender, safety lever, front carrier, Refer to the second section of chapter 2.
Section 5 Rear shock absorber and Rear wheel fork

1. Take off cushion/rear fender/drive sprocket

2. Take off rear shock absorber check:
   a. If rear shock absorber is leakage, if any, replace it
   b. If rear shock absorber is bent or damaged, if any, replace it.
   c. Pull the spring up and down to check if the spring fatiguer or damaged, if any, replace rear shock absorber.

3. Take off rear wheel fork check:
   a. If rear wheel fork axle is distored, if any, replace it.
   b. Check if the rear wheel fork assy is crack bend and damaged, if any, replace it.
Chapter IV Electric Appliance
Section 1 Inspect switch

(I) Inspect switch
Inspect if the circuit between wire end is on with pocket multimeter. If there is any failure, replace the switch.

Pocket multimeter

Remark

- Adjust the multimeter to “Ω” before inspecting.
- Adjust the multimeter to “Ω X 1” when inspecting the circuit.
- Should turn on and off the switch many times when inspecting.
Section 2 Troubleshooting the ignition system failure

If the ignition system does not work (no spark or spark stops)

<table>
<thead>
<tr>
<th>Step</th>
<th>Check</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Spark plug</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Ignition park clearance</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Resistance value of spark plug cap</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Resistance value of ignition coil</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Engine stop switch</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Main switch</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Resistance value of triggering coil</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Resistance value of charge coil</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Circuit connection (whole ignition system)</td>
<td></td>
</tr>
</tbody>
</table>

Remark

Remove following components before troubleshooting:
1) Cushion
2) Front frame
3) Front fender

Check and repair with following special tools.

1. Spark plug
   . Check the spark plug condition
   . Check the spark plug type
   . Check the spark plug clearance
   Refer to chapter 3 “Check spark plug”

Spark plug clearance
0.6~0.7mm (0.024~0.028 in)

Correct

Incorrect

Repair or replace the spark plug

Power spark tester:
Ignition tester:
Pocket multimeter:

Standard spark plug
D8RTC
2. Ignition spark clearance
- Remove the spark plug cap from spark plug
- Connect as shown in figure
- Spark testing instrument
- Spark plug cap
- Spark plug
- Rotate the main switch to “ON”
- Check the ignition spark clearance.
- Press down the starting switch to start the engine. And increase the spark clearance until the engine can not be started.

<table>
<thead>
<tr>
<th>Min spark clearance</th>
<th>6.0mm(0.24in)</th>
</tr>
</thead>
</table>

Not conforming to specification or no spark

Conforming to specification

Ignition system has no problem

3. Resistance of spark plug cap
- Remove the spark plug cap
- Connect the pocket multitester to spark plug cap

Inspect if the resistance of spark plug cap conform to specification

Resistance of spark plug cap: 20Ω @ 68°F (4-7KΩ)

Conforming to specification

Not conforming to specification

Replace spark plug cap

4. Resistance of ignition coil
- Remove the ignition coil connector from cable
- Connect the pocket multimeter (Ω×1) to ignition coil.
Inspect if the resistance of primary coil conforms to specification

- Primary coil resistance
  - At 20°C: 0.43~0.5 Ω
  - Connect the multimeter to ignition coil

Inspect if the secondary coil resistance conforms to specification

- Secondary coil resistance
  - At 20°C: 4.6~7.6K Ω

All conform to specification

5. Engine switch
   - Normal
   - Refer to “Check switch”

6. Main switch
   - Normal
   - Refer to “Check switch”

7. Resistance value of triggering coil
   - Remove CDI magneto connector from clabe
   - Connect the multimeter (Ω x 1k) to wire end of triggering coil
     - Multimeter pen(+) blue wire end
     - Multimeter pen(-) blue wire end
   - Inspect if the resistance of triggering coil conforms to specification
     - Resistance value of triggering value:
       - At 20°C: 180~220 Ω
     - Conforming to specification
     - Replace triggering coil
     - Not conforming to specification
       - Replace ignition coil
8. Resistance value of charge coil

Remove the corresponding connector of charge coil from cable.
Connect the multimeter (100) to wire end of charge coil
Multimeter pen (+) with yellow/green wire end
Multimeter pen (-) with yellow/green wire end

Inspect if the resistance value conforms to specification

Coil resistance value
At 20°C, 450–550Ω

- Conforming to specification
- Not conforming to specification
  - Replace charge coil
  - Poor connect
    - Connect the ignition system correctly

-76-
Section 3 Running of starting circuit

The starting circuit of this vehicle include starting motor, cut-off relay, rear brake switch and neutral switch. If the main switch is in position, the starting motor could be operated only at the following conditions:

- Driving device is at neutral position (neutral switch is closed)
- Tension brake switch (rear brake is closed)

When the vehicle is in driving or reverse start, and the rear brake is in idle start, then the cut-off relay will prevent starting device from running. On this condition, cut-off relay is closed, which leading the current can't reach to starting motor.

- When driving device is at neutral position.
- When rear brake is tensioned

- Battery
- Start motor
- Start relay
- Cut-off relay
- Start switch
- Rear brake switch
- Neutral switch

(A) To main switch
(B) From main switch
Section 4 Troubleshooting electric starting system

If starting motor doesn’t work

Remark
- Remove the following parts before troubleshooting
  1) Cushion
  2) Fuel tank
  3) Front fender
- Use the following special tool to troubleshoot

1. Safety
   - Pass

2. Battery
   - Check the battery condition
   - Voltage of open circuit
     - At 20°C (68°F): 12.8V or much more
     - Pass

3. Starting motor
   - Connect positive terminal of battery with cable
   - Inspect the running condition of starting motor

Pocket-multimeter

No electrification

Incorrect
- Clean the battery terminal
- Recharge or replace battery

Warning
- Jumper wire must have the same or bigger loading capability than battery wire, otherwise it would be burned.
- This kind of testing is similar to marking electric spark, therefore, no inflammable air or liquid nearby must be ensured.

-78-
4. Power off relay
- Remove the relay from the cable.
- Connect a portable multimeter, battery (12V) to wire end of power off relay.
  - Battery end (+): red/white wire end $\oplus$
  - Battery end (-): green/yellow wire end $\ominus$
  - Multimeter pen (+): red/white wire end $\oplus$
  - Multimeter pen (-): blue/white wire end $\ominus$
- Inspect if the power off relay is on.

5. Starting relay
- Remove the connector of starting relay from the cable.
- Connect the multimeter, battery (12V) to terminal of power off relay.
  - Battery wire end (+): blue/white wire end $\oplus$
  - Battery wire end (-): black wire direction $\ominus$
  - Multimeter pen (+): red/white wire end $\oplus$
  - Multimeter pen (-): black wire end $\ominus$
- Inspect if the circuit is on.
6. Main switch
   Correct
   Incorrect
   Replace main switch

7. Neutral switch
   Correct
   Incorrect

8. Rear brake switch
   Correct
   Incorrect
   Replace rear brake switch

9. Starting switch
   Correct
   Incorrect
   Replace handlebar switch (left)

10. Circuit connection
    Correct
    Incorrect
    Connect the whole starting system correctly
Section 5 Check starting Motor

1. Check
   - Reverser
     Not clean
     Clean with #600 sand paper

2. Ensure
   - Reverser diameter @
     Not conforming to specification
     Change the starting motor

3. Measure
   - Mica cut sheet
     Not conform to specification
     Scrape the mica with square scraper

   Mica cut sheet: 0.7mm (0.028 in)

   Remark
   Scrap the mica with square scraper to get proper dimension fit the reverser.

4. Check
   - Armature winding (insolation/power on)
     Failure
     Replace starting motor

   Check procedure of armature winding
   - Connect the multimeter to check power on
     and insolation condition
   - Measure the armature resistance

   Inner resistance of armature winding
   - Power on condition check: At 20°C (68°F) 0.004–0.005Ω
   - Insulation check: At 20°C (68°F) exceed 1MΩ

   If the resistance is incorrect, replace the motor.

**************************************
Check procedure of armature winding
- Connect the multimeter to check power on
  and insolation condition
- Measure the armature resistance

Inner resistance of armature winding
- Power on condition check: At 20°C (68°F) 0.004–0.005Ω
- Insulation check: At 20°C (68°F) exceed 1MΩ

If the resistance is incorrect, replace the motor.
**************************************
5. Measure
   . Length of brush (every one)
   Out of specification → replace it

   ![Length of brush: 10 mm (0.39 inches)
   Range of wear: <6 mm (0.14 inches)]

6. Measure
   . Brushing spring force
   Fatigue/out of specification → replace whole device

   ![Brushing spring force: 326~970 g (3.2~3.8 N)]

7. Check
   . Oil sealing
   . Bushing
   . O-ring
   Wear/damage → replace it

Installation of starting motor:
1. Mount
2. Magnetic steel
3. Bracket

**Remark**
Mark the matching mark @ On the magnetic steel is align to that on the bracket.
Section 6 No charging in the Battery

Steps
Check:
1. Safety
2. Battery
3. Charging voltage
4. Starter coil
5. Coupling of circuit (Whole charging system)

Repair with following special toolings

<table>
<thead>
<tr>
<th>1. Safety</th>
<th>Refer to “Inspection of switch”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>2. Battery</td>
<td>Check battery condition</td>
</tr>
<tr>
<td>Correct</td>
<td></td>
</tr>
<tr>
<td>3. Charging voltage</td>
<td>Connect engine techometer to the wire of spark plug</td>
</tr>
<tr>
<td></td>
<td>Connect pocket tester(DC20V) to the battery</td>
</tr>
<tr>
<td></td>
<td>Pocket multimeter(+) (\rightarrow) White terminal</td>
</tr>
<tr>
<td></td>
<td>Pocket multimeter(-) (\rightarrow) White terminal</td>
</tr>
</tbody>
</table>

Diagram:
- Coil techometer
- Engine techometer
- Pocket multimeter
- NO electrification
- Replace the safety
- Incorrect
- Clean battery terminal
- Recharge or replace battery
Start the engine and accelerate to 2000r/m or so.
Charging voltage: 14-15V at 2000r/m
Remark:
Use battery with full capacity

Oil of specification

No failure on charging circuit

4. Resistance value for startor coil
   - Take out the lighting coil of AC magneto from inserter
   - Connect pocket multimeter to stator coil (Ωx1)

Pocket multimeter (+) - White terminal
Pocket multimeter (-) - White terminal

Pocket multimeter (+) - White terminal
Pocket multimeter (-) - White terminal
Measure the resistance value of startor coil

At 20°C (68°F), 11.10-1.50Ω
Meet specification

Out of specification

Replace parts of startor coil

5. Coupling of circuit
   - Check the whole coupling of charging wire.

Correct

Replace recticed adjuster

Connect the charging system correctly
## Section 7 Troubleshooting

If the or taillight is not work

### Steps

Check:
1. Safety
2. Battery
3. Main switch

4. Lamp switch
5. Coupling of wires(for entire lighting system)

### Pocket multimeter: P/N YU-03112 90890-03112

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safety</td>
<td>Refer to “Inspection of switch” Pass</td>
</tr>
<tr>
<td>2. Battery</td>
<td>Check the battery condition Correct Incorrect</td>
</tr>
<tr>
<td>3. Main switch</td>
<td>Refer to “Inspection of switch” Correct</td>
</tr>
<tr>
<td>4. Lamp switch</td>
<td></td>
</tr>
<tr>
<td>5. Coupling of wires</td>
<td></td>
</tr>
</tbody>
</table>
4. Switch for lamps
Refer to “Inspection of switch”
Correct
Incorrect
If the lamp switch is failure replace the switch of handle(left)

5. Coupling of wires
Check the wire coupling or whole lighting system
Correct
Poor coupling
Connect whole lighting system correctly.

Check the returning condition of each lighting system. Refer to “Inspection of Lighting System”.
Section 8 Inspection of Lighting system

If the taillight is out of work

1. Bulb and bulb socket
   - Check if the bulb and bulb socket is correct
   - Meet specification

2. Voltage
   - Connect the pocket tester (DC 20V) to the terminal of taillamp.
   - Multimeter (+) to blue terminal
   - Multimeter (-) to black terminal

   Adjust main switch to ON position
   - Adjust lamp switch to “LO” or “HI” position
   - Check the voltage of blue wire in coupler of bulb socket (12V)
   - Meet specification

No failure on this circuit

There is failure on the circuit from main switch to bulb socket coupler. Repair it.
Chapter V Engine
Section 1 Disassembly of engine

(1) Remove the engine from finished ATV
1. Dismantle the Heat protecting plate

2. Remove
   . Cushion
   . Front fender
   . Rear fender

3. Oil draining
   Screw out oil draining screw plug. Drain off the lubricating oil of the engine from the oil draining hole.
4. Exhaust pipe and silencer
   1) Remove
      . Exhaust pipe
   2) Remove
      . Silencer

5. Carburetor and air intake pipe
Place the throttle cock grip on “OFF” position, and remove:
- Throttle cable
- Oil pipe
- Hoop
- Carburetor, carburetor seat and hook hitch assy.

**Caution**

Before disassembling, drain off the gasoline of the carburetor float cabinet firstly. Wrap the overflow pipe with cloth to absorb the splashed gasoline. The gasoline is inflammable, pay attention not to splash the gasoline on hot engine.

6. Starting motor
   1) Remove
      - Starting motor line
   2) Remove
      - Connecting plate of starting motor
      - Starting motor

7. Remove
   - Left footrest
   - Right footrest

8. Take off drive sprocket
9. Dismantle the engine connecting plate

10. Dismantle the driving sprocket

11. Disassembly of engine
    Remove the engine unit from lift side

(II) Disassembly of engine
1. Remove
cover cylinder head

2. Remove
bolt
shroud assy

3. Remove
Spark plug
Upper valve cap(intake)
Lower valve cap(exhaust)
4. Remove pipe comp inlet

5. Remove Bolt
Timing sproket

6. Remove Bolt
Timing sproket
7. Remove
   . Cylinder cover unit
   . Cylinder cover pad
   . Location pin
   . Oil seal
   . Lower guide plate (exhaust side)

8. Remove
   Bolt
   Chain tensioner
   Gasket

9. Remove
   . Screw (cylinder body)
   . Cylinder body assy
   . Cylinder body pad
   . Location pin
   . O-ring
10. Remove
  - Circlip
  - Piston pin
  - Piston unit

11. Remove
    motor unit start

12. Remove
    left crankcase cover
    gasket
    pin

13. Remove
    pulley set driven
14. Remove pulley set drive

15. Remove Transmission Belt

16. Remove bolt cover assy fan

17. Remove bolt fan comp cooling
18. Remove
   nut
   fly wheel comp
   stator comp

19. Remove
   bolt
   cover right crank case
   gasket

20. Remove
   bolt
   crank case comp Right

21. Remove
   shaft comp crank
22. Remove bolt cover mission gear shaft drive shaft comp counter gear find cir clip

23. Remove . Distribution cam shaft

Caution
.Screw in the bolt 0mm to cam shaft screw hole to draw out the distribution cam shaft.

24. Remove . Rocker shaft . Air intake and exhaust rocker

Caution
.Screw the slip hammer assy into rocker shaft, then pull out the rocker.

25. Remove . Valve lock clip

Caution
.Disassemble the valve lock clip with valve spring compressing device.

Caution
Pay attention to position of each component for installation to original position.
Section 2 Inspection and Maintenance of Engine

1. Cylinder cover
   1) Clean
     a. Carbon deposit
     Use circular scraper
     b. Nut of spark plug
     c. Valve seat ring
     d. Bottom face of cylinder

   2) Measure
     a. Flatness of cylinder cover bottom face
     Recorrect the bottom face or replace if不合格
     b. Flatness of cylinder cover bottom face is less than 0.10mm (0.004in)

2. Intake and exhaust valve
   1) Check
      a. Valve surface
      b. Valve rod end
      Replace it if it is worn, exfoliation corroded or unqualified
      Min thickness (working limit)
      c. 0.8mm (0.031in)
      Slope
      c. 0.05mm (0.020in)
      Min length (working limit)
      c. 4.0mm (0.157in)

   2) Check
      a. Valve rod end
      b. Valve, valve guide pipe and valve rod oil seal if it is mushroom-shaped or its diameter is bigger than other rod diameter.

      Caution
      Remove the deformation of valve rod end by polishing the valve end with oilstone.
3) Measure
.Rod part run-out of valve rod
Replace it if unqualified
The rod part run-out of valve rod is less than
(0.03mm/0.0012in)

4) Measure
.Clearance between valve rod and valve guide pipe
Clearance=A-B
Inner diameter of valve guide pipe A
Valve rod diameter B
Replace the valve or valve guide pipe if unqualified.
Measure with micrometer and inner diameter gauge.

<table>
<thead>
<tr>
<th></th>
<th>Clearance between valve rod and valve guide pipe</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake valve</td>
<td>0.010<del>0.037mm (0.004</del>0.0015 in)</td>
<td>0.08mm</td>
</tr>
<tr>
<td>Exhaust valve</td>
<td>0.025<del>0.052mm (0.0010</del>0.0020 in)</td>
<td>0.10mm</td>
</tr>
</tbody>
</table>

Caution
.When replacing the valve, should replace the valve guide pipe and valve rod oil seal together.

3. Valve guide pipe
1) Check
.Valve guide pipe
Replace it if it is worn or the oil leaks into the cylinder
2) Disassemble
.Valve guide pipe
Use valve guide pipe disassembling device.

Caution
.Place the cylinder cover in the furnace to heat to 100°C (212°F) for the convenience of disassembly and installation of valve guide pipe. And it can ensure correct installing clearance.
3) Install
   .Circlip ø₁(new)
   .Valve guide pipe ø₁(new)
   Use the installing and disassembling device of valve guide pipe

4) Ream the inner diameter of valve guide pipe to get proper valve rod clearance.

**Caution**
Regrind the valve race after installing valve guide pipe

4. Valve race
1) Clean
   .Carbon deposit(valve race and value face)
2) Check
   .Valve seat ring
Regrind the valve if it is exfoliation corroded.

3) Measure
   .Contacting width of valve and valve race.
Regrind the valve race if unqualified.
   .Paint red lead powder on the valve fit pyramidal face of valve race
   .Place the valve into the cylinder cover.
.Press the valve on through valve guide pipe to leave clear trace on the valves.
.Remove the valve from cylinder cover
.When the valve contacts with valve race, the red line is marked on the valve from valve race, Then can measure the contacting width of valve and valve race.

Valve race correcting procedure

<table>
<thead>
<tr>
<th>Contactingwidth of valve and valve race</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>0.9–1.1mm</td>
</tr>
<tr>
<td>(0.035–0.043in)</td>
<td>1.6mm</td>
</tr>
<tr>
<td>Exhaust</td>
<td></td>
</tr>
</tbody>
</table>

.If the contacting width is too wide, too narrow or not in the middle, it is necessary to recorrect valve race

4) Correct
.Valve race
.Use reamers of 30°, 45° and 60°.

Caution

Rotate the reamer with even force to avoid cutting mark. And remove surplus part to get ideal valve race.

<table>
<thead>
<tr>
<th>Reamer used on each part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

Valve race correcting procedure
.The contacting part A is in the middle of valve face. But the contacting width is too wide.

<table>
<thead>
<tr>
<th>Reamer assy of valve race</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate lightly</td>
<td></td>
</tr>
<tr>
<td>Reamer 30°</td>
<td>Reduce the contacting</td>
</tr>
<tr>
<td></td>
<td>width to 1.0mm(0.04 in)</td>
</tr>
<tr>
<td>Reamer 60°</td>
<td></td>
</tr>
</tbody>
</table>
The contacting part B is the middle of valve face. But the width is too narrow.

<table>
<thead>
<tr>
<th>Reamer assy of valve race</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td></td>
</tr>
<tr>
<td>Reamer 45 ¡ã</td>
<td>Get unified contacting width 1.0mm (0.04 in)</td>
</tr>
</tbody>
</table>

The contacting part C is too narrow, and on the upper edge of valve face.

<table>
<thead>
<tr>
<th>Reamer assy of valve race</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td></td>
</tr>
<tr>
<td>Reamer 35 ¡ã</td>
<td>Make the contacting part in the middle and get the contacting width 1.0mm (0.04 in)</td>
</tr>
<tr>
<td>Reamer 45 ¡ã</td>
<td></td>
</tr>
</tbody>
</table>

The contacting part is too narrow and on the bottom of valve.

<table>
<thead>
<tr>
<th>Reamer assy of valve race</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
<td></td>
</tr>
<tr>
<td>Use reamer of 30 ¡ã firstly</td>
<td>Make the contacting part in the middle and increase the width</td>
</tr>
<tr>
<td>Reamer of 45 ¡ã</td>
<td></td>
</tr>
</tbody>
</table>

5) Grind
- Valve face
- Valve race

**Caution**

Should grind the valve face and valve race after correcting the valve race or replacing valve and valve guide pipe.

Grinding procedure of valve face
- Paint a layer of grinding powder ♦

**Caution**

Ensure no grinding power entering the clearance between the valve and valve guide pipe.
Apply molybdenum disulfide oil on the valve rod part.

Place the valve into the cylinder cover.

Rotate the valve to grind in with seat fully on the valve face, then clean the dirty.

Repeat procedure until the contacting width of valve face and valve seat.

In order to get the best grinding quality, you may slap the valve lightly when rotating the valve forward and backward. Be sure to clean all the dirty on the valve face and valve race after every grinding.

6) Measure the contacting width again after correcting and grinding.

Measure the contacting width and position of valve and valve race again according to method explained in 3.

If the contacting width and position do not conform to specification yet, recorrect and grind the valve race.

5. Valve spring

1) Measure.

If the free length (inner and outer spring) of valve spring unqualified, replace it.

<table>
<thead>
<tr>
<th>Free length of valve spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner spring (intake/exhaust)</td>
</tr>
<tr>
<td>Outer spring (intake/exhaust)</td>
</tr>
<tr>
<td>35.5mm (1.4 in)</td>
</tr>
<tr>
<td>37.2mm (1.46 in)</td>
</tr>
</tbody>
</table>
2) Measure
   Installing pressure of valve spring
   If unqualified, replace the inner and outer spring totally.

   | Installing pressure of valve spring                                      |
   |---------------------------------------------------------------|-------------------|
   | Inner spring (intake/exhaust)                                  |
   | When it is 30.5mm (1.2 in), the pressure 8.4~10.2kg (18.5~22.5 pods) |
   | Outerspring (intake/exhaust)                                   |
   | When it is 32.0mm (1.26 in), the pressure 16.6~20.4kg (36.6~45.0 pods) |

6. Seal check of valve
1) Installation of valve
   Lubricate
   . Valve rod part εû
   . Valve rod oil seal εû

   Install
   . Valve spring seat εû (Lower part)
   . Oil seal of valve rod εû
   . Valve εû
   . Inner spring εû of valve
   . Outer spring εû of valve
   . Spring cover εû of valve
   . Locking clip εû of valve
Must install the long pitch end of all valve spring upward.

2) Check the valve seal
If there is leakage on the valve face, repair again and regrind or replace the valve and regrind.
Inspecting procedure of valve seal
. Inject the clean solvent into intake way and exhaust way respectively.
. Check the valve seal. There should be no leakage on valve race.

3) Regrinding procedure
. Remove components of the cylinder cover again
. Grind repeatedly with fine grinding powder.
. Clean totally
. Reassemble and check the leakage with solvent
. Repeat above procedures until getting ideal seal

7. Distribution cam
1) Check
. Distribution cam
Replace if there is cave, scratch or discoloration

2) Measure
. Distribution cam (use micrometer)
Unqualified Replace
8. Valve rocker and rocker shaft

1) Check
   . Rocker hole
   . Contacting surface with distribution cam
   If over worn, replace it

2) Check
   . Rocker shaft surface
   Replace or check lubrication if there is bent, scratch or discoloration

3) Measure
   . Measure inner diameter of valve rocker hole
   Replace it if unqualified

<table>
<thead>
<tr>
<th></th>
<th>Limit value “A” of distribution cam</th>
<th>Limit value “B” of distribution cam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake cam</td>
<td>36.437mm (1.435 in)</td>
<td>30.031mm (1.182 in)</td>
</tr>
<tr>
<td>Exhaust cam</td>
<td>36.482mm (1.436 in)</td>
<td>30.152mm (1.187 in)</td>
</tr>
</tbody>
</table>

Outer diameter of rocker
11.985~11.991mm (0.4718~0.4721 in)
9. Timing chain
Check
Timing chain
Replace it if the chain is stretched, or not flexible or broken.

10. Timing sprocket and crankshaft sprocket
Check
Crankshaft sprocket (on crankshaft)
If there is wear and damaged, replace the sprocket and chain totally

11. Guide plate
1) Check
Lower guide plate (exhaust side)
Upper guide plate (intake side)
Replace it if it is worn or damaged

12. Chain tensioner
1) Check
Pushing rod of chain tensioner
Washer
Replace it if it is worn or damaged

---

Subtract the outer diameter of rocker shaft from inner diameter of valve rocker hole to calculate the clearance.

<table>
<thead>
<tr>
<th>Clearance</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>Outer diameter of rocker shaft</td>
</tr>
<tr>
<td>hole</td>
<td>Inner diameter of valve</td>
</tr>
<tr>
<td>shaft</td>
<td>rocker hole</td>
</tr>
</tbody>
</table>

Replace a set if unqualified

Clearance between rocker shaft and hole:
0.009-0.037 mm (0.0004-0.0031 in)
Limit:
0.037 mm (0.0015 in)
13. Cylinder and piston

1) Check
   Carbon deposit (from piston top to ring slot)

2) Check
   Surface of cylinder and piston
   Rebore cylinder or replace cylinder and piston if there is vertical scratch.

3) Measure
   Clearance between cylinder and piston
   Measuring method is as following
   Measuring the inner diameter “C” of cylinder with inner diameter gauge is the measuring position
   Remark:
   Measure twice the inner diameter “C” of cylinder from two directions vertical with each other in the same face. Then find out average value.

2) Check
   Flexibility of chain tensioner
   Checking procedure
   . Press the tensioner pushing rod lightly with finger, ad rotate it clockwise with thin screwdriver to screw it in.
   . Press the pushing rod lightly with finger and remove the screwdriver, then the pushing rod screws out stably
   . If the operation is unflexible, replace chain tensioner.
If out of specification, rebore or replace the cylinder and piston (Replace in a set). Measure the diameter “P” of piston lower part with micrometer, ③ is the measuring position.

If out of specification, replace the piston and piston ring as a set at the same time.

Calculate the mating cylinder clearance with the following formula:

\[
\text{Mating cylinder clearance} = \text{“C”} - \text{“P”}
\]

<table>
<thead>
<tr>
<th>Inner diameter of cylinder “C”</th>
<th>Piston lower part diameter “P”</th>
</tr>
</thead>
</table>

Mating cylinder clearance: 0.04–0.06mm (0.0016–0.0024 in)
Limit: 0.15mm (0.0059 in)

If out of specification, rebore or replace the cylinder, and replace the piston and piston ring as a set at the same time.

14. Piston ring and piston pin
   Piston ring
   1) Measure clearance between piston ring and ring groove
   Use feeler gauge Ș Ș
   If out of specification, replace piston and a set of ring

Caution
First clean the carbon deposits inside the piston ring and ring groove, followed by measuring the clearance between piston ring and ring groove.
2) Measurement

Closed clearance of piston ring
Install the piston ring to the cylinder, pull forward about 20 mm (0.8 in), then pull the piston ring with piston top to make it vertical with cylinder wall.

Use feeler gauge
If out of specification replace a set of ring

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>First ring</td>
<td>0.03-0.07mm (0.001-0.003 in)</td>
<td>0.12mm (0.005 in)</td>
</tr>
<tr>
<td>Second ring</td>
<td>0.02-0.06mm ring (0.008-0.024 in)</td>
<td>0.12mm (0.005 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>close clear ance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston ring 1</td>
<td>0.15-0.30mm (0.006-0.012 in)</td>
<td>0.4mm (0.016 in)</td>
</tr>
<tr>
<td>Piston ring 2</td>
<td>0.15-0.30mm (0.006-0.012 in)</td>
<td>0.4mm (0.016 in)</td>
</tr>
<tr>
<td>Oil ring</td>
<td>0.2-0.7mm (0.008-0.028 in)</td>
<td></td>
</tr>
</tbody>
</table>

**Caution**

You cannot measure the closed clearance of scraping place of oil ring assy, if the clearance of scraping plate is bigger, replace a set of oil ring.
Piston pin
1) Inspection
   If the color is changed, or indent is found, replace piston pin, then inspect the Lubrication system.

2) Measurement:
   Outer diameter @ (Piston pin)
   Out of specification, replace it

3) Measurement:
   Inner diameter of piston pin
   Out of specification, replace it

4) Measurement:
   Clearance between piston pin and piston pin hole

   Clearance between piston pin and piston pin hole = @ - @
   Inner diameter of piston pin hole @
   Outer diameter of piston pin @

   Clearance between piston pin and piston pin hole
   0.002-0.022mm (0.0001-0.0009 in)
   Limit 0.07mm (0.003 in)
15. Crankshaft

1) Measurement

- Dimension A of crankshaft assy
  If out of specification replace it or repair it

- Side clearance D of big head of connecting rod
  If out of specification, replace it or repair it
  **Max side clearance**
  0.35mm-0.65mm (0.014-0.026 in)

- Runout E of big head of connecting rod
  If out of specification, replace it or repair it
  **Runout C**
  If out of specification replace it or repair it
  
<table>
<thead>
<tr>
<th>Runout Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1: 0.03mm (0.0012 in)</td>
</tr>
<tr>
<td>C2: 0.06mm (0.0024 in)</td>
</tr>
</tbody>
</table>

- Side clearance D of big head of connecting rod
  If out of specification, replace it or repair it
  **Max side clearance**
  0.35mm-0.65mm (0.014-0.026 in)

- Runout E of big head of connecting rod
  If out of specification, replace it or repair it
  **Runout amount of big head of connecting rod**
  0.010-0.025mm (0.0004-0.0010 in)

- Clearance F of small end
  If out of specification, replace it or repair it
  **Clearance F of small end**: 0.8mm-1.0mm (0.032-0.040 in)
  **Limit**: 2.0mm (0.08 in)

2) Inspection:

- Crankshaft bearing

  If there is some noise or not active in operation or overbig clearance, replace it.
Main points of reassembly of crankshaft:
The oil traces on crankshaft and crank pin should be connected correctly, the malposition of two oil traces should be within 1mm (0.04 in)

16. Drive belt
Check if the transmission belt worn or not and replace it whenever necessary

17. Shaft drive
To check if the gears on the shaft worn or has any crack not and replace it whenever necessary

18. Shaft final
To check if the final shaft gear is worn out or has any crack and replace it whenever necessary.
19. Shaft comp counter
To check if the gears of the counter shaft are worn out or have any cracks and replace it whenever necessary.

20. Bearing and oil seal
1) Inspection
   . Bearing
   If jammed in operation or there are pits and damaged, replace it.
2) Inspection
   . Oil seal
   If damaged or worn, replace it.

21. Circlip and washer
Inspection:
   . Circlip
   . Washer
   If damaged, loose, bent, replace it.

22. Crankcase
1) Clean crankcase with soft agent completely
2) Clean all sealing surfaces and closing surfaces completely
3) Inspection:
   . Crankcase
   Cracks/damage, replace it.
   . Oil trace
   If jammed, blow with compressed air.

Caution
When replacing the crankcase be sure to re-adjust the output gear washer.
Chapter VI Vehicle Ordinary Trouble and Judgment

Trouble
Caution:
The following trouble, not including all possible troubles, is a help for trouble guide.
Please refer to relevant contents for the inspection, adjustment and replacement of parts.

(1) Starting trouble/difficulty
   1) Fuel system
      (1) Fuel tank
      . No oil
      . Fuel filter is clogged
      . Fuel filter net is clogged
      . Breather tube is clogged
      . Fuel is deteriorated or polluted

   (2) Fuel cock
      . Inlet tube is clogged
      . Fuel cock is not be opened

   (3) Carburetor
      . Fuel is deteriorated or polluted
      . Starting nozzle is clogged
      . Air tube is clogged
      . Float is distorted
      . Needle valve is worn
      . Improper valve sealing
      . Improper installation of starting nozzle
      . Starting nozzle is clogged
      . Improper work of starting plug

   (4) Air filter
      . Core of air filter is clogged

(2) Electric system
   (1) Spark plug
      . Improper spark plug clearance (standard clearance is 0.6-0.7mm)
      . Terminal is worn
      . Spark plug is polluted
      . Wrong spark plug heat value
      . Inefficient spark plug cap

   (2) Ignition coil
      . Primary coil/secondary coil is broken or shortened
      . Inefficient high voltage wire
      . Ignition coil is broken

   (3) CDI magneto system
      . CDI is failure
      . Coil is failure
      . Charging coil is failure
      . Woodruff key is bad

   (4) Switches and wires
      . Main switch is bad
      . The engine is off and switch is inefficient
      . Wires is broken or shortened
      . Neutral switch is bad
      . Starting switch is bad
      . Rear brake switch is bad

   (5) Starting motor
      . Starting motor is bad
      . Starting relay is bad
      . Off power relay is bad
      . Super clutch is bad

3) Cylinder
   (1) Cylinder body and cylinder head
      . Spark plug is loosen
      . Cylinder head or cylinder body is loosen
      . Cylinder head washer is damaged
      . Cylinder body is worn or damaged

-116-
(2) Piston and piston ring
- Improper piston ring installation
- Piston ring is worn and out of elasticity
- Piston is damaged or crack

(3) Valve, camshaft and crank shaft
- Valve didn't close entirely
- Improper match between valve and valve seat
- Wrong port timing
- Valve spring is damaged
- Valve camshaft is damaged
- Crank shaft is damaged

(II) Poor idle speed performance
(1) Carburetor
- Starting plug is not close entirely
- Idle metering jet is loose
- Idle metering jet is clogged
- Idle air metering jet is clogged
- Improper idle adjustment
- Leakage of carburetor

(2) Electric system
- Spark plug is bad
- CDI is bad
- Coil is bad
- Charging coil is bad
- Ignition coil is bad

(3) Valve system
- Improper adjustment of valve clearance
- Core of air filter is clogged

(III) Poor middle and high speed performance
Refer to "starting trouble/difficulty" and poor idle speed performance section in this chapter.

(1) Carburetor
- Wrong needle valve position
- Main jet is clogged or loosen
- Fuel is deteriorated or polluted
- Wrong float chamber oil level

(2) Air filter
- Core of air filter is clogged

(IV) Shifting trouble
1. Shifting difficulty
   - Refer to "slippig of clutch" and "ablation of clutch" in this chapter

2. Shifting pedle is clogged
   (1) Shifting shaft groups
   - Shifting shaft is bend
   - Shifting lever groups is damaged

   (2) Shifting cam, shifting fork

   - There is foreign matter in shifting camshaft recess
   - Shifting fork is clogged
   - Shifting fork shaft is bend

(3) Driving system
- Driving gear is clogged
- Foreign matter is clogged
- Incorrect driving system installation

3. Shift is out of gear
   (1) Shifting shaft groups
   - Improper adjustment of limited lever position
   - Limited lever can't back

   (2) Fork
   - Fork is worn

   (3) Shifting cam
   - Recess of shifting cam is worn
(4) Driving system
\[ \begin{align*}
&\text{¡¤ Claw of gear end is worn} \\
&\text{¡¤ Improper adjustment of clamp plate release} \\
&\text{rod clearance of clutch} \\
&\text{¡¤ Clutch spring is loosen (primary clutch and secondary clutch)} \\
&\text{¡¤ Clutch spring is fatigue (primary clutch and secondary clutch)} \\
&\text{¡¤ Friction disc is worn} \\
&\text{¡¤ Clamp plate is worn or deformed} \\
&\text{¡¤ Main clutch shoe lining is worn}
\end{align*} \]

(V) Clutch slips
\[ \begin{align*}
&\text{¡¤ Improper adjustment of clamp plate release} \\
&\text{rod clearance of clutch} \\
&\text{¡¤ Clutch spring is loosen (primary clutch and secondary clutch)} \\
&\text{¡¤ Clutch spring is fatigue (primary clutch and secondary clutch)} \\
&\text{¡¤ Friction disc is worn} \\
&\text{¡¤ Clamp plate is worn or deformed} \\
&\text{¡¤ Main clutch shoe lining is worn}
\end{align*} \]

(1) Clutch
\[ \begin{align*}
&\text{¡¤ Improper adjustment of clamp plate release} \\
&\text{rod clearance of clutch} \\
&\text{¡¤ Clutch spring is loosen (primary clutch and secondary clutch)} \\
&\text{¡¤ Clutch spring is fatigue (primary clutch and secondary clutch)} \\
&\text{¡¤ Friction disc is worn}
\end{align*} \]

(2) Engine oil
\[ \begin{align*}
&\text{¡¤ Low oil level} \\
&\text{¡¤ Poor quality (viscosity is low)} \\
&\text{¡¤ Deteriorated oil}
\end{align*} \]

(VI) clutch is locked
\[ \begin{align*}
&\text{¡¤ 1) Clutch} \\
&\text{¡¤ Clutch is out of control or the clearance is too big} \\
&\text{¡¤ Improper match between release lever and release rod} \\
&\text{¡¤ Deformed clutch clamp plate} \\
&\text{¡¤ Friction disc is deformed} \\
&\text{¡¤ Clutch hub is broken}
\end{align*} \]

(2) Engine oil
\[ \begin{align*}
&\text{¡¤ High oil level} \\
&\text{¡¤ Poor quality (viscosity is high)} \\
&\text{¡¤ Deteriorated oil}
\end{align*} \]

(VII) Engine is overheat
\[ \begin{align*}
&\text{¡¤ Improper spark plug clearance} \\
&\text{¡¤ Wrong spark plug heating value} \\
&\text{¡¤ CDI failure}
\end{align*} \]

(2) Steering system
\[ \begin{align*}
&\text{¡¤ Wrong toe-in} \\
&\text{¡¤ Steering pillar is bend}
\end{align*} \]

(IX) Shock absorber failure/improper operation
\[ \begin{align*}
&1. \text{Shock absorber failure:} \\
&\text{¡¤ Damping rod is bent or damaged} \\
&\text{¡¤ Bad oil sealing lip} \\
&\text{¡¤ Spring of shock absorber is fatigue}
\end{align*} \]

2. Improper operation
\[ \begin{align*}
&\text{¡¤ Improper installation or handlebar is bent}
\end{align*} \]
- Improper installation of steering pillar bearings
- Holding seat of steering pillar or sealing ring is damaged
- Rod is bent
- Spherical connection is bent

(3) Wheel tyre
- Uneven pressure on two sides of tyre
- Wrong tyre pressure
- Uneven tyre wear

(4) Front/Rear tyre
- Deformed run
- Loosen bearing
- Front wheel axle is bent or loosen
- Radial run out of front/rear wheel is too big

(5) Frame
- Bend
- Damaged frame

(6) Rear wheel fork
Bearing or bushing is worn
Rear wheel fork is bent or damaged

(X) Lighting system
1. Head light is out of work
   - Bulb is trouble
   - Too big load
   - Charging difficulty (Lighting coil or rectifier is failure)
   - Wrong connection of wire
   - Wrong connection of ground
   - Poor connection (Main switch or lighting switch)
   - Use-life of bulb is end

2. Bulb is off
   - Bulb is out of specification
Our group reserve the right to change structure, dimension and parameter of the vehicle’s parts without additional notice.