SUPPLEMENTARY SERVICE MANUAL

"Our company has passed the certification of ISO9001."

ATV 250 SERVICE MANUAL
BRIEF INTRODUCTION TO FOUR-WHEELED CROSS-COUNTRY VEHICLE MODEL 250ATV

Four-wheeled cross-country vehicle, model 250ATV 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 250ATV (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 injured, 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 250ATV
First edition July 2003

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 & meters .................................................................................... 2
  (I) Special tools ........................................................................................................................ 2
  (II) Instruments & tools ........................................................................................................... 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
  (1) How to use conversion table ............................................................................................... 8
  (2) Definition of unit ................................................................................................................. 8
  II. Basic specification .................................................................................................................... 9
  III. ATV body ................................................................................................................................ 10
  IV. Electric system .......................................................................................................................... 11
  V. Maintenance specification of engine ..................................................................................... 13
Section 6 Wiring diagram of ATV ....................................................................................................... 16
  (I) Technical explanation and requirement, details of relative component. .............................. 16
  (II) Wiring diagram(1) ............................................................................................................... 18
  (III) Wiring diagram(2) ............................................................................................................. 19
  (IV) Wiring diagram(3) ............................................................................................................. 20
Section 7 Requirements for torque of fastener .................................................................................... 21
  (1) ATV body ............................................................................................................................ 21
  (2) Engine ................................................................................................................................... 23
  (3) General torque specification ............................................................................................... 25
Section 8 Lubrication .......................................................................................................................... 26
  (1) Lubrication oil way .............................................................................................................. 26
  (2) Lubrication diagram ............................................................................................................ 27
Section 9 Lubrication point and type of lubricants ............................................................................ 29
  (1) Lubrication point and type of lubricants(ATV body) ......................................................... 29
  (2) Lubrication point and type of lubricants(Engine) ............................................................... 30
Chapter II Maintenance and adjustment of vehicle ............................................................................ 31
Section 1 Periodic maintenance/ lubrication ....................................................................................... 31
Section 2 Disassembly and assembly of cushion, fender and fuel tank .............................................. 32
  (I) Cushion .................................................................................................................................. 32
  (II) Rear fender .......................................................................................................................... 33
  (III) Fuel tank ............................................................................................................................. 35
Section 3 Maintenance and adjustment of vehicle body ................................................................. 39
(I) Wear inspection of front and rear brake .................................................................................. 39
(II) Adjustment of front brake ...................................................................................................... 39
(III) Adjustment of free clearance of left lever and rear brake pedal ......................................... 40
(IV) Position adjustment of steering lever .................................................................................. 42
(V) Lubricating oil level inspection of rear driving gearcase ....................................................... 42
(VI) Replacement of engine oil of rear driving gear case ............................................................ 43
(VII) Inspection of steering system ............................................................................................. 44
(VIII) Adjustment of toe-in of front wheel .................................................................................. 45
(X) Inspection of front/rear shock absorber ................................................................................ 46
(XI) Adjustment of rear shock absorber ...................................................................................... 46
(XII) Inspection of tire ................................................................................................................ 47
(XIII) Inspection of rim ................................................................................................................ 48
Section 4 Maintenance and adjustment of electrical appliance .................................................... 49
(I) Inspection of battery ............................................................................................................... 49
(II) Inspection of fuse .................................................................................................................. 50
(III) Replacement of headlight lamp ........................................................................................... 51
Section 5 Maintenance and adjustment of engine .......................................................................... 53
(I) Adjustment of clutch .............................................................................................................. 53
(II) Clean of air filter .................................................................................................................... 53
(III) Inspection of spark plug ....................................................................................................... 55
(IV) Adjustment of idle speed ...................................................................................................... 56
(V) Adjustment of free clearance of throttle grip ....................................................................... 56
(VI) Adjustment of speed limiterator .......................................................................................... 57
(VII) Adjustment of valve clearance .......................................................................................... 58
(VIII) Adjustment of timing chain tension .................................................................................. 60
(IX) Inspection of ignition timing ................................................................................................ 61
(X) Measuring of compressive force .......................................................................................... 62
(XI) Inspection oil quantity of engine ........................................................................................ 63
(XII) Replacement of engine oil and inspection of oil flow .......................................................... 64
Chapter III Repair and maintenance of vehicle body .................................................................... 67
Section 1 Rear driving gearcase and driving shaft ........................................................................ 67
(I) Trouble .................................................................................................................................... 67
(II) Inspection ............................................................................................................................. 67
(III) Trouble-shooting table ......................................................................................................... 68
(IV) Disassembly ........................................................................................................................ 69
(V) Inspection ............................................................................................................................. 72
(VI) Pad choice of main driving gear and shift gear .................................................................. 73
(II) If the reverse indicated lamp is out of work ................................................................. 140
(III) If the HB indicated lamp is out of work ...................................................................... 141

Chapter V Engine ................................................................................................................. 142

Section 1 Disassembly of engine ......................................................................................... 142
(I) Remove the engine from finished ATV ................................................................. 142
(II) Disassembly of engine ............................................................................................ 145

Section 2 Inspection and maintenance of engine ............................................................. 159

Section 3 Assembly and adjustment of engine ................................................................. 183
(I) Closing assembly of left & right crankcase .............................................................. 183
(II) Assembly of right crankcase ................................................................................ 184
(III) Assembly of left crankcase .................................................................................. 192
(IV) Selection and installation of adjusting washer ...................................................... 197
(V) Assembly of cylinder head .................................................................................... 204
(VI) Manual starting mechanism and others ................................................................. 211
(VII) Mount the engine on the finished vehicle ............................................................ 211

Chapter VI Vehicle ordinary trouble and its judgement ................................................. 218
(I) Starting trouble/difficulty ......................................................................................... 218
(II) Poor idle speed performance ................................................................................ 219
(III) Poor middle and high speed performance ............................................................... 219
(IV) Shifting trouble .................................................................................................... 219
(V) Clutch slips ............................................................................................................. 220
(VI) Clutch is locked ...................................................................................................... 220
(VII) Engine is overheat ................................................................................................. 220
(VIII) Brake trouble ..................................................................................................... 220
(IX) Shock absorber failure/improper operation ........................................................ 220
(X) Lighting system ..................................................................................................... 221
Chapter I General description

Section 1 Description

1. Front wheel
2. Headlight
3. Steering lever
4. Shift pedal
5. Fuel cock
6. Hand-operated lever
7. Air chock
8. Tail light
9. Rear wheel
10. Rear luggage carrier
11. Exhaust silencer
12. Cushion
13. Fuel tank cover
14. Rear brake pedal
15. Front luggage carrier
16. Left lever of rear brake
17. Fixing clamp of rear brake
18. Main switch lock
19. Throttle grip
20. Right lever of front brake
21. Left switch unit

Caution:
The ATV you purchased may slightly differ from the pictures in the manual due to improvement or other change.
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 toal for crank, mainly used for assembling crank and balancing gear.
13. Assembling and disassembling joint for universal coupling, mainly used for assembling and dismsembling 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 gasoline (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 tube of engine of frame.

**Engine N0.**

It is engraved on the lug of top middle part of right crankcases of engine.

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

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.

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.
Section 5 Specification

(I) 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 converted 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>Torque</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m.kg</td>
<td>7.233</td>
<td>ft.lb</td>
</tr>
<tr>
<td>kg</td>
<td>86.794</td>
<td>in.lb</td>
</tr>
<tr>
<td>cm.kg</td>
<td>0.0723</td>
<td>ft.lb</td>
</tr>
<tr>
<td>g</td>
<td>0.8679</td>
<td>in.lb</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></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>Length</td>
<td></td>
<td></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>Volume/capacity</td>
<td></td>
<td></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>Others</td>
<td></td>
<td></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>9.5(1°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 meter/second</td>
<td>Force</td>
</tr>
<tr>
<td>Nm</td>
<td>Newton meter</td>
<td>Newton meter²</td>
<td>Torque</td>
</tr>
<tr>
<td>m.kg</td>
<td>Meter kilogram</td>
<td>Meter 1 kilo</td>
<td>Torque</td>
</tr>
<tr>
<td>Pa</td>
<td>Pascal</td>
<td>Newton per millimeter</td>
<td>Pressure</td>
</tr>
<tr>
<td>N/mm</td>
<td>Newton per millimeter²</td>
<td>Newton per centimeter</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>Dimension:</th>
<th>Specification</th>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>1940mm</td>
<td>Shifting type</td>
<td>1st speed 24/12(2.833)</td>
</tr>
<tr>
<td>Overall width</td>
<td>1030mm</td>
<td>2nd speed 24/18(1.789)</td>
<td></td>
</tr>
<tr>
<td>Overall height</td>
<td>1750mm</td>
<td>3rd speed 29/23(1.211)</td>
<td></td>
</tr>
<tr>
<td>Height of cushion</td>
<td>810mm</td>
<td>4th speed 26.25/1.040</td>
<td></td>
</tr>
<tr>
<td>Axle base</td>
<td>1150mm</td>
<td>5th speed 23.28(0.821)</td>
<td></td>
</tr>
<tr>
<td>Front wheel distance</td>
<td>2795mm</td>
<td>Reverse gear 7/248, 4/169(4.144)</td>
<td></td>
</tr>
<tr>
<td>Rear wheel distance</td>
<td>770mm</td>
<td>Frame</td>
<td>Cast steel tube</td>
</tr>
<tr>
<td>Min. ground clearance</td>
<td>155mm</td>
<td>Center angle</td>
<td>13°</td>
</tr>
<tr>
<td>Min. turning radius</td>
<td>2800mm</td>
<td>Tire width</td>
<td>6.55mm</td>
</tr>
</tbody>
</table>

**Basic weight:**
- Engine oil (with full tank) 230kg
- Engine: Single-cylinder, twin-crank, rear axle
- Displacement: 228.6cc
- Cylinder bore/stroke: 71.8x58mm
- Compression ratio: 9.7:1
- Starting system: Electric starter, hand-started
- Lubrication system: Pressure splash
- Engine oil: SAE 10W-40, SAE 10W-30
- Ignition: Electronic, electronic ignition model S280 or above model
- Fuel: unleaded
- Oil filter: 1.8L
- Air filter: 1.8L
- Overall capacity: 1.8L

**Oil capacity of gearbox:**
- 0.27L
- Model: SAE 80A/80-X, 80-S standard double curved face
- Capacity of main fuel tank: 17L, Non-lead gasoline No.91
- Capacity of rectangular fuel tank: 1.8L

**Carburetor:**
- Type: Vacuum film type
- Type of spark plug: DRTC
- Clearance of spark plug: 0.6-0.7mm
- Type of carburetor: Wet automatic centrifugal type

**Coolant:**
- Primary coolant system: Gear drive
- Reduction ratio: 73/62(5.18)
- Secondary coolant system: Axle drive
- Reduction ratio: 79/61x48/11(4.414)
- Output type: Normal; 2A = 2A (output of 12V)
- Operation: 12V, 50W, 4W, 12W

**Brake:**
- Type of front brakes: Drum brake, dual-disc, closed type
- Operation type: Right-hand operation to brake
- Type of rear brakes: Drum brake, dual-disc, closed type
- Operation type: Left-hand and right-hand to brake
- Front suspension: Independent suspension device
- Rear suspension: Beam trailing shock absorbing type

**Electric system:**
- Ignition system: C·D·I
- Magneto system: AC magneto
- Battery/capacity: Free of maintenance, 12N14-5B/5/12V, 14AH
- Headlight: 12V, 10W, 6W, 12W
- Taillight: 12V, 10W, 12W
- Neutral indicator: 12V, 3W
- Reverse indicator: 12V, 3W
- High beam indicator: 12V, 3W
### III. ATV body

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering system</td>
<td>Powder metallurgy sliding bearing</td>
<td></td>
</tr>
<tr>
<td>Type of steering bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel</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 23  ; Á7-10</td>
<td></td>
</tr>
<tr>
<td>Size of rim</td>
<td>AT 10  ; Á5.5</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>Front brake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Drum type</td>
<td></td>
</tr>
<tr>
<td>Inside diameter of brake drum</td>
<td>160mm</td>
<td>161mm</td>
</tr>
<tr>
<td>Thickness of friction piece</td>
<td>4.0mm</td>
<td>2.0mm</td>
</tr>
<tr>
<td>Free length of back spring of brake shoe</td>
<td>71.0mm</td>
<td></td>
</tr>
<tr>
<td>Rear wheel</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 22  ; Á10-10</td>
<td></td>
</tr>
<tr>
<td>Size of rim</td>
<td>AT 10  ; Á8.0</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>Rear brake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Drum type</td>
<td></td>
</tr>
<tr>
<td>Outside diameter of brake drum</td>
<td>160mm</td>
<td>161mm</td>
</tr>
<tr>
<td>Thickness of friction piece</td>
<td>4.0mm</td>
<td>2.0mm</td>
</tr>
<tr>
<td>Free length of back spring of brake shoe</td>
<td>71.0mm</td>
<td></td>
</tr>
<tr>
<td>Brake lever and brake pedal</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 rear brake pedal</td>
<td>20-30mm</td>
<td></td>
</tr>
<tr>
<td>Free play of throttle grip</td>
<td>3-5mm</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>Front suspension system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elastic coefficient of spring K1</td>
<td>10N/mm/0-117mm</td>
<td></td>
</tr>
<tr>
<td>Free length of suspending spring</td>
<td>293mm</td>
<td></td>
</tr>
<tr>
<td>Stoke of shock absorber</td>
<td>117mm</td>
<td></td>
</tr>
<tr>
<td>Pre-tension force of spring is adjustable or not</td>
<td>Can’t adjustable</td>
<td></td>
</tr>
<tr>
<td><strong>Rear suspension system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elastic coefficient K2</td>
<td>49N/mm/0-85mm</td>
<td></td>
</tr>
<tr>
<td>Free length of suspending spring</td>
<td>263mm</td>
<td></td>
</tr>
<tr>
<td>Assembling length</td>
<td>244mm</td>
<td></td>
</tr>
<tr>
<td>Stroke of shock absorber</td>
<td>85mm</td>
<td></td>
</tr>
<tr>
<td>Pre-tension force of spring is adjustable or not</td>
<td>Adjustable</td>
<td></td>
</tr>
<tr>
<td><strong>Rear wheel fork</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembling free play (left-end)</td>
<td></td>
<td>1.0mm</td>
</tr>
<tr>
<td>Assembling free play (right-end)</td>
<td></td>
<td>1.0mm</td>
</tr>
</tbody>
</table>

**IV. Electric system**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spark plug</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>D7RTC</td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>10Ω</td>
<td></td>
</tr>
<tr>
<td>Clearance of spark plug</td>
<td>0.6-0.7mm</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition coil</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance of primary coil</td>
<td>At 20°C (68°F), 0.5-1.5Ω</td>
<td></td>
</tr>
<tr>
<td>Resistance of secondary coil</td>
<td>At 20°C (68°F), 4.6-7.6Ω</td>
<td></td>
</tr>
<tr>
<td>Clearance of min. spark</td>
<td>6mm (0.24in)</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition timing (Before upper stop point)</td>
<td>10/2300r/min</td>
<td></td>
</tr>
<tr>
<td>Advancing angle of ignition (Before upper stop point)</td>
<td>30/4300r/min</td>
<td></td>
</tr>
<tr>
<td>Type of ignition advance</td>
<td>Electric type</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Magneto</td>
<td>Resistance of induction coil/colour At 20¡ã(68°F),189-231¡ã , Blue black</td>
<td></td>
</tr>
<tr>
<td>Magneto</td>
<td>Resistance of source coil /colour At 20¡ã(68°F),470-530¡ã , Yellow/green-red</td>
<td></td>
</tr>
<tr>
<td>Magneto</td>
<td>Type of C.D.I Electric capacity contactless type</td>
<td></td>
</tr>
<tr>
<td>Rectifier</td>
<td>No-loading adjusting volatage 14.1-14.9V</td>
<td></td>
</tr>
<tr>
<td>Rectifier</td>
<td>Voltage-resisting value 200V</td>
<td></td>
</tr>
<tr>
<td>Charging system</td>
<td>Type A.C magneto</td>
<td></td>
</tr>
<tr>
<td>Charging system</td>
<td>Rated output voltage At 2000r/min 14-15V</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>Coil resistance/colour At 20¡ã(68°F),1.0-1.2¡ã , White-white</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>Specific gravity 1.28</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>Type/capacity 12N14-BS/12V,14Ah</td>
<td></td>
</tr>
<tr>
<td>Broken circuit of circuit system</td>
<td>Type Fuse</td>
<td></td>
</tr>
<tr>
<td>Broken circuit of circuit system</td>
<td>Main fuse 20A</td>
<td></td>
</tr>
<tr>
<td>Broken circuit of circuit system</td>
<td>Resaved fuse 20A</td>
<td></td>
</tr>
<tr>
<td>Belay of cut-off current</td>
<td>Coil resistance At 20¡ã(68°F),72-88¡ã ,</td>
<td></td>
</tr>
<tr>
<td>Belay of cut-off current</td>
<td>Diode Yes</td>
<td></td>
</tr>
<tr>
<td>Electric starting system</td>
<td>Type Constant mesh type</td>
<td></td>
</tr>
<tr>
<td>Electric starting system</td>
<td>Starting motor Output power 0.35KW</td>
<td></td>
</tr>
<tr>
<td>Electric starting system</td>
<td>Resistance of armature coils At 20¡ã(68°F),0.004-0.005¡ã ,</td>
<td></td>
</tr>
<tr>
<td>Electric starting system</td>
<td>Starting relay Ampere 100A</td>
<td></td>
</tr>
<tr>
<td>Electric starting system</td>
<td>Coils resistance At 20¡ã(68°F),4.8-5.3¡ã ,</td>
<td></td>
</tr>
</tbody>
</table>
V. Maintenance specification of engine

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clutch</td>
<td>0.1~0.2mm</td>
<td>0.1~0.2mm</td>
</tr>
<tr>
<td>Making clearance of clutch plate (sleeve)</td>
<td>0.1~0.25mm</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>Rotor type, pressure splash type lubrication</td>
<td></td>
</tr>
<tr>
<td>Clearance of side</td>
<td>0.04~0.09mm</td>
<td>0.05mm</td>
</tr>
<tr>
<td>End face clearance A° or B°</td>
<td>0.15mm</td>
<td>0.20mm</td>
</tr>
<tr>
<td>Release pressure of safety valve</td>
<td>80~120kPa</td>
<td></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 surface of cylinder is 40mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylinder head</td>
<td>Measure the surface wear of every piston on the lower surface of cylinder head with rule.</td>
<td>0.10mm</td>
</tr>
<tr>
<td>Flatness of lower endface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing chain</td>
<td>Roller chain</td>
<td></td>
</tr>
<tr>
<td>Type of timing chain</td>
<td></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 (Left)</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>&quot;B&quot;</td>
<td>30.252~30.352mm</td>
<td>30.152</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>6.572~6.692mm</td>
<td>6.619mm</td>
</tr>
<tr>
<td>Intake：“A”</td>
<td>36.537~36.637mm</td>
<td>36.437mm</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>30.131~30.231mm</td>
<td>30.081mm</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>6.527~6.667mm</td>
<td>6.622mm</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>Wire length / Outside diameter</td>
<td>38.5mm</td>
<td></td>
</tr>
<tr>
<td>Inside diameter of valve spring seat</td>
<td>30.5mm</td>
<td></td>
</tr>
<tr>
<td>Setting length when valve is closed / Length</td>
<td>28.4~190.0N</td>
<td></td>
</tr>
<tr>
<td>Compressing pressure when assembling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locking device of spring</td>
<td>Counterclockwise</td>
<td></td>
</tr>
<tr>
<td>Tensioner of gings at drive side / Release side</td>
<td>2.5°/1.6mm</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>Valve length: intake/exhaust</td>
<td>37.2mm</td>
<td>0.5mm</td>
</tr>
<tr>
<td>Setting length when valve is closed</td>
<td>32.0mm</td>
<td></td>
</tr>
<tr>
<td>Compressing pressure when assembling intake/exhaust</td>
<td>162.8-200.1N</td>
<td></td>
</tr>
<tr>
<td>Limit value of clearance between intake/exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twist direction of spring (top view intake/exhaust)</td>
<td>Clockwise</td>
<td></td>
</tr>
<tr>
<td>Valve/vane seat valve guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve clearance (it’s valid) intake/exhaust</td>
<td>0.05-0.09mm</td>
<td>0.11-0.15mm</td>
</tr>
<tr>
<td>Size of valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;A&quot; diameter of valve head</td>
<td>28.1-28.6mm</td>
<td>1.6mm</td>
</tr>
<tr>
<td>&quot;B&quot; width of valve face</td>
<td>33.9-34.1mm</td>
<td></td>
</tr>
<tr>
<td>&quot;C&quot; width of valve seat</td>
<td>1.7-2.8mm</td>
<td></td>
</tr>
<tr>
<td>&quot;D&quot; limit thickness of valve seat</td>
<td>0.9-1.1mm</td>
<td></td>
</tr>
<tr>
<td>Outside diameter of valve stem intake</td>
<td>0.8-1.2mm</td>
<td></td>
</tr>
<tr>
<td>Inside diameter of valve guide intake</td>
<td>5.965-5.975mm</td>
<td>1.6mm</td>
</tr>
<tr>
<td>Clearance between valve stem and guide (intake)</td>
<td>0.025-0.032mm</td>
<td>0.10mm</td>
</tr>
<tr>
<td>Roundness of valve stem</td>
<td>0.010-0.037mm</td>
<td>0.13mm</td>
</tr>
</tbody>
</table>

Primary ring
First ring

<table>
<thead>
<tr>
<th>Type</th>
<th>Bucked-shaped back ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (BxT)</td>
<td>1.2x2.8mm</td>
</tr>
<tr>
<td>Clearance of surface (on assembling)</td>
<td>0.15-0.18mm</td>
</tr>
<tr>
<td>Clearance of side (in assembling)</td>
<td>0.05-0.07mm</td>
</tr>
</tbody>
</table>

Second ring

<table>
<thead>
<tr>
<th>Type</th>
<th>Flat type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (BxT)</td>
<td>1.2x2.8mm</td>
</tr>
<tr>
<td>Clearance of endface (in assembling)</td>
<td>0.15-0.20mm</td>
</tr>
<tr>
<td>Clearance of side (in assembling)</td>
<td>0.02-0.06mm</td>
</tr>
</tbody>
</table>

Oil ring

<p>| Size (BxT)                 | 2.5x2.8mm               |
| Clearance of endface (in assembling) | 0.2-0.5mm   |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston</td>
<td><img src="image" alt="Piston Diagram" /></td>
<td>70.00–70.97mm</td>
</tr>
<tr>
<td>Piston size “D”</td>
<td></td>
<td>0.5mm</td>
</tr>
<tr>
<td>Resting point “H”</td>
<td></td>
<td>0.61–0.66</td>
</tr>
<tr>
<td>Piston offset</td>
<td></td>
<td>0.18mm</td>
</tr>
<tr>
<td>Direction of piston offset</td>
<td></td>
<td>0.01–0.05</td>
</tr>
<tr>
<td>Clearance between piston and cylinder</td>
<td></td>
<td>15.99–16.000mm</td>
</tr>
<tr>
<td>Outside diameter of piston pin</td>
<td></td>
<td>16.002–16.013mm</td>
</tr>
<tr>
<td>Inside diameter of pin hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving method of balancing block</td>
<td>Gear driving</td>
<td></td>
</tr>
</tbody>
</table>

**Connecting rod of crank**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit value of radius L1</td>
<td></td>
<td>0.05mm</td>
</tr>
<tr>
<td>Width of crank “A”</td>
<td></td>
<td>0.06mm</td>
</tr>
<tr>
<td>Small end free play of connecting rod “B”</td>
<td></td>
<td>0.8–1.0mm</td>
</tr>
<tr>
<td>Big end free play of connecting rod “C”</td>
<td></td>
<td>0.85–0.95mm</td>
</tr>
<tr>
<td>Big end initial clearance of connecting rod “C”</td>
<td></td>
<td>0.910–0.925mm</td>
</tr>
<tr>
<td>Automatic centrifugal clutch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clutch shoe quantity</td>
<td>3 pieces</td>
<td></td>
</tr>
<tr>
<td>Clutch shoe thickness</td>
<td>2.8mm</td>
<td></td>
</tr>
<tr>
<td>Clutch meshing revolution</td>
<td>18000–21000rpm</td>
<td></td>
</tr>
<tr>
<td>Clutch stalled revolution</td>
<td>32000–3600rpm</td>
<td></td>
</tr>
<tr>
<td>Free length of back spring of brake shoe</td>
<td>40.40mm</td>
<td></td>
</tr>
<tr>
<td>Clutch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action method of clutch</td>
<td>Outside pushing type</td>
<td></td>
</tr>
<tr>
<td>Clutch piece quantity</td>
<td>4 pieces</td>
<td></td>
</tr>
<tr>
<td>Clutch piece thickness</td>
<td>1.45–1.75mm</td>
<td></td>
</tr>
<tr>
<td>Friction piece quantity</td>
<td>5 pieces</td>
<td></td>
</tr>
<tr>
<td>Friction piece thickness</td>
<td>2.94–3.00mm</td>
<td></td>
</tr>
<tr>
<td>Spring of clutch: quantity</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Spring of clutch: length</td>
<td>35.1mm</td>
<td></td>
</tr>
<tr>
<td>Shifting mechanism</td>
<td>Shift gear drum and fork</td>
<td></td>
</tr>
<tr>
<td>Shifting method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing limit of fork guide</td>
<td>0.8mm</td>
<td></td>
</tr>
</tbody>
</table>

**Transmission device**

| Offset limit of splines | | |
| Offset limit of transmission output shaft | | 0.08mm |
| | | 0.08mm |
Section 6 Wiring diagram of ATV

1. Technical explanation

- **A** Main switch wire, indicator wire, mileage meter wire (mounting digital mileage meter) must be put through the guide grip of holding seat of steering bar. (see fig.1)

- **B** Rear brake vent-pipe, carburetor vent-pipe and vent-pipe of rear driving gearbox must be inserted into the hole of supporting pad of vent-pipe. (see fig.1, also see view D)

- **C** Neutral and reverse switch wire, mileage meter wire (mounting with digital mileage meter) should be fixed with bands here. (see fig.1)

- **D** After putting overflowing pipe of carburetor through two rear fixing part of engine (on the frame), then put it in the proper position between engine and rear arm. Note: Overflowing pipe be unblocked. (see fig.1)

- **S** After putting rear brake cable, throttle cable, wire of starting motor and mileage meter (mounting with digital mileage meter) must be put through the hole of plastic grip in the fuel tank support of frame. (see view B-B)

- **P** In this position, starting motor wire and mileage meter wire (mounting with digital mileage meter) must be put through the hole of plastic grip in the fuel tank support of frame. (see view B-B)

- **R** In here, rear brake cable, rear brake vent-pipe and mileage wire (mounting with digital mileage meter) must be put through the cable guide frame welded on the frame. (see fig. B-B)

- **Q** In here, wire of reverse switch neutral switch, and mileage meter (mounting with digital mileage meter) must be fixed with bands. (see fig. B-B)

- **T** When assembling the wire of ser. No. 14 and No. 15 don’t need to put through the guide clip of holding seat of steering bar. (see fig. E-E)

- **W** After putting the vent-pipe of tank through the hole of main switch, lead it to the lower of right side of steering bar, then put it through the wire hook on the frame.

  Note: Hose must be unblocked. (see fig. E-E)

- **V** The leading wire on the switch units of steering bar, must be bound with band. (see fig. G-G)

- **E** After the vent-pipe of front brake is put through plastic clip hole on the frame, surplus portion should be put in the proper position of frame. (see fig. 2)

- **G** After the vent-pipe of battery is checked and no twist is found here, then insert it in the presetting hole of rear fedner. (If free of maintenance battery is used, then this item of requirement doesn’t need.) (see fig. 3)

- **H** Wire of rear brake cable, rear brake vent-pipe and mileage meter (mounting with digital mileage meter) should be put through the cable frame welded on the frame. (see fig. 3)

- **F** In here, wire of starting motor must be first put through the plastic clip on the frame, then connect with the matching units. (see fig. 3)

- **L** Vent-pipe of battery should be put through the plastic clip fixed on the frame. (If free of maintenance battery is used, then this item of requirement doesn’t need.)

- **K** In here, wire of throttle cable, rear brake cable and mileage meter (mounting with digital mileage meter) should be put through the cable guide frame welded on the frame. (Throttle cable
should be mounted on the inner side of guide frame direction).(see fig.4)

Insert the starting relay into the inserter preset by the rear fender, the direction should be ensured the convenience of inserting.(see fig.4)

After putting the vent pipe of battery through the plastic clip mounted on the rear fender, insert it into the hole preset by the rear fender, (Combine with  G)(see fig.4)(If free of maintenance battery is used. then this item of requirement doesn’t need).

When assembling, mounting supporting pad of vent-pipe shouldn’t be leaked, and pay attention to let the direction of mark upward. (see view D )

In here, the wire of taillight must be put through the slot hole preset by tool kit from the bottom of tool kit.(see view F)

2. Technical requirement

- In the drawing, the wiring condition and position for all kinds of wires on the ATV body is marked. When assembling the finished ATV, wiring should be done as per the drawing in principle.

- For the wiring and fixing method which can’t be marked in the drawing, necessary technical explanation has been made, you should abide to execute in assembling.

- For the place of using plastic clip stipulated in the drawing, if can’t be used temporarily, you can use band to fix it.

- The dimension in the drawing is only used for reference in operation, while not be used as checking data. In the details of marking the code No. of component, the self-carrying component (wire etc.) of units only be marked with name.

3. Details of relative component

<table>
<thead>
<tr>
<th>Ser.No.</th>
<th>Code</th>
<th>Name</th>
<th>Q’ty</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>SSA0-000512-0</td>
<td>Wire clip 4</td>
<td>3</td>
</tr>
<tr>
<td>32</td>
<td>SSA0-000511-0</td>
<td>Wire clip 3</td>
<td>2</td>
</tr>
<tr>
<td>31</td>
<td>SSA0-000510-0</td>
<td>Wire clip 2</td>
<td>3</td>
</tr>
<tr>
<td>30</td>
<td>SSA0-000509-0</td>
<td>Wire clip 1</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>150.00-0.39</td>
<td>Cable band</td>
<td>6</td>
</tr>
<tr>
<td>28</td>
<td>150.00-03</td>
<td>band of steering bar</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>C.D.I magneto wire</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>150.00-06</td>
<td>Vent-pipe of carburetor</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>FG-802000-0</td>
<td>Cut-off relay</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>SSA5-320000-0</td>
<td>Starting relay</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>SSA0-000516-0</td>
<td>Cable</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Ven-pipe of rear brake</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>Wire of starting motor</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>High voltage coils and wire</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>SSA0-000515-0</td>
<td>Vent-pipe of battery</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>SSA4-230000-0</td>
<td>Vent-pipe of front</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Wire of headlight</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>SSA4-230000-0</td>
<td>Rear brake cable</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Wire of handle bar switch</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Wire of clutch wire</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>SSA4-210000-0</td>
<td>Throttle cable</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>SSA4-220000-0</td>
<td>Front brake cable units</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Wire of mileage meter</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Wire of neutral switch</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Wire of reverse witch</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Overflow hose of carburetor</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>SSA0-000517-0</td>
<td>Vent-pipe of garbox</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>SSA4-630000-0</td>
<td>Taillight unit</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>FG-803000-0</td>
<td>C.D.I</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>FG-805000-0</td>
<td>Rectifier</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Vent-pipe of gearbox</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>SSA5-510000-0</td>
<td>Main switch lock</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>SSA0-012000-0</td>
<td>Wire clip unit</td>
<td>1</td>
</tr>
</tbody>
</table>

Name

SSA0-000512-0: Wire clip 4
SSA0-000511-0: Wire clip 3
SSA0-000510-0: Wire clip 2
SSA0-000509-0: Wire clip 1
150.00-0.39: Cable band
150.00-03: Band of steering bar
C.D.I magneto wire
150.00-06: Vent-pipe of carburetor
FG-802000-0: Cut-off relay
SSA5-320000-0: Starting relay
SSA0-000516-0: Cable
Ven-pipe of rear brake
Wire of starting motor
High voltage coils and wire
Vent-pipe of battery
Vent-pipe of front
Wire of headlight
Rear brake cable
Wire of handle bar switch
Wire of clutch wire
Throttle cable
Front brake cable units
Wire of mileage meter
Wire of neutral switch
Wire of reverse witch
Overflow hose of carburetor
Vent-pipe of garbox
Taillight unit
C.D.I
Rectifier
Vent-pipe of gearbox
Main switch lock
Wire clip unit

Q’ty

-17-
(II) Wiring diagram(1)

Fig. 1

Fig. 2
(III) Wiring diagram (2)

Fig. 3

Fig. 4

View F
Section 7 Requirements for torque of fastener

(I) ATV body

<table>
<thead>
<tr>
<th>Locking component and location of ATV body</th>
<th>Name of component</th>
<th>Size of thread</th>
<th>Q'ty</th>
<th>Tightening torque of fastener of ATV body</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel rim and front brake hub</td>
<td>Nut</td>
<td>M10 ( \times ) 1.25</td>
<td>8</td>
<td>55 ( \pm ) 5.5 ( \pm ) 40</td>
<td></td>
</tr>
<tr>
<td>Front brake hub and steering vertical post units</td>
<td>Nut</td>
<td>M12 ( \times ) 1.25</td>
<td>2</td>
<td>25 ( \pm ) 2.5 ( \pm ) 18</td>
<td></td>
</tr>
<tr>
<td>Front brake cam arm and cam shaft</td>
<td>Nut</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>9 ( \pm ) 0.9 ( \pm ) 6.5</td>
<td></td>
</tr>
<tr>
<td>Front brake and front shock absorber</td>
<td>Bolt</td>
<td>M12 ( \times ) 1.5</td>
<td>4</td>
<td>78 ( \pm ) 7.8 ( \pm ) 56</td>
<td></td>
</tr>
<tr>
<td>Front shock absorber and frame</td>
<td>Nut</td>
<td>M35 ( \times ) 1.5</td>
<td>2</td>
<td>55 ( \pm ) 5.5 ( \pm ) 40</td>
<td></td>
</tr>
<tr>
<td>Steering vertical post and pulling rod</td>
<td>Nut</td>
<td>M12 ( \times ) 1.25</td>
<td>2</td>
<td>25 ( \pm ) 2.5 ( \pm ) 18</td>
<td></td>
</tr>
<tr>
<td>pulling rod and nut</td>
<td>Nut</td>
<td>M12 ( \times ) 1.25</td>
<td>4</td>
<td>30 ( \pm ) 3 ( \pm ) 22</td>
<td></td>
</tr>
<tr>
<td>Steering vertical post and pulling rod</td>
<td>Nut</td>
<td>M12 ( \times ) 1.25</td>
<td>2</td>
<td>25 ( \pm ) 2.5 ( \pm ) 18</td>
<td></td>
</tr>
<tr>
<td>Steering vertical post(lower) and frame</td>
<td>Nut</td>
<td>M10</td>
<td>1</td>
<td>30 ( \pm ) 3 ( \pm ) 22</td>
<td></td>
</tr>
<tr>
<td>Holding seat of steering vertical post and frame</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>2</td>
<td>23 ( \pm ) 2.3 ( \pm ) 17</td>
<td></td>
</tr>
<tr>
<td>Steering vertical post and upper &amp; lower holding seat of steerig bar</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>4</td>
<td>20 ( \pm ) 2 ( \pm ) 14</td>
<td></td>
</tr>
<tr>
<td>Front wheel fork and frame</td>
<td>Bolt</td>
<td>M10 ( \times ) 1.5</td>
<td>4</td>
<td>45 ( \pm ) 4.5 ( \pm ) 32</td>
<td></td>
</tr>
<tr>
<td>Front wheel fork and brake</td>
<td>Nut</td>
<td>M12 ( \times ) 1.25</td>
<td>2</td>
<td>25 ( \pm ) 2.5 ( \pm ) 18</td>
<td></td>
</tr>
<tr>
<td>Engine upper connection plate unit and frame(upper)</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>2</td>
<td>33 ( \pm ) 3.3 ( \pm ) 24</td>
<td></td>
</tr>
<tr>
<td>Engine assy and engine upper connecting plate unit</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>1</td>
<td>33 ( \pm ) 3.3 ( \pm ) 24</td>
<td></td>
</tr>
<tr>
<td>Engine assy and frame(front)</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>1</td>
<td>48 ( \pm ) 4.8 ( \pm ) 35</td>
<td></td>
</tr>
<tr>
<td>Engine assy and frame(rear upper)</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>1</td>
<td>33 ( \pm ) 3.3 ( \pm ) 24</td>
<td></td>
</tr>
<tr>
<td>Engine assy and frame(rear lower)</td>
<td>Bolt</td>
<td>M6 ( \times ) 1.5</td>
<td>1</td>
<td>33 ( \pm ) 3.3 ( \pm ) 24</td>
<td></td>
</tr>
<tr>
<td>Front fender and frame</td>
<td>Bolt</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>7 ( \pm ) 0.7 ( \pm ) 5.1</td>
<td></td>
</tr>
<tr>
<td>Front fender flap and front fender supporting rod</td>
<td>Screw</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>7 ( \pm ) 0.7 ( \pm ) 5.1</td>
<td></td>
</tr>
<tr>
<td>Bumper and frame</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>4</td>
<td>11 ( \pm ) 1.1 ( \pm ) 8</td>
<td></td>
</tr>
<tr>
<td>Front luggage carrier and bumper</td>
<td>Bolt</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>11 ( \pm ) 1.1 ( \pm ) 8</td>
<td></td>
</tr>
<tr>
<td>Front luggage carrier and frame</td>
<td>Bolt</td>
<td>M8 ( \times ) 1.5</td>
<td>2</td>
<td>34 ( \pm ) 3.4 ( \pm ) 25</td>
<td></td>
</tr>
<tr>
<td>Front fender and front luggage carrier</td>
<td>Bolt</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>7 ( \pm ) 0.7 ( \pm ) 5.1</td>
<td></td>
</tr>
<tr>
<td>Rear fender and frame</td>
<td>Bolt</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>7 ( \pm ) 0.7 ( \pm ) 5.1</td>
<td></td>
</tr>
<tr>
<td>Rear luggage carrier and frame</td>
<td>Nut</td>
<td>M6 ( \times ) 1.5</td>
<td>2</td>
<td>7 ( \pm ) 0.7 ( \pm ) 5.1</td>
<td></td>
</tr>
<tr>
<td>Locking component and location of ATV body</td>
<td>Name of component</td>
<td>Size of thread</td>
<td>Q’ty</td>
<td>Tightening torque of fastener of ATV body</td>
<td>Remark</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-------------------</td>
<td>---------------</td>
<td>------</td>
<td>----------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>Bolt</td>
<td>M8  x  16</td>
<td>2</td>
<td>34  3.4  25</td>
<td></td>
</tr>
<tr>
<td>Rear fender and rear luggage carrier</td>
<td>Bolt</td>
<td>M6  x  20</td>
<td>2</td>
<td>7   0.7  5.1</td>
<td></td>
</tr>
<tr>
<td>Left&amp;right foot rest and frame</td>
<td>Bolt</td>
<td>M10  x  22</td>
<td>4</td>
<td>65  6.5  47</td>
<td></td>
</tr>
<tr>
<td>Left&amp;right foot rest and frame</td>
<td>Bolt</td>
<td>M8  x  16</td>
<td>2</td>
<td>30  3   22</td>
<td></td>
</tr>
<tr>
<td>Supporting weldment in foot rest and bracket weldment</td>
<td>Bolt</td>
<td>M8  x  16</td>
<td>4</td>
<td>30  3  22</td>
<td></td>
</tr>
<tr>
<td>Rear rim and hub</td>
<td>Nut</td>
<td>M10  x  1.25</td>
<td>8</td>
<td>55  5.5  40</td>
<td></td>
</tr>
<tr>
<td>Rear wheel axle and nut</td>
<td>Nut</td>
<td>M16</td>
<td>2</td>
<td>150 15  110</td>
<td></td>
</tr>
<tr>
<td>Rear brake cam arm and cam shaft</td>
<td>Nut</td>
<td>M6  x  30</td>
<td>1</td>
<td>9   0.9  6.5</td>
<td></td>
</tr>
<tr>
<td>Rear brake shoe and rear axle housing</td>
<td>Bolt</td>
<td>M8  x  1.25</td>
<td>4</td>
<td>28  2.8  20</td>
<td></td>
</tr>
<tr>
<td>Rear wheel fork and frame(left)</td>
<td>Bolt</td>
<td>M22  x  1.25</td>
<td>1</td>
<td>130 13  94</td>
<td></td>
</tr>
<tr>
<td>Rear wheel fork and frame(right)</td>
<td>Bolt</td>
<td>M22  x  1.5</td>
<td>1</td>
<td>6   0.6  4.3</td>
<td></td>
</tr>
<tr>
<td>Rear arm shaft and nut(right)</td>
<td>Nut</td>
<td>M22  x  1.5</td>
<td>1</td>
<td>130 13  94</td>
<td></td>
</tr>
<tr>
<td>Rear wheel fork unit and rear driving gearbox units</td>
<td>Nut</td>
<td>M22  x  1.5</td>
<td>4</td>
<td>55  5.5  40</td>
<td></td>
</tr>
<tr>
<td>Rear wheel axle bushing and driving gearbox units</td>
<td>Bolt</td>
<td>M12  x  1.25  x  1.25</td>
<td>4</td>
<td>55  5.5  40</td>
<td></td>
</tr>
<tr>
<td>Rear shock absorber(upper)and frame</td>
<td>Bolt</td>
<td>M12  x  1.75</td>
<td>1</td>
<td>50  5   36</td>
<td></td>
</tr>
<tr>
<td>Lower cover of gearbox</td>
<td>Bolt</td>
<td>M8  x  12</td>
<td>2</td>
<td>17  1.7  12</td>
<td></td>
</tr>
<tr>
<td>Rear wheel axle bushing and rear wheel fork init</td>
<td>Bolt</td>
<td>M12  x  1.25 x  1.25</td>
<td>4</td>
<td>103 10.3  74</td>
<td></td>
</tr>
<tr>
<td>Fuel tank and frame</td>
<td>Bolt</td>
<td>M8  x  35</td>
<td>2</td>
<td>10  1   7.2</td>
<td></td>
</tr>
<tr>
<td>Oil draining bolt of rear driving gearbox</td>
<td>Bolt</td>
<td>M12  x  1.25</td>
<td>1</td>
<td>23  2.3  17</td>
<td></td>
</tr>
<tr>
<td>Oiling bolt of rear driving gearbox</td>
<td>Bolt</td>
<td>M12  x  1.25</td>
<td>1</td>
<td>23  2.3  17</td>
<td></td>
</tr>
</tbody>
</table>
(II) Engine

<table>
<thead>
<tr>
<th>Torque value of fastener</th>
<th>Locking component and location of ATV body</th>
<th>Name of component</th>
<th>Size of thread</th>
<th>Q’ty</th>
<th>Tightening torque of fastener of ATV body</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observeing screw hole of cylinder head</td>
<td>Cap shaped nut</td>
<td>M6</td>
<td>1</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cylinder head</td>
<td>Flange bolt</td>
<td>M8</td>
<td>4</td>
<td>22 2.2 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cylinder head and cylinder</td>
<td>Bolt</td>
<td>M8</td>
<td>2</td>
<td>22 2.2 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sprocket cover</td>
<td>Screw</td>
<td>M6</td>
<td>2</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Valve cover</td>
<td>Bolt</td>
<td>M6</td>
<td>5</td>
<td>10 1 7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bearing stop plate of camshaft</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>8 0.8 5.8</td>
<td>Apply oil to washer</td>
</tr>
<tr>
<td></td>
<td>Spark plug</td>
<td>Nut</td>
<td>M12</td>
<td>1</td>
<td>17.5 1.75 12.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cylinder</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>10 1 7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Balancing shaft gear</td>
<td>Nut</td>
<td>M14 ;Á1.0</td>
<td>1</td>
<td>50 5 36</td>
<td>Apply oil to washer</td>
</tr>
<tr>
<td></td>
<td>Starting ratchet disc</td>
<td>Bolt</td>
<td>M10 ;Á1.25</td>
<td>1</td>
<td>50 5 36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locking nut(adjusting screw of valve clearance)</td>
<td>Nut</td>
<td>M6</td>
<td>2</td>
<td>14 1.4 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cam timing sprocket</td>
<td>Bolt</td>
<td>M10</td>
<td>1</td>
<td>60 6 43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chain tensioner</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>10 1 7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chain tensioner cover</td>
<td>Bolt</td>
<td>M6</td>
<td>1</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper guide plate of chain</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>8 0.8 5.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oil pump</td>
<td>Screw</td>
<td>M6</td>
<td>3</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oil draining screw plug</td>
<td>Plug</td>
<td>M35</td>
<td>1</td>
<td>43 4.3 31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine filter cover of engine oil(drainingoil)</td>
<td>Bolt</td>
<td>M6</td>
<td>1</td>
<td>10 1 7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fine filter cover of engine oil</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>10 1 7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carburetor seat and cylinder head</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>12 1.2 8.7</td>
<td>Twist with cable guide part</td>
</tr>
<tr>
<td></td>
<td>Carburetor and carburetor seat</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>12 1.2 8.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carburetor and carburetor connecting pipe</td>
<td>Hose clip</td>
<td>M5</td>
<td>1</td>
<td>2 0.2 1.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air filter box and carburetor connecting pipe</td>
<td>Hose clip</td>
<td>M5</td>
<td>1</td>
<td>2 0.2 1.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air filter box and intake pipe</td>
<td>Hose clip</td>
<td>M5</td>
<td>1</td>
<td>2 0.2 1.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silencer and frame</td>
<td>Bolt</td>
<td>M8</td>
<td>2</td>
<td>34 3.4 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silencer and exhaust pipe</td>
<td>Bolt</td>
<td>M8</td>
<td>1</td>
<td>20 2 1.4</td>
<td></td>
</tr>
<tr>
<td>Name of component</td>
<td>Size of thread</td>
<td>Q'ty</td>
<td>Tightening torque of fastener of ATV body Nm</td>
<td>m.kg</td>
<td>ft.lb</td>
<td>Remark</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>------</td>
<td>---------------------------------------------</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Exhaust pipe</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>7.2</td>
</tr>
<tr>
<td>Crankcase(closing case)</td>
<td>Screw</td>
<td>M6</td>
<td>11</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Left side cover</td>
<td>Screw</td>
<td>M6</td>
<td>6</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Left crankcase cover</td>
<td>Screw</td>
<td>M6</td>
<td>8</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Right crankcase cover</td>
<td>Screw</td>
<td>M6</td>
<td>9</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Bearing clamp of right crankcase cover</td>
<td>Screw</td>
<td>M6</td>
<td>3</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Bearing clamp of left crankcase cover</td>
<td>Screw</td>
<td>M5</td>
<td>3</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Right connecting box</td>
<td>Screw</td>
<td>M6</td>
<td>3</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Main clutch</td>
<td>Nut</td>
<td>M22</td>
<td>1</td>
<td>78</td>
<td>7.8</td>
<td>56</td>
</tr>
<tr>
<td>Assistant clutch spring</td>
<td>Bolt</td>
<td>M5</td>
<td>4</td>
<td>6</td>
<td>0.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Assistant clutch hub</td>
<td>Nut</td>
<td>M14</td>
<td>1</td>
<td>50</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Shift cam star-shaped gear</td>
<td>Screw</td>
<td>M6</td>
<td>1</td>
<td>12</td>
<td>1.2</td>
<td>8.7</td>
</tr>
<tr>
<td>Locking nut</td>
<td>Nut</td>
<td>M8</td>
<td>1</td>
<td>15</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>(clutch releasig adjustable screw)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting surpassig clutch</td>
<td>Bolt</td>
<td>M8</td>
<td>3</td>
<td>30</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Connecting plate of starting motor</td>
<td>Screw</td>
<td>M16</td>
<td>2</td>
<td>7</td>
<td>0.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Output</td>
<td>Nut</td>
<td>M16</td>
<td>1</td>
<td>60</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>Left case bearing clamp of driving shaft</td>
<td>Screw</td>
<td>M8</td>
<td>3</td>
<td>25</td>
<td>2.5</td>
<td>18</td>
</tr>
<tr>
<td>Rear cover bearing</td>
<td>Inner-hexagoral screw sleeve</td>
<td>1</td>
<td>50</td>
<td>5</td>
<td>36</td>
<td>Apply tightening agent</td>
</tr>
<tr>
<td>Rear cover bearing</td>
<td>Inner-hexagoral screw sleeve</td>
<td>1</td>
<td>50</td>
<td>5</td>
<td>36</td>
<td>Apply tightening agent</td>
</tr>
<tr>
<td>Reverse gear</td>
<td>Special-shaped nut(L.H)</td>
<td>1</td>
<td>50</td>
<td>5</td>
<td>36</td>
<td>Apply tightening agent</td>
</tr>
<tr>
<td>Rear cover</td>
<td>Bolt</td>
<td>M8</td>
<td>4</td>
<td>23</td>
<td>2.3</td>
<td>17</td>
</tr>
<tr>
<td>Front joint</td>
<td>Nut</td>
<td>M12</td>
<td>1</td>
<td>60</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>Reverse gear lever unit</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>12</td>
<td>1.2</td>
<td>8.7</td>
</tr>
<tr>
<td>Reverse gear lever unit</td>
<td>Bolt</td>
<td>M14</td>
<td>1</td>
<td>15</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Locking nut of length adjuster of connecting rod (Reverse gear operation bar assy)</td>
<td>Nut</td>
<td>M8</td>
<td>1</td>
<td>15</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Locking nut of length adjuster of connecting rod (Reverse gear operation bar assy)</td>
<td>Nut</td>
<td>M8</td>
<td>1</td>
<td>15</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Reverse gear operation rod and reverse gear lever mechanism</td>
<td>Flange nut</td>
<td>M6</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>7.2</td>
</tr>
</tbody>
</table>
### Locking component and location of ATV body

<table>
<thead>
<tr>
<th>Name of component</th>
<th>Size of thread</th>
<th>Q’ty</th>
<th>Tightening torque of fastener of ATV body</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift pedal</td>
<td>M6</td>
<td>1</td>
<td>10 Nm 1.0 m.kg 7.2 ft.lb</td>
<td></td>
</tr>
<tr>
<td>Magneto stator</td>
<td>M6</td>
<td>3</td>
<td>7 Nm 0.7 m.kg 5.1 ft.lb</td>
<td></td>
</tr>
<tr>
<td>Neutral switch</td>
<td>M12</td>
<td>1</td>
<td>20 Nm 2.0 m.kg 14 ft.lb</td>
<td></td>
</tr>
<tr>
<td>Reverse gear switch</td>
<td>M12</td>
<td>1</td>
<td>20 Nm 2.0 m.kg 14 ft.lb</td>
<td></td>
</tr>
<tr>
<td>Hand-started driving disc</td>
<td>M6</td>
<td>1</td>
<td>12 Nm 1.2 m.kg 8.7 ft.lb</td>
<td></td>
</tr>
</tbody>
</table>

#### (III) 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</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

### (I) Lubrication oil way

- **Pressure:**
  - Piston/cylinder
  - Piston pin
  - Connecting rod
  - Crank
  - Camshaft

- **Splashing oil:**
  - Valve
  - Rocker
  - Bearing
  - Spindle
  - Driving shaft
  - Middle gearbox
  - Oil pump
  - Rough filter
  - Fine filter
  - Branch valve
  - Sprocket chamber
  - Automatic centrifugal clutch
  - Crank
  - Crankshaft

<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>Camshaft</td>
<td>Valve</td>
</tr>
<tr>
<td>Rocker</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>Fine filter</td>
</tr>
<tr>
<td>Branch valve</td>
<td>Sprocket chamber</td>
</tr>
</tbody>
</table>

-26-
(II) Lubrication diagram

1. Oil draining plug
2. O-ring
3. Compressing spring
4. Rough filter
5. Oil pump washer
6. Oil pump assy
7. Oil pump driven gear
8. Oil pump driving gear
9. Camshaft
10. Crankcase
11. Crank
12. Spindle
13. Driving shaft
14. Fine filter
1. Single-direction valve
2. Engine oil fine filter
3. Engine oil filter cover
4. O-ring
5. Clip
6. Camshaft
7. Rocker
8. Single-direction bearing (automatic centrifugal clutch)
9. Crank pin
10. Crank pin
11. Spindel
12. Driving shaft
**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>Braking camshaft</td>
</tr>
<tr>
<td></td>
<td>Rotating pin seat</td>
</tr>
<tr>
<td></td>
<td>Lip of oil seal</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>Reverse gear lever pivot</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>
<tr>
<td>Lubrication point (name of component)</td>
<td>Type of lubricant</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------</td>
</tr>
<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>O-ring</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>Inner hole of main driving gear of main clutch</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Inner hole of assistant clutch gear unit</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Assistant clutch releasing operation rocker unit</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>Surpassing clutch</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of reverse gear controlling rod</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Outside surface of reverse gear fork shaft</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 reserve gear controlling rod</td>
<td>Lubricating-oil</td>
</tr>
<tr>
<td>Contactor of reserve gear switch</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 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Check the clearance and clean the plug. Replace it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Air filter</td>
<td>Clean it. Replace it if necessary.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Carburetor</td>
<td>Check the idle or starting state. Adjust it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Cylinder head</td>
<td>Check it there is crack or damage in gas tube. Replace it if necessary.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Exhaust system</td>
<td>Check the leakage. Tighten it again if necessary. Replace the gasket if necessary.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Spark suppresser</td>
<td>Clean</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Oil circuit</td>
<td>Check the cracks or damage of oil tube. Replace it if necessary.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Engine oil</td>
<td>Replace. (Preheat the engine before draining the oil)</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Oil filter</td>
<td>Clean</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Oil filter screen</td>
<td>Clean</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Gear case oil</td>
<td>Check the oil level and leakage. Replace.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Brake</td>
<td>Check the operation. Adjust it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Clutch</td>
<td>Check the operation. Adjust it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Wheel</td>
<td>Check the balance, damage, run-out etc. Replace it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Wheel bearing</td>
<td>Check the looseness and damage. Replace it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Front &amp; Rear suspension system</td>
<td>Check the operation and correct it if necessary.</td>
<td>1 month</td>
<td></td>
</tr>
<tr>
<td>Steering system</td>
<td>Check the operation and correct it if necessary. Check the toe-in and adjust it if necessary.</td>
<td>1 month</td>
<td>1 month</td>
</tr>
<tr>
<td>Bearing of steering vertical column</td>
<td>Lubricate every 6 months (lithium soap grease)</td>
<td>1 month</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 month</td>
<td>1 month</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 [assembly]
Pull the cushion lock lever [assembly] 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 rear luggage carrier.  
(3) Disassemble the cushion (see the contents of cushion disassembly in this section)  
(4) Disconnect the negative wire and positive wire of battery.  

Caution  
Should disconnect the negative wire fistly.  
(5) Disassemble the clamp plate of battery.  
(6) Disassemble the starting relay.  
(7) Disassemble the cut-off relay.  
(8) Take out the battery.  
(9) Disassemble the rear fender.
2. Installation

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

(1) Install:
   Rear fender
   Bolt (rear fender and frame). The torsion is 7N.m.
   Bolt and rubber hood of protecting plate (rear fender and frame). The torsion is 7N.m.

(2) Install:
   a. Battery
   b. Battery clamp plate

(3) Install:
   a. Cut-off relay
   b. Starting
   c. Connect the positive wire of battery
   d. Connect the negative wire of battery

(4) Install the cushion

   **Caution**

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

(5) Install the rear luggage carrier

   Torque requirement of fasteners:
   Bolt fastening torque: 3N.m
   Bolt fastening torque: 9N.m

   **Caution**

   Remember to install the bushing on the connecting point of luggage carrier and frame.
(III) Fuel tank

1. Disassembly
   (1) Place the vehicle on the horizontal ground.
   (2) Disassemble the cushion (see “Cushion disassembly” of this section)
   (3) Remove the air hose on the fuel tank cover.
   (4) Remove:
      a. Bolt, flat washer 30, installing bushing of upper cover of fuel tank, washer and rubber hood 2 of fuel tank.
      b. Screw
      c. Plastic expansion screw assy.
      d. Fuel tank cover
      e. Upper cover of fuel tank
   (5) Remove the rubber pad of fuel tank, and screw the fuel tank cover onto the fuel tank immediately.
   (6) Pull the fuel cock lever to “OFF” position.
   (7) 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.

   (8) Remove:
      Bolt, flat washer 30, rubber hood of fuel tank and installing bushing of fuel tank.
   (9) Remove the air inlet pipe of air filter, supporting pad of air pipe.
   (10) Remove the fuel tank.

-35-
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
   b. Supporting pad of air pipe and air rubber pipe

Caution
The convex part on the ring should be forward when installing the Supporting pad of air pipe.

(3) Install the bolt, bushing of rubber hood and washer.
Fastening torque of bolt: 10 N.m

(4) Install:
   a. Upper cover of fuel tank
   b. Fuel tank cover
   c. Plastic expansion screw assy
   d. Screw
   e. Bolt and related fasteners and connecting pieces.
   The fastening torque of bolt is 10 N.m.
(5) Connect:
   . Air hose

(6) Install
   . Cushion (see “Cushion installation” of this section)
(IV) Front fender
1. Disassembly:
(1) Place the vehicle on the horizontal ground.
(2) Disassemble the front luggage carrier
(3) Disassemble the front guarding plate
(4) Cut off the connecting wire of headlight.
   (from connecting point)
(5) Disassemble the bumper
(6) Disassemble the front fender
2. Installation:
Operate according to reverse procedures of “Disassembly”.

(1) Install:
a. Front fender
   Bolt. The fastening torque is 7N.m
b. Bolt. rubber hood of protecting plate: The fastening torque is 7N.m

(2) Install the bumper
The fastening torque of bolt (bumper and frame) is 16N.m.

(3) Install the front guard plate

(4) Install the front luggage carrier.
Bolt (front luggage carrier and frame). The fastening torque is 34N.m.
Bolt (front luggage carrier and bumper). The fastening torque is 11N.m.
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 Φ
      . If the wear indication reach the wear limit mark Φ, replace the brake shoe assy.
      Refer to section “Front wheel and front brake” in chapter VII.

2. Check the rear brake
   (1) Thread down the rear brake pedal to brake the vehicle.
   (2) Check
      . Wear indication Φ
      . If the wear indication reach wear limit mark Φ, replace the brake shoe assy.
      Refer to section “Real wheel and real brake” in chapter VII.

(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
 Adjusting 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.
  . Check the cable joint of balancer to examine the balance.
  . If unbalanced, rotate the two adjusting nuts until the cable joint is balanced.
  . Pick up the front wheel from the ground, and rotate the two front wheels, and ensure the two front brake light 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) Adjustment of free clearance of left lever and rear brake pedal.

**Caution**
Before adjusting, must check the wear condition of rear brake.

**Caution**
In order to avoid too large or too small brake force of rear brake, must ensure qualified free clearance of left lever and rear brake pedal.

**Warning**
When braking after adjusting, must adjust the left lever and rear brake pedal simultaneously.

1. Place the vehicle on the horizontal ground
2. Adjust
FREE CLEARANCE OF LEFT LEVER
FREE CLEARANCE OF REAR BRAKE PEDAL

Adjusting procedure:

**Caution**
Before adjusting, tread the rear brake pedal 2-3 times.
Loosen the locking nut completely, and screw in the cable adjusting screw completely.

Loosen the adjusting nut of rear brake cable and adjusting nut of rear brake pedal.
Tighten up the adjusting nut of rear brake pedal until gaining correct clearance: Free clearance (rear brake pedal): 20-30mm.

Rotate the adjusting nut of rear brake cable until gaining correct clearance: 0-1mm
Rear brake arm assy
Pin

Screw out the adjusting screw of rear brake cable until gaining correct free clearance: Freee clearance (left lever): 5-7mm

Screw up the locking nut.
Check the free clearance of left lever and rear brake pedal.
If not conforming to standard value, repeat above procedures to adjust.

**Warning**
After adjusting, raise the rear wheels from the ground and rotate them to confirm no brake force to block the rotation. Otherwise repeat above adjustment.
(IV) Position adjustment of steering lever

Position adjusting procedure of steering lever.

Place the vehicle on the flat ground.

Change the shift to the 1st gear, and pull the steering lever to reverse gear position.

Loosen the locking nut.

Screw in or out the adjusting nut of steering lever until the middle line of the tension rod plate aims at the alignment mark on the rear transmission cover (or the vehicle will not release the gear in driving when on driving or reverse gear.)

Screw tightly lock nut

Torsion of lock nut: 15 N.m

Caution

After adjusting the steering lever, ensure the reverse gear indicator to light up when the steering lever is on reverse gear position.

(V) Lubricating oil level inspection of rear driving gear case.

Check the lubricating oil level of rear driving gear case. Refill the oil if the level is low:

Caution

The engine must be in cold state. (at normal temperature.)

Checking procedure:

Place the vehicle on the flat ground.

Place an oil catcher under the rear driving gear case.

Remove the oil filling screw plug and sealing washer.

Observe the oil level: the correct lever should be on the bottom of oil filling hole.

If the oil level is too low, please refill the recommended engine oil to specified oil level.

Refer to the section “Replacement of engine oil of real driving gear case”.

Check the damage of sealing washer. If damaged, replace it.

Install the sealing washer and oil filling screw plug

Caution

Install the sealing washer firstly before installing the oil filling screw plug.

After installing the oil filling screw plug, check the leakage.

Torsion of oil filling screw plug: 23 N.m
(VI) Replacement of engine oil of rear driving gear case.
1. Place the vehicle on the flat ground.
2. Place an oil catcher under the rear driving gear case.
3. Remove:
   . Below cover of gear case.
   . Oil Filling screw plug
   . Oil draining screw plug
Drain out the engine oil of the rear driving gear case.
4. Check:
   . Sealing washer (oil filling screw plug position)
   . Sealing washer (oil draining screw plug position)
   'If damaged, replace them.
5. Install:
   Oil draining screw plug (rear driving gear case)
   Torsion of oil draining screw plug: 23N.m
6. Oil filling screw plug

   **Caution**
   Avoid the foreign matter to enter the driving gear case.

   Recommended oil:
   SAE80API “GL-4” engine oil of hypoid gear
   If needing, you may use SAE80W90 engine oil of hypoid gear
   Periodic replacement:
   0.12L
   Total capacity:
   0.27L

7. Install:
   . Oil filling screw plug (rear draining gear case)

   **Caution**
   After refilling, check the leakage.
   Torsion of oil filling screw plug: 23N.m
(VII) Rubber sleeve inspection of rear wheel fork
Check
Rubber sleeve $\diamondsuit$
If damaged or worn, replace it.
Refer to the 6th section “Rear shock absorber and rear wheel fork” of chapter 3.

(VIII) 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.
   - Refer to section “Steering system” of chapter 3.
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 $\diamondsuit$ of steering tension rod have any vertical clearance, replace it.
   - Refer to section “Steering system” of chapter 3.
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 6005-2Z/bearing 6203. When moving the wheel back and forth horizontally, if the clearance is too large, replace the following components:
     1) bearing 6005-2Z/bearing 6203
     2) left/right front seat assy $\diamondsuit$
     3) split pin $\diamondsuit$
     4) front fork ball connection $\diamondsuit$
     5) bushing assy $\diamondsuit$
   - Refer to 4th section “Steering system” of chapter 3.
(IX) 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.
(X) Inspection of front/rear shock absorber
1. Rest the motorcycle on the flat ground
2. Inspection:
   . Ball joint assy (Upper part of front shock absorber).
   If broken/Damaged. replace the front shock absorber.
   . Rear shock rod (Rear shock absorber)
   If scraped/damaged. replace the rear shock absorber.
   . Oil leakage
   If the heavy oil leakage of front /rear shock absorbers is found, replace it.
   Refer to section of “Front shock Absorber and Front wheel Fork” or Section of “Rear shock Absorber ” and Rear “Wheel Fork”. Chapter Three. Section Five and Section Six.

3. Inspection
   . Operation:
   . Shock the front /rear shock absorbers up and down two times.
   . If it is not active in operation, replace the component.
   Refer to Section of “Front shock Absorber and Front wheel Fork” or Section of “Rear” “Wheel Fork”. Chapter Three. Section Five and Section Six.

(XI) Adjustment of rear shock absorber
Adjustment of spring preload:
Turn the adjusting nut 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
(XII) Inspection of tire

**Warning**

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

.Tire characteristics

1) Quality characteristics 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>Manufacturer</th>
<th>Dimension</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>Zhengxin or Wuxi AT22 ;A7-10</td>
<td>Zhengxin or Wuxi</td>
</tr>
<tr>
<td>Rear</td>
<td>Zhengxin or Wuxi AT22 ;A10-10</td>
<td>Zhengxin or Wuxi</td>
</tr>
</tbody>
</table>

.Tire pressure

1) Recommended tire pressure.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>20Kpa(0.20kg f/cm²)</td>
</tr>
<tr>
<td>Rear</td>
<td>25Kpa(0.25kg f/cm²)</td>
</tr>
</tbody>
</table>

2) The overlow tire pressure will cause the tire came out of the rim in bad driving condition. The Min. tire pressure

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>17Kpa(0.17kg f/cm²)</td>
</tr>
<tr>
<td>Rear</td>
<td>22Kpa(0.22kg f/cm²)</td>
</tr>
</tbody>
</table>

3) When installing the tire to the rim, the tire pressure should be no more than.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>250Kpa(2.50kg f/cm²)</td>
</tr>
<tr>
<td>Rear</td>
<td>250Kpa(2.50kg f/cm²)</td>
</tr>
</tbody>
</table>

After installing the tire to the rim, the overhigh pressure will cause explosion. Filling pressure should be conducted slowly and carefully, the overfast filling pressure will cause the tire to explosion.

**Caution**

The Max load of the motorcycle is 165kg (including driver)
1. Measurement

.Tire pressure (nominal 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 manometer, 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 @

(XIII) Inspect rim

.Inspect 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 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 "Removal of cushion" of this chapter.

Battery electrode (negative electrode, positive electrode)

First remove the negative electrode

3. Removal:
a. Battery clamp plate  ¤Ü
b. Battery clamp plate  ¦Ü

Caution

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

4. 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.
5. Inspection of battery
   If damaged, replace it

6. Installation of battery

7. Connect
   Battery electrode (positive electrode negative electrode)
   First connect the positive electrode

8. Installation:
   a. Battery clamp plate
   b. Cushion

(II) Inspection of fuse

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

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

**Caution**
Set the test instrumentation at the position of “52”

Small size test instrumentation:

9/N.YU-03112
90890-03112

If the indicating meadle indicates toward the fuse has broken needing to be replaced.
2. Replacement of fused fuse
   Replacement steps:
   . Cut off ignition and circuit.
   . Install the qualified fuse
   . Start the power for electrical appliance inspection.
   . If the fuse fused, inspect the system again
   Refer to “Elefctrical Appliance” of Chapter Four

3. Installment of fuse cover

(III) 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

**Warning**

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)

   **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 touching 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 convex groove on the light seat.

8. Install the lens to the light seat.

9. Installation
   Headlight

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

10. Connect
    Connecting wire terminal of headlight.
Section Five Maintainace and Adjustment of Engine

(I) Adjustment of clutch
Adjustment steps:
a. Loosen the locking nut
b. Turn the adjusting screw rod counterclockwise slowly up to be unable to turn, then turn 1/8 clockwise, and fasten the adjusting screw rod to this position and tighten up the locking nut with the torque of N.m.

Turn the adjusting screw rod counterclockwise to decrease the clearance of clutch. Turn the adjusting screw rod clockwise to increase the clearance of clutch.

(II) Clean of air filter

Caution
There is a inspection cup on the bottom of the air filter, if the dust or water deposited in the cap, clean the filter core and fitter box of air filter.

1. Remove the cushion (Refer to “cushion removal” of this chapter)
2. Remove the air filter box cover air filter components.
3. Removal
   a. Air filter core
   b. Foam supporting cylinder

   **Warning**
   Never start the engine without a filter. Otherwise, the piston and cylinder will be overworn.

4. Inspection
   a. Air filter core
   b. Foam supporting cylinder

5. Clean of foam supporting cylinder. Clean off the dust on the inner surface of the foam supporting cylinder with compressed air.

6. 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 go slight.

7. Installation:
   a. Install the foam filter core to the foam support cylinder to combine an air filter assy.
   b. Install the air filter assy.
   c. Install the air filter cover.

   **Warning:** Make sure that the close fit surfaces of the filter assy is contact with the close fit surfaces of the fit assy. The box on the fit assy is not allowed.

7. Installation of cushion (Refer to Section Two "Cushion Installation of Air Filter")
(III) 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. The standard spark plug type: DTRTC, If not correct, replace it.

3. Inspection of spark plug
   a. Electrode
      Wear/damaged – replace
   b. Insulator
      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 gauge. 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
(IV) 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.

(V) Adjusting ment 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.
(VI) 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.
(VII) 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
      a. Cushion (Refer to section “Cushion Removal” of this chapter)
      b. Fuel tank (Refer to section “Fuel Tank Removal” of this chapter)

3. **Remove:**
   a. Timing observation hole screw
   b. Manual operation start mechanism

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 stroke:
   (i) When the mark φ on the rotor is align with the mark φ 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 φ 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 φ
   b. Insert the Plug gauge spanner φ between the adjusting screw φ and valve rod.
   c. Turn the adjusting screw φ 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 φ to avoid turning, and fasten the locking nut φ. 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 φŮ(Side of outlet door)
   b. Valve cap φŮ(Side of inlet door)

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

(2) Mount:
   a. Oil tank (see Installation of oil Tank in section )
   b. Upper cover of oil tank
   c. Seat (See Installation of seat in section 2)

(VIII) Adjustment of timing chain tension
The engine has automatic adjusting tensioner on the timing chain tension. So manual adjustment is unnecessary.
(IX) 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 \( \vartriangle \)
   b. Start the engine, and make the engine run at 1450r/min-1550r/min idle speed.

   **Warning**
   - When the engine is running, the machine, oil maybe splash out, so be careful to start the engine.

   c. Check if the mark \( \vartriangle \) on the crankcase is in the range \( \vartriangle \) of ignition under the magneto rotor indication. If it is out of range, check if the rotor and pulse coil is loosen or damaged. (Refer to chapter 4 electricity)

   **Caution**
   Ignition timing can’t be adjusted.
6. Mount plug \( \vartriangle \)

7. Take off ignition timing meter induction engine tachometer.
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 enough) until no increase of read pressure gauge.

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

(XI). 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>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 cylinderhead, 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

(XI). 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:

a. 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.

(XII) 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 fine filter 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, 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

Inspection steps:

a. Loosen the bolt of cylinder head lightly.
b. Start the engine for racing until the machine oil squeeze out from oil tunnel. If there is no machine oil out for one minute, stop the engine at once for avoiding the engine is damaged.
c. After the troubleshooting of no oil out is resolved, start the engine again and check the oil pressure.
d. Fasten the oil turnnel bolt according to standard.

Fasten torque of the oil turnnel bolt: 7N.m
Chapter III Repair and Maintenance of Vehicle body
Section 1 Rear Driving Gear Case and Driving Shaft

(I) Trouble
- Trouble judging guidance

<table>
<thead>
<tr>
<th>Performance</th>
<th>Possible reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When the vehicle accelerates, decelerates or is in idle start, there appears stop or irregular run-out with abnormal noise (pay attention not to confuse with trouble of engine)</td>
<td>A. Damaged bearing</td>
</tr>
<tr>
<td>2. The vehicle sounds obvious boom at low speed, and “Wu Wu” sound when decelerating or accelerating. Or there is regular snap from the case body.</td>
<td>B. Improper clearance</td>
</tr>
<tr>
<td>3. The transmission shaft jams and the rear wheel can not rotate.</td>
<td>C. Damaged gear</td>
</tr>
<tr>
<td></td>
<td>D. Driving shaft breaks</td>
</tr>
<tr>
<td></td>
<td>E. Gear teeth break</td>
</tr>
<tr>
<td></td>
<td>F. Jam caused by shortage of lubricating oil</td>
</tr>
<tr>
<td></td>
<td>G. The gear is jammed by foreign matter</td>
</tr>
</tbody>
</table>

The reason “A”, “B”, “C” are very difficult to judge. The performance is very subtle. And it’s very difficult to distinguish them from normal operating noise. If you doubt it and think these components have been damaged, remove them for special inspection.

(II) Inspection

1. Check abnormal noise:
   - Following noise may indicate mechanism trouble
     a. Boom when sliding, accelerating or decelerating. The noise is direct ratio with speed of rear wheel, but not direct ratio with higher engine speed and transmission case speed.
     b. Noise “Wu Wu”. The noise is different when accelerating or decelerating.
     Judgement: May be incorrect assembly and too small teeth clearance.
     Caution:
     It is very easy to damage the gear if the teeth clearance is too small. If this condition happens in trial driving after reassembly, you should stop driving immediately to minimize the damage of gear.
     c. There is light snap when running at low speed.
     Caution:
     This noise must be distinguished from normal operating noise of machine.
     Judgement: It is possible that the teeth of gear crack.

2. Check following condition:
   a. Drain out the lubricating oil
   If there is a great deal of metal or metal corpuscle on the position of oil draining screw plug, it is needed
to check the rust of bearing which will cause jam.

**Caution**
A little metal corpuscle in oil is normal.

3. Check the oil leakage
Check according to following procedures.
   a. Clean the whole vehicle totally, then wipe and dry it.
   b. Paint inspecting solvent of oil leakage or dry powder on the transmission shaft
   c. Only enough examining distance (Suggestion: $\geq 5$ km) can ensure to examine the leakage.
   If leaking - check component.
   If damaged - replace component

**Caution**
1. The oil leakage of new or newer vehicle is caused by improper installation of oil seal or damage of oil seal.
2. To the part you doubt the oil leakage, must check and confirm carefully to avoid unnecessary disassembly.

(III) Trouble-shooting table
If there is basic trouble condition, check following points.

- Rise up and rotate the front wheel to feel if the front wheel bearing is damaged.
- Replace the front wheel bearing (Refer to “Front wheel and front brake” of this chapter)

- Check the rear wheel shaft to feel if the bearing is damaged
- May be no damage of rear wheel shaft bearing and driving shaft bearing. Recheck it or remove single component.

- Remove the rear wheel shaft, and check if the bearing is damaged
- Replace the rear wheel shaft bearing (Refer to “Rear wheel and rear wheel shaft” of this chapter)

- Remove the transmission shaft components
(IV) Disassembly

**Warning**
Support the vehicle firmly and ensure no turnover

1. Drain the oil:
The oil of rear driving gear case
Refer to 3rd section “Replacement of engine oil of rear driving gear case” of chapter 2.
2. Disassemble
   1) Cushion
   2) Rear luggage carrier
   3) Rear fender
   Refer to 2nd section “rear fender” of chapter

3. Disassemble
   1) Rear wheel (left)
   2) Connecting plate of rear wheel
   3) Rear wheel (right)
   4) Rear brake and rear brake hub
   5) Rear wheel shaft
   Refer to “Rear wheel / rear brake / rear wheel shaft” of this chapter

4. Disconnect:
Air pipe (rear driving gear case)
5. Disassemble
rear driving gear case body

**Caution**
1) When the driving gear case is removed from the rear wheel fork, the transmission shaft may drop out.
2) Pay attention not to lose these components.
1. disassembly
   a. Remove
      bolt Ø M6
      bolt Ø M8

   **Caution**
   Remove the bolts alternately. Loosen each bolt by 1/4 circle, and remove them after all of them are loosened.

   b. Disassemble:
      1) Rear driving gear case body Ø
      2) Annular gear pad Ø
      3) Shift gear Ø
      4) Thrust plain pad Ø

   c. Disassemble:
      Bearing gasket (transmission shaft-last grade)

   **Caution**
   There are left handed thread on the bearing gasket. Rotating it clockwise may loosen the bearing gasket.

   **Caution**
   When reinstalling the bearing gasket, use special wrench Ø
d. Disassemble
Tap the main driving gear lightly with soft hammer, and remove the main driving gear (with thrust pad and bearing)

Caution
If it is necessary to replace the gear, should remove the main driving gear firstly. Do not use the original bearing thrust pad. Replace them.

e. Disassemble:
1) Oil seal
2) Bearing (shift gear)
Use proper pressure assemble tool to rear driving gear case, and support it properly.

f. Disassemble:
Bearing (main driving gear)
disassembling procedures:
1) Warm the rear driving gear case to 150 °C
2) Remove the outer circle of bearing with a proper punching tool
3) Remove the inner circle of bearing of main driving gear.

Caution
It is very difficult to remove the inner circle of the main driving gear bearing. In general it is unnecessary to remove it.
(V) Inspection

1. Check the gear teeth of bevel gear pair. Cave/scratch/wear. Replace the main driving gear and shift gear in set.
2. Check oil seal.
3. Check O-ring. If damaged, replace it.
4. Check the bearing. If damaged, replace it.

Caution

- The bearing can be used repeatedly. But advise you to replace it. Don’t use the oil seal repeatedly.
- When replacing the main driving gear and (or) shift gear be sure to adjust them. Refer to “Pad choice of main driving gear and shift gear” of this section.

5. Check the transmission shaft. If worn or damaged, replace it.

6. Check the driving gear case body and driving gear case cover. If there is crack or damage, replace them.

Caution

When replacing the driving gear case body and cover, be sure to adjust the pad of main driving gear and shift gear. Refer to “Pad choice of main driving gear and shift gear” of this chapter.
(VI) Pad choice of main driving gear and shift gear

1. Choice of main driving gear pad:

Work out the main driving gear pad thickness $A$ = $a - b$

- $a$ = add or subtract the number engraved on the main driving gear.
- $b$ = add or subtract the number engraved on the driving gear case body.

The unit of all the numbers engraved on the main driving gear and driving gear case body is 1/100mm.

For example:
1) If on the main driving gear engraved “+01”
   $a_1$ = 84 + 0.01 = 84.01
2) If on the driving gear case body engraved “10”
   $b_2$ = 83.5 + 0.01 = 83.60
3) So: “$A$” = 0.41
4) Amend the percent digit and choose proper pad.

In the above example, the resulted value is 0.41, but the meter indicates to amend 1 of percentage digit to 0, so the pad thickness is 0.40mm.

<table>
<thead>
<tr>
<th>Number on percent digit</th>
<th>Amending value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1,2</td>
<td>0</td>
</tr>
<tr>
<td>3,4,5,6,7</td>
<td>5</td>
</tr>
<tr>
<td>8,9</td>
<td>10</td>
</tr>
</tbody>
</table>

The pad has the following thickness.

<table>
<thead>
<tr>
<th>Thickness mm</th>
<th>Main driving gear pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>0.50</td>
</tr>
<tr>
<td>0.30</td>
<td>0.60</td>
</tr>
<tr>
<td>0.40</td>
<td></td>
</tr>
</tbody>
</table>
2. Choice of shift gear pad

Shift gear pad €û

Chosing procedures:

Work out the pad thickness “B” following formula

“B” = (c + d - e) + f

=45.5add or subtracts the number engraved on the driving gear case body.

=1 adds or subtracts the number engraved on the driving gear case cover.

=35 adds or subtracts the number on the shift gear bearing thickness (regarding unchangeable)=“11.00mm”

For example:

1) The number engraved on the driving gear case body is “0.7”

=45.5+0.07=45.57

2) The number engraved on the driving gear case cover is “06”

=1+0.06=1.06mm

3) The number engraved on the driving gear case cover is “-05”

=35-0.05=34.95

4) 11.00

5) So the pad thickness “B”

“B” = (45.57+1.06)-(34.95+11)=0.68

<table>
<thead>
<tr>
<th>Number on percent digit</th>
<th>Amending value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

The pad has following thickness.

<table>
<thead>
<tr>
<th>Thickness mm</th>
<th>Main driving gear pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>0.30</td>
<td>0.50</td>
</tr>
</tbody>
</table>
(VII) Installation:
The procedure is the reversal of “disassembly”. But pay attention to following points:

1. Install the needle bearing (small) on main driving gear:
   Procedures:
   a. Warm the case body to 150 °C.
   b. Assemble the outer circle of needle bearing with proper holddown.
   c. Install the inner circle of the needle bearing onto the shift gear.

2. Install oil seal.

3. Install the outer circle of the needle bearing (bigger) of shift gear onto the driving gear case body.

**Warning**
Must use new oil seal.

4. Install main driving gear, pad, and bearing, and install bearing gasket. Calculate the size of pad.

**Caution**

- The bearing gasket is left handed, so tighten it up by rotating counter clockwise.
- Before installing the bearing gasket, apply grease on O-ring.
- When installing the bearing gasket, tighten it with special tool.
Section 2 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；Á7-10</td>
</tr>
<tr>
<td>2</td>
<td>Rim dimension</td>
<td>5.5；Á10</td>
</tr>
<tr>
<td>3</td>
<td>Tire air pressure(normal temperature)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard value</td>
<td>20KPa(Standard value)</td>
</tr>
<tr>
<td></td>
<td>Min value</td>
<td>17KPa(Min value)</td>
</tr>
<tr>
<td></td>
<td>Max value</td>
<td>23KPa(Max value)</td>
</tr>
<tr>
<td>4</td>
<td>Run-out</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radia run-out</td>
<td>2mm</td>
</tr>
<tr>
<td></td>
<td>End face run-act</td>
<td>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 (radius in figure).

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

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

7. Measure:
Inner diameter of front brake hub (@as shown in figure):
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.
¢ÛElimination of engine oil: wipe off with cloth immersed in volatile diluent or volatile solvent.
¢ÛElimination 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 and oil seal with plain screwdriver.

When removing the oil seal with a plain screwdriver, place a cloth on the outer edge of oil seal to avoid damage.

Disassemble the bearing with a corresponding disassembly tool.

Assemble new bearing and oil seal according to reverse procedures of above replacement.

Use a hobdowm corresponding with outer side diameter of oil seal.

Caution: Do not beat the inner circle of bearing or roller, only contact the hobdowm 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

![Diagram showing lubrication points]

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

![Diagram showing installation steps]

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

![Diagram showing installation steps]

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

**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 in 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 3 Rear wheel/rear brake/rear wheel axle

### 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</td>
</tr>
<tr>
<td>2</td>
<td>Rim dimension</td>
<td>8.5</td>
</tr>
<tr>
<td>3</td>
<td>Tire air pressure(normal temperature)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max value</td>
</tr>
<tr>
<td>4</td>
<td>Run-out</td>
<td>Radia run-out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End face run-act</td>
</tr>
<tr>
<td>5</td>
<td>Wear limit of tire</td>
<td>2mm</td>
</tr>
<tr>
<td>6</td>
<td>Wear limit of friction disk</td>
<td>2mm</td>
</tr>
<tr>
<td>7</td>
<td>Rear brake hub wear limit</td>
<td>161mm</td>
</tr>
</tbody>
</table>
(I) Removal steps
1. Rest the motorcycle on a flat ground. Press the rear brake clip.
2. Loosen the connecting nuts of front and rear wheels.
3. 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 to avoid the parts falling, which will cause danger, during removal process, rest the vehicle firmly.
4. Removal (the Ser. No is corresponding to the Ser. No on the drawing)
   - Connecting nut of front and rear wheels
   - Left rear wheel
   - Split pin
   - Rear wheel axle nut
   - Washer
   - Rear wheel connecting plate

5. Removal (the Ser. No is corresponding to the Ser. No on the drawing)
   - Connecting nut of front and rear wheels
   - Right rear wheel
   - Split pin
   - Rear wheel axle nut
   - Washer

6. Loosen the rear brake clip

7. Removal:
   Brake shoe assy
8. Removal: (the ser. No as shown on the drawing)
   ❐ ô Adjusting nut, pin and spring of rear brake arm and rear brake tension rod assy.

9. Removal:
   ❐ ô Rear brake calbe
   ❐ ô Rear brake Tension rod assy
   ❐ ô Air pipe of rear brake

10. Removal:
    ❐ ô Rear brake bearing block
    ❐ ô Rear brake hub

11. Removal:
    ❐ ô Tension spring
    ❐ ô Rear brake arm
    ❐ ô Brake indicating plate
    ❐ ô Rear brake cam shaft

12. Removal:
    ❐ ô O-ring
    ❐ ô Plain pad of rear brake cover

13. Removal:
    ❐ ô Rear wheel axle: Beat the right end of the rear, wheel axle slightly, pull the rear wheel axle from left end.

    **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 groove from damage, do not beat the rear wheel axle directly with hammer.
(II) Inspection steps:

1. Inspection
When inspecting the real wheel, refer to “tire Inspection”, “Rim inspection” Section of chapter Two.

2. Measurement:
   a. radial runout of rim
   b. tire surface
   Refer to “Front wheel and Front Brake Inspection” Section of this chapter

3. Inspection
   – If cracks or damage is found, replace it.
   – If worn or damaged, replace it.

4. Inspection:
   Friction plate of rear brake

5. Measurement
   Thickness of brake friction plate
   See the “Front wheel and front brake inspection” Section of this chapter.
   Attached: The thickness of brake friction plate is 4.0mm (0.16in)
   <Wear limit>: 2.0mm (0.08in)

6. Inspection
   Tension spring of brake shoe
   See the “Front wheel and Front brake Inspection” Section of chapter

7. Measurement
   Internal diameter of rear brake hub
   If out of the specification, replace the hub
   Attached: Internal diameter of rear brake hub: 160mm
   <Wear limit>: 161mm
8. Inspection (The Ser. No as shown on the drawing)
¢asmine surface of rear brake hub
If there is some engine oil or scraped markings, remove it and treat it, the method of treat is as the follows.
Removal of engine oil: Clean with cloth dipped in volatile diluent or volatile solvent.
Removal of scraped marking: Wipe slightly and with even force the scraped marking till to remove it.
¢asmine gear groove of rear brake hub
If worn or damaged, replace it.

9. Inspection
¢asmine if there is some cracks, bend or damage on the brake cover, replace it.
¢asmine if the dust-proof seal is worn or damaged, replace it.

10. Inspection
¢asmine if there is worn scraped marking or damage on the cam shaft of rear brake, replace it.
¢asmine if the air pipe of rear brake is clogged, remove this pipe and clean the dirt, if damaged, replace it.

11. Clean the air hole on the rear brake cover with compressed air.

12. Inspection of rear wheel axle
¢asmine: 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.
13. 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.

14. Inspection:
- Bearing on the rear wheel axle
  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.
- If the oil seal is worn or damaged, replace it.

Replacement steps of bearing and oil seal:
- a. Clean around the bearing of gear case end.
- b. Remove the oil seal with plain screwdriver.

**Caution**
In order to protect the oil seal out edge from damage during the removal process, place a wood block under the screwdriver.
Remove the bearing with corresponding tool.
The installment of new bearing and oil seal is in reverse.

**Caution**
During the installment, 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.
(III) Installment steps:
The reversal steps of “removal steps”, that is installment steps. Pay attention to the following points when installing:
1. Lubrication part
   - Oil seal lip of rear wheel axle.
   - Bearing of rear wheel axle.
   - The corresponding spline tooth of rear wheel axle.
   The lubrication oil is lithium base grease.

2. Installment
   Installment of rear wheel axle

   **Caution**
   Before installing the rear wheel axle, loosen all bolts on the driving gear case; hole the rear wheel axle with hand to make it enter the gear groove of gear case, apply on the left end of the axle slightly with soft hummer.

   **Warning**
   In order to protect the axle thread and spline tooth of axle, never beat the end face of axle directly with hummer.

3. Installment
   Plain pad of rear brake cover
   O-ring 30 ¡Á1.8G

4. Labrication of rear brake cam shaft.
The lubrication oil is lithium base grease.
5. Installation
- Cam shaft of rear brake
- Indicating plate of brake
- Rear brake arm assy

**Caution**
When installing the brake indicating plate to rear brake cam shaft, be sure to align the projective part of brake indicating plate with the concave part of rear brake cam shaft.

At the same time, align the punch mark on the rear brake cam shaft with that of the rear brake arm assy.

The torque of rear arm assy: 9 N.m

6. Application
Sealing agent: Be suitable for the rear brake cover assy and rear wheel axle bushing surface.
Attached: Sealing agent: P/N: ACC-QUICK-GS-KT

7. Installation
- Rear brake cover assy
- Bearing block of rear brake

Caution:
Install the rear brake cover with bolt, the torque of bolt installment is 28 N.m.
8. Installment
Barke shoe assy
9. Lubrication
Dust-proof seal
Lubrication oil for dust-proof seal: lithium base grease.

**Warning**
The lubrication oil is not allowed to be used for brake shoe assy, the lithium base grease is used for rear brake hub spline groove.

**Warning**
The lubrication oil is not allowed to be used for spline on the right end of rear wheel axle, otherwise, during the work, the surplus lubrication oil will leave on the brake shoe, affecting the brake performance.

10. Installment:
Rear brake hub
11. Installment (The Ser. No. as shown on the drawing)
   * Air pipe of rear brake
   * Rear brake tension rod assy
   * Rear brake cable
12. Installment
   Spring
   Pin
   Adjusting nuts of rear brake tension rod assy and rear brake cable.

13. Installment
   * Washer 16
   * Nut M16
14. Tighten up nut M16

Attached: Torque of nut M16: 150Nm
15. Installment
Split pin 4 ½ 30 °

**Caution**
After fastening the fork, the nut on the rear wheel axle is not allowed to be loose. If the nut concave groove is not align with the splint hole on the screw rod, make it by tightening up the nut.

**Warning**
Always use the new split pin

16. Installment
Right rear wheel ½
Connecting nut of front and rear wheels ½
Attached: The torque of the connecting nut of front and rear wheels is 55Nm.

**Caution**
The rotating direction of the wheel is the arrow marking direction on the tire. For this, refer to “Front wheel and front brake” section of this chapter.

**Warning**
When installing the core nut to the rear wheel, be sure to face its core edge to the wheel.

18. Installment
Connecting plate of rear wheel ½
Waschr 16 ½
Rear wheel axle nut M16 ½
Split pin 4 ½ 30 °
Left rear wheel ½
Connecting nut of front and rear wheels ½
Refer to “Rear wheel” section of this chapter.

19. Adjustment
Rear brake pedal clearance
Rear brake cable clearance
Refer to “Adjustment of left lever and rear brake pedal free clearance” Section of chapter Two.
Attached:
Rear brake pedal clearance: 20-30mm
Clearance of left lever centre: 5.0-8.0mm
Section 3 Steering Operation System

(I) Removal steps of steering bar

1. Removal
   Front luggage carrier
   Bumper
   Front fender
   Refer to chapter Two. Section Two

2. Removal
   Main switch lock wire
   “Neutral” indicating light wire
   “Reverse” indicating light wire
   “High beam” indicating light wire
   Clutch switch wire

3. Removal
   Front brake cable
   Throttle grip assy

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

6. 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 M8 \( \times 60 \)
   - Locking washer
   - Clip assy

3. Removal
   - Install the steering vertical column with split pin
   - 2.25 \( \times 24 \)
   - Nut M10
   - Washer 10

4. Removal
   - Split pin
   - Nut M12 \( \times 1.25 \)
   - 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 ø and O-seal ø under the steering vertical welding are worn or damaged, replace them.

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

3. Installation
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. Installation
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 ᵃLOCKING WASHER ᵃBOLT ᵃBOLT
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. Lubrication oil is Lithium base grease.
(V) Installation steps of steering bar

1. Install the lower holding seat, steering tube, and upper holding seat.
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
Refer to “Adjustment of Front brake” and “Adjustment of free clearance about left handle lever and rear brake pedal” in chapter 2.

4. Adjusting the toe-in of front wheel
Refer to “Adjustment of Front wheel toe-in” in chapter 2.

5. Mounting front fender, bumper, front luggage carrier.
Refer to the second section of chapter 2.
Section 4 Front shock absorber and Front wheel fork

(I) Disassembly:
1. Take off front luggage carrier, bumper, front feder.
   Refer to the second section of chapter 2
   Disassemble the front wheel front brake hub.
   brake shoe unit and front brake cap unit
   Refer to “Dischargement of front wheel and front brake” of this chapter
2. Take off split pin, nut and steering rod ball pin assembly.

3. Take off clip 32 on the front shock absorber.
4. Loosen the front shock absorber nut.
5. Take off the bolt under the front shock absorber nut of front shock absorber and front shock absorber.
6. Take off split pin nut on the left/right front seat assy and left/right front seat assy.
7. 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 strighten 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.

Warning
If the left/right front wheel fork welding is bent, don’t strighten it seriously in order to avoid reducing its performance.

4. Check the bushing sub-assembly if it is worn or damaged, replace it.
(III) Installment steps

The opposit 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 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, bolt of front shock absorber.
Attached: Nut torque of front shock absorber: 55Nm
Bolt torque : 78Nm

8. Mount circlip

9. 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.

**Warning**
Must use new split pin.

10. 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.

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

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

(I) Disassembling steps
1. Take off left rear wheel, rear wheel joint plate right rear wheel rear brake hub, rear brake and rear wheel axle. Refer to “Disassembly of rear wheel/rear brake and rear wheel axle” section in this chapter.

2. Take off lower cap of gear case.

3. Take off the rear driving gear case sub-assembly Refer to “Dischargement of rear driving gear case sub-assembly and driving shaft” section of this chapter.

4. Take off split pin, washer and rear shock absorber pin shaft

**Caution**

When take off rear shock absorber pin shaft hold rear wheel fork in order to rear wheel fork don’t drop when taking off the rear shock absorber pin shaft.
5. Take off nut on the rear shock absorber, bolt rear shock absorber.

6. Take off rear brake tension spring.

7. Take off dusty cap on rear arm axle (point)

8. Check the free clearance of rear wheel fork checking steps.
   a: Check the torque value of rear arm joint bolt and the torque value of rear arm bolt and nut of rear wheel fork right side.

   Attached: Torque of rear arm joint bolt and nut is 130N.m
   Torque of rear arm joint nut is 6N.m

   b: Move the rear wheel fork across to check the side clearance (A). If the clearance is big, check the relevant parts of bush bearing 30203 and frame.

   Attached: Free clearance value is less than 1.00mm

   c: Move the rear wheel fork up and down to check the vertical clearance. If the clearance is too tight limited or uneven, check the relevant parts of bush bearing 30203 and frame.
9. Take off rear bush

10. Take off driving axle clamp assy (front) rear arm nut (right side) and rear arm joint bolt.

11. Take off rear wheel fork assy

(II) Checking steps
1. 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 fatigues or damaged, if any, replace rear shock absorber.
2. Check if the rear wheel fork assy is crack bend and damaged, if any, replace it.
Check if the rear wheel bush is crack, bend and damaged. If there is one of these problems replace it.

3. Check the gear case lower cap, if there is one of crack bend damagement problems, replace this part.

4. Check the rear arm joint bolt and rear arm joint bolt and bush. If one of these parts is worn or damaged, replace it.

5. Check the bearing 360203 of rear wheel fork assy, if there is free clearance during the bearing matches with the rear wheel fork, or uneven swirl, replace the bearing. Check the oil sealing, if it is worn or damaged, replace it.

Replacing steps of bearing 30203 and oil sealing.
a: Clean the bearing round
b: Take off the oil sealing with flat screwdriver.

Caution
Put a wooden block at the outer side in order to protect the outer side.
Take off bearing with usually bearing tool
The reverse step of “bearig and oil sealing replacing step” is the mounting step of new bearing and new oil sealing.

**Caution**
Use a pressure tooling which is match with outer diameter of bearing race and oil sealing.

**Warning**
Don’t strike the bearing inner race and roller.
The pressure tooling is only contact with outer race.

(III)Mounting steps:
The reverse steps of “disassembly is the mounting step, but the following points must be paid attention during the installation: ”
1. Lubricate the bearing oil sealing, bush and rear arm joint bolt
   Lubrication oil is Lithium base grease.

2. Mount the real wheel fork assy, rear wheel fork bushing and rear arm joint bolt.
3. Fix the rear arm joint bolt (left), rear arm joint bolt (right) and bush.

Fixing steps:
- a: Fix the left rear arm joint bolt by standard torque.
- b: Fix the right rear arm joint bolt until it contacts with its bush.
- c: Fix right rear arm nut by standard torque.

Attached:
- Bolt torque: 6Nm
- Rear arm nut torque: 130Nm

4. Check rear wheel fork free clearance.
Refer to the 8th step in “disassembly”

5. Lubricate the upper and lower end surface of rear shock absorber (see figure)
Use Lithium base grease as lubrication oil

6. Mount rear shock absorber
Upper nut torque of rear shock absorber: 50Nm

7. Mount split pin
8. Mount the rear driving gear case sub-assembly.
Refer to “Installation of rear driving gear case sub-assembly and driving shaft” section of this chapter.

9. Mount the rear wheel axle, rear brake, rear brake hub, right rear wheel, rear wheel joint plate and left rear wheel.
Refer to “Installation of rear wheel/rear brake/rear wheel axle” section of this chapter.
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.

Remark
Adjust the multimeter to “O” before inspecting.
Adjust the multimeter to “Ω X 1” when inspecting the circuit.
Should turn on and off the switch many times when inspecting.

The manual explains how to inspect the switch. The left figure indicates the wire end position of switch. The vertical line indicates switch position. The first row indicates color of switch wires. To every switch, “O-O” indicates the circuit between the wire ends is on.
- When the switch is adjusted to “OFF”, the “black” and “black/white” wire are on.
- When the switch is adjusted to “ON”, the “red” and “brown” wire are on.
Section 2 Check Lamp (headlight)

Check the lamp condition
1. Remove the lamp

Caution
Pay attention to support the lamp seat. Don’t pull the lead wire, otherwise it will be broke.

Warning
When the headlight light up, please remove the inflammable and your hand from the lamp. Because it will be very hot, you can touch it only until it is cool.

2. Check if the circuit of lamp terminal is on.
Checking steps

- Adjust the choice knob of pocket multimeter to “Ω 1”
- Connect the multimeter pen to corresponding lamp wire end. Firstly connect the multimeter pen(+) to wire end  and pen(-) wire end  to check the circuit between  and . Then connect the multimeter pen(+) to wire end pen(-) to wire end  to check the circuit between  and . If it displays “Ω” one time, replace the lamp.

3. Mount a checked lamp to check the lamp seat.
The same as checking the lamp, connect the multimeter pen to related lamp seat wire and check the circuit by the same method as above.

Color indication:
Br-Brown
R-Red
B-Black
B/W-Black/White
Bl/Blue
G-Green
Y-Yellow
Br/W-Brown/White
R/W-Red/White
O-Orange
Sb-Sky blue
G/Y Green/Yellow
W-White
G/Bl-Green/Blue
Y/R-Red/Yellow
Y/G-Yellow/Green
B/Y Black/Yellow
Ignition system diagram

1. Main switch
7. Magneto
8. CDI assy
10. Spark plug
15. Engine stop switch
23. Automatic air choke
24. Controller
Section 3  Troubleshooting the ignition system failure

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

Step
Check
1. Spark plug
2. Ignition park clearance
3. Resistance value of spark plug cap
4. Resistance value of ignition coil
5. Engine stop switch

6. Main switch
7. Resistance value of triggering coil
8. Resistance value of charge coil
9. Circuit connection (whole ignition system)

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

Repair or replace the spark plug
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>
<tbody>
<tr>
<td>Conforming to specification</td>
<td>Ignition system has no problem</td>
</tr>
<tr>
<td>Not conforming to specification or no spark</td>
<td></td>
</tr>
</tbody>
</table>

3. Resistance of spark plug cap

- Remove the spark plug cap.
- Connect the pocket multimeter to spark plug cap.

<table>
<thead>
<tr>
<th>Inspect if the resistance of spark plug cap conform to specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance of spark plug cap: 20Ω @ 68°F (6kΩ)</td>
</tr>
</tbody>
</table>

- 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 (20°F) 0.43~0.5 Ω

Connect the multimeter to the primary coil

Inspect if the secondary coil resistance conforms to specification

Secondary coil resistance
At 20°C (20°F) 4.6~7.6K Ω

All conform to specification

5. Engine stop switch
Refer to “Check switch”

6. Main switch
Refer to “Check switch”

7. Resistance value of triggering coil

Remove CDI magneto connector from cable
Connect the multimeter to the triggering coil
Multimeter pen (+) to blue wire end
Multimeter pen (-) to blue wire end

Inspect if the resistance of triggering coil conforms to specification

Resistance value of triggering coil:
At 20°C (20°F) 180~220 Ω

Conforming to specification

Replace triggering coil

Replace ignition coil

Replace handlebar switch (left)

Replace main switch

Abnormal
8. Resistance value of charge coil
- Remove the corresponding connector of charge coil from cable.
- Connect the multimeter (\( \Omega \leq 100 \)) to wire end of charge coil
  
  Multimeter pen (+) \( \uparrow \) yellow/green wire end
  Multimeter pen (-) \( \downarrow \) yellow/green wire end

---

**Inspect if the resistance value conform to specification**

<table>
<thead>
<tr>
<th>Coil resistance value</th>
<th>Conforming to specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 20(\text{°})C (68(\text{°})F)</td>
<td>450~550 (\Omega)</td>
</tr>
</tbody>
</table>

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

- Poor connect
  - Replace CDI assy
Electric starting diagram

1. Main switch
2. Battery
3. Protecting device
4. Starting relay
5. Starting relay
11. Power off relay
12. Rear brake switch
16. Start switch
20. Neutral switch
Section 4 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 5 Troubleshooting electric starting system

If starting motor doesn’t work

6. Main switch
7. Neutral switch
8. Rear brake switch
9. Staring switch
10. Circuit connection (Whole starting system)

Remark

Remove the following parts before troubleshooting
1) Cushion
2) Front frame
3) Front fender

Use the following special tool to troubleshoot

6. Main switch
7. Neutral switch
8. Rear brake switch
9. Staring switch
10. Circuit connection (Whole starting system)

1. Safety
   Refer to “check of switch”
   Pass

2. Battery
   Check the battery condition
   Refer to “check battery” in chapter 3
   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.
   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.

-123-
4. Power off relay
- Remove the relay from cable
- Connect portable multitester \( \sim \) and battery (12V) to wire end of power off relay
  - Battery end (+) \( \sim \) red/white wire end \( \sim \)
  - Battery end (-) \( \sim \) green/yellow wire end \( \sim \)
  - Multitester pen (+) \( \sim \) red/white wire end \( \sim \)
  - Multitester pen (-) \( \sim \) blue/white wire end \( \sim \)

  . Inspect if the power off relay is on

The circuit is on

5. Starting relay
- Remove the connector of starting relay from cable
- Connect the multimeter \( \sim \) and battery (12V) to terminal of power off relay.
  - Battery wire end (+) \( \sim \) blue/white wire end \( \sim \)
  - Battery wire end (-) \( \sim \) black wire direction \( \sim \)
  - Multitester pen (+) \( \sim \) red white end \( \sim \)
  - Multitester pen (-) \( \sim \) black wire end \( \sim \)

The circuit is not on

No rotation
- Repair or replace starting motor

The circuit is on

Replace power off relay

The circuit is on

Replace starting off relay
6. Main switch
Refer to “Check switch”

7. Neutral switch
Refer to “Check switch”

8. Rear brake switch
Refer to “Check switch”

9. Starting switch
Refer to “Check switch”

10. Circuit connection
Check the circuit connection of whole starting system
Refer to “Electric diagram”

Incorrect
Replace main switch

Incorrect

Incorrect
Replace rear brake switch

Incorrect
Replace handlebar switch (left)

Incorrect
Connect the whole starting system correctly
Section 6  Check starting Motor

1. Check
   . Reverser
      Not clean 佬  Clean with #600 sand paper
2. Ensure
   . Reverser diameter @:
      Not conforming to specification 佬  change the starting motor

   ![Reverser Diagram]

   **Outer diameter**
   28mm (1.10 in)
   (Wear range)
   27mm (1.06 in)

3. Measure
   . Mica cut sheet ④
      Not conform to specification 佬  Scrape the mica with square scraper

   ![Mica Cut Sheet Diagram]

   **Mica cut sheet**: 0.7mm (0.028 in)

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

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

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

   ![Multimeter Diagram]

   **Inner resistance of armature winding**
   Power on condition check : At 20 ¡± (68 ¡ã F) 0.004 ~ 0.005 ¡±

   Insolation check : At 20 ¡± (68 ¡ã F) exceed 1M ¡±

   If the resistance is incorrect, replace the motor.

   126
5. Measure
   . Length of brush (every one)
     Out of specification → replace it

   ![](image1)
   
   - Length of brush: 10mm (0.39 inches)
   - Range of wear: < 6mm (0.14 inches)

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

   ![](image2)
   
   - Brushing spring force: 326–970g (3.2–3.8N)

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.
Diagram of charqine system

2. Battery
3. Safety
6. Rectified adjuster
7. Magneto
Section 7  No charging in the Battery

Steps
Check:
1. Safety
2. Battery
3. Charging voltage
   (Whole charging system)

Remark
1. Remove some parts before maintenance
   1) Cushion
2. Repair with following special toolings

1. Safety
   Refer to “Inspection of switch”
   - Pass

2. Battery
   - Check battery condition
   Refer to “Inspection of Battery” in charter 3
   - Voltage:
     12.8V or more at 20°C (68°F)
     - Correct

3. Charging voltage
   - Connect engine techometer to the wire of spark plug
   - Connect pocket tester (DC20V) to the battery
   - Pocket multimeter (+) → White terminal
   - Pocket multimeter (-) → White terminal
   - NO electrification
   - Incorrect
   - Clean battery terminal
   - Recharge or replace battery
   - Replace the safety
Start the engine and accelerate to 2000r/m or so.
Charging voltage: 14-15V at 2000r/m
Remark:
Use battery with full capacity

4. Resistance value for starter coil
   - Take out the lighting coil of AC magneto from inserter
   - Connect pocket multimeter to stator coil (\(\Omega \times 1\))

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

Pocket multimeter(+) \(\rightarrow\) White terminal
Pocket multimeter(-) \(\rightarrow\) White terminal
Measure the resistance value of starter coil

At 20\(^\circ\)C (68\(^\circ\)F) 11.10-1.50 \(\Omega\),

Meet specification

5. Coupling of circuit
   - Check the whole coupling of charging wire.
   - Refer to “Electric diagram”.

Correct

Replace rectified adjuster

Meet specification

No failure on charging circuit

Out of specification

Replace parts of starter coil

Poor connection

Connect the charging system correctly
Diagram of lighting system

1. Main switch
2. Battery
3. Safety
13. Tail light
17. Lamp switch
18. Headlight
Section 8 Troubleshooting

If the headlight or taillight is not working:

Steps:
Check:
1. Safety
2. Battery
3. Main switch
4. Lamp switch
5. Coupling of wires (for entire lighting system)

Remark:
- Remove out the following parts before maintenance of troubleshooting:
  1) Cushion
  2) Front luggage carrier
  3) Front covering parts
  - Use special toolings for troubleshooting

1. Safety
Refer to “Inspection of switch”

Pass

2. Battery
- Check the battery condition
  Refer to “Inspection of battery” in chapter 3
  Voltage of open circuit
  12.8V or more at 20°C (68°F).

Correct

Incorrect
- Clean terminal of battery
  - Recharge or replace battery

3. Main switch
Refer to “Inspection of switch”

Correct

Incorrect
  - Replace main switch

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

No electrification

Replace fuse

-132-
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
Refer to “Diagram”
Correct

Poor coupling
Connect whole lighting system correctly.

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

-133-
Section 9 Inspection of Lighting system

(I) If the headlight is out of work

1. Bulb and bulb socket
   - Check the bulb and bulb socket condition

2. Voltage:
   - Connect multimeter to the coupler of headlight socket (DC, 20V)

   ![Multimeter Connection Diagram]

   Multimeter(+) = green terminal or yellow terminal
   Multimeter(-) = black terminal

   A. When lamp switch is adjusted to LO position.
   B. When lamp switch is adjusted to HI position.

   - Adjust main switch to “ON” position.
   - Adjust main switch to “ON” or “HI” position.
   - Check the voltage of “green” and “yellow” wires in coupler of bulb socket.

   - No electrification
     - Replace bulb and bulb socket
   - Out of specification
     - Meet specification
     - There is failure on the circuit from main switch to bulb socket coupler. Repair it.

   - No failure on circuit
(II) 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 (+) : blue terminal
   Multimeter (-) : 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

   No electricity
   Replace bulb and bulb socket

   Out of specification
   There is failure on the circuit from main switch to bulb socket coupler. Repair it.
Section 10 Troubleshooting

(I) If indicated lamp is out of work

Steps
Check:
1. Safety
2. Battery
3. Front switch

4. Coupling of wires (Whole signal system)

Remark:
- Remove the following parts before troubleshooting.
  1) Cushion
  2) Front frame.
  3) Front pedal
- Use special toolings for troubleshooting

1. Safety
   Refer to “Inspection of switch”
   Correct

2. Battery
   Check the battery condition
   Refer to “Inspection of battery” in chapter 3.
   Volatage of open circuit
   12.8V or more at 20°C (68°F)
   Correct

Pocket multimeter

No electrification
Replace fuse

Incorrect

Clean battery terminal
Recharge or replace battery
3. Main switch
Refer to “Inspection of switch”
- Correct

4. Coupling of wires
- Check the coupling of whole signal system wires
  Refer to “Diagram of wires”
- Correct

Incorrect
Replace main switch

Poor connection
Connect it correctly

Check each signal system condition
Refer to “Inspection of signal system”
Section 11 Inspection of Signal system

(I) If the neutral indicated lamp is out of work

1. Bulb and bulb socket
   - Check if bulb and bulb socket circuit is correct
   - Correct

2. Neutral switch
   - Refer to “Inspection of switch”
   - Correct

3. Voltage
   - Connect pocket tester (DC 20V) to the terminal of bulb socket
   - Multimeter (+) to brown terminal φ(U)
   - Multimeter (+) to sky blue terminal φ(U)
   - Adjust main switch to “ON” position.
   - Check voltage (12V)
   - Meet specification
   - No failure on this circuit

No electrification
Replace bulb and/bulb socket

No electrification
Replace neutral switch

Out of specification
If there is failure on the circuit from main switch to the bulb socket coupler, repair it.
(II) If the reverse indicated lamp is out of work

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.   | Bulb and bulb socket  
      |   Check if bulb and bulb socket is correct  
      |   Pass  | No electrification  
      |   Replace bulb and bulb socket |
| 2.   | Reverse switch  
      |   Refer to “Inspection of switch”  
      |   Pass  | No electrification  
      |   Replace reverse switch |
| 3.   | Voltage  
      |   Connect pocket multimeter (DC 20V) to the taillight terminal  
      |   Multimeter (+) brown terminal ➪  
      |   Multimeter (+) green/bule terminal ➪  |  
      |   Adjust main switch to “ON” position.  
      |   Check voltage (12V)  
      |   Meet specification  
      |   No failure on this circuit |

Diagram:

Out of specification  

If there is failure on the circuit from main switch to the bulb socket coupler, repair it.
(III) If the HB indicated lamp is out of work

1. Bulb and bulb socket
   - Check if bulb and bulb socket circuit B are correct.
     - Pass

2. Reverse switch
   - Refer to “Inspection of switch”
     - Pass
     - Replace handlebar switch (left)

3. Voltage
   - Connect pocket tester (DC 20V) to the tail-light terminal
     - Multimeter (+) to brown terminal
     - Multimeter (+) to green/blue terminal

   - Adjust main switch to “ON” position.
   - Check voltage (12V)
     - Meet specification
     - No failure on this circuit

   - Out of specification
     - If there is failure on the circuit from main switch to the bulb socket coupler, repair it.
Chapter V Engine
Section 1 Disassembly of engine

1. Remove the engine from finished ATV
   1. Remove Cushion
   2. Front luggage carrier
   3. Front bumper
   4. Front fender
   5. Rear luggage carrier
   6. Rear fender

   The disassembling method refers to “Fender, fuel tank disassembly” of chapter II.

2. Oil draining
   Screw out oil draining screw plug. Drain off the lubricating oil of the engine from the oil draining hole.

3. Exhaust pipe and silencer
   1. Remove Exhaust pipe
   2. Remove Silencer

4. Carburetor and air intake pipe
   Place the throttle cock grip on “OFF” position, and remove:
   1. Throttle cable
   2. Oil pipe
   3. Hoop
   4. 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 flammable. Pay attention not to splash the gasoline on hot engine.

5. Starting motor
   1. Remove Starting motor line

-142-
2) Remove
   - Connecting plate of starting motor
   - Starting motor

6) Rear brake cable and footrest
   1) Remove
      - Adjusting nut
      - Pin
      - Spring
      - Rear brake cable and tension rod (Remove from rear brake arm)

2) Remove
   - Left footrest
   - Shift pedal
   - Supporting rod of front fender

3) Remove
   - Right footrest
   - Spring

7) Wire and hose
   1) Remove
      - Spark plug cap
      - CDI magneto wire
      - Reverse switch wire
      - Neutral switch
      - Air pipe
8. Rear driving unit and rocker (rear wheel fork and shock absorber)
   1) Remove
      - Remove the air case (air case of last grade and rear brake hub) from the clip on the frame.
      - Fix the front wheel and raise up the rear wheel (place the supporter on the frame).

2) Remove
   - Bolt (upper end of the rear shock absorber)

3) Remove
   - Hoop (rubber hood)
   - Dustproof cap of rear arm shaft
   - Rear arm nut (right)
   - Connecting screw column of rear arm (right)
   - Connecting bolt of rear arm (left)

4) Remove
   - Rear wheel driving unit / rocke assy
   Caution:
      - When disassembling the rocke assy, support the shock absorber to avoid dropping down.
      - When removing the rocke from the rubber hood, the driving shaft may drop down. Pay attention not to lose components.

9. Disassembly of engine
   1) Remove
      - Bolt (top supporting of engine)
      - Bolt (bottom supporting of engine)
      - Bolt (rear upper supporting of engine)
      - Bolt (rear lower supporting of engine)
   2) Remove the engine unit from right side
(II) Disassembly of engine

1. Remove
   . Hand starting unit

2. Remove
   . Screw
   . Reverse controlling bar unit
   . Washer
   Pay attention not to lose washer

3. Remove
   . Sprocket cabinet cover

4. Remove
   . Spark plug
   . Upper valve cap (intake)
   . Lower valve cap (exhaust)
5. Remove
   Chain tensioner
Caution:
Before removing the chain tensioner, loosen the screw firstly.

6. Remove
   Bolt
Timing sprocket
Caution:
When loosening the bolt, it is needed to fix the hand starting ratchet.
Grasp the metal wire to avoid the timing chain to drop into crankcase.

7. Remove
   All the bolts and nut on the cylinder cover.
Caution:
Loosen every bolt and nut by 1/4 circle, then disassembly.
Loosen them, from big one to small one according to the numbers marked on the cylinder cover.

8. Remove
   Cylinder cover unit
   Cylinder cover pad
   Location pin
   Oil seal
   Lower guide plate (exhaust side)
9. Remove
. Screw \( \phi \) (cylinder body)
. Cylinder body assy \( \phi \)
. Cylinder body pad \( \phi \)
. Location pin \( \phi \)
. O-ring \( \phi \)

10. Remove
. Circlip \( \phi \)
. Piston pin \( \phi \)
. Piston unit \( \phi \)

Before disassembling the piston pin circlip, cover the crankcase with a clean cloth to avoid the circlip to drop into case suddenly.
Before disassembling the piston pin, remove the burr of circlip groove and piston pin. If it is still difficult to remove the piston pin, remove it with drawing aid.
Do not remove the piston pin with wood hammer.

11. Remove
. Starting ratchet \( \phi \)

**Caution**

Fix the starting ratchet with special tool, and loosen the bolt on the starting ratchet.

12. Remove
. Left crankcase cover \( \phi \)
13. Remove
   . Gasket of left crankcase cover
   . Location pin
   . Intermediate gear shaft
   . Washer
   . Duplex intermediate gear (starting motor)

14. Remove
   . Magneto
Caution:
   Disassemble the magneto rotator with special tool

15. Remove
   . Semicircle key
   . Electric starting gear assy
   . Washer

16. Remove
   . Upper guide plate (air intake side)
   . Timing chain

17. Remove
   . Screw (rear cover)
18. Remove
   . Screw (rear driving cover)
   . Rear driving cover

19. Remove
   . Output shaft unit
   . Location pin

20. Remove
   . Output shaft assy
   . Bearing
   . Washer
   . Forward gear

21. Remove
   . Fine filter cover of engine oil
   . Fine filter of engine oil
   . O-ring
   . Right crankcase cover
   . Location pin
   . Gasket of right crankcase cover

22. Remove
   . Compressing spring
   . Upper cam plate assy
   . Steel ball bracket assy
   . Lower cam plate
23. Remove
Main clutch nut

**Caution**
Loosen the locking pad before removing the nut, and fix the main clutch shoe with special tool, then remove the nut.

24. Remove
- Locking pad
- Main clutch shoe unit
- Washer
- Main clutch housing unit
- Washer

**Caution**
The two are grooves on auxiliary clutch when installing the main driving gear. So when removing the main clutch unit, must aim any one of the two grooves at the main driving gear firstly.

25. Remove:
- Nut
- Output gear

**Caution**
- Slap flat the self-locking part of the nut
- Place the engine to 1st gear to operate
- When loosening the nut(output gear), must fix the auxiliary hub assy with special tool.

26. Remove
- Clutch post rod
- Bearing
- Compressing cover
- Clutch spring
27. Remove
.Nut (clutch hub assy)

**Caution**
Slap the locking washer flat before removing the nut. Must fix the clutch hub assy with special tool when screwing the nut.

28. Remove
.Locking washer
.Clutch hub assy
.Friction wafer
.Clutch piece
.Compressing plate
.Spline washer
.Clutch gear assy

29. Remove
.Right connecting case
.Location pin
.Gasket of right connecting case

30. Remove
.Oil pump unit
.Pad
31. Remove
- Shift lever unit
- Washer
- Limit torsion spring
- Limit lever unit

Caution
Pull the limit lever unit and shift lever unit along the arrow direction, then you can remove them from the star-shaped gear.

32. Remove
- Star-shaped gear (on shift cam)

Caution
The location pin is easy to drop down. Pay attention not to lose it.

33. Remove
- Nut (balance shaft gear)

Caution
Slap the locking washer flat before removing the nut.
Put a cloth folded thickly between the balance shaft gear and balance shaft driving gear for seizing to prevent the rotation of the two gears when removing the nut.
34. Remove
- Locking washer
- Balance shaft gear
- Flat key

35. Remove
- All the closing case screw.

**Caution**
Loosen every screw 1/4 circle with cross-slot screwdriver, then remove all of them.

36. Remove
- Left crankcase
- Location pin

**Caution**
- Disassemble the left crank case with crankcase separator.
- Tighten up the screw of separator, and must keep the separator body parallel with crankcase face. If necessary, screw the screw in reverse direction to adjust the separator body level.
- When applying force to case body separator, knock the front supportor of engine, shift shaft and balance shaft alternately and continuously.

37. Remove
- Long fork shaft
- Short fork shaft
- Shift cam shaft
- Fork 3
- Fork 2
- Fork 1

**Caution**
Pay attention to position of every part, especially the position and direction of every fork.
38. Remove
   - Main shaft assy and driving shaft unit
   - Washer (driving shaft unit)

39. Remove
   - Circlip
   - Balance shaft driving gear
   - Crankshaft
   - Semicircle key

   **Caution**
   - Press out the crank shaft with pressure device.

40. Remove
   - Stop plate
   - Pressing plate

   **Caution**
   Knock the locking part of stop plate flat before removing the stop plate.

41. Remove
   - Distribution cam shaft

   **Caution**
   - Screw in the bolt 10mm to cam shaft screw hole to draw out the distribution cam shaft.
42. Remove
   . Rocker shaft
   . Air intake and exhaust rocker

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

43. Remove
   . Valve lock clip

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

44. Remove
   . Valve spring cover
   . Valve outer spring
   . Valve inner spring
   . Valve
   . Oil seal of valve rod
   . Spring seat of valve

**Caution**
   . Pay attention to position of each component for installation to original position.

45. Remove
   . Starting lever cap
   . Starting lever

**Caution**
   . Before uniting the knot pull out the rope long enough to tie a knot to avoid to be pulled into the cap

46. Remove
   . Screw pin
   . Guide plate
   . Compressing spring
   . Circlip
   . Driving jaw
   . Torsion spring
47. Remove
   - Coiling spring
   - Coiling spring backboard
   - Driving plate assy
   - Left sidecover assy

48. Remove
   - Pressure plate

**Caution**
- Remove the screw with impact screwdriver

49. Remove
   - Bearing
   - Washer

50. Remove
   - Circlip
   - Rear joint

**Caution**
The disassembling method of rear joint is as following:
- Pull and press the driving fork downward
- Use a sleeve with proper diameter below the front joint, and press the earing into the sleeve as shown as figure.
- Repeat the procedure to corresponding bearing
- Repeat the driving fork and rear joint
51. Remove
   - Nut
   - Washer
   - Front joint

   **Caution**
   Clamp the front joint with gymbals, then loosen the nut.

52. Remove
   - Output shaft
   - Connecting jaw

53. Remove
   - Inner-hexagon screw bushing
   - Bearing
   - Washer

   **Caution**
   Use inner-hexagon screw bushing wrench

54. Remove
   - Irregular left handed nut
   - Reverse gear
   - Washer

   **Caution**
   The irregular left handed nut is left handed screw thread. Rotate the nut clockwise when loosening it.
   Use irregular nut wrench.
55. Remove
  Nut � viewHolder
  Bearing 🢫

Caution
Use inner-hexagon screw bushing wrench 🢫

56. Remove
  Reverse fork shaft 🢫
  Reverse fork 🢫
  Steel ball 🢫
  Compressing spring 🢫

Caution
When disassembling the reverse fork shaft, the steel ball is easy to rollout. Pay attention not to lose it.

57. Remove
  Circlip 🢫
  Reverse controlling rod 🢫
  Reverse controlling rod 🢫
  Reverse controlling shaft 🢫
Section 2 Inspection and Maintenance of Engine

1. Cylinder cover
   1) Clean
   . Carbon eposit
   Use circular scraper ✠

   **Caution**
   Please do not use sharp tool to avoid scraping
   . Nut of spark plug
   . Valve seat ring
   . Bottom face of cylinder

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

2. Intake and exhaust valve
   1) Check
   . Valve surface
   . Valve rod end
   Replace it if it is worn, exfoliation corroded or unqualified
   Min thickness (working limit)
   ① 0.8mm(0.031in)
   Slope
   ② 0.05mm(0.020in)
   Min length (working limit)
   ③ 4.0mm(0.157in)

2) Check
   . Valve rod end ✠
   Replace the 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 – 0.037mm (0.004 – 0.0015 in)</td>
<td>0.08mm (0.0031 in)</td>
</tr>
<tr>
<td>Exhaust valve</td>
<td>0.025 – 0.052mm (0.0010 – 0.0020 in)</td>
<td>0.10mm (0.0039 in)</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 (new)
. Valve guide pipe (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 valve 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 redle is marked on the valve form valve race, Then can measure the contacting width of valve and valve race.

Valve race correcting procedure

The contacting part A is in the middle of valve face. But the contacting width is too wide. 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>Part</th>
<th>Reamer used on each part</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>30°</td>
</tr>
<tr>
<td>B</td>
<td>45°</td>
</tr>
<tr>
<td>C</td>
<td>60°</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 Reamer 30°</td>
<td>Reduce the contacting 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 Reamer 45</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 Reamer 35; Reamer 45</td>
<td>Make the contacting part in the middle and get the contacting width 1.0mm(0.04 in)</td>
</tr>
</tbody>
</table>

The contacting part D 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 Reamer of 30; Reamer of 45</td>
<td>Make the contacting part in the middle and increase the width 1.0mm(0.04 in)</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.
Pain 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>35.5mm (1.4 in)</td>
</tr>
</tbody>
</table>
2) Measure
Installing pressure of valve spring
If unqualified, replace the inner and outer spring totally.

<table>
<thead>
<tr>
<th>Installing pressure of valve spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner spring (intake/exhaust)</td>
</tr>
<tr>
<td>When it is 30.5mm (1.2 in), the</td>
</tr>
<tr>
<td>pressure 8.4 ~ 10.2kg (18.5 ~ 22.5pods)</td>
</tr>
<tr>
<td>Outerspring (intake/exhaust)</td>
</tr>
<tr>
<td>When it is 32.0mm (1.26 in), the</td>
</tr>
<tr>
<td>pressure 16.6 ~ 20.4kg (36.6 ~ 45.0pods)</td>
</tr>
</tbody>
</table>

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

Install
- Valve spring seat (Lower part)
- Oil seal of valve rod
- Valve
- Inner spring of valve
- Outer spring of valve
- Spring cover of valve
- Locking clip 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

   Limit value “A” of distribution cam
   Limit value “B” of distribution cam

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

   Inner diameter of rocker hole: 12.000–12.018mm (0.4724–0.4731 in)

   Measure the outer diameter \( a \) of rocker shaft
   Replace it if unqualified

   Outer diameter of rocker
   11.985–11.991mm (0.4718–0.4721 in)
.Subtract the outer diameter of rocker shaft from inner diameter of valve rocker hole to calculate the clearance.

<table>
<thead>
<tr>
<th>Clearance between rocker hole and shaft=</th>
<th>Outer diameter of rocker shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner diameter of valve rocker hole</td>
<td></td>
</tr>
</tbody>
</table>

Replace a set if unqualified

Clearance between rocker shaft and hole:
0.009-0.037mm (0.0004-0.0031 in)
Limit:
0.037mm (0.0015 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 sproket (on crankshaft)
If there is wear and damaged, replace the sproket 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
2) Check
Flexibility of chain tensioner
Checking procedure
. Press the tensioner pushing rod lightly with finger, and 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 un flexible, replace chain tensioner.

13. Valve cover and sprocket cabinet cover
1) Check
. Valve cover (upper valve cover \( \hat{\phi} \) and lower valve cover \( \hat{\phi} \))
. Sprocket cabinet cover \( \hat{\phi} \)
. O-ring \( \hat{\phi} \)
Replace it if there is crack and damaged

14. Cylinder and piston
1) Check
. Carbon deposit (from piston top to ring slot)
2) Check
. Surface of cylinder and piston
Re bore 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 \( @ \) is 40 mm (1.6 in) far away from cylinder top
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.

<table>
<thead>
<tr>
<th>Inner diameter ( C ) of cylinder</th>
<th>Standard value</th>
<th>Wear limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.97 - 71.02 mm (2.794 - 2.796 in)</td>
<td>71.10 mm (2.799 in)</td>
<td></td>
</tr>
</tbody>
</table>

\[ C = \frac{X + r}{2} \]
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, is the measuring position is 4mm away from piston bottom (0.16 in).

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:

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

Inner diameter of cylinder “C”
Piston lower part diameter “P”

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

15. Piston ring and piston pin
Piston ring
1) Measure
.Clearence between piston ring and ring groove
.Use feeler gauge ✷
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 20mm (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>Clearances between piston ring and ring groove</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>Clearances between piston ring and ring groove</th>
<th>Standard</th>
<th>Limit</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

Outer diameter (piston pin): 15.991-16.00mm
(0.6296-0.6299 in)

3) Measurement:
   . Inner diameter ⑤ of piston pin
   Out of specification, replace it

Inner diameter of piston pin hole
16.002-16.013mm (0.63-0.6304 in)

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

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

1) Measurement

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

   Dimension of crankshaft assy
   55.95-56.00mm (2.203-2.205 in)

. Runout C
   If out of specification replace it or repair it

   Runout Limit
   C1: 0.03mm (0.0012 in)
   C2: 0.06mm (0.0024 in)

. 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 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)

17. Driving gear of balance shaft and gear of balance shaft
Inspection:
- Driving gear of balance shaft
- Gear of balance shaft
If worn or damaged, replace two gears at the same time

18. Primary gear and electric starting gear
1) Inspection
- Main driving gear
- Clutch gear assy
If scraped, worn or damaged, replace it
If the noise is overhigh during operation, replace two gears at the same time.
2) Inspection
- Duplex intermediate gear
- Intermediate gear axle
If scraped, worn, or damaged, replace it
- Electric starting gear assy
- Contact surface of overrunning clutch
- Bimetallic bushing
If scraped, worn or damaged, replace duplex intermediate gear, intermediate gear axle, electric starting gear assy as a set.
3) Inspection of overrunning:
- Install the electric starting big gear to the running clutch and fasten the running clutch
- Turn the starting big gear counterclockwise in direction A as shown on the drawing, the starting big gear will drive the overrunning clutch, if not, it indicates the running clutch is out of operation, replace it.
- Turn the electric starting big gear clockwise in direction B as shown or the drawing, the starting big gear will run in idle speed if not, it indicates that the overrunning clutch is out of operation, replace it.
Inspection
Bolt (overrunning clutch)
Loosen and replace with a new one and apply fastening agent.
Caution:
Fastening torque of bolt (overrunning clutch) is 30Nm (3.0m.kg 22ya.pound).
Apply the fastening agent on the bolt.

19. Main clutch
Clutch case
1) Inspection:
   Clutch case assy (inner surface)
   Ablation, wear or damage, replace it.
   Single direction (inside the clutch case assy)
   If scraped, worn or damaged, replace it.
2) Inspection the operation of single direction clutch
   Make sure that the inner spline cover can only rotate clockwise in direction A, if the inner spline cover functions unsmoothly or rotates.
   Counterclockwise, replace the inner spline cover and main clutch case assy at the same time.

Main clutch shoe
1) Inspection
   Clutch shoe
   If ablation is found, replace it.

   Wear limit of main clutch shoe: @ 1.5mm (0.06in)

2) Measurement
   Thickness of main clutch shoe
   If out of specification, replace.

20. Vice clutch
Clutch case
Inspection
Split groove of clutch case
If there is a pressing mark, worn or damaged on the groove face, remove the burr, or replace it.
Clutch hub assy and pressing plate
Inspection
- Tooth groove on the clutch hub
- Tooth groove on the pressing plate
If there is scraped, worn or damaged, replace the clutch hub or pressing plate.

Friction plate
1) Inspection
- Friction plate
If damaged, worn, replace a set of friction plate
2) Measurement:
- Friction plate thickness
- Measure four positions
If out of specification, replace a set of friction plate

Wear Limit:
2.8mm (0.110 in)

Clutch plate
Measurement:
- Planeness of clutch plate
Use flat plate and feeler gauge
If out of specification, replace it.

Planeness Limit:
0.2mm (0.008 in)

Clutch post rod and earing
Inspection:
- Bearing (Post rod)
If rough in surface or jammed in rotation, replace it
- Clutch post rod
- Pressing cover
If worn, damaged, replace it.
Clutch spring
1) Inspection
   . Clutch spling
   If worn damaged, replace it
2) Measurement
   . Free length of clutch spring
   If not of specification replace a set of spring
   Min Limit of clutch spring length
   32.9mm (1.30 in)

Clutch operation rocker assy
Inspection
   . Operation rocker assy
   . Adjusting screw
   . O-ring
   If cracks, wear or damage replace it

Oil pump
1) Measurement
   . Clearance between oil pump and out rotor
   with feeler gauge
   If out of specification, replace oil pump
   Clearance Limit
   0.09mm (0.004 in)
2) Measurement
   . Side clearance between outer rotor and inner rotor
   If out of specification, replace oil pump
   Side clearance limit
   0.2mm (0.008 in)
3) Inspection
   . Gear of driving oil pump on driving gear of balance shaft
   . Oil pump gear assy
   If worn scraped damaged, replace it
22. Shift fork and fork shaft  
1) Inspection  
   . Fork  
   Connection surface to gear and shift cam  
   If worn, scraped, bent or damaged, replace it.

2) Inspection  
   . Fork shaft  
   (Roll the fork shaft on a plane)  
   If bent replace it.  
   Warning  
   Never attempt to straight a bent fork shaft

3) Inspection  
   . Movement of fork on the fork shaft  
   If not smooth in operation, replace fork or fork shaft

23. Shift cam  
   Inspection  
   . Groove of shift cam  
   If worn, damaged, scraped, replace it.  
   . Start wheel  
   If damaged or worn, replace it  
   . Needle bearing  
   If rough in surface or not active in operation, replace it.

24. Main/vice shaft and gear  
1) Measurement  
   . Runout of shaft  
   (Main/vice shaft)  
   Measure with bracket and runout meter  
   If out of specification, replace it.

| Runout Limit | 0.08mm (0.0031 in) |
2) Inspection
   - Gear (refer to shift mechanism and output gear)
   - Engaging jaw position
     If cracks, damage, wear, replace it.
   Caution
     When replacing the output gear, be sure to adjust the adjusting washer of output gear

3) Inspection
   - Movement of gear (shift mechanism)
     If not smooth in operation, replace it.

25. Shift shaft and limit lever
1) Inspection
   - Shift shaft
   - Hook plate
     If bent, worn, damaged, replace it.
2) Inspection:
   - Limit lever
     If not smooth in operation, replace it
     If bent or damaged, replace it.
3) Inspection
   - Shift torsion spring (on the shift shaft)
   - Tension spring (Hook plate)
   - Limit torsion spring (On Limit lever)
     If worn, damaged, replace it.

26. Disengaging mechanism of clutch Inspection
   - Upper and lower camplates
   - Steel ball stand/steel ball
   - Compressing spring
     If worn, scraped, damaged, replace it
2. 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.

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

29. 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.
30. Hand operated mechanism
1) Inspection
   . Inspection
   . Inspection
   . If cracks beat, damaged, replace it.
   . Driving jaw
   . Compressing spring
   . Torsion spring (Driving jaw position)
   Wear/cracks/damage, replace it.

2) Inspection:
   . Rolling spring (Starting)
   Wear/cracks/damage, replace it.
   . Tension wire
   Wear/cracks/damage, replace it.
   . Driving plate assy
   Cracks/damage, replace it.

31. Output mechanism
1) Inspection
   . All gears
   . If pressing mark/abrasion/wear is found, replace it
   . Connecting jaw
   If pressing mark/abrasion/wear is found, replace it
   . Driving shaft
   . Output shaft
   If damaged or bent, replace it.

**Caution**

When replace array gear or output shaft, be sure to readjust core gear washer, refer to “Selection of adjusting washer” section.

2) Inspection
   . Bearing
   If pressing mark or abrasion is found, replace it.

3) Inspection
   . Front joint and rear join
   . Driving fork
   . Needle bearing
4) Inspection
   . Reverse fork
     If wear/abrasion/bend/damage is found on the surface connecting with connecting jaw and reverse operating shaft, replace it.
   . Compressing spring
     If the elasticity is lost, or worn replace it
   . Steel ball
     If wear, damage, or scratch marks is found, replace it

5) Inspection:
   Reverse fork shaft
   Roll the reverse fork shaft on the flat surface, if bent, replace it.

Caution
Never straighten a bent shaft and reuse it

6) Inspection
   . Flexibility of fork movement
   Install the reverse fork to forkshaft, if not active or smooth in operation, replace fork and fork shaft.

7) Inspection
   . Reverse control lever
   . Operating plate
   . Reverse operating shaft
     If bend, cracks or damage is found, replace it.

8) Inspection
   . Rear cover
     If cracks or damage on the position connecting with left crankcase, rear driving cover is found, replace the rear cover.
   . O-ring
     If damaged or deformed, replace it

Caution
When replacing the rear cover, be sure to re-adjust the gear core washer, refer to “Selection of Adjusting washer” section.
Section 3 Assembly and adjustment of Engine

(I) Closing assembly of left & right crankcase
1. Installation
   . Crankshaft phinx
   (Install to right crankcase)
   Caution:
   When installing the crankshaft, fasten the connecting rod to the installing hole of cylinder with hand.

2. Installation
   Spindle assy and driving shaft assy phinx

3. Installation
   . Balance shaft phinx
   . Fork 1 phinx
   . Fork 2 phinx
   . Fork 3 phinx
   . Shift cam phinx
   . Short fork shaft phinx
   . Long fork shaft phinx

Caution

. Lubricate each gear and bearing.
. Before closing, be sure to set the shift mechanism at neutral and active in operation.
(II) Assembly of right crankcase

4. Applying
   ¡Seal agent çû
Apply the seal agent on the closing surface of left crankcase.
Seal agent: Letai 518 anaerobic plane seal glue.

5. Installment:
   ¡Location pin çû
6. Install the left crankcase to the right crankcase.
   Beat with soft hammer slightly.

Caution

Before installing the closing screw, be sure to rotate shaft at random direction so as to check if the function of shifting mechanism is normal.

7. Tighten up
   Screw (crankcase)
Caution
   Tighten up the screw as the order shown on the drawing.

8. Applying oil
   ¡4-stroke engine oil
Applying to the bearing and oil hole

9. Inspection:
   ¡Operation of crankshaft and shift mechanism
   Not active replace
1. Balance shaft gear and driving gear
   1) Installment
      - Woodruff key
      - Driving gear of balance shaft
      - Circlip

   2) Installment:
      - Balance shaft gear (be driven)
      - Flat key

   Caution
   Use the gear puller.

   2) Installment:
      - Balance shaft gear (be driven)
      - Flat key

   Caution
   The mark of driving gear should align with the mark of driven gear.

   3) Installment:
      - Locking washer
      - Nut (Driven gear)

   Caution
   - Be sure to use new locking washer.
   - Install the locking washer locating plate inside the key groove of balance shaft.

   4) Tighten up:
      - Nut (Driven gear)

   Caution
   Place a fold cloth between the balance shaft gear and the gear of driving gear so as to avoid turning of shaft, then tighten up the nut.

   5) Bend the locking plate of locking washer.
2. Shift shaft and oil pump
1) Installment:
- Star gear
- Locating pin (long)
- Shift pin (short)

**Caution**
Install the location pin (long) to the fitting mark position.

2) Installment:
- Star gear (install to shift cam)

**Caution**
The hole of shift cam should be align with the location pin (long) of star gear.

3) Tighten up:
- Screw (Star gear)
- Apply the thread fastening agent on the screw.

4) Installment
- Shift torsion spring (install to shift shaft)
- Washer
- Limit lever and limit torsion spring assy
- Washer

5) Installment
- Shift shaft

**Caution**
- Before installing the shift shaft, apply the grease to the oil seal lip (left crankcase).
- Pull the hook plate in arrow direction and limit lever and press and install them to the star gear
- Make sure that the torsion spring pin within spring hook
6) Applying engine oil
   - 4-stroke engine oil
   (Apply the parts inside the oil pump)

7) Installation:
   - Oil pump seat
   - Outer rotor
   - Inner rotor
   - Locating pin
   - Oil pump gear assy
   - Driving pin
   - Oil pump cover
   - Screw

Applying engine oil
   - 4-stroke engine oil
   (Apply to the lubrication oil trace of crankcase)

   Apply lubrication oil

**Caution**
The enough 4-stroke engine oil should be applied to lubrication oil trace of crankcase, otherwise the engine would be damaged.

9) Applying engine oil
   - 4-stroke engine oil
   (Applying on the lubrication oil trace of oil pump)

10) Installation
    - Oil pump pad
    - Oil pump (to crankcase)
    - Tighten up screw

**Caution**
- Be sure to use new pad

3. Right connecting case

1) Installation
   - Right connecting case gasket
   - Locating pin
   - Right connecting case

**Caution**
- Be sure to use new gasket.

2) Tighten up
   Screw (right connecting case).
4. Main, vice clutch

1) Installment:
- Clutch gear assy (secondary)
- Spline washer

2) Installment:
- Friction plate
- Clutch plate (Install to clutch hub)

**Caution**
Install the clutch plate and friction plate to the clutch hub alternately, from friction plate to friction plate.

3) Installment:
- Clutch hub (Install to pressure plate)

**Caution**
The arrow mark of clutch hub should align with the arrow mark on the pressure plate.

4) Installment:
- Clutch hub, pressure plate, clutch plate and friction plate assy (to main shaft)
- Locking washer
- Nut (clutch hub)

**Caution**
Be sure to use new locking
- Be sure to install the locking washer inside the indent of clutch hub.

5) Tighten up:
- Nut (Clutch hub)

**Caution**
Fasten the clutch hub, then tighten up the
6) Bend the locking plate of locking washer.

7) Installment:
- Clutch spring
- Pressure cover
- Bearing
- Clutch post rod

8) Installment:
- Output gear
- Nut

**Caution**
Be sure to use new nut.

9) Tighten up
- Nut

**Caution**
Fasten the clutch hub of vice clutch, and tighten up the nut.

10) Lock the nut with screwdriver.
11) Installment
- Washer
- Main clutch case assy
- Washer
- Clutch shoe assy

**Caution**
- There are two indents on the vice clutch case.
When installing the main clutch case, one of the indents should align with the main clutch gear.

12) Installment:
- Locking washer
- Nut (Main clutch)

**Caution**
- Be sure to use new locking washer.
- The locating plate of locking washer should be installed in the indent of clutch shoe assy.

13) Tight up:
- Nut (Main clutch)

**Caution**
Fasten the clutch shoe assy, then tighten up nut.

14) Bend the locking plate of locking washer.
5. Clutch disenagaiing mechanism and right case cover
1) Installment:
- Lower cam plate
- Steel ball stand assy
- Upper cam plate assy
- Compressing spring
- The locating notch of lower cam plate should align with convex block of shift shaft.
- The locating notch of upper cam plate should align with guide rod.

2) Installment:
- Locating pin
- Right crankcase gasket
- Right crankcase gasket
- Oil fine filter
- O-ring
- Oil fine filter cover
- Clutch operating rocker assy

**Caution**
- Be sure to use new gasket.
- The hole of clutch operating rocker assy should align with shift shaft.

3) Tighten up
- Screw (right crankshaft cover)

-191-
1. Reverse operation system

1) Mount:
- Reverse operation shaft
- Operation plate
- Reverse control lever
- Circlip

Mount the above on the rear driving cover.

2) Mount:
- Compressing spring (on reverse gear fork)
- Steel ball

**Caution**
Mount a positioning set pin into the fork first for fixing the steel ball and spring, that is easy to mount the fork pin into fork.

3) Lubrication
Apply lubrication oil (SAE20W/40) in the inner diameter of fork and pin.

4) Mount
- Reverse gear fork shaft (With O-ring)
- Mount the reverse gear fork pin into the hole of rear driving cover
- Reverse gear fork

**Caution**
Mount the reverse fork shaft into the hole of the reverse fork and then pull out the locating pin and take it out.
- Check if the fork is working.
2. Output shaft assy
1) Mount
   - Bearing (to rear cover)
   - Nut collar

   **Caution**
   Use the nut collar spanner to tighten the collar.

3) Mount
   - Washer
   - Reverse gear
   - Compromise left-turning nut

   **Caution**
   - Fasten the compromise left-turning nut by counter clockwise direction, because it is left-turning thread.
   - Use special-shaped nut spanner

4) Fasten
   - Special-shaped left-handed nut

5) Mount:
   - Washer
   - Bearing
   - Nut collar

   **Caution**
   - Use allen wrench
   - Coat \(518\) anaerobic sealing gum or equal substitute on outer end surface of bearing which side is near to washer.
   - Coat thread fastening agent on allen nut collar

6) Fasten
   - Allen nut collar
7) Mount:
- Output shaft
- Connecting claw
- Front splice
- Washer
- Nut

Check every needle bearing because the needle may drop out from bearing cone to lose. If it is like this, the universal joint can’t be turned flexibly.

Insert the needle bearing into the universal joint entirely to ensure the hog ring can be mounted.

8) Fasten
- Nut

Caution
- Fix the front splice with universal joint holder and connect the locking nut.
- Apply the thread fastening agent on the nut when mounting it.

9) Mount
- Rear joint and driving fork.

Mounting steps:
- Mount the relative driving fork into the splice
- Coat grease on the needle bearing
- Press every needle bearing into the front splice with proper tube to ensure that the driving fork is inserted into the needle bearing hole.
- Fix the hog ring into every bearing groove.

Caution
- Check every needle bearing because the needle may drop out from bearing cone to lose. If it is like this, the universal joint can’t be turned flexibly.
- Insert the needle bearing into the universal joint entirely to ensure the hog ring can be mounted.
3. Mount:
- Locating pin
- Washer
- Bearing
- Forward shift gear assy
- Output shaft assy

**Caution**
Apply grease on O-ring

4. Coat
- Sealing agent
  (Coat on the matching surface of rear driving cover.)
- Brand of sealing agent is 518 anaerobic sealing gum or equal substitute.

5. Mount:
- Rear driving cover
- Tighten bolt

**Caution**
Before mounting the rear driving cover on the crank, make the gear on the forward shift position.

6. Tighten:
- Bolt (rear cover)

**Caution**
When mounting rear cover to the crankcase, the arrow must be upward.

7. Electric starting system.
7. Electric starting system

1) Mount
   - Timing chain
   - Up guide plate
   - Timing chain shaft wire

   **Caution**
   Tight the shaft wire of timing chain for avoiding it is dropped into the crankcase.

2) Mount
   - Washer
   - Electric starting gear assy
   - Woodruff key
   - Magneto rotor

   **Caution**
   - Clean the conical part of crank and magneto
   - When installing the magneto the key must be in key groove of crank for avoiding it.
   - Mount the magneto drops out on the crank, and then fix the electric starting gear assy turn the magneto by counterclockwise to make it into the electric starting big gear.

3) Mount:
   - Double wheel
   - Washer
   - Wheel axle
   - Locating pin
   - Sealing washer of left crankcase cover

   **Caution**
   Must use new washer
4) Mount:
- Left crankcase cover
- Fasten screw (8 pieces)

5) Mount:
- Starting click pulley assy

**Caution**
- Fix the click pulley with rotor seat and tighten the bolt.
- Before mounting the starting click pulley, apply grease on oil sealing and O-ring.

Selection and installation of adjusting washer when mounting the crankcase. When mounting the crankcase, output gear and output shaft, the applied washer thickness is determined by the actual machining dimension of the following parts. Adjust the correct breaking of the bevel gear and the clearance of every moving parts by washer thickness.

- Crankcase
- Output gear
- Reverse gear
- Rear cover
- Forward gear
- Output shaft

When replacing above parts, must select the adjusting washer again.

1. Mounting position of washer
   - A = Washer of output gear
   - B = Washer of forward gear
   - C = Washer of reverse gear
   - D = Washer of output shaft
2) For example:

If ° +0.02 ° is engraved on the output gear.

That is: ° = 42 + 0.02 = 42.02

If ° 41.45 ° is engraved on the left crankcase

So the washer thickness is:

A = 42.02 - 41.45 = 0.57mm

3) The following is prepared thickness of washer (mm):

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.3</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1) Calculate the washer thickness of forward gear by following formula.

\[ B = \text{Ø} - c - e - f \]

(Ø) is the value engraved on the left crankcase

c = (at the forward gear) bearing thickness (no change)

\[ 0.0 \pm 1.300 \text{mm} \]

f = Theory installing distance; \( 37.5 \pm 0.2 \) of forward gear adds value engraved on forward gear.

For example:

If \( \text{Ø} = 110.08 \) is engraved on left crankcase; \( c = 59.02 \pm 0.2 \)

If \( e = 0.02 \) is engraved on the forward gear,

\[ f = 37.5 + 0.02 = 37.52 \]

So the washer thickness is:

\[ B = 110.08 - 59.02 - 13.00 - 37.52 = 0.54 \text{mm} \]

3) The following is the prepared washer thickness (mm)

<table>
<thead>
<tr>
<th>Range of A</th>
<th>Selected Washer</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>0.3</td>
<td>0.5</td>
</tr>
</tbody>
</table>
is the value engraved on left crankcase
is the value engraved on rear cover
is the bearing thickness
¡° 12.00 ¡± at the reverse gear
means that the theory installing distance ¡®39¡¯ of reverse gear adds value engraved on reverse gear.

2) For example ¡° 58.98 ¡± is engraved on left crankcase ¡° 7.49 ¡± is engraved on rear cover ¡° -0.02 ¡± is engraved on reverse gear,

=39+(-0.02)=38.98
So washer C thickness is:
C=58.98-7.49-12.00-38.98=0.51mm

3) The following is the prepared thickness of washer(mm):

The washer thickness is 0.54mm, by calculation, the washer thickness should select 0.50mm according to above table.

3. Select washer C
When replacing left crankcase reverse gear, and rear cover, reverse gear washer C need to be adjusted.

1) Calculate the washer thickness of forward gear by following formula.

Washer thickness of reverse gear:

= - - - -

is the value engraved on left crankcase
is the value engraved on rear cover
is the bearing thickness ¡° 12.00 ¡± at the reverse gear)
means that the theory installing distance ¡® 39 ¡¯ of reverse gear adds value engraved on reverse gear.

2) For example
= 58.98 ¡± is engraved on left crankcase
= 7.49 ¡± is engraved on rear cover
If ¡° -0.02 ¡± is engraved on reverse gear, = 39+(-0.02)=38.98
So washer C thickness is:
C=58.98-7.49-12.00-39.98=0.51mm

3) The following is the prepared thickness of washer (mm):

The way selected washer C is same with the way of washer B. The washer thickness is 0.51mm by calculation. So the washer thickness should select 0.50mm according to washer C selection way.
5. Select Washer $D$
When replacing left crankcase forward gear, reverse gear, rear cover and output shaft, washer $D$ of output shaft needed to be adjusted.

1) Calculate the washer thickness of output shaft by following formula

\[
D = d + j - e - B - k - 0.25
\]

- $d$ is the value engraved on left crankcase
- $j$ is the value engraved on rear cover
- $e$ is the bearing (at output gear) thickness
- $B \approx 13.00$ is the value engraved on forward gear
- $k \approx 3$ is the value engraved on output shaft

2) For example:
- If $d \approx 0.97$ is engraved on rear cover
- If $j \approx 110.05$ is engraved on left crankcase
- If $e = 14.4$ is engraved on forward gear
- If $k = 80.45$ is engraved on output shaft

So the washer thickness is:

\[
D = 110.05 - 0.97 - 13.00 - 0.50 - 14.4 - 80.45 - 0.25 = 2.42 \text{ mm}
\]

3) The following is the prepared washer thickness (mm)

<table>
<thead>
<tr>
<th>Washer selection table</th>
</tr>
</thead>
<tbody>
<tr>
<td>range of washer thickness</td>
</tr>
<tr>
<td>$0.5 \leq d \leq 0.6$</td>
</tr>
<tr>
<td>$0.6 \leq d \leq 0.7$</td>
</tr>
<tr>
<td>$0.7 \leq d \leq 0.8$</td>
</tr>
<tr>
<td>$0.8 \leq d \leq 0.9$</td>
</tr>
<tr>
<td>$0.9 \leq d \leq 1.0$</td>
</tr>
<tr>
<td>$1.0 \leq d \leq 1.1$</td>
</tr>
<tr>
<td>$1.1 \leq d \leq 1.2$</td>
</tr>
<tr>
<td>$1.2 \leq d \leq 1.3$</td>
</tr>
<tr>
<td>$1.3 \leq d \leq 1.4$</td>
</tr>
<tr>
<td>$1.4 \leq d \leq 1.5$</td>
</tr>
<tr>
<td>$1.5 \leq d \leq 1.6$</td>
</tr>
<tr>
<td>$1.6 \leq d \leq 1.7$</td>
</tr>
<tr>
<td>$1.7 \leq d \leq 1.8$</td>
</tr>
<tr>
<td>$1.8 \leq d \leq 1.9$</td>
</tr>
<tr>
<td>$1.9 \leq d \leq 2.0$</td>
</tr>
<tr>
<td>$2.0 \leq d \leq 2.1$</td>
</tr>
<tr>
<td>$2.1 \leq d \leq 2.2$</td>
</tr>
<tr>
<td>$2.2 \leq d \leq 2.3$</td>
</tr>
<tr>
<td>$2.3 \leq d \leq 2.4$</td>
</tr>
<tr>
<td>$2.4 \leq d \leq 2.5$</td>
</tr>
<tr>
<td>$2.5 \leq d \leq 2.6$</td>
</tr>
<tr>
<td>$2.6 \leq d \leq 2.7$</td>
</tr>
<tr>
<td>$2.7 \leq d \leq 2.8$</td>
</tr>
<tr>
<td>$2.8 \leq d \leq 2.9$</td>
</tr>
<tr>
<td>$2.9 \leq d \leq 3.0$</td>
</tr>
</tbody>
</table>

The washer thickness is $2.42 \text{ mm}$ by calculation. So the washer thickness should select $2.5 \text{ mm}$ according to above table.
6. Installation of adjusting washer

1) Washer A Mount
   - Washer A
   - Bearing

   **Caution**
   This step is carried out before assembly with closing case.

2) Washer B Mount:
   - Clamp plate

   **Caution**
   This step is carried out before assembly with case.

2) Washer B Mount:
   - Forward gear
   - Washer B
   - Bearing
3) Washer C
Mount:
- Washer
- Reverse gear
- Special-shaped left-handed nut

**Caution**
- The special-shaped left-handed nut left-handed thread, so tighten it in counterclockwise direction.
- Use special-shaped nut wrench.

4) Washer D
Mount:
- Washer
- Bearing
- Bushing

**Caution**
- Use inner allen bushing wrench.
- Coat 518 anaerobic sealing gum or equal substitute on outer end surface of bearing which side is near to washer.
1. Mount:
- Double end bolt
- Mount:
- Piston
- Piston pin
- Circlip

**Caution**
- Arrow on the piston must point to the forward of engine
- Before mounting the piston pin, cover Crankcase hole with cleaning towel or clothes for avoiding circlip and other small parts dropping into crankcase.
- Be sure to use new circlip.

3. Apply oil:
- Apply 4-stroke machine oil on the piston pin, piston ring groove and piston edge.

4. Installation of piston ring
Assembly the piston ring split clearance staggeringly according to showing figure.
- Top ring
- Oil ring (lower ring)
- The second ring
- Oil ring (up ring)

5. Install:
- Cylinder body washer
- Locating pin
- O-ring

**Caution**
- Be sure to use new sealing washer and o-ring
- Be sure to check the standard of manufacture and engraved figure on the ring. The marking surface is toward to piston top.
- Before mounting cylinder, apply a layer of 4-stroke engine oil on piston ring.
6. Mount:
- Cylinder
- Tighten bolt (cylinder) temporarily

**Caution**
- When pressing the piston ring with one hand, assemble the cylinder with another one.
- The timing chain should through the bending locking end of chain chamber.

7. Lubricate:
- Valve rocker
- Rocker shaft

Lubrication oil: SAE 10W30 machine oil

8. Install
- Valve rocker
- Rocker shaft

**Warning**
- Thread hole on the rocke shaft is toward out.
- Mount short rocker shaft (With O-ring), at the side of outlet and the long rocker shaft (with slot at the side of inlet.)
- The slot direction, need to be adjusted when mounting inlet rocker shaft, to make the slot align with hole of cylinder cover bolt.
10. Mount:
- Valve cam

**Caution**

The driving pin on the end of valve cam must align to the timing mark on the cylinder cover.

9. Mount:
- Bearing (to valve cam)
- Bearing (to valve cam)

**Caution**

The bearing with oil sealing is toward out when assembling it, and the bearing with dust cap is toward inside when assembling it.

11. Mount:
- Clamp plate (Bearing)
- Locking plate (new)

12. Fasten
- Bolt

13. Bend locking plate end
14. Mount:
- Lower guide plate
- Oil sealing
- Locating pin
- Cylinder cover washer assy
- Cylinder head
- Washer
- Cylinder head nut
- Washer
- Screw

**Caution**
- Apply 4-stroke engine oil on the washer

15. Fasten the bolt and nut according to the order in the figure.

16. Mount:
- Timing spocket pulley
- Mounting step of timing spocket pulley:
  - Turn the cam shaft to make the cam pin correspondance with the matching mark of cylinder head.
1. Turn the crank until the mark TDC  is correspondance with the mark on the crankcase cover .
2. Mount the timing chain to the timing spocket pulley.
3. Mount the timing spocket pulley to the cam shaft for ensuring the mark of timing spocket pulley  is correspondance with the mark  on the cylinder head, then fasten the spocket pulley bolt with hand. (Be ensure the tension of the timing chain at the outlet when mounting the timing spocket pulley)
4. Insert the special tooling into the tension hole of timing chain and pull the tensioner timing chain toward inside.
5. The matching mark of timing spocket is sure to correspond to the matching mark of cylinder head when pulling the timing chain tensioner.
6. Change the matching position between spocket pulley and chain if the marks is not aligned.
7. After the marks is aligned, fasten the bolt of timing sprocket.

**Caution**
Fix the starting ratchet and tighten the bolt of timing spocket.

17. Mount:
Tensioner of timing chain

Mounting steps:
- Take off bolt from the tensioner of timing chain.
1. Insert the small screwdriver φ into the groove of tension rod, and turn the screwdriver by clockwise, at same time to press tension rod until the screwdriver can't be turned.

2. Hold the screwdriver at this position, and mount the tensioner assy (with washer) on the cylinder, then turn the locking bolt of tensioner sub-assembly.
3. Take off the screw drive from the tensioner, and then tighten the locking bolt of tensioner assy.
4. Mount tension bolt with washer.

**Caution**
Always use new washer.

18. Adjust:
1. The valve clearance
   There is a valve clearance between two rocker when the mark of timing spocket is align with the mark of cylinder cover.
   - Inlet valve clearance(cool): 0.05-0.09mm
   - Outlet clearance(cool): 0.11-0.15mm

19. Apply 4-stroke engine oil
   (On the up side of cam shaft)
   - Oil quantity is 0.05L
20. Mount:
- Valve cover (mount o-ring in the sealing groove of throttle cover first)
- Valve cover (mount o-ring in the sealing groove of throttle cover first)
- Spark plug

**Caution**
Check the o-ring, if it is deformed or damaged, replace it.

21. Mount:
- Spocket chamber cover (mount o-ring in the sealing groove of spocket chamber cover first).

**Caution**
Check the o-ring, if it is deformed or damaged, replace it.

22. Mount:
- O-ring
- Carburetor seat
- Washer
- Carburetor (mount o-ring in sealing groove first)

**Caution**
Check all o-ring. If it is damaged, replace it.

23. Mount:
- Carburetor seat and carburetor (on cylinder cover)
- Wire clamp

**Caution**
The carburetor seat and the o-ring in the sealing groove of cylinder cover connecting surface can’t be forgotten to mount.
1. Mount:
   - Coilspring backboard assy

   **Caution**

   Hang the coil spring hook hanger into the split of spring backboard, and wind the coil spring in counterclockwise.

2. Install:
   - Washer
   - Coilspring backboard assy

   **Caution**

   End of the coil spring is hung the inner race of left side-cover coil spring.

3. Wind the rope in the drive disc groove 4\(\frac{1}{2}\) circles by clockwise.

4. Lubricate:
   - Coilspring backboard assy
   - Drive disc

5. Mount:
   - Drive disc

   **Caution**

   The projection need to be mounted into two hole groove and the coil spring hook hanger also need to be mounted into the hole groove.
6. Mount:
- Torsion spring (starting ratchet pawl)
- Starting ratchet pawl
- Hog ring
- Compress spring
- Guide plate
- Screw pin

**Caution**
When mounting torsion spring (starting ratchet pawl), make the end of torsion spring align to groove on the drive disc.

7. Turn the drive disc 3 circles by clockwise, and pre-tighten the coil spring.

8. Mount:
- Starting lever
- Cover

**Caution**
Make the rope across the hole of left side, and knit it in order to the rope is not pulled into left side cover.
- After knitting and untie it
9. Mount:
- Washer
- Washer
- Reverse lever system

**Caution**
Coat sealing gum on the bolt.

10. Mount:
- Manual starting system

(VII) Mount the engine on the finished vehicle.
Its steps is opposed to steps of “Engine Disassembly”

**Caution**
Support motorcycle firmly for avoiding turning over.

1. Mount:
- Engine
Mount the engine from right side of frame.

2. Mount:
- Bolt (Installation position of engine-rear lower)
- Bolt (Installation position of engine-rear upper)
- Bolt (Installation position of engine-front)
- Bolt (Installation position of engine-top)

**Caution**
- Mount all the installing bolts from right side of motorcycle
- Turn the nut and bolt temporarily, but don’t fasten them at this time.
3. Mount:
- Drive assy of rear wheel and rear wheel fork

Assembly steps:
1) Lubricate following parts before mounting the rear wheel fork
   - Bearing
   - Oil sealing
   - Bushing
   - Coupling bolt of rear arm
   - Splined of drive shaft

Lubrication oil:
Lithium base lubrication oil
2) Mount the drive shaft on the spline of main drive gear.
3) Pull rear wheel fork forward, and mount drive shaft on the rear joint of direction knot.

4. Connect:
- Rubber bushing etc.

5. Mount:
   - Coupling bolt of rear arm
   - Rear arm nut
   - Coupling bolt of rear arm

Caution
Turn the rear arm shaft bolt and rear arm shaft nut temporarily, and don’t fasten them at this time.

6. Check:
   - Operation of drive shaft

Checking steps:
   - Hold the front wheel and put the proper bracket on the frame for lifting rear wheel
   - Front and rear turning rear wheel
   - Front and rear turning rear wheel

Check the operation of driving shaft. If the operation is not good, check the installation of drive shaft again.
7. Fasten:
- Bolt (Installation position of engine-rear lower)
- Bolt (Installation position of engine-rear lower)
- Bolt (Installation position of engine-front)
- Bolt (Installation position of engine-top)
- Coupling bolt of rear arm (Rear arm shaft-right)
- Coupling bolt of rear arm (Rear arm shaft-ring)
- Rear arm nut
Bolt (Installation position of engine-rear lower) 33Nm (3.3m.bg.24ft.lb)
Bolt (Installation position of engine-rear lower) 33Nm (3.3m.bg.24ft.lb)
Bolt (Installation position of engine-front) 48Nm (4.8m.bg.35ft.lb)
Bolt (Installation position of engine-top) 33Nm (3.3m.bg.24ft.lb)
Coupling bolt of rear arm (rear arm shaft-left) 130Nm (13m.bg.4.3ft.lb)
Coupling bolt of rear arm (rear arm shaft-ring) 0.6Nm (0.6m.bg.94ft.lb)
Rear arm nut: 130Nm (13m.bg.94ft.lb)
Bolt (rear shock absorber-top): 50Nm (5.0km.bg.36ft.lb)

8. Mount:
Dust cap of rear arm shaft

9. Connect:
- Breather tube (rear drive)
Refer to “Diagram of vehicle” in section 6 of chapter
10. Connect:
- Spark plug terminal
- CDI magneto terminal
- "Reverse" switch terminal
- "Neutral" switch terminal
- Breather tube (rankcase)
- Brake cable
Refer to “Diagram of vehicle” in section 6 of chapter 15-84
11. Mount:
- Starting motor
- Coupling plate of starting motor
- Wire of starting motor

**Caution**
Lubricate o-ring before mounting the starting motor.

12. Mount:
- Spring
- Foot rest (right)
Bolt (foot rest):
  - 65Nm (6.5 m·47 ft·lb)
Bolt (shifting pedal):
  - 10Nm (1 m·7.2 ft·lb)
Bolt (foot rest):
  - 65Nm (6.5 m·47 ft·lb)
Bolt (foot rest):
  - 30Nm (3.0 m·22 ft·lb)

13. Mount:
- Bracing of front fender
- Shifting pedal
- Foot rest (left)

14. Connect
- Rear brake cable (rear)
- Rear brake rod

15. Adjust:
- Rear brake
Refer to “Adjustment of rear brake lever and brake pedal” in chapter 3
16. Mount:
- Exhaust pipe
- Silencer

17. Fill oil:
- Crankcase
Total: 2.2L
Refer to relevant part in section 5 of chapter 2.

18. Adjust:
- Free clearance of plunger (clutch)

19. Adjust:
- Position of drive selection lever
Refer to relevant part in section 5 of chapter 2

20. Adjust:
- Idle speed
Refer to relevant part in section 5 of chapter 2
Idle speed: 1400-1500 r/min

21. Adjust:
- Idle stroke of throttle cable
Refer to relevant part in section 5 of chapter 2
Idle stroke of throttle cable: 3-5 mm
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
      . Staring 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
(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 loosened
- 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 "slippage of clutch" and "ablation of clutch" in this chapter

2. Shifting pedal 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
- Claw of gear end is worn
- Clutch slips
  1. Clutch
     - Improper adjustment of clamp plate release rod clearance of clutch
     - Clutch spring is loosen (primary clutch and secondary clutch)
     - Clutch spring is fatigue (primary clutch and secondary clutch)
     - Friction disc is worn
     - Clamp plate is worn or deformed
  2. Clutch
     - Improper match between release lever and release rod
     - Deformed clutch clamp plate
     - Friction disc is deformed
     - Clutch hub is broken
(2) Engine oil
- Improper oil level
- Improper oil toughness
- Poor oil quality
-V) Clutch is locked
  1. Clutch
     - Improper adjustment of brake clearance
     - Improper brake arm position
     - Improper match between release lever and release rod
     - Deformed clutch clamp plate
     - Friction disc is deformed
     - Clutch hub is broken
(2) Engine oil
- Improper oil level
- Improper oil toughness
- Poor oil quality
(III) Cylinder system
- Improper spark plug clearance
- Wrong spark plug heating value
- CDI failure
(2) Fuel system
- Main jet of carburetor is wrong
- Improper oil level
(3) Cylinder system
- Core of air filter is clogged
(II) Cylinder system
- Improper spark plug clearance
- Wrong spark plug heating value
- CDI failure
-VII) Engine is overheat
(1) Ignition system
- Improper spark plug clearance
- Wrong spark plug heating value
- CDI failure
(2) Steering system
- Wrong toe-in
- Steering pillar is bend
(II) Cylinder system
- Improper spark plug clearance
- Wrong spark plug heating value
- CDI failure
(1) Handle bar
- Improper installation or handlebar is bent
(IX) Shock absorber failure/improper operation
1. Shock absorber failure:
   - Damping rod is bent or damaged
   - Bad oil sealing lip
   - Spring of shock absorber is fatigue
2. Improper operation
   - Improper installation or handlebar is bent
(VII) Engine is overheat
(1) Ignition system
- Improper spark plug clearance
- Wrong spark plug heating value
- CDI failure
(2) Steering system
- Wrong toe-in
- Steering pillar is bend
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 coilor 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