FACT 50 4s
Maintenance Manual

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Preface

This maintenance manual is used for operating and maintaining Motorcycle FACT 50 4T.

Preparing Documents include all necessary instructions and statements. Please carefully read this manual before operation.

Inspection & Adjustment states how to check and adjust your motorcycle. All safety rules and maintenance regulations shall be carried out from the beginning of periodic inspection.

Except for Chapter I, the rest chapters explain the disassembly/assembly/inspection of engine, entire motorcycle and electrical parts.

Breakdown drawing, systematic drawing, failure analysis and statements are contained at the first part of each chapter.

Please note that photos, pictures or instructions are for your reference only. The actual object may differ from this mentioned here. We will not make notification for any discrepancy.

Preparing documents

General safety  Maintenance rules

Specification table  Failure diagnosis

General Safety

Carbon monoxide

Engine must be started up in a well-ventilated place, not in a closed area.

Note

Exhaust gas contains poisonous carbon monoxide, which may cause unconsciousness or even death of human.
Start up engine in an open place. The exhaust cleaning system shall be adopted if engine is started up in a closed area.

**Petrol**

Ventilation is required for working places. Fire is strictly forbidden in any working place or where petroleum is stored.

**Battery**

Battery emits explosive gas. Therefore, it shall be far away from fire sources, naked flame or smoking places. Make sure good ventilation during charging.

Battery contains sulfuric acid (electrolyte). It will burn your skin or eyes when contacted. Therefore, wear protective clothing and mask.

— Clean with fresh water immediately if electrolyte splashes on the skin.

— Clean with fresh water at least for 15 minutes immediately and then go to the doctor if electrolyte splashes on eyes.

Electrolyte is poisonous. Drink a large quantity of fresh water, milk, milk of magnesia (laxative antacid) or mineral oil if electrolyte is swollen accidentally. Then go to the doctor. It shall be unreachable for children.

Do not remove the battery during commissioning. Otherwise, it may cause damage to inner parts of the vehicle.

**Maintenance Rules**

Metric tools are preferable for the maintenance of this motorcycle. Improper tools may cause damage.

Clean up the surface of components or assembly parts before removing or opening the shield for maintenance, which can prevent dirt from falling into the engine, chassis or braking system.

Wash and dry parts with air compressor after disassembly and before measurement of attrition value.

Solvent or oil can easily damage aging rubber articles. Check rubber before reassembly and replace rubber if necessary.
When loosening assembly parts, please start from outside to inside. Small assembly parts shall be loosened first.

Complex assembly parts, such as gearbox, shall be stored in proper order for facilitating installation in the future.

Please specially note important connections before disassembly. Replace parts which will not be in use before disassembly.

Bolts and screws with different length shall be separately used for different assembly parts and shields, and they shall be correctly mounted. Insert a bolt into a hole to check whether it is proper if you are confused.

Fill the groove with grease before mounting an oil seal. Check whether the oil seal is smooth or damaged during assembly.
When installing a hose (fuel, vacuum or cooling agent), insert its end into the bottom of the connector so that the hose clip can properly fix the connector. Rubber or plastic dirt-proof boot shall be mounted at the original design position.

槽: groove 夹子: clip 接头: connector

During dismantling ball bearings, one or two (inside & outside) bearing rollers shall be supported by tools. Ball bearings may be damaged during disassembly and have to be replaced if only one roller (either inside or outside) is imposed with force.

以上两例都会使轴承破裂; Bearings will be broken under either occasion as mentioned.
Loose cables threaten electrical safety. Check each cable after it is clamped to another for electrical safety;
Wire clamps are not allowed to bend towards welding point;
Bind cables at the designated place;
Do not deploy cables at the end of frame or at sharp point;
Do not deploy cables at the end of bolts or screws;
Cable deployment shall be far from heat source and where cables may be clamped during moving;
Cables along the handlebar shall be neither too tight nor too loose, and do not interface with any neighboring parts at steering positions;
Cables shall be properly deployed without twist or knot;
Check whether the connector jacket is damaged and whether the connector is over-stretched before mounting connectors;
Adopt adhesive tape or hosepipe to protect cables if they are positioned at sharp point or corner;
Bind cables with tape after repairing;
Control cables shall not be bent or twisted. Clumsy operation may be caused in light of damaged control cables.
Identification

1. The identification number of motorcycle frame is marked at: *LBBTEBAA????????*. The 10th digital and 11th digital respectively indicate year code and factory code. “*” shall be added before and after the frame number. The frame sign is nailed at . See Fig. 1-1.

![Fig. 1-1](image)

2. The engine serial number is printed on the shell of crankcase. See fig. 1-2.

![Fig. 1-2](image)

Significant Notes

1. Please apply valid Qianjiang parts and accessories. Any part or accessory not in accordance with the design specification of Qianjiang Company may cause damage to engine.
2. Only metric tools are valid for maintenance and repair. Metric screws, bolts and nuts can not be exchanged with imperial fasteners.
3. New gaskets, O-rings, cotter pins and locking pieces shall be applied for re-assembly.
4. Bolts with large diameter or positioned inside shall be fastened first and then diagonally screw down until reaching required torque, otherwise there is special instruction.
5. Wash disassembled parts with cleanser. Lubricate all sliding surface before assembly.
6. Check whether all the parts and accessories are correctly mounted and operated after assembly.
7. Clean and remove oil before measurement. Add recommended lubricant to the lubricating areas during assembly.
8. Apply lubricant to the surface of engine and driving system if they are dismantled for long-term storage, which can prevent rust and dirt.
**Special Tools**

Special tools refer to tools which are specially designed for assembling or disassembling some motorcycle parts on special positions. Applicable special tools are necessary for precise adjustment and installation. With them, parts and accessories can be mounted safely, reliably and rapidly, which improves efficiency and saves energy.

1. Tools for repairing the engine

   Special tools are required for properly disassembling/assembling some engine parts.

   Table and drawing (1-1, 1-2) of special tools for disassembling/assembling engine parts are as follows:

   **Table 1-1**

<table>
<thead>
<tr>
<th>Name</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special socket spanner</td>
<td>Used for assembling/disassembling bolts for flywheels, Fig. 1-3</td>
</tr>
<tr>
<td>Clutch clamp holder</td>
<td>Fig. 1-4</td>
</tr>
<tr>
<td>Flywheel puller</td>
<td>Fig. 1-5</td>
</tr>
<tr>
<td>Feeler gauge</td>
<td>Fig. 1-6</td>
</tr>
<tr>
<td>Bearing disassembly tools</td>
<td>Fig. 1-7</td>
</tr>
<tr>
<td>Bearing assembly tools</td>
<td>Fig. 1-8</td>
</tr>
<tr>
<td>Oil seal remover</td>
<td>Fig. 1-9</td>
</tr>
<tr>
<td>Handle for dismantling tools</td>
<td>Fig. 1-10</td>
</tr>
<tr>
<td>Piston pin pulling device</td>
<td>Fig. 1-11</td>
</tr>
<tr>
<td>Piston pin pliers</td>
<td>Fig. 1-12</td>
</tr>
<tr>
<td>Socket spanner for spark plug</td>
<td>Fig. 1-13</td>
</tr>
<tr>
<td>Clutch thickness measuring device</td>
<td>Fig. 1-14</td>
</tr>
<tr>
<td>Cylinder diameter measuring device</td>
<td>Fig. 1-15</td>
</tr>
<tr>
<td>Dial indicator</td>
<td>Measuring the inner diameter of piston pin, Fig. 1-16</td>
</tr>
</tbody>
</table>

   **Table 1-2 (continued)**

<table>
<thead>
<tr>
<th>Fig. 1-3</th>
<th>Fig. 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>厚度规 (塞尺):</td>
<td>feeler gauge</td>
</tr>
</tbody>
</table>

   | Fig. 1-5           | Fig. 1-6厚度规 (塞尺): feeler gauge |

<table>
<thead>
<tr>
<th>Fig. 1-16</th>
<th>Fig. 1-17</th>
</tr>
</thead>
</table>
Fig. 1-7

Fig. 1-8

Fig. 1-9

Fig. 1-10

Fig. 1-11

Fig. 1-12

Fig. 1-13

Fig. 1-14

handle

pliers   piston
2. Tools for repairing the chassis

Table and drawing (1-17, 1-18) of ordinary tools and special tools for disassembling/assembling chassis parts are as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque spanner</td>
<td>Fig. 1-19</td>
</tr>
<tr>
<td>Inner hexagon spanner</td>
<td>Fig. 1-20</td>
</tr>
<tr>
<td>Socket spanner</td>
<td>Fig. 1-21</td>
</tr>
<tr>
<td>Micrometer</td>
<td>Fig. 1-22</td>
</tr>
<tr>
<td>Magnetic rack, V-block</td>
<td>Fig. 1-23</td>
</tr>
<tr>
<td>Dial indicator</td>
<td>Fig. 1-24</td>
</tr>
<tr>
<td>Vernier calipers</td>
<td>Fig. 1-25</td>
</tr>
<tr>
<td>Circlip pliers</td>
<td>Fig. 1-26</td>
</tr>
<tr>
<td>Screwdriver with striking cap</td>
<td>Fig. 1-27</td>
</tr>
<tr>
<td>Tool for assembling oil seal of front fork</td>
<td>Fig. 1-28</td>
</tr>
<tr>
<td>Tool for hammering seal of front fork</td>
<td>Fig. 1-29</td>
</tr>
<tr>
<td>Steering nut spanner</td>
<td>Fig. 1-30</td>
</tr>
</tbody>
</table>

(1) Ordinary tools for repairing the chassis

Table 1-18 (continued)
(2) Special tools for repairing the chassis: tool for hammering seal of front fork

(3) Steering nut spanner
3. Tools for electric parts

Table and drawings (1-31, 1-32) of special tools for testing electric parts are as follows:

### Table 1-31

<table>
<thead>
<tr>
<th>Name</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimeter</td>
<td>Fig. 1-33</td>
</tr>
<tr>
<td>Ignition tester</td>
<td>Fig. 1-34</td>
</tr>
</tbody>
</table>

### Table 1-32 (continued)

**Specification (FACT 50 4T25Km)**

<table>
<thead>
<tr>
<th>Model</th>
<th>FACT 50 4T</th>
<th>Engine type</th>
<th>QJ137QMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length mm</td>
<td>1800</td>
<td>Fuel type</td>
<td>Unleaded petrol (92/95)</td>
</tr>
<tr>
<td>Width mm</td>
<td>700</td>
<td>No. of cylinder</td>
<td>1</td>
</tr>
<tr>
<td>Height mm</td>
<td>1150</td>
<td>ID × stroke</td>
<td>37mm×46.5mm</td>
</tr>
<tr>
<td>Wheelbase mm</td>
<td>1270</td>
<td>Total displacement</td>
<td>50cc</td>
</tr>
<tr>
<td>Weight kg (Curb weight)</td>
<td>Forward shaft</td>
<td>Startup</td>
<td>Electric/kick</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>Cooling</td>
<td>Air cooling</td>
</tr>
</tbody>
</table>
## Specification (FACT 50 4T45Km)

<table>
<thead>
<tr>
<th>Model</th>
<th>FACT 50 4T</th>
<th>Engine type</th>
<th>Engine</th>
<th>QJ137QMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length mm</td>
<td>1800</td>
<td>Fuel type</td>
<td>Unleaded petrol (92/95)</td>
<td></td>
</tr>
<tr>
<td>Width mm</td>
<td>700</td>
<td>No. of cylinder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Height mm</td>
<td>1150</td>
<td>ID × stroke</td>
<td>37mm×46.5mm</td>
<td></td>
</tr>
<tr>
<td>Wheelbase mm</td>
<td>1270</td>
<td>Total displacement</td>
<td>50cc</td>
<td></td>
</tr>
<tr>
<td>Weight kg</td>
<td>Forward shaft</td>
<td>Startup</td>
<td>Electric/kick</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission gear</th>
<th>Clutch</th>
<th>Dry centrifugal clutch</th>
<th>Variable speed gear</th>
<th>Stepless</th>
<th>Transmission</th>
<th>Belt transmission</th>
<th>Battery capacity/type</th>
<th>12V-4AH/ dry-charged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric devices</td>
<td>Magnetor capacity</td>
<td>89.6W/5000rpm</td>
<td>Spark plug</td>
<td>BR7ES (NGK)</td>
<td>Spark plug gap</td>
<td>0.6-0.8mm</td>
<td>Ignition</td>
<td>CDI</td>
</tr>
<tr>
<td></td>
<td>Spark plug gap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Total</th>
<th>92</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front outer tire</td>
<td>120/70-12</td>
<td></td>
</tr>
<tr>
<td>Front rim</td>
<td>3.50×12</td>
<td></td>
</tr>
<tr>
<td>Rear outer tire</td>
<td>130/70-12</td>
<td></td>
</tr>
<tr>
<td>Rear rim</td>
<td>3.50×12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lubrication</th>
<th>Splash lubrication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air filter</td>
<td>e9QJAF-B70</td>
</tr>
<tr>
<td>Capacity of gasoline tank</td>
<td>6.0±0.2L</td>
</tr>
<tr>
<td>Carburetor type</td>
<td>PD19JB</td>
</tr>
<tr>
<td>Idle speed - rpm</td>
<td>1800±100rpm/min</td>
</tr>
<tr>
<td>Max. torque</td>
<td>3.05N.m/3000rpm</td>
</tr>
<tr>
<td>Max. Hp</td>
<td>1.24kW/4000rpm</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>6.9: 1</td>
</tr>
<tr>
<td>Max. speed</td>
<td>25km/h</td>
</tr>
<tr>
<td>Dia. of front brake disc (mm)</td>
<td>φ190mm</td>
</tr>
<tr>
<td>I.D. of rear brake drum (mm)</td>
<td>φ110mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Hp</td>
<td>1.24kW/4000rpm</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>6.9: 1</td>
</tr>
<tr>
<td>Max. speed</td>
<td>25km/h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Braking system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dia. of front brake disc (mm)</td>
<td>φ190mm</td>
</tr>
<tr>
<td>I.D. of rear brake drum (mm)</td>
<td>φ110mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clutch</th>
<th>Dry centrifugal clutch</th>
<th>Variable speed gear</th>
<th>Stepless</th>
<th>Transmission</th>
<th>Belt transmission</th>
<th>Battery capacity/type</th>
<th>12V-4AH/ dry-charged</th>
<th>Magnetor capacity</th>
<th>89.6W/5000rpm</th>
<th>Spark plug</th>
<th>BR7ES (NGK)</th>
<th>Spark plug gap</th>
<th>0.6-0.8mm</th>
<th>Ignition</th>
<th>CDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission gear</td>
<td>Clutch</td>
<td>Dry centrifugal clutch</td>
<td>Variable speed gear</td>
<td>Stepless</td>
<td>Transmission</td>
<td>Belt transmission</td>
<td>Battery capacity/type</td>
<td>12V-4AH/ dry-charged</td>
<td>Magnetor capacity</td>
<td>89.6W/5000rpm</td>
<td>Spark plug</td>
<td>BR7ES (NGK)</td>
<td>Spark plug gap</td>
<td>0.6-0.8mm</td>
<td>Ignition</td>
</tr>
<tr>
<td>Electric devices</td>
<td>Magnetor capacity</td>
<td>89.6W/5000rpm</td>
<td>Spark plug</td>
<td>BR7ES (NGK)</td>
<td>Spark plug gap</td>
<td>0.6-0.8mm</td>
<td>Ignition</td>
<td>CDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Braking system</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dia. of front brake disc (mm)</td>
<td>φ190mm</td>
</tr>
<tr>
<td>I.D. of rear brake drum (mm)</td>
<td>φ110mm</td>
</tr>
<tr>
<td>(Curb weight)</td>
<td>Backshaft</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Tire Size</td>
<td>Front outer tire</td>
</tr>
<tr>
<td></td>
<td>Front rim</td>
</tr>
<tr>
<td></td>
<td>Rear outer tire</td>
</tr>
<tr>
<td></td>
<td>Rear rim</td>
</tr>
</tbody>
</table>

| Transmission gear | Clutch | Dry centrifugal clutch |
|                   | Variable speed gear | Stepless |
|                   | Transmission | Belt transmission |

| Electric devices | Battery capacity/type | 12V-4AH/ dry-charged |
|                 | Magnetor capacity | 89.6W/5000rpm |
|                 | Spark plug | NGK CR6HSA |
|                 | Spark plug gap | 0.6-0.7mm |
|                 | Ignition | CDI |

<table>
<thead>
<tr>
<th>Cooling</th>
<th>Air cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Splash lubrication</td>
</tr>
<tr>
<td></td>
<td>e9QJAF-B70</td>
</tr>
<tr>
<td></td>
<td>Capacity of gasoline tank</td>
</tr>
<tr>
<td></td>
<td>Carburetor type</td>
</tr>
<tr>
<td></td>
<td>Idle speed - rpm</td>
</tr>
<tr>
<td></td>
<td>Max. torque</td>
</tr>
<tr>
<td></td>
<td>Max. Hp</td>
</tr>
<tr>
<td></td>
<td>Compression ratio</td>
</tr>
<tr>
<td></td>
<td>Max. speed</td>
</tr>
<tr>
<td></td>
<td>Dia. of front brake disc (mm)</td>
</tr>
<tr>
<td></td>
<td>I.D. of rear brake drum (mm)</td>
</tr>
</tbody>
</table>
FACT 50 4T

Dimensions:
- Height: 1150 mm
- Length: 1270 mm
- Width: 1800 mm
- Wheelbase: 700 mm
Failure Diagnosis

Diagnosis on failure or difficulty in starting engine

Failure or difficulty in starting engine

Check ignition system

Remove the spark plug and check whether there is carbon fouling between electrode.

Y
N

Sparkover test for spark plug

Eliminate carbon fouling

Weak spark or no spark between electrode

Large blue or bluish purple spark between electrode

Screw off spark plug cap and conduct sparkover test for high-voltage line

Check whether ignition is timely conducted with an ignition timing lamp

N
Y

Large blue spark

Weak spark or no spark

Check whether spark plug and cap are in good condition

Check power supply for ignition

Non-contact ignition system for electromagnetic motor

1. Check whether short circuit or open circuit occurs to ignition coil
2. Check whether short circuit or open circuit occurs to trigger coil

Check whether CDI ignition device is in good condition

Check the compression pressure of cylinder with pressure gauge

N
Y

1. Check whether CDI ignition device is in good condition
2. Check whether flywheels and trigger coil are loosened

Loosen drain screws of the carburetor and check whether there is gasoline in the overflow pipe

Check whether there is gasoline in the fuel tank

Add gasoline

Normal compression pressure

Insufficient compression pressure
1. Check leakage on outer connections of the engine.
2. Check whether the piston ring is seized in the groove or whether it has enough elasticity.
3. Check abrasion of the piston ring and the cylinder.

Remove spark plug and check it

Moist electrode of spark plug

Check whether there is oil spillover in the carburetor

Y  N

1. Check whether the float needle valve and the valve seat are firmly combined
2. Check whether the conical surface of float needle valve is abrasive as stepped.
3. Check whether the carburetor float is broken
4. Check whether the carburetor float is too low

Check whether air filter is blocked

Flameout shortly after startup

The carburetor is blocked inside or the float is too high

Dry electrode of spark plug

Drop a little gasoline into the cylinder for trial startup

Y  N

1. Check whether the air vent in fuel tank cover is blocked.
2. Check whether the fuel filter and the fuel switch are blocked.
3. Check whether the fuel switch works normally.
4. Check whether the oil hole of the carburetor is blocked.
5. Check whether the carburetor float is too high

Continue to work after startup

Startup device of carburetor (startup & enrichment system) is at fault
Diagnosis on engine overheating

1. Check whether gasoline grade is improper or gasoline is stored for a long time
2. Check whether the engine works at high speed for a long time or with overload during driving

Check cooling system

Air-cooled engine

Check whether heat sink is spotted or there is too much oil stain

Clean

Check whether cooling fan or air director is damaged (forcedly air-cooled engine)

Inspection & solution

Check whether ignition is timely conducted with an ignition timing lamp

1. Check whether CDI ignition device is in good condition
2. Check whether flywheels and trigger coil are loosened

Check whether clutch is slipping

Slipping clutch

Solution to slipping clutch
Remove the spark plug; check the colors of spark plug insulators and judge the proportion of mixed combustible gas based on abnormality.

- The spark plug insulators are black; the exhaust muffler emits black smoke or causes backfire if the engine works at low speed; bad acceleration property; instable idle speed; flameout probability; it works normally at high speed.
  - Mixed combustible gas is too dense.
    1. Check whether the air filter is blocked.
    2. Check whether the startup device for carburetor (startup & enrichment system) works normally.
    3. Check whether the carburetor float is too low.

- The spark plug insulators are brown
  - Normal combustible gas mixture

- The spark plug insulators are white; the engine may intermit during acceleration; the carburetor generates backfire; insufficient power of engine
  - Mixed combustible gas is diluted.
    1. Check whether the fuel switch works normally.
    2. Check whether the carburetor float is too high.
    3. Check whether the measuring jets and drill ways in the carburetor are blocked.

Mixed combustible gas

Check whether the cylinder outlet or the exhaust muffler is blocked due to accumulated carbon fouling.

Check the lubrication system of the two-stroke engine

1. Check fuel level in the crankcase.
2. Check whether fuel in the crankcase has low viscosity or is dirty.
3. Check whether the fuel filter is blocked.
4. Check whether the fuel pump works normally.
5. Check whether the lubricant channel is blocked.

Lubrication system of the two-stroke engine

1. Check whether the air filter is blocked.
2. Check whether the startup device for carburetor (startup & enrichment system) works normally.
3. Check whether the carburetor float is too low.

Normal combustible gas mixture

The spark plug insulators are brown

Mixed combustible gas is too dense.

1. Check whether the air filter is blocked.
2. Check whether the startup device for carburetor (startup & enrichment system) works normally.
3. Check whether the carburetor float is too low.

1. Check fuel level in the crankcase.
2. Check whether fuel in the crankcase has low viscosity or is dirty.
3. Check whether the fuel filter is blocked.
4. Check whether the fuel pump works normally.
5. Check whether the lubricant channel is blocked.
Diagnosis on power shortage of engine

Power shortage of engine

Raise the main kickstand and suspend wheels; rotate wheels with hands

Flexible rotating of wheels

Check tire pressure

Low pressure

Check whether air leakage occurs to tire valve and whether tire is pierced or broken

Normal pressure

Remove the spark plug and block the threaded hole with finger; press the startup button or step on the kick-start lever

Inflexible rotating of wheels

1. Check whether there is braking drag.
2. Check whether wheel bearing is excessively abraded or damaged.
3. Check whether the middle sleeve of hub is missed or too short.

Touch with your fingers and you can feel fierce air rushing out with puffing sound.

Normal compression pressure of cylinder

Start the engine and slowly accelerate; observe the rotation speed change of engine.

The rotation speed of engine rises as it slowly accelerates.

1. Check whether the clutch is slipping.
2. Check whether the driving belt is excessively abraded.
3. Check whether the centrifugal roller of driving pulley is excessively abraded.
4. Check whether the conical surface of driving wheels and friction wheels is excessively abraded or abraded to be groove.
5. Check whether the conical surface of driven wheels and moving driven wheels is excessively abraded or abraded to be groove.
6. Check whether the raceway on the inner surface of friction wheels is excessively abraded or pressed to be concave.

The rotation speed of engine does not rise as it slowly accelerates.

Check whether ignition is timely conducted with an ignition timing lamp.

Y

1. Check whether the fuel supply system works normally.
2. Check whether the carburetor, air filter and exhaust muffler are blocked.
3. Check whether the vacuum diaphragm of plunger valve of carburetor is cracked or broken.

N

1. Check whether CDI ignition device is in good condition.
2. Check whether flywheels and trigger coil are loosened.
Diagnosis on abnormal idle speed of engine

Abnormal idle speed of engine

No idle speed
- Check compression pressure of cylinder

High idle speed
- Check whether the carburetor throttle is completely closed with your hand.

Unstable idle speed
- Check whether ignition is timely conducted with an ignition timing lamp.

Insufficient compression pressure
1. Check leakage on outer connections of the engine.
2. Check whether the piston ring is ruptured or seized in the groove or whether it has enough elasticity.
3. Check abrasion of the piston ring and the cylinder.

Normal compression pressure
- Check whether idle jet is too big.

Idle speed after adjustment
- Adjust the idle speed of carburetor.

No idle speed after adjustment
- The air adjusting screws of the carburetor or the adjusting screws of throttle valve are improperly adjusted.

Check whether carburetor float is too high.
1. Check whether carburetor float is too high.
2. Clean and clear

Adjust the float height to standard value.

1. Check whether CDI ignition device is in good condition
2. Check whether flywheels and trigger coil are loosened

Check whether carburetor idle jet, idle fuel way and air path are blocked.
- Adjust the electrode gap.

1. Check whether the heat insulator of carburetor is cracked.
2. Check whether the fixing nuts of carburetor are loosened.
3. Check whether the negative pressure pipe of fuel switch is broken.
4. Check whether air leakage occurs to reed valve.
Diagnosis on excessive fuel consumption of engine

Excessive fuel consumption of engine

Check whether operation is correct

Y

Raise the main kickstand and rotate wheels with hands

N

1. Check whether the motorcycle runs with overload or not at economical speed or at low gear.
2. Check whether petrol grade is proper.

Inflexible rotating of wheels

Flexible rotating of wheels

1. Check whether there is braking drag.
2. Check whether wheel bearing is seriously abraded or damaged.
3. Check whether the middle sleeve of hub is missed or too short.

Check tire pressure

Low pressure

Inflated as required

Normal pressure

Check whether oil leakage occurs in fuel tank, fuel switch, fuel pipe or carburetor.

Solve problems based on actual situation

Check the proportion of mixed combustible gas.

Normal combustible gas mixture

Mixed combustible gas is too dense.

Check whether the idle speed of engine is too high.

Y

Check and adjust the carburetor.

N

Check whether the carburetor is blocked inside.
1. Check whether the air filter is blocked.
2. Check whether the carburetor float is too low.
3. Check whether the main measuring jet of carburetor is too big.

Mixed combustible gas is diluted.

Check whether ignition is timely conducted with an ignition timing lamp

Y

N

Check whether the driving belt of clutch is slipping.

Check the ignition system.
Diagnosis on dense bluish white smoke from the exhaust muffler of the two-stroke engine

The exhaust muffler of the two-stroke engine emits dense bluish white smoke.

Check whether the fuel level in the crankcase exceeds the upper limit.

Y

Excessive fuel filling into the crankcase. Drain out the excessive part and make sure the fuel level is not over the upper limit.

N

Start up the engine and remove the dipstick when it works at high speed. Check whether there is smoke from the fuel filler.

1. Check whether the cylinder, the piston and the piston ring are excessively abraded.
2. Check whether the piston ring has enough elasticity or whether it is seized in the groove.
3. Check whether piston ring joint is staggered.

Diagnosis on difficulty in transmission shift

Start the engine and check whether the idle speed is too high.

Y

Re-adjustment

N

Check whether it is coordinated when shifting

Y

Check whether the clutch is completely released

N

Improve operation

Y

Check whether the gearshift shaft is deformed or the gearshift arm is deformed or excessively abrasive

Y

Replace

N

1. Check whether the groove of the gearshift cam is excessively abrasive or damaged.
2. Check whether the fork hole is excessively abrasive.
3. Check whether the fork is deformed.
4. Check whether the fork shaft is deformed or excessively abrasive.

1. Check whether the free stroke of the clutch grip is between 10mm–20mm.
2. Check the balanced elasticity of clutch spring.
3. Check whether the tooth-shaped groove of the drive hub and the driven hub is abraded to be jagged.
4. Check whether the driven disc of the clutch is bent or deformed.
5. Check whether components of the clutch lever are excessively abrasive.
Diagnosis on transmission gear skip shift

Transmission gear skip shift
- Check whether the positioning wheel spring is ruptured or lacks elasticity.
  - Y: Replacement
  - N: Disassemble crankcase and check whether the engagement depth for each gear is in accordance with requirements.
    - Proper depth in engaging
      - Y: Check whether the engaging end of the cam claw on the engaged gear face is abraded to be conical or largely circular, and whether the groove on the corresponding gear face is abraded to be trumpet-shaped.
      - N: Replace gear
    - Insufficient depth in engaging
      - Y: Check whether the shift fork is excessively abraded or deformed.
      - N: Clean and remove oil stain
    - N: Replace shift fork
    - Y: Check whether the engagement depth for each gear is in accordance with requirements.

Diagnosis on clutch slipping

Automatic shoe-type centrifugal & dry clutch is slipping.
- Check whether the shoe-type friction plate is spotted with oil stain.
  - N: Check whether the shoe-type friction plate is excessively abraded.
    - N: Check whether the contact surface area between shoe-type friction plate and friction disc is beyond 70%.
    - Y: Replace the whole set of clutch shoes
  - Y: Replace the whole set of clutch shoes
- Y: Clean and remove oil stain
- Y: Repair or replace clutch shoes

Check whether the spline teeth of main shaft/countershaft and the spline groove in the clash gear are excessively abraded.
- Check whether shift fork hole and shift shaft are abraded. Check whether the gap between shift fork pin/gearshift shaft and cam groove is too big. Check whether the installation of transmission is correct.
- Check whether the shoe-type friction plate on the engaged gear face is abraded to be conical or largely circular, and whether the groove on the corresponding gear face is abraded to be trumpet-shaped.
- Check whether the engaging end of the cam claw on the engaged gear face is abraded to be conical or largely circular, and whether the groove on the corresponding gear face is abraded to be trumpet-shaped.
- Check whether the contact surface between shoe-type friction plate and friction disc is excessively abraded.
**Diagnosis on malfunction of hydraulic disc brake**

**Malfunction of hydraulic disc brake**

- Check the level of brake fluid inside the brake fluid reservoir.
  - The level of brake fluid is below the lower limit of the reservoir.
    - Add brake fluid until it is beyond the lower limit; check whether there is oil leakage in brake caliper, brake hose and hose joints.
  - The level of brake fluid is beyond the lower limit of the reservoir.
    - Do you have "sponge" feeling when operating brake lever?
      - Yes: There is air left in the oil passage of brake system.
      - No: Check whether the abrasion of brake friction plate reaches limit mark and whether the brake disc is excessively abraded.

**Diagnosis on malfunction of drum brake**

**Malfunction of drum brake**

- Check whether the free stroke of brake lever is within 10mm ~ 20mm or whether the free stroke of brake pedal is within 20mm ~ 30mm.
  - No: Readjustment
    - The brake arm works flexibly but you can feel resistance when gripping the lever.
    - The steel wire rope of brake control cable is inflexible when pulling.
  - Yes: Separate the brake arm and the steel wire rope of brake control cable; check the brake arm with hands.
    - The brake arm works inflexibly.
    - The moving part of brake cam is rusty or blocked by something.

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1. Check whether the piston surface of master brake pump and the wall of oil tank are excessively abraded or damaged.
2. Check whether the piston cup of master brake pump is damaged, cracked or aged.
3. Check whether the seal of brake caliper is damaged, cracked or aged.
4. Check whether the piston surface of brake caliper and the wall of oil tank are excessively abraded or damaged.

1. Check whether the curved surface of brake cam is excessively abraded.
2. Check whether the friction plate of brake shoe is excessively abraded.
3. Check whether the inner diameter of brake hub is excessively abraded.
4. Check whether the friction surface of brake shoe is spotted with oil stain.
5. Check whether the contact surface area of the friction plate of brake shoe and the brake hub is less than 70%.
Diagnosis on battery charging failure

- **Battery charging failure**
  - Remove the connector between the conductor bundle of electromagnetic motor and the cable assembly; measure the resistance between the output conductor terminals of charging coil and check whether it is in accordance with the standard.
    - Resistance value lower than standard value.
      - Short circuit of charging coil
    - Resistance value in accordance with standard value.
    - Infinite resistance value.
      - Open circuit of charging coil or output conductor.

Set the multimeter to DC voltage 0V~20V; measure the voltage between the conductor terminal (connector to battery) (normally red wire or red/white wire) and the negative pole.

- **No voltage**
  - Open circuit between the connector and the battery.
- **Voltage available**
  - Check whether the rectifier or the rectifier regulator is broken down with an ohm meter.
Diagnosis on insufficient battery charging

Insufficient battery charging

Check whether the brake lamp is always light.

Y

Adjust or replace the brake lamp switch.

N

Set the ignition switch to “OFF”; remove the negative cable from the battery; connect the negative electrode of the ammeter to the battery negative terminal and the positive electrode to the positive terminal; check current leakage.

Leakage current smaller than the required.

Check whether the charging coil of the magnetor is short-circuit.

Y

Replace the charging coil

N

1. Check whether the battery electrolyte is enough.
2. Check whether the battery electrolyte is diluted.
3. Check whether the battery electrode plates are vulcanized or short-circuit.

Leakage current larger than the required (normally it shall be no more than 1mA).

Short circuit between the rectifier or the rectifier regulator or the battery and the ignition switch.
**Diagnosis on starter motor failure in rotation**

**Motorcycle scooter**

1. **Riding-style motorcycle**
   - The electric horn does not make sound or makes weak sound; the steering lamp emits weak light.
   - Grip the brake lever (motor scooter), or make the transmission at neutral gear, or grip the clutch lever; press the startup button.
   - The contact of conductor joint is bad.

2. **Diagnosis on starter motor failure in rotation**
   - The electric horn makes loud sound and the steering lamp emits bright light.
   - The contact of conductor joint is bad.

3. **Press the startup button and there is no joint sound from starter relay.**
   - Disassemble the connector of starter relay from the cable assembly; use two lead wires to connect the battery with two down-leads of the starter relay coil.
   - The starter motor does not work after connection, and there is no sound from starter relay.
   - Check the inner circuit of the electric starting control system.
   - Y: Check whether the contact of starting button is bad.
   - N: Check whether the contact of starting button is good.

4. **Check the inner circuit of the electric starting control system**
   - Y: Check whether the contact of starting button is bad. (Open circuit or short circuit of starter relay coil.)
   - N: Check whether the contact of starting button is good.

5. **Contacts of starter relay are burnt or damaged.**
   - Use screwdriver or large-diameter lead wire to short-circuit the battery terminal on the starter relay and the starter motor terminal.
   - The starter relay works normally after short circuit.
   - The starter motor works normally after short circuit.

6. **Press the startup button and there is joint sound from starter relay.**
   - Use screwdriver or large-diameter lead wire to short-circuit the battery terminal on the starter relay and the starter motor terminal.
   - The electric horn makes loud sound and the steering lamp emits bright light.
   - The starter relays are burnt or damaged.
   - Disassemble the starter motor and check:
     1. whether the carbon brush is excessively abraded;
     2. whether the carbon brush spring is ruptured or lacks elasticity;
     3. whether the armature commutator is excessively abraded;
     4. whether open circuit or short circuit occurs to the armature coil.

7. **Open circuit or short circuit of starter relay coil.**
   - Riding-style motorcycle
   - Grip the brake lever and check whether the brake lamp is light.
   - Y: Check whether the contact of starting button is bad.
   - N: Check whether the contact of starting button is good.

8. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
   - Grip the brake lever and check whether the brake lamp is light.
   - Y: Check whether the contact of starting button is bad.
   - N: Check whether the contact of starting button is good.

9. **Disassemble the starter motor and check:**
   - 1. whether the carbon brush is excessively abraded;
   - 2. whether the carbon brush spring is ruptured or lacks elasticity;
   - 3. whether the armature commutator is excessively abraded;
   - 4. whether open circuit or short circuit occurs to the armature coil.

10. **Y: Check whether the contact of starting button is bad.**
    - N: Check whether the contact of starting button is good.

11. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
    - Grip the brake lever and check whether the brake lamp is light.
    - Y: Check whether the contact of starting button is bad.
    - N: Check whether the contact of starting button is good.

12. **Disassemble the starter motor and check:**
    - 1. whether the carbon brush is excessively abraded;
    - 2. whether the carbon brush spring is ruptured or lacks elasticity;
    - 3. whether the armature commutator is excessively abraded;
    - 4. whether open circuit or short circuit occurs to the armature coil.

13. **Y: Check whether the contact of starting button is bad.**
    - N: Check whether the contact of starting button is good.

14. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
    - Grip the brake lever and check whether the brake lamp is light.
    - Y: Check whether the contact of starting button is bad.
    - N: Check whether the contact of starting button is good.

15. **Disassemble the starter motor and check:**
    - 1. whether the carbon brush is excessively abraded;
    - 2. whether the carbon brush spring is ruptured or lacks elasticity;
    - 3. whether the armature commutator is excessively abraded;
    - 4. whether open circuit or short circuit occurs to the armature coil.

16. **Y: Check whether the contact of starting button is bad.**
    - N: Check whether the contact of starting button is good.

17. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
    - Grip the brake lever and check whether the brake lamp is light.
    - Y: Check whether the contact of starting button is bad.
    - N: Check whether the contact of starting button is good.

18. **Disassemble the starter motor and check:**
    - 1. whether the carbon brush is excessively abraded;
    - 2. whether the carbon brush spring is ruptured or lacks elasticity;
    - 3. whether the armature commutator is excessively abraded;
    - 4. whether open circuit or short circuit occurs to the armature coil.

19. **Y: Check whether the contact of starting button is bad.**
    - N: Check whether the contact of starting button is good.

20. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
    - Grip the brake lever and check whether the brake lamp is light.
    - Y: Check whether the contact of starting button is bad.
    - N: Check whether the contact of starting button is good.

21. **Disassemble the starter motor and check:**
    - 1. whether the carbon brush is excessively abraded;
    - 2. whether the carbon brush spring is ruptured or lacks elasticity;
    - 3. whether the armature commutator is excessively abraded;
    - 4. whether open circuit or short circuit occurs to the armature coil.

22. **Y: Check whether the contact of starting button is bad.**
    - N: Check whether the contact of starting button is good.

23. **Bad contact inside the brake lamp switch or open circuit of its auxiliary circuit.**
    - Grip the brake lever and check whether the brake lamp is light.
    - Y: Check whether the contact of starting button is bad.
    - N: Check whether the contact of starting button is good.

24. **Disassemble the starter motor and check:**
    - 1. whether the carbon brush is excessively abraded;
    - 2. whether the carbon brush spring is ruptured or lacks elasticity;
    - 3. whether the armature commutator is excessively abraded;
    - 4. whether open circuit or short circuit occurs to the armature coil.
Diagnosis on starter motor running weak

Starter motor running weak

Turn the ignition switch; press the horn or turn the steering lamp switch.

The electric horn does not make sound or makes weak sound; the steering lamp emits weak light.

Battery power shortage or bad contact of conductor joint

Check whether the contact of conductor joint between starter relay and starter motor is bad.

Remove the lead wires connecting to starter motor and battery from the starter relay and press the starting button. Check whether the resistance between the battery terminal and the starter motor terminal is normal with ohm meter when the starter relay makes joint sound.

Disassemble the starter motor and check:
1. whether the carbon brush is excessively abraded;
2. whether the carbon brush spring is ruptured or lacks elasticity;
3. whether the surface of armature commutator is stained, burnt or damaged.
4. whether the armature commutator is excessively abraded.

Contacts of starter relay are burnt or damaged.

Inspection & elimination
Diagnosis on motorcycle lamp failure in illumination

Motorcycle lamp failure in illumination

AC power supply system for illumination

- Remove the connector between the conductor bundle of electromagnetic motor and the cable assembly; check whether there is power supply via the output conductors of the lighting coil with a test lamp.
  - The test lamp is not light.
    - Open circuit or short circuit of lighting coil or output wires
      - The lamp is light
        - Short circuit inside the rectifier regulator.
          - Replace the headlamp bulb and check all the other lamp bulbs.

  - The test lamp is light.
    - Start the engine and remove the connector between the rectifier regulator and the cable assembly.
      - The lamp is light
        - Dismantle the headlamp assembly and check whether any bulb is burnt.
          - Y: Use a lead wire to short circuit the power wire and the output wire of the illumination switch.
            - N: Open circuit or short circuit between the electromagnetic motor/ignition switch and the illumination switch.

DC power supply system for illumination

- Press the horn button or turn the steering lamp switch.
  - The horn can make loud sound and the steering lamp is light.
    - Normal battery power supply
      - No spark
        - Spark
          - Power shortage of battery
            - Y: 1. Check whether the fuse is burnt out.
              - 2. Check whether open circuit or short circuit occurs between the battery and ignition switch.
              - 3. Check whether open circuit or short circuit occurs to the ignition switch.

- The horn can not make loud sound and the steering lamp is not light.
  - Rapidly strike a lead wire on the negative/positive poles of battery and check spark.
    - No spark
      - Spark
        - Power shortage of battery
          - Y: 1. Check whether the fuse is burnt out.
            - 2. Check whether open circuit or short circuit occurs between the battery and ignition switch.
            - 3. Check whether open circuit or short circuit occurs to the ignition switch.
Diagnosis on burnt-out bulbs

1. Check whether the conductor joint connecting battery is in good condition.
2. Check whether the electrolyte is deficient inside the battery.
3. Check whether the electrolyte density inside the battery is too low.

Remove the connector between the rectifier regulator and the cable assembly; check whether there is open circuit between the lighting/charging coil of electromagnetic motor and the rectifier regulator with an ohm meter.

Set the multimeter to DC voltage 0V~20V; measure the voltage between the conductor terminal (connector to battery) (normally red wire or red/white wire) and the negative pole.

- No voltage
  - Open circuit between the connector and the battery
- Voltage available
  - Check whether the rectifier regulator works normally.
Diagnosis on weak light from lamps

Weak light from lamps

AC power supply system for illumination

- Remove the connector between the conductor bundle of electromagnetic motor and the cable assembly; check whether the resistance between the output cable terminals of lighting coil of electromagnetic motor is lower than the standard value with an ohm meter.

DC power supply system for illumination

- Turn the ignition switch; press the horn or turn the steering lamp switch.

Y

- The horn makes coarse sound; the steering lamp emits weak light.

N

- Power shortage of battery or bad connection between battery and the ignition switch.

Y

- The horn makes loud sound and the steering lamp emits bright light.

N

- Still weak light from the lamp.

Y

- The lamp works normally.

N

- Low stable voltage of rectifier regulator.

Y

- Check whether there is short circuit in the charging coil of electromagnetic coil and the charging system.

N

- Inspection & elimination

Y

- Dismantle the headlamp assembly and check whether the bulb glass is black or yellowish green.

N

- Replace headlamp bulb.

N

- Replace lamp bulb.

1. Check whether contacts inside the illumination switch and dimmer switch are in good condition.
2. Check whether the contact of connector and earth wire is in good condition.
Diagnosis on steering lamp failure in illumination

Steering lamp failure in illumination

- Steering lamps at one side are partly not light.
  - Remove the lamp covers and check whether the bulbs are burnt.
    - Y: Replace bulbs
    - N: Measure the voltage between the contact of the power cord of lamp holder and the negative pole with a voltmeter.
      - Voltage available: Open circuit of output power cord or bad earth of lamp bulb and lamp holder.
      - No voltage: Bad earth of lamp holder or bad connection between steering lamp bulb and lamp holder.

- Steering lamps at one side are wholly not light.
  - Remove the lamp covers and check whether the bulbs are burnt.
    - Y: Replace bulbs
    - N: Remove the connector of steering lamp switch and check whether the switch works normally at the breakdown side with an ohm meter.
      - Open circuit of output power cord or bad earth of lamp holder at the breakdown side.
      - Bad contact inside the steering lamp switch: Turn the steering lamp switch and use a lead wire or a screwdriver to short-circuit two lugs of flasher.

- All the steering lamps are not light.
  - Press the horn button and check whether the horn works normally.
    - The horn makes loud sound: Normal battery power supply
    - The horn can not make or makes coarse sound: Battery power supply shortage

The steering lamp is light.

- Replace steering lamp bulb and check whether the rectifier regulator works normally.
- Check whether there is power supply via the input power cord of steering lamp switch with a test lamp.

The steering lamp is not light.

- Remove the connector of steering lamp switch and use a lead wire to short-circuit the input power cord of the switch and the power cords connecting the left/right steering lamp.
  - The flasher is broken.
- The steering lamp is not light.
  - Bad contact inside the steering lamp switch.
Diagnosis on electric horn failure in making sound

1. **Electric horn failure in making sound**
   - Turn the ignition switch and steering lamp switch; check the work condition of steering lamp.

   - **The steering lamp is not light or emits weak light.**
     - Battery power supply shortage or open circuit/short circuit between battery and ignition switch.

   - **The steering lamp emits bright light.**
     - Normal battery power supply

   - Remove the power cord from the terminal of the electric horn and strike the power cord with the earth; check the spark

     - **Spark available**
       - Connect to the power cord of electric horn; use a screwdriver to contact the non-power cord terminal (to button) with the earth.

     - **No spark**
       - Short circuit between the ignition switch and electric horn

   - **The electric horn makes sound.**
     - Bad contact inside the horn button or open circuit between the electric horn and the button.

   - **The electric horn does not make sound.**
     - Adjust the volume and tune of the electric horn.

     - **The electric horn does not make sound.**
       - The electric horn works normally.

     - **The electric horn is broken.**
       - Improper adjustment
**Diagnosis on brake lamp failure in illumination**

- Brake lamp failure in illumination
- Disassemble the cover of brake lamp and check whether the circuit board is burnt.
  - Y
  - N
  - Replace the circuit board of brake lamp
  - Use a lead wire to short-circuit two terminals or two terminal pins of brake lamp switch.
  - The brake lamp is not light.
    - Use a screwdriver or a lead wire to strike the power lead of brake lamp with the earth; check the spark.
    - Spark available
      - Short circuit or open circuit between the brake lamp switch and the brake lamp.
    - No spark
      - Short circuit or open circuit between the ignition switch or brake lamp switch.
  - The brake lamp is light.

**Diagnosis on power shortage of battery**

- Power shortage of battery
- Check whether the brake lamp is always light.
  - Y
  - Adjust or replace the brake lamp switch.
  - Leakage current is lower than the required value.
  - Leakage current is higher than the required value. (Normally, the leakage current is required to be no more than 1mA.)
  - N
  - Turn the ignition switch to “OFF” position; disassemble the negative cable from the battery and connect the negative/positive electrode of ampere meter to the negative/positive terminal of battery; check leakage current.
  - Leakage current is lower than the required value.
  - Leakage current is higher than the required value.
Check whether short circuit occurs to the charging coil of electromagnetic motor.

Y

Replace charging coil

N

Short circuit between the rectifier or the rectifier regulator or the battery and the ignition switch.

1. Check whether the electrolyte inside the battery is sufficient.
2. Check whether the electrolyte density inside the battery is too low.
3. Check whether the battery plate is sulfurized or short-cut.
**Inspection/Adjustment**

Preparing information                  Cylinder pressure

Periodic Maintenance & Inspection Table    Gear oil

**Engine oil/ Oil filter**                  Replacement of gear oil

Fixing steering stem bearing & handlebar   Driving belt

Inspection & adjustment of throttle cable   Free stroke of front/rear brake

Air filter                                Inspection of brake fluid level

Spark plug                                Headlamp

Battery                                   Clutch

Carburetor                                 Front/rear suspension system

Ignition timing                            Bolt/nut/fastener

Rim/tire                                   Tire specification

**Preparing principles**

**General**

**Warning !**

- Make sure that it is well ventilated before starting the engine. It is forbidden to start it in a closed area. Exhaust gas, which contains monoxide, may cause unconsciousness or even death of human being.
- Petrol is liable to volatile or explode under certain condition. Ventilation is required and no any fire exists in working places. Fire is strictly forbidden in working areas or where oil is stored.
- Do not remove the battery during commissioning. Otherwise, it may cause damage to inner parts of the vehicle.
### Specification

#### Engine

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle speed</td>
<td>1800±100rpm/min</td>
</tr>
<tr>
<td>Spark plug gap</td>
<td>0.6-0.7mm</td>
</tr>
<tr>
<td>Spec. of spark plug</td>
<td>NGK CR6SHA</td>
</tr>
</tbody>
</table>

#### Frame

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free stroke of front brake lever</td>
<td>10-20mm</td>
</tr>
<tr>
<td>Free stroke of rear brake lever</td>
<td>10-20mm</td>
</tr>
<tr>
<td>Tire pressure unit: Kpa</td>
<td>FACT 50 4T</td>
</tr>
<tr>
<td>Tire pressure</td>
<td></td>
</tr>
<tr>
<td>Front outer tire</td>
<td>120/70-12</td>
</tr>
<tr>
<td>Front rim</td>
<td>3.50×12</td>
</tr>
<tr>
<td>Rear outer tyre</td>
<td>130/70-12</td>
</tr>
<tr>
<td>Rear rim</td>
<td>3.50×12</td>
</tr>
<tr>
<td>Torque value</td>
<td></td>
</tr>
<tr>
<td>Locking nut for front wheel spindle</td>
<td>55-62 N·m</td>
</tr>
<tr>
<td>Fixing nut for rear wheel</td>
<td>100-113 N·m</td>
</tr>
</tbody>
</table>

#### Certification for Related Parts

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Certificate No.</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire</td>
<td>Front outer tire</td>
<td>E11 75R 000210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rear outer tire</td>
<td>E11 75R 000216</td>
<td></td>
</tr>
<tr>
<td>Lamps</td>
<td>Headlamp</td>
<td>E3 00 1006</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tail lamp</td>
<td>E11 50R-000054</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Front steering lamp</td>
<td>E3 50R-001024</td>
<td>Oval</td>
</tr>
<tr>
<td></td>
<td>Rear steering lamp</td>
<td>E3 50R-001024</td>
<td>Oval</td>
</tr>
<tr>
<td></td>
<td>Front position lamp</td>
<td>E3 50 R001023</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rear-view mirror</td>
<td>E3 001002</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>Horn</td>
<td>E4 000066</td>
<td>Model DL 127</td>
</tr>
<tr>
<td></td>
<td>Side reflector</td>
<td>E11 020614</td>
<td>Yellow</td>
</tr>
<tr>
<td></td>
<td>Rear reflector</td>
<td>E11 020613</td>
<td>Red</td>
</tr>
</tbody>
</table>
## Periodic Maintenance & Inspection Table

<table>
<thead>
<tr>
<th>Inspection item</th>
<th>Service cycle and time</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per 300 KM</td>
<td>Per 1000 KM</td>
</tr>
<tr>
<td></td>
<td>New</td>
<td>One month</td>
</tr>
<tr>
<td>* Air filter</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>* Petrol filter</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Fuel filter</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Replacement of engine fuel</td>
<td>R</td>
<td>Replacement every 1000KM</td>
</tr>
<tr>
<td>Tire pressure</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Battery inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Actuation gap inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Inspection of steering handle fastening</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Absorber working inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Screw fastening inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Oil leakage inspection for gearbox</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Inspection or replacement of spark plug</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Replacement of gearbox oil</td>
<td>I</td>
<td>Replacement every 5000KM</td>
</tr>
<tr>
<td>Lubrication of each part</td>
<td></td>
<td>L</td>
</tr>
<tr>
<td>Muffler</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Ignition timing</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Carburetor</td>
<td>A</td>
<td>I</td>
</tr>
<tr>
<td>* Exhaust gas inspection at idle speed</td>
<td>A</td>
<td>I</td>
</tr>
<tr>
<td>* Throttle inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Fuel pipeline inspection</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Lighting/metering/electric devices</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Main stand bracket</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Absorber</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>* Torque force of engine bolts</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>
Anticipated Inspection

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ignition system—obviously continuous ignition abnormality, engine fire or overheating, which requires inspection and maintenance.</td>
</tr>
<tr>
<td>2</td>
<td>Carbon fouling elimination—obviously insufficient horsepower, which requires carbon fouling removal from cylinder head, piston head and exhaust system.</td>
</tr>
<tr>
<td>3</td>
<td>Piston &amp; cylinder—excessive abrasion; replace cylinder if it is blocked.</td>
</tr>
</tbody>
</table>

Please have your motorcycle inspected and adjusted periodically at Qianjiang distributors for being in best condition.

The above table is established under the presupposition of 1000 km/month.

I—Inspection A—Adjustment R—Replacement C—Cleaning L—Lubrication

Note:

1. “*” Regulations on exhaust emission made by the State Environmental Protection Agency shall be complied with. Maintenance must be carried out in accordance with the instruction manual supplied by the company. We are not responsible for any loss rising from private adjustment or maintenance.

2. Increase frequency of washing air filter if your motorcycle runs on the sandy/gravel road or under heavily polluted environment so as to extend its service life.

3. Motorcycles which often run at high speed or with high mileage shall be maintained frequently.

### Engine oil/filter

#### Oil level

* Note
  - The motorcycle should be parked on a flat ground when checking its oil level.
  - After the engine runs for 2-3 minutes or stops running for about 2-3 minutes, check the oil level.

Check the oil level.

Add oil to the upper limit when there is an alarm from the oil level sensor.

#### Oil replacement

* Note

It will be easier to change oil when the engine is warming up.

Turn off the engine.

Remove the drain bolt at the bottom of the crankcase and discharge oil.

When oil is discharged completely, you can install the drain bolt and packing washer after they are cleaned.

Add oil to the required level.
Check oil leakage when the engine operates at its idle speed for minutes. 
Check the oil level again. 
（放油螺栓：drain bolt）

**Throttle cable inspection/adjustment**

Check whether the throttle cable works smoothly. 
Check the free stroke of the throttle cable. 
**Free stroke: 5-10mm**

It is mainly adjusted at the carburetor side. 
Loosen the fixing nut and then rotate the adjusting nut for adjustment.

**Air filter**

Filter replacement. 
Remove the body guard. 
Remove the fixing screws of air filter. 
Remove the top cap of air filter. 
Remove the cartridge from the filter.

Check whether the cartridge is stained or damaged. 
Replace it if necessary. 
Remove the clamp assembly. 
Remove the filter. 
Check whether the filter is stained or damaged. 
Replace it if necessary.

**Replacement time**

Replace it as early as possible if the motorcycle is always running on rainy days or on rugged road.

**Note**

- Make sure the air filter cap is well installed before installing
the filter.

**Spark plug**

Remove the spark plug. Check whether the spark plug is damaged or stained or has carbon fouling. If yes, please clean it with spark plug cleaner or steel brush.

Check spark plug gap.

**Gap: 0.6-0.8mm**

(火花塞间隙：spark plug gap)

* Note
For the installation of spark plug, it shall be installed with hand first and then fastened with spark plug sleeve.

**Battery**

**Battery disassembly**

Remove the fixing screws of the battery box cover. Remove the battery box cover. Remove the negative wire and then the positive wire. Remove the battery.

**Warning!**
When the positive wire is disassembled, do not make the tool contact with the frame. Otherwise, it may cause short-circuit spark, which may ignite gasoline and damage the battery. It is dangerous.

Install it in reverse order.
Warning!
To prevent short circuit, connect the positive wire first and then the negative wire.
Do not remove the battery during commissioning. Otherwise, it may cause damage to inner parts of the vehicle.

Check the charging condition (closed circuit voltage)
Open the battery box cover.
Remove the negative wire and then the positive wire.
Remove the battery.
Measure voltage between battery terminals.
**Fully charged:** 13.1V
**Insufficient charging:** 12.3V
*Note
Use a voltmeter to check the charging condition.

Charging
**Connection:** the positive pole of the charger to the positive pole of the battery.
The negative pole of the charger to the negative pole of the battery.

*Note
• The battery should be far away from fire source.
• Turn off the charger before or after charging to avoid explosive danger caused by spark which may exist in any connection.
• Comply with the current and time requirements for charging as stated on the battery.

*Note
• Except emergencies, you should not use emergency charging.
• Measure voltage in 30 minutes after the battery is charged.

**Charging current:** standard: 0.4A
quick: 4.0A
**Charging time:** standard: 10-15 hours
quick: 30 minutes
Charging completed: open circuit voltage: above 12.8V

Carburetor

Idle speed adjustment

* Note
Idle speed adjustment is carried out when the engines warms up.

It is carried out when the engines warms up.
Operate the engine and connect the engine rotary meter.
Adjust the adjusting screws of the throttle cable.

**Idle speed: 1800±100rpm/min**
When it rotates unstably at idle speed or it is unsmooth during oil filling slightly, adjust the idle speed adjusting screw.

Ignition timing

* Note
Check the ignition system when the ignition timing is incorrect.

Remove the fixing bolt.
Remove the guard.
Use an ignition timing lamp to check ignition timing.

Cylinder pressure

Operate it when the engine warms up.
Remove the seat the body guard.
Remove the spark plug.
Install the cylinder pressure gauge.
At full throttle, measure the cylinder pressure by starting the engine.

Following items shall be checked in case of extra-low pressure:
—whether the spacer of cylinder cover is damaged;
—whether piston ring is damaged;
—whether piston ring is worn;
—whether the piston or the cylinder is worn. （测气缸压力：measure the cylinder pressure）

When compression pressure is too high, please check whether there is too much carbon fouling inside the combustion chamber and at piston head.

**Gear oil**

**Inspection**

* **Note**
Set the middle kickstand on the flat ground and keep the motorcycle upright for checking the oil level.

Disassemble the dipstick after the engine stops.
It is good if the oil level at the lower limit of the dipstick. （放油螺栓：drain bolt）
Add gear oil when the oil level is too low.
Install the dipstick.

* **Note**
Make sure whether the bolt is well sealed, slippery or damaged.

**Gear oil replacement**

Remove the dipstick.
Remove the drain bolt and gear oil is drained.
Install the drain bolt.

* **Note**
Make sure whether the bolt is well sealed, slippery or damaged.
Add gear oil.
Check whether there is oil leakage in any part.
Install the dipstick.

**Drive belt**

Remove the cover of left crankcase.
Check whether the drive belt is ruptured or abraded.
Periodically maintenance shall be guaranteed, and replace the drive belt if necessary.

**Free stroke of front/rear brake**

Free stroke of front brake
Measure the free stroke of front brake at the tip of the brake lever.
**Free stroke: 10-20mm**

Free stroke of rear brake
Measure the free stroke of rear brake at the tip of the rear brake lever.
**Free stroke: 10-20mm**

**Inspection of brake fluid level**
Brake to the maximum and check the oil level through the oil sight glass. In case the brake fluid level is at or below the arrow in the picture, certain brake fluid shall be added until it reaches the upper limit.

**Note:**
The fuel pump assembly shall be parallel with the ground during inspection.

### Headlamp

Remove the front shield.
Disconnect the connector of the headlamp.
Remove the headlamp.

(前大灯：headlamp)

### Clutch

Start the engine and increase its speed gradually to check the work condition of the clutch. If the motorcycle fails to run or the engine flames out, you should check the clutch block.
Replace it if necessary.

### Front/rear suspension system

**Front**

Pull the front brake tight; compress the front absorber upwards or downwards for check.
Check whether there is oil leakage in the front absorber and
whether any component is damaged or loosened.

Rear

Compress the rear absorber upwards or downwards for check.
Check whether each part of the rear absorber is damaged or loosened.
Suspend the rear wheel and check shimmy.
Check whether the suspension bushing of the engine is loose or not.

Bolt/nut/fastener

Check whether each bolt, nut and fastener is loose.
If yes, tighten it to required torque.

Rim/tire

Check whether tires or rims have any crack, nail or any other damage.
Check tire pressure.

*Note
Check tire pressure when it is cold.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Tire pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front outer tire 120/70-12</td>
<td>145-170</td>
</tr>
<tr>
<td>Front rim 3.50×12</td>
<td></td>
</tr>
<tr>
<td>Rear outer tire 130/70-12</td>
<td>170-195</td>
</tr>
<tr>
<td>Rear rim 3.50×12</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Check tire pressure when it is cold.*
Tire specification

<table>
<thead>
<tr>
<th>FACT 50 4T</th>
<th>Front outer tire</th>
<th>120/70-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front rim</td>
<td>3.50×12</td>
<td></td>
</tr>
<tr>
<td>Rear outer tire</td>
<td>130/70-12</td>
<td></td>
</tr>
<tr>
<td>Rear rim</td>
<td>3.50×12</td>
<td></td>
</tr>
</tbody>
</table>

Check whether the locking nut of the front wheel spindle is loose.
Check whether the fixing nut of the rear wheel is loose.
Tighten it to the required torque value if it is loose.

**Torque value:**
- Locking nut of the front wheel spindle: 55-62 N·m
- Fixing nut of the rear wheel: 100-113 N·m

Fixing steering stem bearing and handlebar

Move the handlebar to confirm there is no wire interference.
Rotate the front wheel and move the handlebar freely for check.
If the handlebar moves difficultly, release it and then check the bearing of the fixing steering stem.
## Inspection and Maintenance of Electrical System

### Table of Torque Force of Electrical System Fasteners

<table>
<thead>
<tr>
<th>Name of fastening parts and fasteners</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clutch cover bolt of the startup motor</td>
<td>12</td>
</tr>
<tr>
<td>Clutch fixing nut of the startup motor</td>
<td>95</td>
</tr>
<tr>
<td>Rectifier bolt</td>
<td>5.0</td>
</tr>
<tr>
<td>High-voltage coil fixing bolt</td>
<td>9.0</td>
</tr>
<tr>
<td>Flywheel fixing nut</td>
<td>5.0</td>
</tr>
<tr>
<td>Body guard bolt</td>
<td>9.0</td>
</tr>
</tbody>
</table>
Charging system

1. Battery/Charging System

Preparing documents -------------1.1  Failure diagnosis -------------1.2
Battery ---------------1.3            Charging system ---------------1.4
Voltage/current regulator -------1.5   Charging coil of magnetor---1.6
Disassembly of magnetor-----1.7

1.1 Preparing documents

Work Instructions

*Note
1. Battery can be charged or discharged repeatedly. If it is placed after discharge, its service life will be shortened and performance is undermined. Normally, the battery performance will be degraded after two or three years. For battery with performance degradation (reduced capacity), voltage will recover temporarily after charging but decrease sharply when loading.
2. Battery overcharge: normally, overcharge can be judged upon the battery. In the case of short circuit inside the battery, its terminal is unable to detect voltage or the detected voltage is very low. Regulator failure: overvoltage inside the battery will shorten its service life.
3. The battery will be self-discharged if being stored for a long time, which reduces its capacity. It shall be charged about every three months.
4. Check the charging system following the sequence listed on the failure diagnosis table.
5. Do not remove the connector when there is current through electrical parts, otherwise it will cause overvoltage and damage to electrical parts inside the voltage regulator. Please operate it after the main switch turns off.
6. It is unnecessary to check the maintenance-free battery and add electrolyte and distilled water.
7. Check all the electric load.
8. Emergency charging can only be used under emergency situation.
9. Remove the battery from the motorcycle for emergency charging.
10. Do not use electrolyte-added batteries when interchanging batteries.
11. Use a voltmeter to check charging condition of the battery.
12. Do not remove the battery during commissioning. Otherwise, it may cause damage to inner parts of the vehicle.
Preparing principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery</strong></td>
<td>Capacity/Type: 12V-4AH/ dry-charged</td>
</tr>
<tr>
<td></td>
<td>Voltage (20) Fully charged:</td>
</tr>
<tr>
<td></td>
<td>Necessary charging:</td>
</tr>
<tr>
<td></td>
<td>Charging current:</td>
</tr>
<tr>
<td></td>
<td>Charging time:</td>
</tr>
<tr>
<td><strong>Magnetor</strong></td>
<td>Capacity:</td>
</tr>
<tr>
<td></td>
<td>Impedance of lighting coil (20)</td>
</tr>
<tr>
<td></td>
<td>Impedance of charging coil (20)</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>Type: Single-phase semiwave SCR charging SCR semiwave short-circuit</td>
</tr>
<tr>
<td>regulator</td>
<td>Limited voltage</td>
</tr>
<tr>
<td></td>
<td>Lighting limit</td>
</tr>
<tr>
<td></td>
<td>Charging limit</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tightening torque force

<table>
<thead>
<tr>
<th>Tool</th>
<th>Torque Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectifier bolt</td>
<td>5.0 N·m</td>
</tr>
<tr>
<td>High-voltage coil fixing bolt</td>
<td>9.0 N·m</td>
</tr>
<tr>
<td>Flywheel fixing nut</td>
<td>5.0 N·m</td>
</tr>
<tr>
<td>Body guard bolt</td>
<td>9.0 N·m</td>
</tr>
</tbody>
</table>

1.2 Failure diagnosis

**Power supply dead**

- Battery overdischarge
- Unconnected battery wiring
- Fuse blow
- Poor switch

**Low voltage**

- Poor battery charging
- Poor contact
- Poor charging system
- Poor voltage/current regulator

**Interrupted current**

- Poor contact of the charging wire
- Poor contact of the charging system
- Poor contact or short circuit of the lighting system
- Poor voltage/current regulator
- Poor magnetor
1.3 Battery

1.3.1 Battery disassembly
Remove fixing screws of the battery box cover.
Remove the battery box cover.
Remove the negative wire and then the positive wire.
Remove the battery.

**Warning!**
When the positive wire is disassembled, do not make the tool contact with the frame. Otherwise, it may cause short-circuit spark, which may ignite gasoline and damage the battery. It is dangerous.
Install it in reverse order.

* **Note**
To prevent short circuit, connect the positive wire first and then the negative wire.
Do not remove the battery during commissioning. Otherwise, it may cause damage to inner parts of the vehicle.

Check the charging condition (closed circuit voltage).
Open the battery cover and remove the battery plate assembly.
Remove cables to the battery connectors.

Measure voltage between battery terminals.
**Fully charged:** 13.1V  
**Insufficient charging:** 12.3V (not working for 1 hour)

* **Note**
Use a voltmeter to check the charging condition.

1.3.2 Charging
**Connection method:** connect the positive terminal of the charger with the positive terminal of the battery; connect the negative terminal of the charger with the negative terminal of the battery.

**Warning!**
- The battery should be far away from fire source.
- Turn off the charger before or after charging to avoid explosive danger caused by spark which may exist in any connection.
- Comply with the current and time requirements for charging as stated on the battery.

* **Note**
• Except emergencies, you should not use emergency charging.
• Measure voltage in 30 minutes after the battery is charged.

**Charging current:**
- standard: 0.4A
- quick: 4.0A

**Charging time:**
- standard: 10-15 hours
- quick: 30 minutes

**Charging completed:**
- open circuit voltage: above 12.8V

### 1.4 Charging system

#### 1.4.1 Short-circuit test

Remove the earth lead from the battery. Install a voltmeter between the negative terminal and the earth lead. Turn off the switch. Check short-circuit.

* **Note**
  
  Connect the positive terminal of the multimeter with the negative terminal of the battery.

  Check whether there is short-circuit in the main switch or in the main wire in the case of any abnormality.

#### 1.4.2 Charging check

Use a multimeter to check the charging status of the battery when it is being fully charged.
Install the fully charged battery after the engine warms up.
Connect a voltmeter between terminals.
Remove the main fuse and connect an ammeter between terminals.
Start the engine and increase its speed gradually to measure the limiting voltage and current.

**Limiting voltage/speed:** 14-15V (2500rpm)  
(万用电表：multimeter)

Check the voltage regulator if the limiting voltage is not within its required range.
Check the limiting voltage of the lighting system.

* **Note**

  Set the multimeter to the AC voltage position.

**Limiting voltage:** 13.1±0.5V/2500rpm

Check the voltage/current regulator if the limiting voltage is not within its required range.
1.5 Voltage/current regulator

1.5.1 Main wiring check

Remove 4p plug of the voltage/current regulator.

Check conductivity between main wiring terminals.

<table>
<thead>
<tr>
<th>Item (wire color)</th>
<th>Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Battery(red) and GND of the body</td>
<td>With battery voltage</td>
</tr>
<tr>
<td>Between GND wire (black) and GND of the body</td>
<td>With lead</td>
</tr>
<tr>
<td>Between charging coil (white) and the GND of the body</td>
<td>Resistance in the coil of the magnetor.</td>
</tr>
<tr>
<td>Between lighting cable (green/red) and the GND of the body (resistor plug; automatic side starter plug; remove the lighting switch and check it at the “OFF” position)</td>
<td>Resistance in the coil of the magnetor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multimeter Positive</th>
<th>White (A)</th>
<th>Green/red (L)</th>
<th>Red (B)</th>
<th>Black (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: MΩ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (A)</td>
<td>0</td>
<td>6.5</td>
<td>19–21</td>
<td></td>
</tr>
<tr>
<td>Green/red (L)</td>
<td>1–10</td>
<td>24–25</td>
<td>19–23</td>
<td></td>
</tr>
<tr>
<td>Red (B)</td>
<td>10–50</td>
<td>0</td>
<td></td>
<td>19–21</td>
</tr>
<tr>
<td>Black (E)</td>
<td>5–15</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

1.5.2 Voltage-current regulator check

When the main cable is inspected to be normal, check whether the plug of the voltage/current regulator is in good contact. Measure impedance between terminals of the voltage/current regulator.

* Note

- Do not touch any metal part of the test rod of the multimeter with your finger for check.
- Check with multimeter. Different multimeters show different impedance and different results.

Replace the voltage-current regulator when the impedance between terminals is abnormal.

1.6 Magnetor charging coil

* Note

Check the magnetor charging coil on the engine.
Check

Remove the 6p connector of the magnetor.
Measure impedance between the white coil of the magnetor and the body with multimeter.
**Standard: 1.5-2Ω**
Replace the magnetor coil when the measured value exceeds the standard value.

1.7 Magnetor lighting coil

* Note
Check the magnetor lighting coil on the engine.

1.7.1 Check

Remove the 3p connector of the magnetor.
Measure impedance between the green/red coil of the magnetor and the body with multimeter.
**Standard: 2.0-2.5Ω**
Replace the magnetor coil when the measured value exceeds the standard value.

1.7.2 Disassembly

Remove the body guard.
Remove the right body guard.
Remove the fixing bolts and screws; dismantle the fan cover.
Remove four fixing bolts of the cooling fan; dismantle the cooling fan.
Fix the flywheel using the universal spanner.
Remove fixing bolts of the flywheel.
Remove the flywheel using the flywheel remover.
Remove the solid key.
Remove the conductor joint.
Remove the stator.
1.7.3 Installation

Install the stator on the body of the engine.
Connect the magnetor joint.

Clean up the crankshaft and the taper part of the flywheel.
Install the solid key into the groove above the upper crankshaft key and confirm it.
Aim the groove in the flywheel at the solid key on the shaft.

* Note
Ensure there is no any bolt in the inner magnetic side of the flywheel.

Fix the flywheel with the universal spanner and tighten fixing nuts.

**Torque force: 9.0 N·m**

Install the left body guard.
Ignition System

点火系统

1. storage battery 12V，4AH  2. FBT assembly  3. rectifier  4. power lock assembly  5. CDI igniter  6. relay  7. seat lock assembly  8. horn  

点火系统：Ignition System
2. Ignition System

Preparing documents-----------------2.1  CDI Group -----------------2.4
Failure diagnosis -----------------2.2  Ignition coil -----------------2.5
Ignition system check------------2.3  Trigger ---------------------2.6

2.1 Preparing documents

Work Instructions
1. Check the ignition system following the sequence listed in the table of failure diagnosis.
2. This ignition system is an electronically and automatically angling device. It is solidified in the CDI group and you don’t have to adjust the ignition time.
3. Check the ignition system following the sequence listed in the table of failure diagnosis.
4. Do not make CDI of the ignition system fall down or hang down or hammer it with strong force (primary causes for failure). Pay special attention during disassembly.
5. Failure of the ignition system is mostly caused by poor contact of the socket. Check whether each connector is in good condition.
6. Check whether the heat value used for the spark plug is proper. If not, the engine may work abnormally or the spark plug may be burnt.
7. Check in this chapter is based on the maximum voltage. It also refers to check on the impedance of the ignition coil.
8. Check the main switch according to the conduction table.
9. Remove the magnetor and the stator according to instructions.

Preparing principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark plug recommended</td>
<td>C5HSA(NGK)</td>
</tr>
<tr>
<td>Hot type</td>
<td>C6HSA(NGK)</td>
</tr>
<tr>
<td>Cold type</td>
<td>C7HSA(NGK)</td>
</tr>
<tr>
<td>Spark plug gap</td>
<td>0.6-0.7mm</td>
</tr>
<tr>
<td>Ignition coil impedance</td>
<td>0.6Ω±10%</td>
</tr>
<tr>
<td>Primary coil</td>
<td>5-11KΩ</td>
</tr>
<tr>
<td>Secondary coil</td>
<td>0.5-5.5KΩ</td>
</tr>
<tr>
<td>With plug cap</td>
<td></td>
</tr>
<tr>
<td>Without plug cap</td>
<td></td>
</tr>
<tr>
<td>Impedance of trigger</td>
<td>100-500Ω</td>
</tr>
<tr>
<td>Measure the maximum primary voltage of the ignition coil</td>
<td>95-400V</td>
</tr>
<tr>
<td>Trigger voltage</td>
<td>Above 1.7V</td>
</tr>
<tr>
<td>Charging coil voltage</td>
<td>95-400V</td>
</tr>
</tbody>
</table>

Tools
Attachments to the Maximum Voltage Table
Multimeter
## 2.2 Failure diagnosis

### Non-sparking of spark plug

<table>
<thead>
<tr>
<th>Abnormality</th>
<th>Cause (confirm it sequentially as follows)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ignition coil</strong></td>
<td></td>
</tr>
<tr>
<td>Too low high-voltage</td>
<td>The inner resistance is too small and it should be tested by required tester.</td>
</tr>
<tr>
<td></td>
<td>Low speed of the crankshaft.</td>
</tr>
<tr>
<td></td>
<td>Interfered tester (It is normal that voltage is always beyond the required value upon several measurements.)</td>
</tr>
<tr>
<td></td>
<td>Poor wiring contact of the ignition system.</td>
</tr>
<tr>
<td></td>
<td>Poor ignition coil.</td>
</tr>
<tr>
<td></td>
<td>Poor charging coil (measured at the maximum voltage).</td>
</tr>
<tr>
<td><strong>Side voltage</strong></td>
<td></td>
</tr>
<tr>
<td>No or interrupted high voltage</td>
<td>Incorrect connection of the tester.</td>
</tr>
<tr>
<td></td>
<td>Poor main switch.</td>
</tr>
<tr>
<td></td>
<td>Poor contact of CDI terminal.</td>
</tr>
<tr>
<td></td>
<td>Short circuit or poor contact of the GND of CDI.</td>
</tr>
<tr>
<td></td>
<td>Poor contact of charging coil (measured at the maximum voltage).</td>
</tr>
<tr>
<td></td>
<td>Poor trigger (measured at the maximum voltage).</td>
</tr>
<tr>
<td></td>
<td>Poor terminal of high-voltage wires.</td>
</tr>
<tr>
<td></td>
<td>Poor CDI group (when item - is checked to be abnormal or there is no spark for spark plug.)</td>
</tr>
<tr>
<td>Normal high voltage, but no spark</td>
<td>Poor spark plug or secondary leakage of the ignition coil.</td>
</tr>
<tr>
<td></td>
<td>Poor ignition coil.</td>
</tr>
<tr>
<td><strong>Charging coil</strong></td>
<td></td>
</tr>
<tr>
<td>No high voltage</td>
<td>The inner resistance is too small and it should be tested by required tester.</td>
</tr>
<tr>
<td></td>
<td>Low speed of the crankshaft.</td>
</tr>
<tr>
<td></td>
<td>Interfered tester (It is normal that voltage is always beyond the required value upon several measurements.)</td>
</tr>
<tr>
<td></td>
<td>Poor charging coil (Item - is checked to be normal.)</td>
</tr>
<tr>
<td>No or interrupted high voltage</td>
<td>Poor ignition coil.</td>
</tr>
<tr>
<td></td>
<td>Poor charging coil.</td>
</tr>
<tr>
<td><strong>Trigger</strong></td>
<td></td>
</tr>
<tr>
<td>Too low high-voltage</td>
<td>The inner resistance is too small and it should be tested by required tester.</td>
</tr>
<tr>
<td></td>
<td>Low speed of the crankshaft.</td>
</tr>
<tr>
<td></td>
<td>Interfered tester (It is normal that voltage is always beyond the required value upon several measurements.)</td>
</tr>
<tr>
<td></td>
<td>Poor trigger (Item - is checked to be normal.)</td>
</tr>
<tr>
<td>No or interrupted high voltage</td>
<td>Poor ignition coil.</td>
</tr>
<tr>
<td></td>
<td>Poor trigger.</td>
</tr>
</tbody>
</table>
2.3 Ignition system check

* Note
• When there is no spark, check whether there is loose wiring or poor contact, and make sure all voltage values are normal.
• There are kinds of multimeters with different impedances and different test values.

Connect a high-pressure shunt or an ammeter with an input impedance above $10\Omega$ to the multimeter.

2.3.1 Primary voltage of the ignition coil

If you replace the original spark plug with a better one, make ground connection with the engine.

* Note
Make sure all wiring is correct before test.
Cylinder compression pressure normally refers to the test value when the spark plug is installed on the cylinder head.

Connect the lead of the ignition coil and also the shunt between the primary coil terminal (black/white) and the GND.
Press the startup motor or step the actuating lever to measure the maximum primary voltage of the ignition coil.
**Minimum voltage: above 95V**

* Note
Never touch any metal part of the test rod with your finger to avoid electric shock.

2.3.2 Charging coil

* Note
Install the spark plug on the cylinder head and carry out measurement when the compression pressure is normal.
Remove 4P and 2P connectors of CDI group. Connect the peak-voltage shunt between the charging coil (black/red) with 2P connector and the 4P connector (black terminal).
Press the startup motor or step the actuating lever to measure the maximum voltage of the charging coil.
Connection: positive pole to black/red; negative pole to black.

**Minimum voltage:** above 95V

*Note*

Never touch any metal part of the test rod with your finger to avoid electric shock.

When the maximum voltage measured at the terminal of CDI Group is abnormal, dismantle the body guard and the magnetor terminal.

Connect the charging coil (black/red) to the shunt.

- If the voltage of CDI is measured to be abnormal while the voltage at the magnetor terminal is normal, it is caused by poor contact or disconnected wiring.
- If the voltage at both CDI and magnetor terminal appears to be abnormal, it is caused by poor charging coil. Please refer to charging coil check.

### 2.3.3 Trigger

*Note*

Install the spark plug on the cylinder head and carry out measurement when the compression pressure is normal.

Remove 4P and 2P connectors of CDI group. Connect the peak-voltage shunt between the trigger (blue/white) with 2P connector and the 4P connector (black terminal).

Press the startup motor or step the actuating lever to measure the maximum voltage of the trigger.

Connection: positive pole to blue/white; negative pole to green/white.

**Minimum voltage:** above 1.7V

*Note*

Never touch any metal part of the test rod with your finger to avoid electric shock.

When the maximum voltage measured at the terminal of CDI Group is abnormal, dismantle the right body guard and the magnetor connector.

Connect the trigger (blue/white) to the shunt.

- If the voltage of CDI is measured to be abnormal while the voltage at the magnetor terminal is normal, it is caused by poor contact or disconnected wiring.
- If the voltage at both CDI and magnetor terminal appears to be abnormal, it is caused by poor trigger. Please refer to the table of failure diagnosis.
2.4 CDI Group

2.4.1 System check
Check the system.
Remove the CDI Group, and check components of the ignition system at the terminal.
(黑: black 红: red 白: white 绿: green 蓝: blue 墨绿: blackish green)

2.4.2 Check
Remove CDI Group and check whether the terminal is loose or corrosive

<table>
<thead>
<tr>
<th>Item</th>
<th>Test terminal</th>
<th>Standard (20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main switch</td>
<td>Red--red/white</td>
<td>Conduction when the main switch is “OFF”</td>
</tr>
<tr>
<td>Trigger</td>
<td>Blue/white – white/green</td>
<td>100-500Ω</td>
</tr>
<tr>
<td>Primary coil of the ignition coil</td>
<td>Black/white--black</td>
<td>0.6Ω±10%</td>
</tr>
<tr>
<td>Secondary coil of the ignition coil</td>
<td>Black--spark plug cap（excluding the spark plug）</td>
<td>0.5-5.5KΩ</td>
</tr>
</tbody>
</table>

2.5 Ignition coil

2.5.1 Disassembly
Remove the body guard.
Remove the spark plug cap.
Remove the primary lead of the ignition coil.
Remove the fixing bolts and then the ignition coil.
Install the ignition coil in reverse order.
* Note
Install the primary coil with black/white terminal.

2.5.2 Check the primary coil
Measure impedance between terminals of the primary coil.
**Standard: 0.6Ω±10% (20)**
It shows good if the impedance is within the range of standard values.
Replace the primary coil if the impedance shows ∞ which indicates that the coil breaks.
2.5.3 Secondary coil

Attached with spark plug. Measure the impedance between the wiring side of the spark plug cap and the terminals.

**Standard: 5-11KΩ**

It shows good if the impedance is within the range of standard values.

The impedance $\infty$ indicates that the coil breaks.

Remove the spark plug cap. Measure the impedance between the primary side wire of the ignition coil and the negative terminal.

**Standard: 0.5-5.5KΩ±10%**

2.6 Trigger

*Note
Check the trigger on the engine.

**Check**

Remove the body guard.
Remove the trigger terminal.
Measure the impedance between the blue/white terminal of the side wire of the engine and the body GND.

**Standard: 100-500Ω**

Replace the magnetor if the measured value exceeds the standard value.
Startup System

1. storage battery 12V, 4AH  2. seat lock assembly  3. horn  4. rectifier  5. power lock assembly  6. CDI igniter  7. relay  8. release resistance

（启动示意图：Startup Schematic Diagram）
3. Startup System

Preparing documents--------------3.1
Failure diagnosis -------------3.2
Startup motor-----------------3.3
Starter relay---------------3.4

3.1 Preparing documents

Work Instructions

Disassemble the startup motor on the engine.
For the disassembly of the startup clutch, please comply with related regulations

Preparing principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the brush of the startup motor</td>
<td>6.2mm</td>
<td>3mm</td>
</tr>
<tr>
<td>Bushing of the startup idler shaft</td>
<td></td>
<td>8.3mm</td>
</tr>
<tr>
<td>Outer diameter of the startup idler shaft</td>
<td></td>
<td>7.94mm</td>
</tr>
</tbody>
</table>

Tightening torque force

- **Bolts for the clutch cover of the startup motor**: 12 N·m
- **Retaining nut for the clutch of the startup motor**: 95 N·m

Tools

- Spanner for retaining nuts
- Universal fixing spanner
3.2 Failure diagnosis

Startup failure  Weak in rotation  No rotation of RE rotary engine

of the startup motor  of the startup motor

• Fuse blow  • Low battery  • Poor startup clutch
• Low battery  • Poor wiring contact  • Reversal rotation of the startup motor
• Poor main switch  • Gear seized  • Low battery
• Poor startup clutch
• Poor brake switch
• Poor starter relay
• Poor wiring contact
• Poor startup motor

3.3 Startup motor

3.3.1 Disassembly

* Note
Before the startup motor is disassembled, turn off the main switch, remove the GND wire of the battery, and then power on to check whether the startup motor works for ensuring safety.

Remove the wire clip of the startup motor.
Remove the fixing bolts of the startup motor, and dismantle the startup motor.
Roll the waterproof rubber case and dismantle the connector of the startup motor.

3.3.2 Breakdown

Remove screws in the shell, front cover, motor housing and other parts

3.3.3 Check

Check other components.
Replace any part with abraded, damaged or burnt surface.
Clean the commutator surface if there is metal power
attached to it.
Check conduction between the surfaces of other components.
Ensure non-conduction between armature shafts of the commutator.
Check the conduction of the shell of the startup motor.
Ensure non-conduction between the conduction terminal and the startup motor shell.
Check conduction between the conduction terminal and the brush.
Replace any abnormal part.
Check conduction of the brush bracket. Replace it when there is conduction.
Measure the length of the brush.

Limit for use: replace it if lower than 3mm
Check smooth rotation of the needle bearing inside the front cover and whether it is loose when press-in.
Replace it if there is any abnormality.
Check whether the oil seal is abraded or damaged.

3.3.4 Assembly

Lubricate the oil seal inside the front cover with grease.
Install the brush on the bracket.
Lubricate moving parts at two ends of the brush shaft with grease.
Press each brush into the bracket and install the electrode front cover.

* Note
  • Pay special attention that the contact surface between the brush and the armature shall not be damaged.
  • Pay attention that the armature shaft shall not damage lips of the oil seal.

Install the new o-ring into the front cover.  

*Aim the screw hole of the motor shell at the screw hole of the front cover for installation.
Lock screws in the shell.

* Note
When the shell and the front cover are assembled, it is easy to pull the front cover with magnet to attract the armature.
Press it gently for assembly

3.3.5 Installation

Install the lead of the startup motor and the dustproof boot.
Replace any damaged or abnormal o-ring.
Lubricate o-ring with fuel and then install it on the startup motor.
Install the wire clip for rear brake.
3.4 Starter relay

3.4.1 Check

Remove the body guard.
When the main switch is “on”, check there is “click” sound at the time of pressing the startup motor.
With click sound, it is normal.
Without click sound: • check voltage of the starter relay;
        • check the GND loop of the starter relay;
        • check the movement of the starter relay.

3.4.2 Check voltage of the starter relay

Set up the main stand, and measure voltage between the negative pole of the green/yellow wire of the starter relay (启动继电器: starter relay) terminal and the body ground connection.
When the main switch is “on”, hold the brake lever. The battery voltage shall comply with regulations.
When there is no voltage at the starter relay terminal, check the conduction of the brake switch and leads.

3.4.3 Check GND loop of the starter relay

Remove the starter relay connector.
Check conduction between the black wire of the lead terminal and the body ground connection.
When the startup button is pressed, it shall show good conduction between the black wire of the terminal and the body ground connection.
Check conduction of the startup button and leads when it is not conducted.

3.4.4 Check

Connect the starter relay to the battery, and the terminal of the startup motor to the multimeter.
Connect the fully charged battery between the black wire and the green/yellow wire of the relay. The relay shall sound “click” and the multimeter shall indicate resistance of “zero”.

(绿黄/线: green/yellow wire)
Bulbs/switches/meters

1. left rearview mirror assembly  2. right rearview mirror assembly  3. front left steering lamp assembly  4. front right steering lamp assembly  5. meter  6. power lock assembly  7. headlamp (twin lamps)  8. tail lamp  9. rear left steering lamp assembly  10. rear right steering lamp assembly  11. rear reflector

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of headlamp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>E3 00 1006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of front steering lamp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>E3 50R-001024</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of tail lamp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>E11 50R-000054</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of rear steering lamp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>E3 50R-001024</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of front position lamp:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>E3 50 R001023</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Idem. No. of reaview mirror:</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>E3 001002</td>
</tr>
</tbody>
</table>
4. Bulbs/Switches/Meters

4.1 Preparing documents

Work Instructions

Remove the switch from the vehicle to measure its conduction.

4.2 Failure diagnosis

When the main switch “ON” is not light, it is due to:
• Poor bulbs.
• Poor switch.
• Bad contact or broken wires.

4.3 Replacement of headlamp bulbs

4.3.1 Disassembly

Remove the foot guard and pedal assembly.
Remove the front shield.
Disconnect the headlamp connector.
Remove fixing screws for dismantling the headlamp.
Remove the headlamp.
Remove the glass of the headlamp.
Fix the headlamp and rotate the socket clockwise to remove the bulb.

（前大灯：front lamp）
4.3.2 Installation
Install the bulb in reverse order.

4.4 Replacement of rear steering lamp bulbs

4.4.1 Disassembly
Remove the foot guard and pedal assembly.
Remove the front shield, and disconnect the steering lamp connecting wire.
Loosen the fixing nuts (4) of the steering lamp.
Remove the bulb from the socket.

4.4.2 Installation
Install the bulb in reverse order.

4.5 Replacement of tail lamp bulbs

4.5.1 Disassembly
Remove the seat.
Remove the fixing screws of rear left/right guard for dismantling the tail lamp shade.
Disconnect the tail lamp connector.
Remove the rear left/right guard, and then the tail lamp shade.
Remove the tail lamp.

4.5.2 Installation
Install the tail lamp in reverse order.

4.5.3 Replacement of tail lamp bulbs

4.5.3.1 Disassembly
Remove fixing screws of the tail lamp shade.
Remove the tail lamp shade for dismantling tail lamp bulb.
Remove the bulb from the socket.

4.5.3.2 Installation
Install the bulb in reverse order.
4.6 Meter
Remove the left and right rearview mirror.
Remove fixing screws of the handlebar cover.
Remove the decorating cover of the upper handlebar shade.
Remove the odometer assembly to dismantle the odometer.
Install the speedometer in reverse order.

4.7 Main switch

4.7.1 Check
Remove the front guard.
Remove the foot guard.
Remove the main switch lead terminal.
Check conduction of the terminal

4.7.2 Replacement of main switch
Remove the foot guard and pedal assembly.
Remove the front shield.
Remove the fixing bolts and the fixing seat of the main switch.
Remove the fixing bolts and replace the main switch

4.8 Horn

Check
Remove horn wires.
It shows good when the horn wire is connected to the battery
4.9 Handlebar switch

Remove the left/right rearview mirror assembly.
Remove the fixing screws of the left/right combined switch.
Loosen the left/right combined switch.
Remove the right grip assembly and the left steering grip.

Remove the left/right combined switch.

逻辑图: Logic Diagram
### Inspection and maintenance of the chassis

#### Torque Force Table of Chassis Fasteners

<table>
<thead>
<tr>
<th>Name of fastening parts and fasteners</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel pump assembly fixing bolt</td>
<td>5-9</td>
</tr>
<tr>
<td>Mounting bolt of front brake cylinder assembly</td>
<td>22-29</td>
</tr>
<tr>
<td>Brake handle fixing bolt</td>
<td>5-9</td>
</tr>
<tr>
<td>Fixing screw of muffler decorating shade</td>
<td>5-9</td>
</tr>
<tr>
<td>Fixing bolt of handlebar weld assembly</td>
<td>40-60</td>
</tr>
<tr>
<td>Front wheel spindle locking nut</td>
<td>55-62</td>
</tr>
<tr>
<td>Front absorber fixing bolt</td>
<td>37-44</td>
</tr>
<tr>
<td>Rear wheel fixing nut</td>
<td>100-113</td>
</tr>
<tr>
<td>Rear absorber top nut</td>
<td>37-44</td>
</tr>
<tr>
<td>Rear absorber bottom nut</td>
<td>22-29</td>
</tr>
<tr>
<td>Rear rack fixing screw</td>
<td>22-29</td>
</tr>
<tr>
<td>Fuel tank fixing bolt</td>
<td>5-9</td>
</tr>
<tr>
<td>Helmet box fixing bolt</td>
<td>5-9</td>
</tr>
<tr>
<td>Muffler fixing bolt</td>
<td>22-29</td>
</tr>
<tr>
<td>Muffler connector fixing bolt</td>
<td>5-9</td>
</tr>
<tr>
<td>Engine fixed axis</td>
<td>55-62</td>
</tr>
</tbody>
</table>
Front disc brake

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Dia. of front brake disc: 190mm</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Thickness of front brake disc: 3.6 mm</td>
<td>Limit for use: 2.6mm</td>
</tr>
<tr>
<td>C</td>
<td>Thickness of friction disc: 5.0mm</td>
<td>Limit for use: 4.0mm</td>
</tr>
<tr>
<td>D</td>
<td>Torque for mounting bolt 8: 5-9N·m</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Torque for mounting nut 27: 37-44N·m</td>
<td></td>
</tr>
</tbody>
</table>


A Dia. of front brake disc: 190mm
B Thickness of front brake disc: 3.6 mm
Limit for use: 2.6mm
C Thickness of friction disc: 5.0mm
Limit for use: 4.0mm
D Torque for mounting bolt 8: 5-9N·m
E Torque for mounting nut 27: 37-44N·m
Free stroke of brake handle:
Rear drum brake

A  Torque for mounting nut
5: 100-113N·m
B  I.D. of brake drum
: 110mm
Abrasion limit: 111mm
C  Thickness of brake shoe:
4.5mm
Limit for use: 3.5mm
D  Free stroke of rear brake handle: 10-20mm
E  Torque for mounting bolt
4: 22-29N·m

5. Brake

Maintenance instruction ------------------------5.1
Failure diagnosis -------------------------------5.2
Front disc brake -------------------------------5.3
Rear drum brake -------------------------------5.4

5.1 Maintenance instruction

Work Instructions

* Note

• Do not stain the brake assembly with oil spots during installation or disassembly.
• Clean it with required cleaning agent to maintain the brake performance.

*Check brake before riding.*

5.1.1 Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
<th>Limit for use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness of front brake disc</td>
<td>3.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Thickness of front friction disc</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Diameter of front brake disc</td>
<td>190</td>
<td>-</td>
</tr>
<tr>
<td>I.D. of rear brake drum</td>
<td>110</td>
<td>-</td>
</tr>
<tr>
<td>Thickness of rear brake shoe</td>
<td>4.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

5.1.2 Torque force

Fixing bolts for fuel pump assembly   5-9 N·m
Mounting bolts for front brake cylinder assembly 22-29 N·m
Fixing bolts for brake handle 5-9 N·m Fixing nuts for rear wheel 100-113 N·m

5.2 Failure diagnosis

Brake

Poor brake performance  Slow reaction or tight lever

1. Improper adjustment of the brake 1. Improper adjustment of the brake
2. Abraded brake shoe or friction disc assembly 2. Abraded brake shoe or friction disc assembly
3. Improper installation of brake shoe  
3. Improper installation of brake shoe or friction disc assembly  
4. Stained brake shoe or friction disc assembly  

Abnormal noise  
1. Abraded brake shoe or friction disc assembly  
2. Stained brake shoe or friction disc assembly of the front brake disc  

5.3 Front disc brake  

5.3.1 Disassembly  
*Note  
• Replace the friction disc assembly.  
• If the friction disc will be used again, mark it before disassembly so as to reinstall it at the original place.  
Remove following assemblies from the right grip and the front absorber.  
Front brake:  
1. brake handle (17)  
2. fuel pump assembly (1)  
3. brake hose assembly (12)  
4. brake cylinder assembly (24)  
5. front brake disc (22)  

* Note  
• Do not stain the brake assembly with oil spots during installation or disassembly.  
• Clean it with required cleaning agent to maintain the brake performance.  
Loosen fixing bolts for the brake cylinder assembly.  
Remove the brake cylinder assembly from the front absorber.  
Remove the front wheel spindle.  
Remove the front wheel.  
Remove the brake disc from the front wheel.  

5.3.2 Check  
Check whether the friction disc assembly is abraded. Replace brake shoes if necessary.  
Measure the friction disc assembly and the front brake disc.  
Record maximum values.  

Specification  
FACT 50 4T  Diameter of the front brake disc φ190mm  
Thickness of the front brake disc  3.6mm
* Note
* Measurement with micrometer.

Measure the thickness of the friction disc assembly. If the thickness of the front brake disc or the friction disc assembly is below the required value for maintenance or it is stained with grease, please replace it.

**Limit for use:** friction disc  5.0mm  
Front brake disc  2.6mm

**Note:**
Replace friction discs in pair. The friction disc can be measured within the motorcycle without removing down.

### 5.3.3 Installation

Install the front brake disc and the front wheel. Install the front brake hose assembly and the brake cylinder assembly.

Do not stain the friction discs and the front brake disc with grease.

* Note
Any grease on friction discs will reduce the brake performance and even lead to failure.

Tighten bolts and nuts to the required torque force.

**Torque force:**
Fixing bolts for fuel pump assembly         5-9  N·m
Mounting bolts for front brake cylinder assembly  22-29  N·m

Do not stain friction discs with oil spots. Use brake cleaning agent to clean friction discs with oil spots.

* Note
Any oil spot on friction discs will reduce brake performance.

### 5.4 Rear drum brake

#### 5.4.1 Disassembly
Remove the muffler.
Remove the fixing nuts of the rear wheel.
Remove the rear wheel.
Remove the brake shoe assembly.

* **Note**
  - Replace the brake shoe assembly.
  - If the brake shoe will be used again, mark it before disassembly so as to reinstall it at the original place.

Remove following assemblies from the rear wheel.

Rear brake:
1. rear swing arm mounting bolts (12)
2. rear brake swing arm assembly (11)
3. rear wheel fixing nuts (5)
4. rear indicator (8)
5. rear brake return spring (10)
6. rear brake camshaft (9)
7. brake shoe assembly (6)
8. brake shoe spring (7)
9. outer tire E11 75R 000216
10. rear rim assembly 3.50×12

**Note:** for breakdown details, see P80.

5.4.2 Check
Check whether the brake drum and the brake shoes are abraded. Replace it if necessary.
Measure the maximum brake shoe thickness and the maximum inner diameter of brake drum.

* **Note**
  - Measure the brake shoe thickness and the inner diameter of brake drum with micrometer.

If the thickness of the brake shoe is below the required value for maintenance or it is stained with grease, please replace it.

**Note:** replace brake shoes in pair.

- Inner diameter of the rear brake drum  φ110mm
- Thickness of rear brake shoe  4.5mm
- Limit for use: inner diameter of brake drum 111mm
- brake shoe  3.5mm
5.4.3 Installation

Install the brake shoe assembly.
Install the rear wheel.
Install the muffler.

* Note
Any grease on brake shoes will reduce the brake performance and even lead to failure.

Tighten bolts and nuts to the required torque force.

**torque force:**

Fixing nuts for rear wheel: 100-113 N·m
Do not stain brake shoes and brake disc with oil spots.
Use brake cleaning agent to clean brake shoes and brake disc with oil spots.

Rear brake:
1. rear swing arm mounting bolts (12)
2. rear brake swing arm assembly (11)
3. rear wheel fixing nuts (5)
4. rear indicator (8)
5. rear brake return spring (10)
6. rear brake camshaft (9)
7. brake shoe assembly (6)
8. brake shoe spring (7)
9. outer tire E11 75R-000216
10. rear rim assembly 3.5×12

* Note
Any oil spot on brake shoes will reduce the brake performance.

**Note:** for breakdown details, see P80.
Body

*Note:
Do not damage any body part during disassembly.
Do not damage any hook or claw in the body during disassembly.
Aim panels in the body at each corresponding groove.
Ensure correct installation of each part.

1. seat assembly
2. rear rack
3. tapping screw ST3×10
4. tapping screw ST5×16
5. battery box cover
6. helmet box
7. front cover
8. odometer shade
9. handlebar cover
10. handlebar cover
11. right guard
12. connecting bracket of the left/right guard I
13. screw M6×14
14. decorating panel of the front shield
15. tapping screw ST4.2×16
16. front shield
17. tapping screw ST5×16
18. tapping screw ST4.8×16
19. headlamp
20. helmet hook
21. frame number cover
22. foot protection board
23. foot pedal
24. tail lamp
25. connecting bracket of the left/right guard II
26. lower cover of foot protection board
27. front inner fender
28. front fender
29. rear license plate bracket
30. rear fender
31. bolt M6×12
32. rear fender bracket
33. card nut M6
34. bolt M6×20
35. rear fender
36. rear shelves bearing
37. tapping screw ST4×12
38. tapping screw ST5×12
39. screw M5×14
40. card
41. rear left steering lamp
42. left rearview mirror
43. right rearview mirror
6. Body

Dismantle the body in following order:

Left/right rearview cover → odometer shade → handlebar cover 1 → handlebar cover 2 → front inner fender → helmet

Hook → frame number cover → foot protection board → front shield → headlamp → set assembly → helmet

Front cover → connecting bracket of the left/right guard → left/right guard → front fender → rear rack → lower cover of protection board

→ battery box cover → foot pedal → tail lamp → rear left/right turn light → rear license plate bracket → rear fender

*Note
Do not damage any body part during disassembly.
Do not damage any hook or claw in the body during disassembly.
Aim panels in the body at each corresponding groove.
Ensure correct installation of each hook or claw part during assembly.
Do no damage any part during assembly.
Front wheel

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| A | Tire size: outer tire 120/70-12  
   | Auth. No. of the front wheel outer tire: E11 75R 000210 |
| B | Rim size: 3.50×12 |
| C | Rim run-out limit:  
   | Vertically: 2.0mm  
   | Horizontally: 2.0mm |
| D | Front wheel spindle bending limit: 0.2mm |

1 front wheel spindle M12X1.25X224  2 left spindle sleeve of front wheel  3 oil seal 22×35×7  4 bearing 6201-2RS  5 middle spindle sleeve assembly  6 front rim 3.50×12  7 tire 120/70-12  8 gear housing assembly  9 nut M12X1.25  10 valve cap  11 valve  12 front brake disc  13 installation nut of front brake disc  14 nut
Front suspension

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Torque for mounting bolt 12: 37-44 N·m</td>
</tr>
<tr>
<td>B</td>
<td>Torque for mounting bolt: 5-9 N·m</td>
</tr>
</tbody>
</table>
| C | Number of upper steel balls: 21  
|   | Number of lower steel balls: 21 |

1 front right absorber assembly  2 front left absorber assembly  3 weld assembly of lower connecting bracket  4 odometer cable clamp  5 brake cable clamp  6 gland nut  7 dust cover  8 one-piece cup  9 steel ball φ5  10 upper cup of the lower bearing  11 lower cup of the lower bearing  12 bolt M10×1.25×30  13 bolt M6×16
Handlebar

<table>
<thead>
<tr>
<th></th>
<th>Torque for mounting bolt 2 (handlebar fixing bolts): 40-60N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Free stroke of front brake handle: 10-20mm</td>
</tr>
<tr>
<td>C</td>
<td>Free stroke of rear brake handle: 10-20mm</td>
</tr>
<tr>
<td>D</td>
<td>Free stroke of throttle lever (Fig. 6): 2-5mm</td>
</tr>
</tbody>
</table>

1 handlebar weld assembly  2 bolt M10×1.25×45  3 nut M10×1.25  4 left grip  5 throttle lever assembly  6 left handle  7 right combined switch  8 right combined switch fitting seat  9 screw M5×20  10 screw M5×25  11 left combined switch assembly  12 left combined switch assembly fitting seat  13 spring washer  5  14 nut M5  15 screw M5×20  16 right combined switch assembly  17 handle set screw M5  18 right rearview mirror  19 left rearview mirror  20 left combined switch assembly  21 right handle  22 handle set screw M5  23 nut M5
7. Front Wheel / Front Suspension

Preparing documents------------------------7.1

Failure diagnosis ------------------------7.2

Front wheel -----------------------------7.3

Handlebar ---------------------------------7.4

Front fork assembly ----------------------7.5

7.1 Preparing documents

Work Instructions

Before removing the front wheel, you should use jack to support the body bottom and suspend the front wheel which shall not be reversely rotated.

Pay attention that brake shoes, friction disc assembly and front brake disc shall not be stained with grease during operation.

Motorcycle Standards

<table>
<thead>
<tr>
<th>Measurement points</th>
<th>Item</th>
<th>Standard (mm)</th>
<th>Limit for use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel spindle</td>
<td>Bending</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Front wheel</td>
<td>Rim shimmy</td>
<td>Vertically</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontally</td>
<td>Within 1.0</td>
</tr>
</tbody>
</table>

Torque force

<table>
<thead>
<tr>
<th>Fixing bolts for handlebar weld assembly</th>
<th>40-60 N·m</th>
<th>Bearing puller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locking nut for the front wheel spindle</td>
<td>55-62 N·m</td>
<td>Locking nut spanner</td>
</tr>
<tr>
<td>Fixing bolts for the front absorber</td>
<td>37-44 N·m</td>
<td></td>
</tr>
</tbody>
</table>

7.2 Failure diagnosis

7.2.1 Difficulty in steering

Failure of the steering handle bearing.
Damaged steering handle bearing.
Low tire pressure.
Flat tire.
7.2.2 Unsteady steering
Damaged steering handle bearing.
Low tire pressure.
Bending of the front fork or the front wheel spindle.
Deformed or unbalanced front tire.

7.2.3 Front tire shimmy
Deformed rim.
Loose front wheel bearing.
Poor tire.

7.2.4 Difficulty in wheel rolling
Failure of wheel bearing or gear housing.

7.2.5 Abnormal noise of the front absorber
Fricative sound of the absorber guard.
Loose bolts in the absorber.

7.3 Front wheel

7.3.1 Disassembly

Note:
Support the motorcycle firmly.

Loosen the mounting bolts of the brake cylinder assembly.
Remove the brake cylinder assembly.
Place a proper holder under the engine to lift the front wheel.
Loosen the fixing nut of the front wheel spindle (9) ; remove the front wheel spindle (1) and the front wheel.

Remove the gear housing assembly (8) .
Remove the front brake disc.

Remove the sleeve, oil ring and bearing 6201-2RS, and middle sleeve assembly and bearing 6201-2RS.

*Note: for the disassembly and installation of the front wheel, see P88.
7.3.2 Check

7.3.2.1 Check the bending of the wheel spindle
Place the wheel spindle on the V-base and measure the eccentricity ratio with a dial indicator.

Limit for use: replacement when beyond 0.2mm

7.3.2.2 Check the rim shimmy
Place the rim on a precision bracket and check the rim shimmy.
Rotate the wheel by manual and read indication.

Limit for use:
Vertically: replacement when beyond 2.0mm
Horizontally: replacement when beyond 2.0mm

7.3.2.3 Check the front wheel bearing
Remove the front wheel spindle and the front brake disc.
Remove the left bushing and the oil seal of the front wheel.
Remove the bearing.

Check rolling of the bearings.
The bearings will not roll if abraded or loosened. Replace it.

7.3.3 Bearing replacement
Remove the front wheel spindle, front wheel, middle spindle sleeve and left spindle sleeve; then remove the oil seal and the bearing respectively with oil seal remover and bearing puller.

Note: replace dismantled bearings with new ones.
Lubricate the bearings with grease during installation.
Then press the bearings in with bearing installation tools.

* Note
• Bearings must be pressed in horizontally.

7.3.4 Installation

Install it in reverse order.
Instructions:
Lubricate the front wheel spindle, gear housing assembly, oil seal (opening), spindle sleeve, bearing 6201-2RS and middle spindle sleeve assembly.
Albany grease is suggested.

Install the front wheel spindle (1), front wheel, gear housing assembly (8) and nut M10X1.25 (9).
When the gear housing assembly (8) is installed, the odometer gear housing assembly shall be aligned well. If the front wheel spindle is not well aligned and locked, the odometer housing assembly will be deformed.
Install the brake cylinder assembly on the front rim.
Tighten the front wheel spindle (shown in the right picture).

* Note: for the disassembly and assembly of the front suspension of FACT 50 4T, please see P88.
Torque force:
Locking nuts for the front wheel spindle  55-62 N·m

7.4 Steering handle

7.4.1 Disassembly

Remove the rearview mirror assembly.
Remove the fixing screws of the decorating covers of the upper/lower handlebar shade.
Remove the decorating cover of the upper handlebar cover, and then the meter.
Remove the front shade assembly.
Remove the left/right combined switch assembly.
Remove the fuel pump assembly.
Remove the left grip and the throttle lever assembly.
Loosen the fixing bolt (2) and nut (3) of the handlebar weld assembly.
Remove the handlebar weld assembly (1).

7.4.2 Installation

* Note: for the disassembly and assembly of the handlebar, please see P90.
Install it in reverse order.

**Fixing bolt of handlebar weld assembly**

Torque force: 40-60 N·m

### 7.5 Front fork

#### 7.5.1 Disassembly

Remove the front wheel.
Remove the body guard.
Remove the brake hose and the odometer cable.
Remove the handlebar.
Remove the gland nut (6) and the dust cover (7).
Remove the one-piece cup (8) and steel balls (9).
Remove the front fork.
Remove the upper/lower cup (10,11) of the lower bearing and steel balls (9).
Loosen the fixing bolt (12) of the front absorber.
Remove the front left/right absorber assembly (1,2).

**Tools:**
Fixing bolt spanner for the steering handle weld assembly.
Fixing nut spanner.
Special disassembly tool for bearing cup.

* **Note:**
The opening of the body guard shall be cleaned with cloth.
The upper/lower bearing cup shall be dismantled with a special disassembly tool for bearing cup.

#### 7.5.3 Installation

Lubricate the steel cups of the bottom bearing with grease and confirm 21 steel balls.
Do not move the handlebar (to prevent steel balls from falling into the handlebar).
Hold the handlebar; lubricate the steel cups of the top bearing with grease and confirm 21 steel balls.
Lubricate the top seating with grease.

Move the handlebar from side to side to make steel balls contact closely.

**Tools:**
Fixing nut spanner.
Ensure the front fork is not loose by left and right movement.
**Steps:**
Install the left/right absorber assembly.
Install the handlebar.
Install the body guard.
Install the front wheel.

* Note: for the disassembly and assembly of the front fork, please see P89.
Rear wheel/rear suspension

A Torque for fixing nut 5 of the rear wheel: 100-113 N·m

B Torque for mounting bolt 4: 22-29 N·m

D Torque for mounting bolt 14: 37-44 N·m

E I.D. of brake hub (friction limit): 111 mm

F Thickness of brake pad (wear limit): 3.5 mm

1 outer tire 130/70-12 2 rim 3.50×12 3 cotter pin 4 bolt M8×31 5 nut M16×1.5 6 brake shoe assembly 7 brake shoe spring 8 rear indicator 9 rear brake camshaft 10 rear brake return spring 11 rear brake swing arm 12 rear swing arm mounting bolt 13 o-ring 14 bolt M10×1.25×40 15 rear absorber assembly
Rear wheel

A  Tire size: 130/70-12
B  Rim size: 3.50×12
C  Rim run-out limit:
   Vertically: 2.0mm
   Horizontally: 2.0mm
D  Torque of fixing nut 5 of the rear wheel: 100-113N·m
E  Auth. No. of rear tire: E11 75R 000216

1 outer tire 130/70-12  2 rim 3.50×12  3 valve cap  4 valve  5 nut M16×1.5  6 brake shoe assembly  7 brake shoe spring  8 rear indicator  9 rear brake camshaft  10 rear brake return spring  11 rear brake swing arm assembly  12 rear swing arm mounting bolt  13 O-ring
8. Rear Wheel/Rear Suspension

Preparing documents -------------------8.1

Failure diagnosis ----------------------8.2

Rear wheel -----------------------------8.3

Rear absorber --------------------------8.4

8.1 Preparing documents

Work Instructions

The surface of the brake drum and brake shoes shall not be stained with oil spots.

Preparing Principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
<th>Limit for use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear wheel shimmy</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Vertically</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontally</td>
<td></td>
<td>2.0</td>
</tr>
</tbody>
</table>

Locking torque force

Fixing nuts for the rear wheel 100-113 N·m
Fixing bolts of rear absorber (top) 37 - 44 N·m
Fixing bolts of rear absorber (bottom) 22 - 29 N·m

8.2 Failure diagnosis

8.2.1 Rear wheel shimmy

Deformed rim.
Tire failure.
Rear wheel not fixed.
Low tire pressure.

8.2.2 Too soft absorber

Elastic fatigue of spring
8.3 Rear wheel

8.3.1 Disassembly
Remove the muffler assembly.
Remove the rear inner fender.
Remove fixing nuts of the rear wheel spindle.
Remove the rear wheel.

8.3.2 Check
8.3.2.1 Check rim shimmy
Rotate the wheel by manual and measure the eccentricity ratio with a dial indicator.
Limit for use:
Vertically: replacement when beyond 2.0mm
Horizontally: replacement when beyond 2.0mm
When the rear wheel shimmy exceeds the limit, the rear wheel bearing is loose, which causes shimmy. Check and replace the rear wheel bearings.

8.3.3 Installation
Install the rear wheel in reverse order and lock nuts.

Fixing nuts for the rear wheel
Torque force: 100-113 N·m

FACT 50 4T rear wheel
8.4 Rear absorber

8.4.1 Disassembly

Remove the seat and the rear left/right guard.
Remove the rear storage box, rear rack assembly and rear fender.
Remove fixing bolts of the rear absorber.
Remove the rear absorber.

8.4.2 Installation

Installation of the rear absorber:
Torque force:
Upper fixing nut: 37-44 N·m
Lower fixing nut: 22-29 N·m

Install the rear absorber.
Install the rear storage box, rear rack assembly and rear fender.
Install the seat and the rear left/right guard.
**Fuel tank/seat**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Note: for the disassembly of the fuel tank, turn the fuel switch to “OFF”.</td>
</tr>
<tr>
<td>B</td>
<td>Torque for bolt 9: 5-9N·m</td>
</tr>
<tr>
<td>D</td>
<td>Torque for bolt 10: 5-9N·m</td>
</tr>
</tbody>
</table>

1 seat assembly  2 fuel tank assembly  3 right cover sheet  4 left cover sheet  5 front cover of helmet box  6 rear storage box rack  7 seat steel rope  8 rear storage box rack holder  9 bolt M6×16  10 bolt M6×12
Fuel tank

Gasoline capacity: 6.0±0.2L

Torque for bolt 2: 5-9N·m

Note: for the disassembly of the fuel tank, turn the fuel switch to “OFF”.

1 tank assembly  2 bolt M6×16  3 fuel tank switch assembly  4 fuel tube 1 φ4.5Xφ8.5X80mm  5 thermal-isolating spring  6 clamp φ8  7 vacuum tube φ4Xφ8X360mm  8 clamp φ7  9 fuel tube 2 φ4.5Xφ8.5X250mm  10 filter assembly  11 oil level sensor  12 bolt M5×16  13 oil level sensor gasket  14 sealing rubber  15 filter jacket  16 filter element
Seat

1 seat assembly   2 seat hinge assembly   3 O ring 84.4×3.1   4 boss bolt M6×14   5 helmet box   6 assembling bolt M6×20

<table>
<thead>
<tr>
<th></th>
<th>Torque for bolt 4: 5-9N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Torque for bolt 6: 5-9N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>
9. Fuel Tank/Seat

Preparing documents ---------9.1
Failure diagnosis ----------9.2
Fuel tank/seat -------------9.3

9.1 Preparing documents

Work Instructions
It shall be dismantled far from fire sources.
Turn the fuel switch to “OFF” when the fuel tank is dismantled.
Tighten all the bolts and screws to the required torque value for assembly.
After assembly, check whether all the parts are correctly installed and operated.

Preparing Principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline tank capacity</td>
<td>6.0±0.2L</td>
<td></td>
</tr>
</tbody>
</table>

Tightening torque force

<table>
<thead>
<tr>
<th>Item</th>
<th>Torque Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixing screws for the rear rack</td>
<td>22-29 N·m</td>
</tr>
<tr>
<td>Fixing bolts for the fuel tank</td>
<td>5 - 9 N·m</td>
</tr>
<tr>
<td>Fixing bolts for the helmet box</td>
<td>5 - 9 N·m</td>
</tr>
</tbody>
</table>

9.2 Failure diagnosis

Decreasing gasoline
Natural consumption of gasoline
Leakage of gasoline
9.3 Fuel tank/seat

9.3.1 Disassembly

Open the seat.
Remove (four) fixing bolts of the seat.
Remove the machine oil pot guard.
Remove the machine oil pot.
Remove the seat and the helmet box (1).

Remove the rear storage box rack.
Remove the rear left/right guard assembly.
Remove the rear rack and helmet box.
Remove the rear rack holder.

Turn the fuel switch to “OFF”.
Disconnect the fuel hose.
Remove the fuel tank.

Note:
For details, see P101, P102, P103.

9.3.1 Installation

Install it in reverse order.
Torque force for mounting:
- Fixing screws for the rear rack  \(22-29 \, \text{N} \cdot \text{m}\)
- Fixing bolts for the fuel tank  \(5 - 9 \, \text{N} \cdot \text{m}\)
- Fixing bolts for the helmet box  \(5 - 9 \, \text{N} \cdot \text{m}\)
Disassembly and Installation of Engine

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>torque force of engine stationary axis 1: 55-62N·m</td>
</tr>
<tr>
<td>B</td>
<td>torque force of bolt 2: 37-44N·m</td>
</tr>
<tr>
<td>C</td>
<td>torque force of bolt 4: 22-29N·m</td>
</tr>
</tbody>
</table>

1 engine stationary axis M12×1.25×280  2 bolt M10×1.25×40  3 seat steel rope  4 bolt M8×31  5 rear shock absorber assembly  6 engine assembly  7 rear wheel assembly  8 rear brake rocker arm assembly
10. Disassembly/installation of engine

Preparing documents -----------10.1

Failure diagnosis -----------10.2

Engine ----------------------------10.3

Engine suspension standing clamp------10.3

10.1 Preparing documents

Work Instructions

Make motorcycle not tilt in removing motor.
Remove motor when maintain crankshaft and final drive shaft.
When maintaining magnetogenerator, camshaft, carburetor, driving wheel, clutch, driven wheel and oil pump, the motor can stay at the frame and needs not to be removed.

Preparing Principles

Motor is not only kinetic resource of motorcycle, but also driving part and main rear suspension device. On one hand, the motor with rotating action output by crankshaft, getting slowed by clutch and V shape tape stepless speed variator, can drive rear wheel directly; on the other hand, the motor acts as girder rocker arm.

Locking torque force:

<table>
<thead>
<tr>
<th>Description</th>
<th>Torque Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine stationary axis</td>
<td>55-62 N·m</td>
</tr>
<tr>
<td>Rear shock absorber standing bolt (upper)</td>
<td>37-44 N·m</td>
</tr>
<tr>
<td>Rear shock absorber standing bolt (lower)</td>
<td>22-29 N·m</td>
</tr>
</tbody>
</table>

10.2 Failure diagnosis

Swinging motor

Swinging or bended of girder rocker arm
Loose motor driving device
Loose motor suspension bolt
10.3 Disassembly of engine

10.3.1 Disassembly

Remove bolt and left crankcase ventilated tube. Disassembly procedures:
- remove frame cover.
- remove gas filter.
- remove primary cable of ignition coil.
- remove starter motor cable.
- remove fuel tube and vacuum tube.
- remove starter valve 2P connector.
- remove magnetogenerator/ pulser 3P connector.

Remove bolt and underground cable of motorcycle.

remove rear shock absorber standing bolt (upper).
Remove the right suspension bolt and gasket.
Remove the left suspension bolt.
Remove the engine from the frame.

10.3.2 Engine suspension standing clamp

10.3.2.1 Disassembly

Remove spark plug cap.
Remove fuel tube and vacuum tube from carburetor.
Remove engine suspension bolt/nut and engine assembly.

Remove bolt and ignition coil.
remove bolt, fuel tube and vacuum tube.

10.3.2.2 Inspection

Check whether the shock absorber of engine suspension is abraded or damaged.
Check whether the rubber ring of shock absorber is abraded or damaged.

10.3.2.3 Installaiton

Install bolt and ignition coil.
Install fuel tube, vacuum tube and bolt.

Install spark plug cap.
Connect carburetor fuel tube and vacuum tube.
Connect the engine suspension assembly to engine assembly.
Install bolt and nut of engine suspension temporarily.

10.3.3 Installation
Install according to reversed procedures of “disassembly”.

Note:
For details, see P106.

Torsion value of installation:
- engine stationary axle 55-62 N·m
- rear shock absorber standing bolt (upper) 37-44 N·m
- rear shock absorber standing bolt (lower) 22-29 N·m
## Inspection and Maintenance of Engine

### Table of Torque Force of Engine Fasteners

<table>
<thead>
<tr>
<th>Name of fastening parts and fasteners</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan cowl locking bolt</td>
<td>10-12</td>
</tr>
<tr>
<td>Cylinder cover locking nut</td>
<td>15-18</td>
</tr>
<tr>
<td>Spark plug</td>
<td>22-25</td>
</tr>
<tr>
<td>Air intake pipe locking bolt</td>
<td>10-12</td>
</tr>
<tr>
<td>Cooling fan blade locking screw</td>
<td>10-12</td>
</tr>
<tr>
<td>Flywheel locking bolt</td>
<td>45-50</td>
</tr>
<tr>
<td>Locking screw for the magnetor stator coil</td>
<td>10-12</td>
</tr>
<tr>
<td>Right crankcase locking bolt</td>
<td>10-12</td>
</tr>
<tr>
<td>Bearing plate locking bolt</td>
<td>10-12</td>
</tr>
<tr>
<td>Double-end stud for cylinder double-head</td>
<td>15-18</td>
</tr>
<tr>
<td>Motor fixing bolt</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking screw for the crankcase left cover shade</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking bolt for the crankcase left cover</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking nut for the drive wheel</td>
<td>40-45</td>
</tr>
<tr>
<td>Locking nut for the driven wheel</td>
<td>40-45</td>
</tr>
<tr>
<td>Locking nut for the driven wheel clutch</td>
<td>55-60</td>
</tr>
<tr>
<td>Locking screw for the overrunning clutch outer ring</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking screw for the electric starter idler plate</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking bolt for the gearbox cover</td>
<td>10-12</td>
</tr>
<tr>
<td>Locking bolt for the oil drain hole of the left crankcase</td>
<td>18-22</td>
</tr>
<tr>
<td>Locking nut for the locating pin shaft of left crankcase</td>
<td>18-22</td>
</tr>
</tbody>
</table>
Lubricating System

Note: Worm gears and worm wheels shall rotate flexibly without being seized or imbalanced tightening. A little axial movement shall be allowed for worm wheels. Fuel pump O-ring shall not cut the edge. Machine oil pump plugs shall not leak and sealing gaskets shall be in good condition.
10. Lubricating System

Preparing documents -----------10.1
Failure diagnosis ---------------10.2
Fuel pump ---------------------10.3

10.1 Preparing documents

Work Instructions
Worm gears and worm wheels shall rotate flexibly without being seized or imbalanced tightening. A little axial movement shall be allowed for worm wheels. Fuel pump O-ring shall not cut the edge. Machine oil pump plugs shall not leak and sealing gaskets shall be in good condition. After installation, remove bolt 3 during engine trial running, and lock it when machine oil runs out continuously.

Function of the lubricating system: the lubricating system of the engine is to provide lubricating oil to the frictional surface of each part, which transforms dry friction into liquid friction between lubricating oil particles and also reduces abrasion of parts. It also cools components with high thermal load, absorbs shock from bearings and other parts, reduces noise, increases sealing between piston ring and cylinder wall, and cleans and removes particles in the surface.

10.2 Failure diagnosis

Decreasing fuel          Burnt engine
Natural consumption of fuel     No fuel or low fuel pressure
Fuel leakage                Blocked fuel pipes
Abrasive or incorrectly installed piston ring  No fuel used
10.3 Fuel pump

10.3.1 Disassembly

Loosen the bolt and remove the fan cowl assembly.

Loosen fan screws and remove the fan.

Remove the right cover.

Remove the worm wheel from the crank and also the fuel pump assembly.
Remove screw, take down the fuel pump base, and disassemble the fuel pump.

Check the radial clearance between inner and outer rotors. Limit for use: 0.19mm.

Check the clearance between outer rotor and fuel pump base. Limit for use: 0.21mm.
Check the end clearance of rotors. Limit for use: 0.11mm.

**Assembly of fuel pump**

As shown below

1. cross recessed small pan head screws
2. locating pin
3. O ring
4. fuel pump base
5. inner rotor
6. outer rotor
7. fuel pump body
8. hexagon flange bolt
9. round pin
10. fuel pump gear assembly
11. fuel pump shaft
12. hexagon flange nut
13. hexagon flange bolt
14. fuel pump sub assembly

**10.3.2 Installation**

Install it in reverse order.
Measure the outer diameter of the plunder.
Limit for use: 2.61mm.

**Carburetor**


**Note:** Gasoline is very dangerous. Fire is strictly forbidden in workplace.

After the carburetor is disassembled, block the intake manifold with cloth in case that any foreign matter enters.
11.Carburetor

Preparing documents ---------------11.1
Failure diagnosis -------------------11.2
Carburetor disassembly ----------- 11.3
Carburetor installation ------------ 11.4
Carburetor adjustment ----------- 11.5

11.1 Preparing documents

Work Instructions

· Gasoline is very dangerous. Fire is strictly forbidden in workplace.
· Pay special attention to spark.
· Forcibly pulling and bending of wires is not allowed. Distortion and damage will affect their function.
· After the carburetor is disassembled, block the intake manifold with cloth in case that any foreign matter enters.
· If not used for more than one month, gasoline in the float chamber of the carburetor shall be drained out since it may block the idling jet after deterioration, which affects idle speed.

**Carburetor functions:** Carburetor is a critical component in the fuel supply system of the engine; its work condition directly affects the stability as well as the dynamic and economic indicators of the engine. It atomizes certain amount of gasoline into small oil drops, and evenly mixes it with different quantities of air to form combustible vaporific mixed gas of different concentration upon different working conditions of the engine. The mixed gas will be supplied to the engine to ensure continuous and normal operation.

**Preparing Principles**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main jet</td>
<td>47.5</td>
</tr>
<tr>
<td>Main metering jet</td>
<td>50#</td>
</tr>
<tr>
<td>Idle metering jet</td>
<td>22.5#</td>
</tr>
<tr>
<td>Oil needle</td>
<td>B05-2</td>
</tr>
</tbody>
</table>

Unit: mm
11.2 Failure diagnosis

Abnormal startup               Difficulty in startup, flameout after startup,
unstable idle speed

- No fuel in the carburetor
- Blocked oil filter
- Blocked oil pipe
- Adhesive needle valve
- Oil level maladjustment

- Blocked carburetor
- Too dense or dilute mixed gas
- Secondary air suction into the air intake system
- Idle speed maladjustment
- Oil volume maladjustment

- Blocked idle speed system or electric enrichment valve

Too much fuel in the engine       Too dilute mixed gas

- Oil spilling
- Secondary air suction into the fuel system
- Fuel deterioration
- Abnormal enrichment valve
- Blocked idle speed system or choke system

- Blocked oil jet
- Blocked needle valve
- Low oil level
- Blocked fuel system
- Abnormal plunger

- Secondary air suction into the air intake system

Too dense mixed gas            Interrupted spark at acceleration

- Abnormal enrichment valve
- Abnormal needle valve
- Over high oil level
- Oil spilling from the carburetor
- Blocked air channel
- Dirty air filter

- Too dilute mixed gas

11.3 Carburetor disassembly

11.3.1 Disassembly

Turn fuel switch to "OFF".

Remove the oil inlet pipe and loosen the throttle cable.

Remove the plug of the oil drain pipe and discharge fuel in
the float chamber into another box.

Remove the connector of electric enrichment valve.

Loosen the screws of carburetor to the engine connector and
the air filter connector; remove the carburetor between two
connectors.
11.3.2 Carburetor breakdown

Loose screws of the electric enrichment valve and remove the electric enrichment valve assembly.

Check abrasion of electric enrichment valve and oil needle. If it is severe, replace the electric enrichment valve assembly.

Loose screw and remove upper cover.
Remove spring and plunger assembly. Check abrasion of plunger. Replace it if abraded.
Check abrasion of oil needle. Replace it if abraded.

Loosen screws and remove the float chamber.
Remove the float assembly, float pin and needle valve assembly.
11.3.3 Check

Check whether the needle valve assembly, needle valve seat and float assembly are abrasive or damaged.

Replace any abrasive or damaged needle valve core. Replace the carburetor body if the needle valve seat is abrasive.
Replace any abrasive float tongue.
Check whether the carburetor oil needle is abrasive or damaged. If yes, replace it and also the main jet.
Check whether the idle metering jet, main metering jet and main jet are abrasive, damaged or stained. If yes, replace it.
Replace any abrasive plunger.
Clean any stained carburetor or fuel pipes according to instructions.

11.4 Installation and adjustment

Assemble or install it in reverse order.

Carburetor adjustment

Note: the idle adjusting screw has been adjusted for the carburetor in factory, which needs no adjustment usually. In disassembly, record the rotation number for installation.
Start and warm up for about 3 minutes to make the engine run at normal driving temperature.
Adjust the idle adjusting screw to make the engine run at 1800rpm;
Tighten the mixture adjusting screw to the extreme with moderate force;
Then the engine flames out (if not, check whether the air filter connecter is leaked, or screws are tightened or air filter inlet is blocked);
Retreat the mixture adjusting screw by one circle;
Restart and adjust the idle adjusting screw to reach 2000-2500rpm;
Adjust the mixture adjusting screw (counter-clockwise) slowly until the engine reaches the maximum speed
(retreat the screw by 2 circles to the maximum);
Readjust the idle adjusting screw to lower the engine speed to 1800±100rpm;
Pull the throttle to speed up for several times and check whether the idle speed is steady;
Test exhaust and compare it with standard.
Cylinder cover

1 cylinder cover assembly  2 cylinder cover gasket  3 intake valve  4 spark plug  5 exhaust valve  6 locating pin (Ф10×14)  7 valve spring gasket  8 valve spring  9 exhaust double end stud  10 valve oil seal assembly  11 O ring (40×2.65)  12 valve cover  13 gasket  14 acorn nut  15 valve rocker  16 rockshaft  17 camshaft assembly  18 washer  19 rocker spring  20 tappet adjusting screw  21 adjusting screw hold-down nut  22 valve spring cup  23 valve collet  24 intake double end stud  25 carburetor insulator  26 paper washer of carburetor insulator  27 adjusting shim on rocker  28 camshaft platen  29 bolt M6×10  30 chain wheel cover assembly  31 bolt M6×20  32 bolt M6×80  33 vacuum end bolt  34 hexagon flange nut M6  35 camshaft chain wheel  36 bolt M8×16  37 O ring  38 drain plug

Note: The cylinder cover bears large bolt pretension to ensure sealing between the cylinder cover and the cylinder body. Pretension: 50Nm
12. Cylinder Cover

Preparing documents -------------------12.1
Failure diagnosis ----------------------12.2
Cylinder cover ------------------------12.3
Cylinder cover check ------------------12.4
Installation of cylinder cover --------12.5

12.1 Preparing documents

Work Instructions

The cylinder cover bears large bolt pretension to ensure sealing between the cylinder cover and the cylinder body. Pretension: 50Nm.
All components must be cleaned and dried with high-pressure air before check.
Function of the cylinder cover: the cylinder cover is used to seal the cylinder and form the combustion chamber with the piston. It bears HPHT gas, and achieves air intake and exhaust through distribution mechanism.

12.2 Failure diagnosis

When the vehicle is running, there is gas leakage or too high combustion pressure between the cylinder cover and the cylinder body
Cylinder cover gasket is broken.
Bent bottom surface of the cylinder cover.
Too much carbon fouling in the combustion chamber.

12.3 Cylinder cover

12.3.1 Disassembly

Loosen fixing bolts for the fan cowl.
Remove the fan cow.
Loosen fixing nuts and spark plug, remove the cylinder cover.

12.4 Cylinder cover check

Check whether cylinder cover is broken.
Check flatness of cylinder cover bottom surface.
Limit for use: 0.04mm.

12.5 Installation of cylinder cover

Install it in reverse order.

Cylinder block and piston
1. piston  2. piston pin  3. cylinder block  4. cylinder gasket  5. cylinder cover  6. nut

**Note:** all parts shall be cleaned and blown by high pressure air before check.
13. Cylinder Block and Piston

Preparin g documents-----------------13.1     Piston---------------------------13.4
Failure diagnosis -------------------13.2      Piston installation-----------13.5
Cylinder block-----------------------13.3

13.1 Preparing documents

Work Instructions
All parts shall be cleaned and blown by high pressure air before check.

Function of the cylinder block: cylinder block provides space for gas compression, combustion and expansion, and also guides piston movement.
It also transfers part of heat energy in the cylinder to cooling medium around.

Function of the piston:
Piston bears pressure arising from mixed gas combustion inside the cylinder and transfers such pressure to the connecting rod for driving the crankshaft.
It forms combustion chamber along with the cylinder cover.
It acts as slide valve for air inlet/stop, periodically compresses fresh mixed gas from the crankcase into the cylinder and discharges exhaust gas after combustion in the cylinder.

Preparing Principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner diameter</td>
<td>37-37.01</td>
<td>37.01</td>
</tr>
<tr>
<td>Bending</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cylindricity</td>
<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
<td>Flatness</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Roundness</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top ring</td>
<td>0.02-0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Ring 2</td>
<td>0.02-0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Top ring</td>
<td>0.1-0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Ring 2</td>
<td>0.1-0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Outer diameter of piston</td>
<td>36.975-36.985</td>
<td>36.975</td>
</tr>
<tr>
<td>Clearance between piston and cylinder</td>
<td>0.02-0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Inner diameter of piston pin hole</td>
<td>10.002-10.008</td>
<td>10.008</td>
</tr>
<tr>
<td>Outer diameter of piston ring</td>
<td>9.994-10</td>
<td>9.994</td>
</tr>
<tr>
<td>Clearance between piston pin hole and piston pin</td>
<td>0.002-0.014</td>
<td>0.014</td>
</tr>
<tr>
<td>Inner diameter of the smaller end of the connecting rod</td>
<td>14.995-15.006</td>
<td>10.018</td>
</tr>
</tbody>
</table>
13.2 Failure diagnosis

Low compression pressure
- Abrasive, burnt or ruptured piston
- Abrasive or damaged cylinder or piston
- Damaged spacer or crankcase leakage

White smoke from the exhaust pipe
- Abrasive or damaged piston ring
- Abrasive or damaged cylinder or piston

Over-high compression pressure
- Abnormal noise of the piston

Too much carbon deposit in the combustion chamber
- Damaged cylinder, piston or piston ring
- Abrasive piston pin hole and piston pin

13.3 Cylinder block

13.3.1 Disassembly of the cylinder block
Remove the cylinder cover and then the cylinder block.

13.3.2 Cylinder block check
Check the abrasion of the inner wall of the cylinder.
If it is serious, replace it.
Check the flatness of the cylinder block.
Limit for use: 0.03
13.4 Piston

13.4.1 Disassembly

Remove the retainer ring of the piston.

Note: during assembly, do not make the retainer ring fall into the crankcase.

Remove the piston pin and the piston.

Check the piston, piston pin and piston ring.

Remove the piston ring.

Note: Do not rupture or damage the piston ring.

Eliminate carbon deposit in the groove of the piston ring.

Remove the piston ring, and install each piston ring on the cylinder bottom.

Note: Press the piston ring into the cylinder with piston head.

Measure the joint gap of the piston ring.

Limit for use: 0.25mm.

Measure the inner diameter of the piston pin hole.

Limit for use: 10.008mm.
Measure the outer diameter of the piston pin.
**Limit for use: 9.94mm.**
clearance between the piston pin holr an the piston pin
**Limit for use: 0.014mm.**

Measure the outer diameter of the piston.
**Note:** The measuring point shall be at 90° with the piston pin, and at 11.5mm below the piston skirt.
**Limit for use: 39.975mm.**

Check whether cylinder inner wall is scratched or abraded.
**Note:** It is at 90 degree with the piston pin. Measure the inner diameter of the cylinder at the top, middle and bottom points.
**Limit for use: 37.01mm.**
Measure the maximum clearance between the cylinder and the piston.
**Limit for use: 0.03mm.**

Measure the roundness of the inner wall of the cylinder (inner diameter difference at X direction and Y direction).
**Limit for use: 0.05mm.**
Measure the cylindricity of the inner wall of the cylinder (inner diameter difference at the top, middle and bottom points of X direction and Y direction).
**Limit for use: 0.05mm.**
Measure the inner diameter of the smaller end of the connecting rod.

*Limit for use: 10.018mm.*

### 13.4.2 Piston Installation

Install the locating pin.

Apply fuel to each piston ring and piston. Install the piston ring with inclined side upward.

**Note:**

Do not scratch the piston or break the piston ring.

After the piston ring is installed, it shall be able to rotate freely in the piston ring groove.

Remove any residual spacer attached to the crankcase.

**Note:**

Do not make any object fall into the crankcase.

Install the piston, piston pin and retainer ring.

**Note:**

The notch side of the piston skirt shall face the air intake channel for installation.

### 13.5 Piston installation

Install the spacer on the crankcase.

Apply fuel to the inner wall of the cylinder, piston and piston ring.

Carefully install the piston ring into the cylinder.

**Note:**

Do not damage the piston ring.
Drive face/clutch/driven wheel

1 gasket  2 spring  3 friction plate  4 check ring

Note: During operation, the surface of the triangle belt can not be stained with any grease which must be removed. It helps avoid slipping between the triangle belt and the belt pulley as much as possible.
Kickstart Mechanism

Note: During operation, the surface of the triangle belt can not be stained with any grease which must be removed. It helps avoid slipping between the triangle belt and the belt pulley as much as possible.

1. snap spring  2. start claw  3. idle gear  4. idler shaft  5. start shaft assembly  6. kickstart shaft spring
14. Drive Face/Clutch/Driven Wheel/Kickstart Mechanism

Preparation documents .......................... 14.1 Clutch/driven wheel  .......... 14.5
Failure diagnosis ............. 14.2 Breakdown of clutch and driven wheel ...... 14.6
Left crankcase cover .............. 14.3 Installation .......................... 14.7
Drive face .............................. 14.4 Kickstart mechanism .............. 14.8

14.1 Preparing documents

During operation, the surface of the triangle belt cannot be stained with any grease that must be
removed. It helps avoid slipping between the triangle belt and the belt pulley as much as possible.
Function: Drive face, clutch and driven wheel constitute stepless transmission. The triangle belt transfers torque
between the drive face and the driven wheel.

Preparing Principles

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner diameter of right half-driven wheel</td>
<td>20-20.05</td>
<td>20.05</td>
</tr>
<tr>
<td>Outer diameter of the sliding sleeve</td>
<td>19.94-19.98</td>
<td>19.94</td>
</tr>
<tr>
<td>Width of the triangle belt</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Thickness of the clutch facing</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Inner diameter of the clutch sleeve</td>
<td>107-107.2</td>
<td>107.2</td>
</tr>
<tr>
<td>Free length of the clutch spring</td>
<td>93-97</td>
<td>93</td>
</tr>
<tr>
<td>Outer diameter of the bushing on the right half driven wheel</td>
<td>33.95-33.975</td>
<td>33.95</td>
</tr>
<tr>
<td>Outer diameter of the sliding sleeve on the left half driven wheel</td>
<td>34.025-34.064</td>
<td>34.064</td>
</tr>
<tr>
<td>Outer diameter of the ball</td>
<td>15.8-16.2</td>
<td>15.8</td>
</tr>
</tbody>
</table>

14.2 Failure diagnosis

No run after engine startup  Insufficient horsepower  Vibration during driving

Abrasive triangle belt   Abrasive triangle belt   Ruptured clutch facing spring
Damaged driven wheel     Distorted clutch spring
Broken or damaged clutch facing  Abrasive ball
14.3 Left crankcase cover

Disassembly

Remove fixing bolts, spacer and locating pin.

Note:
Fixing bolts should be removed in staggered sequence.

Remove the locating pin.

14.4 Drive face

14.4.1 Disassembly

Remove fixing nuts for drive face and the left half-drive face. Remove the triangle belt from the drive face.

Check whether the triangle belt is cracked and whether rubber or cotton yarn falls down or is abnormally abrasive. Measure the width of the triangle belt.

Limit for use: 18mm.

Note:
Apply original parts from our company for replacement.
Remove the right half drive wheel assembly

14.4.2 Breakdown of right half drive wheel assembly

Check abrasion of the ball.
Measure the outer diameter of the ball.
Limit for use: 15.8mm
Measure the inner diameter of the right half drive wheel. 
Limit for use: 20.05mm.
Measure the outer diameter of the sliding sleeve. 
Limit for use: 19.94mm.

14.5 Clutch/driven wheel

14.5.1 Disassembly
Install the clutch sleeve with the fixer and remove fixing nuts.
Remove the clutch sleeve, clutch/driven wheel.

14.5.2 Breakdown of clutch
Remove the retainer ring and break down the clutch.
Note:
Do not stain the clutch facing with any grease during breakdown.
Check abrasion of the clutch sleeve. Measure the outer diameter of the clutch sleeve. **Limit for use: 107.2mm.**

Check abrasion of the clutch facing. Measure the thickness of the clutch facing. **Limit for use: 3.5mm**

### 14.6 Breakdown of clutch and driven wheel

Clutch spring compressor must be used for disassembling the clutch spring. **Note:** Spring compressor must be used for disassembly to avoid damage to spring. Install the spring compressor, and remove fixing nuts of the clutch. Loosen the compressor, and disassemble the clutch and the driven wheel.

（扳手：spanner 离合器弹簧器压缩器：clutch spring compressor）

Remove the spring guard.  
（弹簧护套：spring guard）
Remove the guide pin.
Remove the weldment on the left half driven wheel.
Remove the oil seal on the left half driven wheel.

Check the free length of the clutch spring.
Limit for use: 93mm.

（自由长度：free length）

Check abrasion of the driven wheel.
Measure the outer diameter of the bushing on the right half driven wheel.
Limit for use: 33.95mm.

Measure the inner diameter of the sliding sleeve on the left half driven wheel.
Limit for use: 34.064mm.

14.6.1 Replacement of the bearing on the right half driven wheel

Remove the needle bearing from the right half driven wheel.
Remove the elastic retainer ring and the outer rolling bearing.

Note:
Removed bearing cannot be used any more.

（滚针轴承：needle bearing 弹性挡圈：elastic retainer ring 滚动轴承：rolling bearing）
Apply grease evenly to the outer rolling bearing and then place it into the sleeve.

**Note:**
Place the outer rolling bearing into the sleeve with its marked side outwards. Then fill the sleeve with 8-9g grease. Install the elastic retainer ring.

Install the needle bearing.
Press the needle bearing in with the equipment shown in the picture.

14.6.2 Combination of clutch and driven wheel

Eliminate any grease on the surface of the driven wheel.
Install the oil seal in the sliding sleeve of the left half driven wheel.
Apply grease evenly on the O-ring and install it on the sliding sleeve of the left half driven wheel.

(润滑油脂: lubricating grease 油封: oil seal O型圈: o-ring)

Combine the left half and the right half-driven wheel.
Apply grease evenly to the guide pin and then install it into the guide groove.
Install the spring guard.
Eliminate leaked grease.

(弹簧护套: spring guard)

Install the clutch spring and the clutch on the driven wheel.
Compress the set with the clutch spring. Install locking nuts after compression.

Note:
Properly compress the spring to avoid damage to the spring.

扳手（锁紧螺母）: spanner (locking nut)
离合器弹簧压缩器: clutch spring compressor

14.7 Installation

Install the drive face/ clutch/ driven wheel in reverse order.

14.8 Kickstart mechanism

Disassembly/Check
Remove the left crankcase cover.
Loosen the screw and remove the guard.
Remove the start claw assembly.
Remove the start shaft assembly.

Check abrasion of the start shaft.
Check abrasion of stress area of the start shaft sleeve and the idler shaft.
Check abrasion of idle gear.
Measure clamping force of the snap spring.

Normal standard: 8-12N.

Note: 1. snap spring  2. start claw  3. idle gear  4. idler shaft  5. start shaft assembly  6. kickstart shaft spring
Decelerator

**Function:** transfer torque and decide final output torque and rotational speed.

1 gearbox cover gasket  2 input shaft  3 hex flange bolt  4 output shaft assembly  5 input shaft gear  6 intermediate shaft assembly  7 hex flange nut  8 rolling bearing  9 gasket  10 output shaft seal ring  11 rolling bearing  12 gearbox cover  13 hex flange lock nut  14 O-ring  15 anchor pin
15. Decelerator

Prepping documents ----------------------15.1
Failure diagnosis -----------------------15.2
Gearbox --------------------------------15.3
Assembly-----------------------------15.4

15.1 Preparing documents

Function: transfer torque and decide final output torque and rotational speed.

15.2 Failure diagnosis

No run after engine startup
Broken driving gear
Burnt driving gear

Leaked gear oil
Too much gear oil
Damaged oil seal

15.3 Gearbox

15.3.1 Disassembly
Remove the drain bolt and drain out gear oil inside the gearbox.
Loosen the bolt and remove the gearbox cover.
Remove the spacer and the locating pin.
Remove the clutch spindle and gear of output shaft.
Remove the middle shaft and the middle gear.

### 15.3.2 Check the Output Gearbox Cover

Check abrasion and damage of the clutch spindle, gear and bearing.
Exchange gearbox cover bearings.
Press the clutch spindle when the clutch spindle bearings are exchanged; remove it from the gearbox cover.

**Note:**
Removed bearing cannot be used any more. It shall be replaced.
Use special tools to dismantle the bearing and the oil seal.

Remove the oil seal from the gearbox and knock the bearing out.

**Note:**
Removed bearing cannot be used any more. It shall be replaced.
Use special tools to dismantle the bearing and the oil seal.

### 15.4 Assembly

Assemble it in reverse order.

**Note:**
Use special tools to assemble the bearing and the oil seal to avoid any damage.
Crankcase

Note: The crankcase is thin-section casting thus shall not suffer impact during operation which may cause deformation or fracture.
All components must be cleaned and blown with high-pressure gas before test.
Lubricant in the crankcase should be drained out before operation.

1 double-end stud (B)  2 pin bush  3 double-end stud (A)  4 left box assembly  5 forward-bouncing joint  6 tube union  7 distance sleeve  8 crankshaft seal ring  9 starter bearing  10 drain belt  11 gasket  12 oil seal  17×30×5  13 shock absorbing bushing  14 hex flange bolt  15 gasket  16 locating pin 10×20  17 hex flange belt  18 deep groove ball bearing  19 rolling bearing  20 bearing  21 crankcase spacer  22 right box assembly  23 hex flange belt  24 stationary spring shaft  25 plug  26 connecting rod with plunge
16 Crankcase

Preparing documents ------------------16.1
Failure diagnosis ----------------------16.2
Crankcase -------------------------------16.3
Assembly -------------------------------16.4

16.1 Preparing documents

Work instructions

The crankcase is thin-section casting thus shall not suffer impact during operation which may cause deformation or fracture.

All components must be cleaned and blown with high-pressure gas before test.

Lubricant in the crankcase should be drained out before operation.

**Function of the crankcase:** The crankcase is the load-bearing part of the engine. Its main function is to support the crankshaft, clutch, gearbox, cylinder block and cylinder cover, sustain combustion shock and inertia force from the movement of the connecting rod, and form part of closed space (oil sealing, gas sealing).

Suspension holes in the crankcase are linked with suspension holes in the body, which connects the engine to the frame and other parts.

**Preparing Principles**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crankshaft Left-right clearance of the larger end of the connecting rod</td>
<td>0.1-0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Crankshaft Radial clearance of the larger end of the connecting rod</td>
<td>0.008-0.018</td>
<td>0.018</td>
</tr>
</tbody>
</table>

**Tools**

Universal holder  Clutch spring compressor
Screwdriver lever  Socket spanner
Guide rod  Bearing screwdriver
16.2 Failure diagnosis

Noise in crankcase
- Loose or broken parts inside the crankcase
- Loose crankpin bearing
- Loose crankshaft bearing
- Seized clutch

16.3 Crankcase

16.3.1 Crankcase disassembly
Loosen the bolts and remove the fan, flywheel and coil.

Remove right cover and fixing bolts of the crankcase.
Remove the left/right crankcase.

Note:
Do not damage the spacer.

Remove the spacer and the locating pin.

Remove the crankshaft from the crankcase.
Remove any spacer on the joint surface of the crankcase.

Note:
Do not damage the joint surface of the crankcase.
Remove the oil seal from the left crankcase.

16.3.2 Check

Measure the left-right clearance of the larger end of the connecting rod.

Limit for use: 0.3mm.

Measure the clearance of the larger end of the connecting rod (X-Y direction).

Limit for use: 0.018mm.

Check whether crankshaft bearing makes noises or is loosen when it rotates.

If yes, replace the crankshaft assembly.
**Note:**
Removed oil seal cannot be used any more.
Remove the oil seal with a special tool

**16.4 Assembly**

Install the crankcase in reverse order.

**Note:**
Install the oil seal with special tools to avoid any damage to it.
Inspection and Maintenance of Exhaust Emission System

Muffler

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>muffler assembly</td>
</tr>
<tr>
<td>2</td>
<td>muffler tube assembly</td>
</tr>
<tr>
<td>3</td>
<td>bolt M6×20</td>
</tr>
<tr>
<td>4</td>
<td>gasket 6mm</td>
</tr>
<tr>
<td>5</td>
<td>sealing gasket</td>
</tr>
<tr>
<td>6</td>
<td>tube assembly</td>
</tr>
<tr>
<td>7</td>
<td>bolt M8×20</td>
</tr>
<tr>
<td>8</td>
<td>bolt M6×16</td>
</tr>
<tr>
<td>9</td>
<td>exhaust pipe gasket assembly</td>
</tr>
<tr>
<td>10</td>
<td>heat-insulating rubber</td>
</tr>
<tr>
<td>11</td>
<td>muffler hoop</td>
</tr>
<tr>
<td>12</td>
<td>nut M6</td>
</tr>
<tr>
<td>13</td>
<td>exhaust pipe assembly</td>
</tr>
<tr>
<td>14</td>
<td>connecting flange gasket</td>
</tr>
<tr>
<td>15</td>
<td>screw M6×25</td>
</tr>
<tr>
<td>16</td>
<td>spring gasket 6mm</td>
</tr>
<tr>
<td>17</td>
<td>gasket 6mm</td>
</tr>
<tr>
<td>18</td>
<td>nut M6</td>
</tr>
<tr>
<td>19</td>
<td>screw without head M6×25</td>
</tr>
</tbody>
</table>

A Torque for fastening fixing screw 15 of the muffler connector: 5-9 N·m

B Torque for fastening fixing bolt 8 of the muffler: 5-9 N·m

C Torque for fastening fixing bolt 3 of the muffler hoop: 5-9 N·m
18. Exhaust Emission & Control System

Warranty on the exhaust emission & control system ---------------------------18.1
Instructions on the periodic maintenance/ compliance with standards------18.2
Mechanical function of the exhaust control system --------------------------18.3
Catalytic conversion system -----------------------------------------------18.4
Measures when the idle speed emission value exceeds the standard--------18.5

18.1 Warranty on the exhaust emission & control system

1. The exhaust emission & control system of this motorcycle is in conformity with the revision of EC/97/24/5/I and 2002/81/EC B issued by the EU. We warrant that the exhaust emission & control system works normally during its effective period provided that users completely comply with all operation and maintenance requirements.
2. All new motorcycles delivered by our company have satisfied the noise test and comply with EC 97/24/9 implemented by the EU.

18.2 Instructions on periodic maintenance

· It is the national requirement that all motorcycles produced domestically shall comply with exhaust emission standards to lessen environmental pollution. We strictly accord with these exhaust emission standards and also make great effort in purifying air and reducing pollution.
· This motorcycle has been strictly examined before delivery and is in conformity with all exhaust emission standards. We provide the following periodic inspection table for exhaust emission in consideration of different use by customers. Users shall carry out periodic inspection, adjustment or maintenance according to the schedule to ensure normal emission.
· For any problem, please contact Qianjiang distributors or Qianjiang service center.
· Relevant emission provisions are shown as follows:

<table>
<thead>
<tr>
<th>Emission regulation</th>
<th>CO</th>
<th>HC+ NOₓ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission standard</td>
<td>≤1.0g/km</td>
<td>≤1.2g/km</td>
</tr>
</tbody>
</table>

Pay attention to following items to ensure meeting emission standards:
1) Please use lead-free gasoline #92 or #95, or the catalytic conversion device (two-stroke system) will be affected.
2) Please use fuel with stipulated specification since any problem in the ignition system, the charging system or the fuel system has significant effect on the catalytic device. Please go to our designated distributor or service center for inspection, adjustment or repair immediately when there is any problem found in the engine.
18.3 Mechanical function of the exhaust control system

General
This system adopts two-stroke single-cylinder engine, carburetor and air conduction device to maintain qualified exhaust gas. Meanwhile, active carbon canister is used for exhaust gas evaporated from fuel.

※ Air induction device
Induce air into the exhaust pipe to react incompletely combusted CO and HC into harmless gas.

<table>
<thead>
<tr>
<th>Division</th>
<th>Device</th>
<th>Constitution</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust</td>
<td>Catalytic</td>
<td>Catalytic</td>
<td>Canned oxidized catalyst installed in the center of the exhaust pipe is able to oxidize CO, HC and NOX.</td>
</tr>
<tr>
<td>system</td>
<td>device</td>
<td>converter</td>
<td></td>
</tr>
</tbody>
</table>

18.4 Catalytic conversion system

18.4.1 Structure:
18.4.2 Instruction:

1. The function of convertible catalyst is to converse exhaust gas HC, CO and NOx after complete combustion to harmless gas such as H₂O, CO₂ and N₂ before emission.

2. Convertible catalyst contains rare metal such as platinum and rhodium. Only lead-free gasoline can be used.※Note that lead gasoline may invalidate catalyst.

• General instructions for maintaining motorcycles (exhaust pipe) with catalytic converter:

1）For motorcycles with catalytic converter, when the engine is running or just closes down, it shall not be touched for a while because of high temperature.

2）Motorcycles with catalytic converter shall not be near flammable material.

3）There is CO inside the exhaust pipe, which is harmful to health. So do not run the engine in closed space.

4）Lead gasoline can not be used for motorcycles with catalytic converter (to prevent catalytic poisoning).

5）Do not push the motorcycle to start the engine. If it is necessary, please wait until the temperature of the engine and the catalytic converter lower down.

6）Do not make gear up or flame out when descending.

7）Do not drive the motorcycle with bad ignition

8）Do not remove spark plug and start the engine to see whether there is spark when repairing the ignition system of the engine. If it is necessary, it shall be finished in a short time.
18.5 Measures when the idle speed emission value exceeds the standard
(Four-Stroke)

Note 1: measure it with the idle speed measurement program.

Note 2: adjust the engine speed with stop screws to live up to requirements and measure CO/HC at the idle speed.