PREFACE

This manual offers all service specialist with professional techniques of maintenance and repairing for PM50 & PM110. It provides a Detailed guide for those whom may concern with how to maintain, repair, Reassemble, and exchange parts of their scooters.

At every section, we illustrate each important point by assembling Procedures, explosive diagrams and photographs.

Although we have tried our best to make this manual as perfect as Possible, please kindly inform us if any fault needs to be corrected in this manual.

Thank you for purchasing our POG scooters.

FACTORY :
Motive Power Industry Co., Ltd.
CONTENTS:

1. The specifications
2. Service information
   (1) The operation notice
   (2) Torque value
   (3) Lubrication instruction
   (4) Wiring diagram
   (5) Troubleshooting
3. Checking and Adjustment
   (1) Regular checking table
   (2) Battery
   (3) Cleaning air cleaner
   (4) Final reduction mechanism oil
   (5) Spark plug
   (6) Compression pressure measurement
   (7) Ignition timing
   (8) Throttle cables adjustment
   (9) Idle adjustment
   (10) Front brake adjustment
   (11) Rear brake adjustment
   (12) Tire
4. Dismantling, maintaining, repairing and assembling operation
   (1) Lubrication system
   (2) Plastic parts of chassis
   (3) Engine dismantling
   (4) Drive pulley, starter, clutch, driven pulley
   (5) Cylinder head, cylinder, piston
   (6) AC generator, flywheel magneto
   (7) Final transmission mechanism
   (8) Crankcase, crankshaft
   (9) Carburetor
   (10) Steering column, front wheel, brake comp, front fork
   (11) Rear wheel, rear brake, rear damper
(12) Fuel tank, oil tank

5. Electric equipment
   (1) Troubleshooting
   (2) Battery
   (3) Recharge system
   (4) Ignition system
   (5) Starting system
# SCOOTER SPECIFICATION (1)

<table>
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<tr>
<th>Name</th>
<th>PMX SPORT50</th>
<th>ERAME</th>
<th>STEEL</th>
</tr>
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<td>REAR</td>
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<td>IDLE RPM</td>
<td>1900 ± 100</td>
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<tr>
<td>IGNITION</td>
<td>CDI</td>
<td></td>
<td></td>
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<td>SPARK PLUG</td>
<td>NGK BP7HS</td>
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<td>FORCE AIR</td>
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<td>ELECTRIC, KICK</td>
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<td>OIL PUMP</td>
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<tr>
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<td>OIL PUMP</td>
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<td>LUBRICATION</td>
<td>SEPARATED</td>
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<td></td>
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</table>
2. Service information:

(1) The operation notice
(2) Locking torque value
   a. For engine
   b. For chassis
   c. Others
(3) Lubrication instruction
   a. For engine
   b. For chassis
   c. Wheel bearing
(4) Wiring diagram
(5) Troubleshooting
   1. Difficult starting or can’t
   2. Weak acceleration
   3. Engine running unsmoothly (low speed)
   4. Engine running unsmoothly (high speed)
   5. Clutch, drive, driven pulley
   6. Handlebar steering astrayed when running
   7. Front, rear damper not balanced
   8. Bad braking
   9. Oil indicator malfunction
   10. Fuel indicator malfunction
   11. The starting motor malfunction
   12. No sparking
   13. Charging abnormal
(1) The operation notice:

1. For parts like the gasket, o-ring, clips and circlets, please change a new part whenever re-assembled.

2. When trying to tighten screws or nuts, please lock tightly according to each recommended locking torque and in the sequence of the “X” pattern.

3. Please use PGO recommended parts.

4. After dismantling, please clean all parts involved or used for checking and grease all contact surfaces when reassembling.

5. Use grease recommended by P.G.O.

6. When removing battery, please disconnect the negative cable (-) first. However, please connect the positive cable (+) first when assembling.

7. Before installing a new fuse, please be sure that the specification is correct.

8. After reassembling please re-confirm that all connecting point, locking parts, circuits, polar characteristics are functioning well before selling out.
## (2) Locking Torque Value:

### 1. Engine

<table>
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<tr>
<th>No</th>
<th>Locking Location</th>
<th>Thread Dia (mm)</th>
<th>Locking Torque kg-m</th>
<th>Remarks</th>
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<tr>
<td>1</td>
<td>Cylinder head</td>
<td>7</td>
<td>1.0~1.4</td>
<td>When the engine is cold</td>
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<tr>
<td>2</td>
<td>Flywheel plate</td>
<td>10</td>
<td>3.2~4.0</td>
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<tr>
<td>3</td>
<td>Rear brake lever</td>
<td>6</td>
<td>1.0~1.2</td>
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</tr>
<tr>
<td>4</td>
<td>Driving pulley</td>
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<td>3.2~4.0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Clutch outer</td>
<td>10</td>
<td>3.5~4.0</td>
<td></td>
</tr>
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<td>6</td>
<td>Right crankcase</td>
<td>6</td>
<td>1.0~1.2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Drive gear box cover</td>
<td>6</td>
<td>1.0~1.2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Left crankcase</td>
<td>6</td>
<td>1.0~1.2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Draining and filler bolt</td>
<td>8</td>
<td>1.8</td>
<td>When the engine is cold</td>
</tr>
<tr>
<td>10</td>
<td>Inlet pipe</td>
<td>6</td>
<td>1.0~1.2</td>
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<tr>
<td>11</td>
<td>Flywheel magneto</td>
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<td>1.0~1.2</td>
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<td>1.0~1.2</td>
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<td>Muffler nut on cylinder head</td>
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<td>14</td>
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<td>1.0~1.4</td>
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<td>15</td>
<td>Spark plug</td>
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<td>16</td>
<td>Fan cover</td>
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<td>1.0~1.2</td>
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<td>1.0~1.4</td>
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<td>18</td>
<td>Nut of rear wheel axle</td>
<td>16</td>
<td>8.0~10.0</td>
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<td>Kick starter</td>
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<td>1.0~1.2</td>
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<td>20</td>
<td>Muffler bolt on crankcase</td>
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### 2. Chassis

<table>
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<th>Thread Dia</th>
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</thead>
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<td>1</td>
<td>Steering stem nut</td>
<td>10mm</td>
<td>3.0~4.0</td>
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<td>2</td>
<td>Front axle nut</td>
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<td>5.0~6.0</td>
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<td>3</td>
<td>Fixed nut fasten eng. and chassis</td>
<td>12mm</td>
<td>5.0~6.0</td>
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<tr>
<td>4</td>
<td>Fixed bolt fasten hanger and chassis</td>
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<td>3.5~4.5</td>
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<tr>
<td>5</td>
<td>Rear shock absorber (upper)</td>
<td>10mm</td>
<td>3.0~4.5</td>
</tr>
<tr>
<td></td>
<td>Rear shock absorber (lower)</td>
<td>8mm</td>
<td>2.4~3.0</td>
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<tr>
<td>6</td>
<td>Lock nut faster frt. brake disk and frt. wheel rim</td>
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<td>2.0~3.0</td>
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<tr>
<td>7</td>
<td>Lock bolt between frt. brake caliper and frt. absorber</td>
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<tr>
<td>8</td>
<td>Lock bolt of frt braking hose</td>
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3. Other parts: Please refer the following table:

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<td>8mm bolt and nut</td>
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<td>10mm bolt and nut</td>
<td>3.4-4.0</td>
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<td>12mm bolt and nut</td>
<td>5.0-6.0</td>
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<td>5mm screw</td>
<td>0.35-0.5</td>
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<td>6mm screw</td>
<td>0.7-1.1</td>
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<td>6mm flange bolt and screw</td>
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<td>7mm flange bolt and screw</td>
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<td>10</td>
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<tr>
<td>11</td>
<td>10mm flange bolt and screw</td>
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B. Chassis parts
C. Wheel bearing part
(5) Trouble shooting:

1. difficult starting or can’t start:

<table>
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<tr>
<th>Check and adjust</th>
<th>Trouble condition</th>
<th>The reason</th>
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<tbody>
<tr>
<td>Loose carburetor draining Screw, check if in side of Carburetor have fuel or not</td>
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<td></td>
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<tr>
<td>The fuel supply in carburetors Is enough or smooth</td>
<td>No fuel supply in carburetor</td>
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</tr>
<tr>
<td>Remove spark plug, insert Spark plug cover, and touch With engine check there is Any spark</td>
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<td></td>
</tr>
<tr>
<td>There is sparking In spark plug</td>
<td>No sparking or Weak sparking</td>
<td></td>
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<tr>
<td>Measurement of Compression pressure</td>
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<tr>
<td>Pressure is normal</td>
<td>Insufficient or No Pressure</td>
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<tr>
<td>Start engine: follow the Instruction of starting engine</td>
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</tr>
<tr>
<td>Engine has no knocking</td>
<td>Engine knocking But can’t start</td>
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<tr>
<td>Remove spark plug And check again</td>
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<td></td>
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<tr>
<td>dry</td>
<td>wet</td>
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</table>

- ①check there is fuel or not
- ②pipe between full tank and carburetor is blocked
- ③Float is blocked
- ④Fuel gauge is blocked
- ⑤auto cock is malfunction
- ⑥spark plug out of order
- ⑦dirty
- ⑧CDI unit out of order
- ⑨A.C. generator out of order
- ⑩ignition coil disconnect or short circuit
- ⑪main switch out of order
- ⑫defective magneto coil
- ⑬starting clutch out of order
- ⑭piston ring stuck
- ⑮reed valve deteriorated
- ⑯cylinder, piston, piston ring worn out
- ⑰cylinder gasket leakage
- ⑱cylinder body has sand hole
- ⑲bad action of auto choke
- ⑳air trapped in intake manifold
- ⑳wrong ignition timing
- ⑳bad adjustment of carburetor’s fuel adjusting screw
- ⑳carburetor fuel level too high
- ⑳malfunction of auto choke
- ⑳throttle valve open too largely
2. Weak acceleration:

Check and Adjust

Trouble condition

The reason

Start engine and open throttle
Gradually, check and inspect

Engine can rotate up

Engine can’t rotate Up completely

Check ignition timing, (check With ignition time lamp)

Timing is correct

Timing is not correct

Check cylinder
Compression pressure (use cylinder compression pressure gauge)

Pressure is normal

Pressure is Not normal

Check carburetor
Is blocked or not

No blocked

blocked

Clean the carburetor

Remove spark plug and Check it

No dirty and no color change

Dirty, color change

Check and Adjust

① air cleaner blocked
② fuel supply system abnormal
③ fuel tank cover blocked
④ muffler blocked
⑤ auto chock is malfunctioned
⑥ auto chock is malfunctioned

CDI unit is out of order

alternator flywheel magneto out of order

① cylinder, piston ring worn out
② cylinder gasket leakage
③ cylinder body has sand hole
④ Reed valve malfunction

Timing is correct

Timing is not correct

Pressure is normal

Pressure is Not normal

Check carburetor
Is blocked or not

No blocked

blocked

Clean the carburetor

Remove spark plug and Check it

No dirty and no color change

Dirty, color change

check the dirt

specification is not correct
Check the oil level in gear box
Is too much or dirty

Oil level is normal

Check the combustion color of cylinder head

Check engine overheat
Or not

Running accelerately or High speed continuously

No knocking

Knocking

Oil level is Not normal

Oil route is blocked

Insufficient oil pumping from oil pump

Piston and cylinder worn out

Mixture is too lean

Bad quality of the fuel

Too much carbon in the combustion room

Ignition timing is too early

Oil level is too high

Oil level is too low

Oil does not interchange

Oil route is blocked

Insufficient oil pumping from oil pump

Piston and cylinder worn out

Mixture is too lean

Bad quality of the fuel

Too much carbon in the combustion room

Ignition timing is too early

Checking combustion color of cylinder head

Normal

Abnormal

Checking engine overheat

Not overheat

Overheat

Too much carbon in the combustion room

Bad quality of the fuel

Clutch slip

Mixture is too lean

Ignition timing is too early
3. Engine running unsmoothly (low speed and idling)

Check and adjust

Trouble condition

Check ignition timing

Correct

Not correct

① CDI faulty
② AC generator faulty

Adjust carburetor air screw

Good adjustment

Faulty adjustment

① mixture too rich (to loose the screw)
② mixture too lean (to tight the screw)

Check if there is air
Leakage on carburetor gasket

No leakage

leakage

① gasket broken
② carburetor locking nut loosen
③ hose ruptured
④ intake manifold gasket broken
⑤ carburetor O ring distorted

Good sparking

Sparking abnormal
Or no sparking

Check A.C. Generator

good

fault

① spark plug dirty
② CDI out of order
③ AC magnet coil abnormal
④ ignition coil faulty
⑤ H.V. coil disconnect or short circuit
⑥ main switch abnormal

① A.C. generator malfunction
② hose is damaged
③ air pipe is blocked or damaged
4. Engine running unsmoothly (high speed)

- Check and adjust
- Trouble condition
- The reason

- Check ignition timing
  - correct
  - Not correct
    - CDI sets faulty
    - AC generator faulty

- Check auto cock, Fuel supply system
  - good
  - unsmoothly
    - fuel level is too low
    - fuel pipe, fuel filter is blocked
    - autocock faulty

- Check carburetor Is blocked or not
  - No blocked
  - blocked
    - clean and wash it
5. Clutch, drive and driven pulley

<table>
<thead>
<tr>
<th>Trouble condition</th>
<th>The reason</th>
</tr>
</thead>
</table>
| Engine can start but can’t Move the vehicle | ① driving belt worn out, distortion  
② driven plate worn-out  
③ driven plate spring distorted  
④ clutch lining worn-out  
⑤ driving pulley shaft gear teeth cracked  
⑥ final gear damage |
| Engine runs, but it stops And seems to rush out (rear wheel rotates while idling) | ① clutch lining spring cracked or worn out  
② weight rollers melt and stick to driving face  
③ shaft worn out |
| Climbing is not smoothly                        | ① driving belt worn-out, distorted, slipping  
② weight roller worn-out  
③ driven plate worn-out  
④ driven plate spring distorted  
⑤ driving pulley shaft worn-out |
| Can’t reach high speed                          | ① driving belt worn-out or slipping  
② weight roller worn-out  
③ driving pulley shaft worn-out |
| Noise, or bad smell when running                | ① additional grease on driving belt, pulley  
② driving belt worn-out  
③ driven plate spring distorted  
④ driving pulley shaft worn-out |
6. Handlebar steering astrayed when running.

- **Trouble condition**: Handlebar operates heavily
  - **The reason**: (front and rear wheel pressure are normal)
    ① steering column lock nut locked too tightly
    ② steel ball cracked

- **Trouble condition**: Front and rear wheel swings
  - **The reason**: 
    ① rear, front wheel bearing swings
    ② front, rear wheel rim distorted
    ③ front axle nut is loose

- **Trouble condition**: Handlebar astrayed to one direction
  - **The reason**: 
    ① front and rear wheel center not well-aligned
    ② front fork crooked

7. Front, rear damper not in balanced

- **Trouble condition**: Damper is too soft
  - **The reason**: (front and rear wheel pressure is normal)
    ① damper spring is too soft
    ② carrying weight is too large
    ③ damper oil leakage

- **Trouble condition**: Damper is too heavy
  - **The reason**: 
    ① front fork guide rod crooked
    ② damper and damper cover cracked

- **Trouble condition**: Damper has abnormal noise
  - **The reason**: 
    ① problems in damper tube and spring
    ② damper and damper cover cracked

8. Brake disorder.

- **Trouble condition**: Brake plate “△” mark points
  - **The reason**: (adjustment according to standard procedure)
    ① brake lining worn-out
    ② brake lining cam worn-out
    ③ brake cam worn-out
    ④ brake hub worn-out

- **Trouble condition**: Noise when brake
  - **The reason**: 
    ① brake lining worn-out
    ② Alien material attached on brake lining
    ③ Contact surface of the wheel hub becomes rough

- **Trouble condition**: Faulty performance
  - **The reason**: 
    ① brake cable over stretching or moving unsmoothly
    ② brake lining contacting surface not evenly
    ③ water or sand drop into brake system
    ④ some grease on brake lining surface
9. Oil indicator malfunction
(a) The oil lamp doesn't light up, (when the main switch is at “ON” position)

Check and adjust

Trouble condition

The reason

Turn the signal lamp On, Check wiring Of battery

Normal

Lamp dims, light does Not flash, no light

fuse burn-out
battery has no power
main switch abnormal
circuit plug dropped off
main wiring disconnected

Lamp lights

Lamp does not light up

bulb burn out

electric plug is loose or disconnected
main wiring disconnected
wrong wiring connection

Check electric plug

Good condition

No good

electric plug is loose or disconnected
main wiring disconnected
wrong wiring connection

Remove the oil lamp, And connect with Battery directly

Remove oil gauge, Check the lamp light Up or not by moving The float

Float upward: lamp Extinguishes
Float downward: lamp turn on

Good

No good

float faulty
oil gauge switch dis-connected or short circuit

(b) Oil is enough but the indicator turns on all the time (when the main switch is “ON”)

Check and adjust

Trouble condition

The reason

Check all electric plug

Good

Disorder

electric plug is loose or drop-off
main wiring disconnected
wrong wire connection

Remove oil gauge, Check the lamp by Moving the floating

Good

Disorder

float faulty
oil gauge switch dis-connected or short circuit

Float upward: lamp Extinguishes
Float downward: lamp Turns on

oil tank distorted
some impure material dropping in
10. Fuel indication malfunction
   (a) wrong fuel level indication (when the main switch is “ON”)

Check and adjust

Trouble condition

The reason

Turn the signal lamp On; check wiring of battery

normal

Lamp dims, light
Not flash, not light

Fuse burn-out
Battery has no power
Main switch abnormal
Circuit plug dropped off
Main wiring disconnected

Remove the fuel gauge
Moving float up and down to check
The needle movement

Needle moves

Needle no motion

Float abnormal

Do the short and opening circuit test on the fuel gauge plug which connect to wire harness. Check the needle movement

Needle moves

Needle on motion

Fuel gauge abnormal

Check electric plug

good

abnormal

Electric plug is loose or disconnected
Wrong connection
Wire broken or short circuit
(b) Fuel gauge needle is not steady and sometimes moves up and down (when the main switch is “ON”)

**Trouble condition**
- normal
- No motion

**The reason**
- fuse burn-out
- battery has no power
- main switch abnormal
- circuit plug dropped off or broken
- main wiring disconnected
- fuel gauge contact abnormal
- Insufficient or no damping
- Oil inside the fuel gauge
- electric plug drop-off or loose
- wire broken or short circuit

**Check and adjust**
- Turn signal lamp on, Check wiring of battery
- Remove the float
  Inside the tank,
  Move up and down to Check the needle’s movement
- Move needle up and
  Down quickly(1 move/
  Second), check the Needle’s movement
- Check electric plug
  Connecting condition

**Needle moves**
- Needle moves
  good
- Needle no movement
  abnormal
The starting motor abnormal
(a) Starting motor can not rotate

Check and adjust

Trouble condition

The reason

- fuse burn-out
- battery has no power
- main switch abnormal
- circuit plug dropped off
- main wiring disconnected

Check brake switch

Brake lamp
Lights up

Brake lamp
no light

Fuse burn-out
Battery has no power
Main switch abnormal
Circuit plug dropped off
Main wiring disconnected

Turn signal lamp
No to check wiring
Of battery

normal

Lamp dims, no
Flashing no light

Battery has no power

Start switch bad connection
Relay wire broken or short circuit
Circuit plug is loose

Push starting switch
And check the function
Of start relay

normal

No function

Start switch bad connection
Relay wire broken or short circuit
Circuit plug is loose

Connect starting motor
To battery directly

Starting Motor runs up

Starting motor
Has no motion

Start switch bad connection
Relay wire broken or short circuit
Circuit plug is loose, drop-off
Main wiring broken
(b) Starting motor running slowly or no pick-up

Check and adjust

Trouble condition

The reason

Turn signal lamp On, to check wiring of battery

normal

Lamp dims, no Flashing, no light

① battery has no power

Connect starting Motor to Battery directly

Running normal

Running slowly

① electric plug is loose or drop off
② start relay bad connection

Kick the kickstarter lever

Easy to kick

Difficult to kick

① cylinder burn out
① wire broken or shout circuit

③ Starting motor can not stop after starting

Check and adjust

Trouble condition

The reason

Main switch, Turn off

Motor can’t stop

Motor stops

① start gear can’t return
② start relay capacitor melted or short circuit
12. No sparking

Check and adjust

Trouble condition

The reason

Replace new spark Plug, then check again

Good sparking

Weak sparking Or no sparking

Spark plug faulty

Check spark plug, cap And H.V. cable is Loose or not

Spark plug cap is loose

Plug is poor connection

Check the CDI plug Is loose or not

Plug is poor connection

Check the connection Between CDI plug and Each terminals, check The resistivity of Each terminals

Plug is poor connection

Check relative parts

Check ignition coil By the CDI tester

Defective ignition coil

Good sparking

Good

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13. Charging abnormal (battery over charging or over discharging)

- **Check and adjust**
  - Measure battery's voltage then start engine
  - Check voltage rectifier: plug is loose or not
  - Check the voltage between chassis  and the red cable of voltage rectifier
  - Check the resistivity of A.C. generator coil
  - Start engine, then measure the voltage between chassis and red cable of rectifier

- **Trouble condition**
  - Voltage remain the same
    - Voltage goes up to normal value, but after engine stops, the voltage goes down again
      - 1) Battery is dead
      - 2) Battery malfunction
  - Voltage is good
    - Voltage is loosen
      - 1) Poor connection
      - 2) Red cable disconnected
  - No voltage
    - 1) Voltage rectifier malfunction
    - 2) White cable disconnect
  - Voltage is normal
    - Voltage goes up higher than specification
      - 1) Defective coil
      - 2) Poor connection
      - 3) A.C. generator's white cable disconnected
    - Voltage goes down to normal value
      - Check connection of the cable of voltage rectifier
        - Good
          - Poor connection
            - 1) Cable poor connection
            - 2) Poor connection of black cable
        - Out of spec
          - Voltage rectifier faulty

- **The reason**
  - Voltage rectifier malfunction
  - White cable disconnected
  - Poor connection
  - Defective coil
  - A.C. generator's white cable disconnected
  - Battery is dead
  - Battery malfunction
  - Red cable disconnected
3. Checking and Adjustment:
(1) Regular checking table
(2) Battery
(3) Cleaning air cleaner
(4) The final reduction mechanism oil
(5) Spark plug
(6) Compression pressure measurement
(7) Ignition timing
(8) Throttle cables adjustment
(9) Idle adjustment
(10) Frt brake adjustment
(11) Rr brake adjustment
(12) Tire
(1) Regular checking table:
1. 【】 mark indicates periodical checking
2. 【】 indicates changing the parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Checking period</th>
<th>Judgement standard</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>gen-eral che-c-kng</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>first month or Initial 500km</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>every6 months or 5000km</td>
<td>every12 months or 10000km</td>
<td></td>
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<tr>
<td></td>
<td>every1 months or 1000km</td>
<td>every3 months or 2500km</td>
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<tr>
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<td>every3 months or 12000km</td>
<td>every6 months or 10000km</td>
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<tr>
<td>Suspension</td>
<td></td>
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<tr>
<td>Handlebar steering column</td>
<td>Loose or swing</td>
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<tr>
<td>Operation</td>
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<td>Turning angle</td>
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<td>Damaged</td>
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<tr>
<td>Shaft fixed condition</td>
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<tr>
<td>Front fork</td>
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<td>Shaft: loose</td>
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<td>Brake</td>
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<tr>
<td>Lever</td>
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<tr>
<td>a. clearance</td>
<td></td>
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<tr>
<td>b. movement of brake</td>
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<tr>
<td>Brake cable</td>
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<tr>
<td>Brake cam</td>
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<tr>
<td>Wheel hub and brake shoe</td>
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<tr>
<td>a. clearance between hub and lining</td>
<td></td>
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<tr>
<td>b. brake shoe and brake lining worn-out</td>
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<tr>
<td>c. wheel hub worn and damaged</td>
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<tr>
<td>Front wheel axle</td>
<td>damaged or distortion</td>
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<tr>
<td>Rear wheel axle</td>
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<td>Wheel</td>
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<tr>
<td>tire</td>
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<tr>
<td>Pressure</td>
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<td>Cracked or damaged</td>
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<td>tire surface or other intruders</td>
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<tr>
<td>Axle</td>
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<tr>
<td>Tighten the bolt and nut</td>
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<tr>
<td>Rim</td>
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<tr>
<td>swingness and damage condition</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Judgement standard: clearance:
Front: 5-7mm
Rear: 5-7mm

Unit: kgf, mm/unit kgf, N/1 driver
Front tire: 2.0
Rear tire: 2.0

Change tire according to △ mark

Swingness limit:
Vertical: below 2.0mm
Horizontal: below 2.0mm

Check from Stering column

<table>
<thead>
<tr>
<th>Item</th>
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<th>Remark</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>first month or Initial 500km</td>
<td>every6 months or 5000km</td>
<td>every12 months or 10000km</td>
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<tr>
<td>Wheel</td>
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<tr>
<td>Bearing</td>
<td>Clearance on Front axle</td>
<td>○</td>
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<tr>
<td>Spring</td>
<td>Damage Condition</td>
<td>○</td>
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<tr>
<td>Ass'y part</td>
<td>loose or damage condition</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Rear Damper</td>
<td></td>
<td></td>
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<tr>
<td>Connect part</td>
<td>Loose on Connecting Part</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Brake cam</td>
<td>loose or damage condition</td>
<td>○</td>
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<td>Suspension arm</td>
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<tr>
<td>Transmission</td>
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<tr>
<td>Clutch and</td>
<td>Function</td>
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<td>Shift mechanism</td>
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<td>Gear oil</td>
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<td>Ignition</td>
<td>Spark plug</td>
<td>○</td>
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<td>Starting motor gear</td>
<td>○</td>
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<tr>
<td>Wiring</td>
<td>Recharge Function</td>
<td>○</td>
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<td>Electrolyte level</td>
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<td></td>
<td>Electrolyte gravity</td>
<td>○</td>
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<tr>
<td></td>
<td>Looseness or Damage on plug</td>
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</table>

Judgement standard: LH crank case
Clearance: 0.6~0.7mm NCK:BP7HS OR SAME SPEC
Level between “UPPER” and “LOWER”
Specific gravity: 1.270-1.290
<table>
<thead>
<tr>
<th>Item</th>
<th>Checking period</th>
<th>Judgement standard</th>
<th>Remark</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>gen-era l che-cki ng</td>
<td>home</td>
<td>office</td>
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<tr>
<td>Performance, Noise</td>
<td></td>
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<td>Low speed, Acceleration</td>
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<td>Exhaustion</td>
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<td>Air cleaner</td>
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<td>Cylinder, cyli-nder head, inlet Pipe, locking Condition</td>
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<td>Compression pressure</td>
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<td>Oil leakage</td>
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<td>Oil quantity, Dirty</td>
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<td>Oil quantity, Oil filler blocked</td>
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<tr>
<td>Fuel quantity</td>
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<td>Clean Carburetor</td>
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<td>Carburetor’s Throttle and Choke function</td>
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<td>Carburetor Float height</td>
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<td></td>
<td>gen-eral check-ki ng</td>
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<td></td>
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<tr>
<td></td>
<td>first month or Initial 500km</td>
<td>every 6 months or 500km</td>
<td>every 12 months or 10000km</td>
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<tr>
<td>Lamp system</td>
<td></td>
<td></td>
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<tr>
<td>Function</td>
<td>□</td>
<td>□</td>
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<tr>
<td>Dirty or broken</td>
<td>□</td>
<td>□</td>
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<tr>
<td>Horn, signal Lamp, reflector</td>
<td>Function</td>
<td>□</td>
<td>□</td>
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<tr>
<td>lock</td>
<td>Function</td>
<td>□</td>
<td>□</td>
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<td>Rear view mirror</td>
<td>Dirty or broken</td>
<td>□</td>
<td>□</td>
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<td>License plate</td>
<td>Dirty or damaged</td>
<td>□</td>
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<tr>
<td>Dashboard</td>
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<td>Muffler silencer</td>
<td>Losseness or Damage on Ass'y part</td>
<td>□</td>
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<td></td>
<td>Function</td>
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<td>□</td>
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<tr>
<td>chassis</td>
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<tr>
<td>The previous Abnormal case</td>
<td>Confirm it does Not happen Again</td>
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<tr>
<td>others</td>
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<td>□</td>
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<tr>
<td></td>
<td>Decarbonate on Combusion room And muffler</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
(2) Battery: Recharge when power is out
1. Open the cover and remove the battery cover.
   → Take out the battery,
2. Remove the negative cable and then the positive cable, → take out the battery to recharge.
3. To re-assemble the battery, please follow the opposite Procedure of disassembling after recharging

Note:
A. The battery is totally sealed, do not remove seal bolts when recharging
B. It’s no need to add any electrolyte for this re-filling free battery
Please recharging(12V) by the following current
Standard recharging: 0.5A ⨯ 5-10 hr or rapid recharging: 5A ⨯ 30min.(110c.c.)
Standard: 0.4A * 4-10Hr or Rapid: 4A * 30min(50cc)
(3) Cleaning air cleaner
1. Remove air cleaner cover
2. Take out the air cleaner filter
3. Clean the filter by the compressor air
4. Assemble the air cleaner by reversing above procedure

Note: Do not start the engine
    When the air cleaner is
    Not installed

(4) The final reduction mechanism oil
1. Change the oil in the gear box:
   a. Turn off the engine after warm up.
   b. Put a bowl under the engine.
   c. Remove the draining bolt and
      Filler bolt to drain the gear
      oil off.
   d. Lock the draining bolt before
      refill 90c.c. gear oil and
      then lock the filling bolt.
   e. Locking torque: 1.8kg-m

Note: Be sure the crankcase, tire or wheel are cleaned if there is grease/oil on it
(5) Spark plug

1. Remove spark plug
2. Check the spark plug electrode and check if it is burnt out or not and carbonized or not
3. Clean the electrode, if it is dirty
4. Spark plug specification
   - NGK: BY7HS or same spec.
     - Gap of spark plug: 0.6~0.7mm
   - Electrode
     - Burn out
     - Carbon piled up
   - Washer is
     - Distorted or not
   - Procelain is
     - Cracked or not
(6) Compression pressure measurement:
1. Measure it when the engine is warm.
2. Open the seat, remove the luggage.
3. Remove the cover.
4. Remove spark plug then place compression pressure gauge.
5. Fully open the throttle, kick on kickstarter 5 times continuously, measure the compression pressure.
6. Compression pressure:
   - 110cc: 7kg/cm² - 500rpm
   - 50cc: 6kg/cm² - 600rpm
7. When the compression pressure is too low, check the following:
   a. cylinder head gasket cracked.
   b. piston cylinder worn out.
   c. piston ring worn out.
8. If the compression pressure is too high, it is due to carbon piled up on combustion chamber and Piston tip.

(7) Ignition timing:

This scooter is using CDI set, it is no need to adjust ignition timing.
If ignition timing is not correct, check the CDI sets AC magneto, change it if it is abnormal.

Checking ignition timing:
1. Open the seat, remove the luggage compartment
2. Remove the body cover
3. Remove fan case.
4. Check with ignition timing lamp.
   - Keep the engine running at 1,900 ± 100 r.p.m.
   - If the checking mark should lay in ± 3 apart from “F”, mark.
5. Ignition timing: B.T.D.C.
   - 17 ± 3 ◦ / @ 1900rpm
(8) Throttle cables adjustment:
1. Check the clearance of throttle twist grip.
2. Normal clearance: 1.5-3.5 mm
3. Adjust it by:
   - Take away the rubber
   - Loosen the nut
   - Rotating the adjuster nut to adjust the clearance, change it if the throttle cables can’t be adjusted.
(9) **Idle adjustment:**

1. Remove left body cover
2. Start the engine and connect the tachometer
3. Adjust the throttle valve screw to the specified revolution 1900 ± 100 rpm
4. If the idling rpm is still unsteady or fuel up is not smooth, please adjust it by followings.
   a. Screw in the air adjust screw clockwise, then screw out counterclockwise.
   
   Recommended loop:
   b. Rotate air adjust screw clockwise and counterclockwise to find out the highest revolution location.
   c. Rotate the throttle valve screw to idling condition.
   d. Fuel up gradually until the idling running rpm is steady.
   e. If the rpm is still not steady please repeat above procedure.

(10) **Front brake adjustment:**

1. Check the clearance of front brake lever.
   
   Clearance: 2-5 mm
2. If the clearance is beyond, check whether:
   a. The air mix into the pipe/caliper.
   b. The disk brake system is leaking.

**Note:**
Try brake lever to see if it’s loose.
Check the brake fluid. Once air mixed in the fluid pipe, which will reduce or damage the brake efficiency or even its function.

3. Check the brake fluid level:
   a. Refill the brake fluid when the fluid level is under the LOWER line.

**Note:**
a. To prevent the fluid splitting onto the parts or clothes, put a piece of cloth on the bottom when refilling.
   b. Be caution not to mix water or particles into the master cylinder when refilling.
   c. Never use the fluid not complied with spec.
   d. In case the fluid stains on the eyes, wash with water at once and then ask for medical care immediately.
(11) Rear brake adjustment

1. Check the clearance of rear brake lever.
   Clearance: 10-20mm

2. If the clearance is beyond the above standard, adjust it by rotating the adjuster nut.
   a. Left-handed rotation enlarges the clearance.
   b. Right-handed rotation reduces the clearance.

Note:
When the arrow of rear brake indicator lays in the arrow of left crankcase, change the brake lining.
(12) Tire:

1. Check the tire air pressure

Notice:

Check the tire before running

2. Tire pressure:
   - Front tire: 2.0 kg/cm²
   - Front tire: 2.0 kg/cm²

3. Tire dimension:
   - Front tire: 120/70-12
   - Rear tire: 130/70-12

4. Check is there any sharp object pierce the tire.

5. Check the depth of tire thread.
   - a. Depth (front & rear):
      - According to mark of tyre “▲” to change a new tyre

Note:

a. Check and adjust the tire pressure when it is too low.
   The pressure is according to the carrier, Driver, passenger, accessories and cruise Speed.

b. Proper loading is very important for steering, riding, braking, performance and safety.

c. Never carry any parcel unfastened.

d. Load the heaviest parcel on the center of vehicle, balancing the weight on both sides.

e. Beware of the weight loaded properly and check the tire pressure. The total weight of carrier, driver, passenger, and accessories cannot exceed the approved limit. An overload vehicle is easy to cause tire damage and accident for rider.
4. Dismantling, maintaining, repairing and assembling operation:

(1) Lubrication system
(2) Plastic parts
(3) Engine dismantling
(4) Drive pulley, starter, clutch, driven pulley
(5) Cylinder head, cylinder, piston
(6) AC Generator flywheel magneto
(7) Final transmission mechanism
(8) Crankcase, crankshaft.
(9) Carburetor, reed valve, auto cock
(10) Steering column, front wheel, front damper, front fork
(11) Rear wheel, rear brake, rear damper
(12) Fuel tank, oil tank
(1)Lubrication system:
   1. Lubrication system diagram.

2. Troubleshooting.
   A. If there is too much white fume from exhaust system, which means too much Carbon piled up on the spark plug or the oil quality is not good.
   B. Engine over heating:
      a. The adjustment of oil pump is not properly. (Lack of oil)
      b. The quality of oil is not good.
   C. Piston over burning.
      a. There is air in the oil pump system.
      b. Oil pump is out of order.
   D. The route from oil tank to oil pump is blocked.
      a. Ventilation hole on the tank cover is blocked.

Note: 1. When removing oil pump, do not drop any unexpected objects into the oil pipe.
       2. Please release the air if there is air trapped in the oil pipe.
       3. Locking torque of oil pump: 0.8-1.2 kg-m
3. Removing oil pump.

a. Remove the luggage and rear bracket.
b. Remove the input/output oil pipe.
c. Take out the oil pump by removing
   The locking screw on oil pump and
   Oil gauge cable.

Clean the oil pump and
Crank case before operation

4. Check oil pump.
Remove oil pump and check:
  a. O-ring is distorted or not.
  b. Contact part of crankcase is
      injured or not.
  d. Oil pump body is damaged or not
  e. The gears are damaged or not.
  f. Check seal and see if there
     Is oil leakage or not.
  g. Never dismantle oil pump it
     Can not function well after
     Dismantling.
5. Assemble the oil pump.
   a. Assemble the oil pump by reversing
      Above procedure.
      O-ring of oil pump should be lubricated by
      Grease or oil, then place on cankcase.
      The contact surface of oil pump and crank
      Case should be assembled firmly.
      The gears of oil pump should be lubri-
      Cated by grease.
   b. Be sure oil pump screw is tightened nitely
      Locking torque: 0.8~1.2kg-m

   After assmebling, check the following:
   a. the adjustment of control cables
   b. Is there air in oil pipe.
   c. oil leakage at any location.

6. Releasing air in the oil pump.

   a. If there is air in the oil pipe, it will cause engine lubrication trouble
   b. Releasing air operation means the release of air trapped in the air
      pipe oil pipe and oil pump. Please firstly release air from the oil pipe

   (a) Fill up specific amount of oil to oil tank.
   (b) Place dry cloth under the oil pump.
   (c) Remove oil pipe.
   (d) Use injector to fill up the oil in the
      oil pump body and oil pipe. Be sure the oil
      pipe and oil pump are full of oil before
      assembling.
   (e) After assembling, check if there is still air
      trapped in the oil pipe.
(2) Dismantling & assembling of plastic parts

1. Screwing out the screws of front windshield

2. Screwing out the screws of windshield & front inner cover.
   ➔ take off the windshield.
3. Screwing out the screws of the rear carrier
   ➔ take off the rear carrier

4. Open the seat, screwing out the 9 screws of luggage compartment
   ➔ take off the luggage compartment.

5. Screwing out the screws of front body cover
   ➔ take off the front body cover.
6. Screwing out the screws of left side cover
   \( \Rightarrow \) take off the left side cover.
7. Screwing out the screws of right side cover  
   ➔ take off the right side cover.

8. Screwing out the screws of rear cover  
   ➔ take off the rear cover.
9. Take off the upper & lower handle cover firstly, then screwing off the screws of front fender.

10. Screwing out the screws of front inner cover.
11. Screwing out the screws of front mudguard.

12. Before taking off the step floor, screwing out the screws of battery cover firstly ➔ take off the battery cover.
13. Disconnect the negative cable firstly, then positive cable
   ➔ take out the battery.

14. Screwing out the four screws of the step plate
    ➔ take off the step plate.
15. Screwing out the screws of step floor & lower mudguard
    ➔ take off the step floor & lower mudguard.

Locking torque:
   M6: 0.7-1.1kg-m
   M5: 0.35-0.5kg-m

Note: Pay attention not to clamp or scraping the cables by the plastic parts when assembling.
(3) Dismantling Engine

A. Dismantling engine.

1. Take off the luggage compartment.

2. Remove vacuum pipe, fuel pipe, oil pipe. Cable of auto choke and carburetor.
4. Remove the cap of spark plug.

5. Remove engine hanger shelf’s nut, rear damper blot and rear brake cable.

6. Remove the engine.
B. installing engine.

1. Install engine please reverse above procedure.

2. Locking torque:
   - M8: 2.0~3.0 kg-m
   - M10: 3.0~4.0 kg-m
   - M12: 5.0~6.0 kg-m

3. After installing, inspect and adjust the following:
   - a. the wire connecting.
   - b. throttle cable, oil control cable.
   - c. fuel and oil route.
   - d. rear brake adjustment.
(4) Drive pulley, starter, clutch, driven pulley

A. Troubleshooting:
   a. Engine starts, but vehicle does not move.
      1. Driving belt worn out
      2. Driven plate worn out
      3. Clutch lining worn out
   b. The vehicle stops or trembles when running,
      1. Clutch lining spring cracked or broken.
   c. Can’t reach high speed, no pick-up
      1. Driving belt worn out.
      2. Driving plate spring distortion.
      3. Weight roller worn out.
      4. Driving plate abnormal.

Note:
No grease and oil allowed stain on the driving belt and driven plate.

B. Measurement data

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value(mm)</th>
<th>Limit of use(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The bush inner dia of Slide driving plate</td>
<td>23.98-24.052</td>
<td>24.240</td>
</tr>
<tr>
<td>Driving plate’s boss Outer dia</td>
<td>23.974-23.960</td>
<td>23.934</td>
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<tr>
<td>Weight roller outer Dia</td>
<td>15.992-16.008</td>
<td>15.500</td>
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<tr>
<td>Clutch cover</td>
<td>120.0-120.2</td>
<td>120.500</td>
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<tr>
<td>Driven plate spring Free length</td>
<td>154.600</td>
<td>149.300</td>
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<td>Driving plate sets Outer dia</td>
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<td>33.940</td>
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<tr>
<td>Slide driven plate Inner dia</td>
<td>34.000-34.025</td>
<td>34.050</td>
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</tbody>
</table>
C. Driving pulley.

1. Remove the 10 screws of left cover.

2. Take off the left cover.
3. Remove the fixing nut of clutch.

4. Take off the ramp plate, belt & rear clutch, and the driving plate.
7. Loosen 2 hexagon screws, and take off the driving gear starter fixing plate set.

8. Remove the start idle gear set.
9. Assemble the driving pulley, please reverse the above procedure.

<table>
<thead>
<tr>
<th>Locking torque:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. M10 nut of driving pulley: 3.5~4.0kg-m</td>
</tr>
<tr>
<td>2. M10 nut of clutch outer: 3.5~4.0kg-m</td>
</tr>
</tbody>
</table>

10. Checking the driving belt
   (1) Check whether it is cracked or its rubber and fiber are loose or not. Also check if they are extraordinarily worn out.
   (2) Driving belt width:
       limit of use: change it when below 16.5mm.

11. Disassemble slide driving plate set
   (1) Remove bush of slide driving plate
   (2) Remove screw, and disassemble the cover of slide driving plate.
   (3) Remove ramp plate.
   (4) Remove weight rollers.

12. Checking list:
   (1) Check the wearing condition of weight roller.
       limit of use: change it when below 15.5mm.
   (2) Check inner dia of slide driving plate’s gasket.

<table>
<thead>
<tr>
<th>Limit of use:</th>
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</thead>
<tbody>
<tr>
<td>Change it when above 20.068 mm</td>
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</tbody>
</table>

(3) Check the wearing condition for driving pulley surface.

(4) Check the outer diameter of the driving plate’s boss.

<table>
<thead>
<tr>
<th>Limit of use:</th>
</tr>
</thead>
<tbody>
<tr>
<td>change it when Below 23.934mm</td>
</tr>
</tbody>
</table>
13. Assemble the slide driving plate.

(1) Clean the inner surface of slide driving plate, then assemble the roller.
(2) Assemble the ramp plate.
(3) Please reverse the procedures of disassembling to finish assembling.
D. Starter dismantling
1. Dismantle the left crankcase cover
2. Remove the hexagon nut, then remove the starter lever.
3. Remove five screws of partition plate.
4. Remove the starter spring from the start returning positioner.
5. Remove the driven gear comp of kick starter.
6. Remove the retaining c-type clip
7. Remove the spindle comp.
8. Checking the starter
   a. Check the wearing condition of the outer diameter of the spindle comp
      and the inner diameter of bush and gear.
   b. Check the wearing condition of the shaft of driven gear comp, gear
      sets and ratchet.
9. Assembling the starter
   To assemble the starter, follow the opposite procedures of dismantling.
   Locking torque: M6: 1.0~1.2 kg-m

Note:
① Make sure that one end of the torsion spring is hooked on the groove of driven gear, and another end of the torsion spring is hooked on the poled inside the left crank case.
② Put some grease on shaft and gear sets before assembling.
E. Clutch driven pulley

1. Dismantle the clutch
   a. Remove left crankcase cover.
   b. Remove driving plate.
   c. Remove driving belt.
   d. Remove M10 locking nut, then the clutch.

2. Assembling the clutch: please follow the opposite procedure of dismantling.

   Locking torque:
   M10: 3.5~4.0kg-m

3. Checking the clutch:

   a. Check the clutch driven face.
   Check the clutch cover about its wearing
   Condition and inner diameter measurement.

   Limit of use:
   Change it when above 120.5mm

   Dismantling the clutch needs the special Tool, please contact your dealers.

   b. Check the clutch lining wearing condition
   and measure the lining thickness
   limit of use: change it below 2.5mm.
c. Check driven spring free
   length: standard: 154.6mm
   Limit of use: change it as it is below 149.3mm

d. Check wearing condition of driving plate set.
   Outer diameter measurement:
   Limit of use: change it as it is above 33.940mm

e. Check wearing condition of slide driven plate.
   Inner diameter measurement:
   Limit of use: change it as it is above 34.060mm

f. Check is there any wearing occur to the ditch area.

g. Check wearing condition of seal location, if necessary change a new one.
(5) Cylinder head, cylinder, piston:

A. Troubleshooting.

a. Compression pressure is too low, difficult to start engine, low RPM running unsmoothly.
   1. Cylinder washer cracked.
   2. Spark plug not being locking well.
   3. Piston ring worn out or cracked.
   4. Cylinder, piston worn out or injured.
   5. Reed valve is out of order.

b. Compression pressure is too high, engine overheating or knocking.
   Cylinder head or piston tip too much carbon accumulated.

c. Piston noise
   1. Cylinder, piston worn out.
   2. Piston pin hole, piston pin worn out.
   3. Connecting rod small end or bearing worn out.

d. Piston, cylinder noise
   1. Piston ring worn out or cracked.
   2. Cylinder worn out or injured.

B. The operation notice:

1. Clean before operation to avoid other object drop in engine.
2. The connecting washer must be washed cleanly.
3. Dismantle cylinder and cylinder head, don't injure the contact surface.
4. Cylinder inner surface and piston outer face can't be injured.
5. The dismantling part should be washed cleanly when checking, the contact surface should lubricate by specified oil.

C-1. The operation data information for 110cc:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard Value(mm)</th>
<th>Limit of use(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>110cc</td>
<td>110cc</td>
</tr>
<tr>
<td>Cylinder head flatness</td>
<td></td>
<td>0.100</td>
</tr>
<tr>
<td>Piston outer diameter (measured at the skirt area where is 12mm from the skirt lower end)</td>
<td>51.960-51.980</td>
<td>51.905</td>
</tr>
<tr>
<td>Clearance between cylinder and piston</td>
<td>0.035-0.045</td>
<td>0.100</td>
</tr>
<tr>
<td>Piston pin hole inner dia</td>
<td>14.004-14.010</td>
<td>14.032</td>
</tr>
<tr>
<td>Piston pin outer diameter</td>
<td>13.998-14.000</td>
<td>13.074</td>
</tr>
<tr>
<td>Clearance between piston pin and pin hole</td>
<td>0.006-0.012</td>
<td>0.030</td>
</tr>
<tr>
<td>Piston ring gap (1st ring/2nd ring)</td>
<td>0.15-0.35</td>
<td>0.450</td>
</tr>
<tr>
<td>Connecting rod small end inner Dia</td>
<td>18.002-18.010</td>
<td>18.02</td>
</tr>
<tr>
<td>Cylinder bore</td>
<td>52.000-52.020</td>
<td>52.05</td>
</tr>
</tbody>
</table>
C-2. PISTON & CYLINDER DATAS for 50cc:

<table>
<thead>
<tr>
<th>Part name/description</th>
<th>Standard Value (mm)</th>
<th>Limit of use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder head</td>
<td>Flatness</td>
<td>0.100</td>
</tr>
<tr>
<td>cylinder</td>
<td>Bore</td>
<td>39.995~40.015</td>
</tr>
<tr>
<td>Piston/ Piston ring</td>
<td>Clearance b/w Piston ring piston and</td>
<td>0.05~0.06</td>
</tr>
<tr>
<td></td>
<td>Lst ring</td>
<td>0.05~0.06</td>
</tr>
<tr>
<td></td>
<td>2nd ring</td>
<td>0.05~0.06</td>
</tr>
<tr>
<td>Piston outer diameter</td>
<td></td>
<td>39.950~39.970</td>
</tr>
<tr>
<td>Measuring location of piston outer dia. (12mm from the lower end of skirt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearance b/w piston and cylinder</td>
<td>0.045~0.065</td>
<td>0.10</td>
</tr>
<tr>
<td>Piston pin hole inner dia</td>
<td>13.022~13.013</td>
<td>13.045</td>
</tr>
<tr>
<td>Piston pin hole inner diameter</td>
<td>10.002~10.008</td>
<td>10.025</td>
</tr>
<tr>
<td>Piston pin outer diameter</td>
<td>9.994~10.000</td>
<td>9.970</td>
</tr>
<tr>
<td>Clearance between piston and piston pin</td>
<td>0.004~0.018</td>
<td>0.030</td>
</tr>
<tr>
<td>Connecting rod small end inner dia</td>
<td>13.996~14.007</td>
<td>14.025</td>
</tr>
</tbody>
</table>

D. dismantle cylinder head, cylinder, piston
1. Remove the engine.
2. Screwing out the two M6-bolt of cooling cowl.
3. Screwing out the two M6-blot of fan cover.
4. Remove the cooling cowl and fan cover.

5. Remove the spark plug.
6. Screwing out the two M6-nut of muffler and cylinder, and the two M8-bolt of crankcase.

7. Remove muffler.

8. Remove the four M7-nut of cylinder head, then remove cylinder head and cylinder head gasket.
9. Remove the C-type clip on the piston and piston pin by the nipper. Take off piston.

10. Dismantling of the piston ring Remove the 1st ring, then 2nd ring.
11. When assembling, please reverse the procedures of dismantling.

<table>
<thead>
<tr>
<th>Locking torque:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M7: 1.0-1.4kg-m</td>
</tr>
<tr>
<td>M6: 1.0-1.2kg-m</td>
</tr>
</tbody>
</table>

Opening end of piston ring
E. Check for the flatness of cylinder head.
Check the flatness of contact surface of cylinder head.

Limit of use: If it exceeds 0.1mm
Change a new one.

- cylinder
- piston
- piston pin snap
- piston pin
- needle bearing

F. Combustion chamber cleaning

- Clean out the carbon piled up in combustion chamber.

- Do not scratch the combustion chamber and contact surface of cylinder during cleaning operation
G. Check cylinder and piston:

1. Check the wearing and damage condition on the contact surface of cylinder and piston.
2. Clean out the carbon on the cylinder exhausting port.

Be careful not to scratch the inner Surface of cylinder.

3. Cylinder bore measurement:
   (1) Measure each point: upper, middle, lower orderly, and in X.Y. axis to find the smallest value.
   (2) Limit of use: it when over 52.050mm(110cc)
4. Piston outer diameter measurement:
   (1) Measure at the skirt area where is 12 mm from the skirt lower end.
   (2) Limit of use: change if when below 51.905 mm (110 cc)
   (3) Calculate the clearance between cylinder and piston.

   Limit of use: change it when over 0.100 mm

5. Inner diameter measurement of the piston pin hole
   Limit of use: change it when over 14.032 mm (110 cc)
6. Outer diameter measurement of the piston pin
   limit of use: change it when under 13.074mm (110cc)

7. Check piston ring:
   Measure piston ring gap inside cylinder:
   Limit of use: change new ones when the first ring and second ring are over 0.4mm

   Push the piston ring into the cylinder
   By piston, then measure the gap
8. Check connecting rod small end
   (1) Install piston pin, bearing onto the connecting rod small end, then check the looseness of the piston pin.
   (2) Measure the inner diameter of the connecting rod small end.

   Limit of use: replace a new one when over 18.020mm. (110cc)

H. Installing cylinder and piston
1. Place the piston ring into the second ring ditch first, then install the piston ring into the first ditch.
2.
   a. Piston ring should be installed into piston ring ditch by even force
   b. After assembling, be sure that the piston ring sliding surface is at the same height as the piston outer surface.
   c. If the piston ring cannot fit into the ditch, please clean up the carbon in the piston ring ditch or piston ring itself.
3.
   a. Piston ring must be installed in the correct location.
   b. After installing the piston ring, it should be able to rotate freely.
   c. If it is necessary to change the new piston ring, it must change the whole set.
4.
   a. The location of the piston ring gap and the lock pin must be in opposite side.
   b. The mark”→” on the piston tip must be pointing to the exhausing port.
   c. Lubricate the piston pin before installation.
5. Please follow the opposite procedure of dismantling to install cylinder and cylinder head.
(6) A.C. Generator, Flyweel Magneto
A. Dismantling AC alternator flywheel magneto.
   1. Remove fan cowl.
   2. Screwing out the four M6-bolt of fan.
   3. Screwing out the nut on flywheel.
   4. Remove the AC flywheel magneto by special tool.
5. Remove the flywheel.

6. Remove the electric plug of AC Flywheel magneto.
   Take out the magneto.

**B. Install AC generator**

To install, please reverse the dismantling procedures.

<table>
<thead>
<tr>
<th>Locking torque:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6: 1.0~1.2kg-m</td>
</tr>
<tr>
<td>M10: 3.2~4.0kg-m</td>
</tr>
</tbody>
</table>
(7) Final Transmission Mechanism

A. Trouble shooting

- Engine can be started, but vehicle doesn’t move.
  1. Gear worn-out or cracked.
  2. Gear burnt out.
- Noise occurs when running.
  1. Gear worn out, burnt or gear surface damaged.
  2. Bearing worn out or loosen.
- Oil leakage
  1. Too much oil.
  2. Seal worn out or damaged.

B. Disassemble the final transmission mechanism.

  1. Remove the rear wheel.
  2. Drain off the oil in the gear box.
3. Remove the bolt in gear box cover, take off the gear box.
4. Remove final reduction gear and idle gear shaft.

5. Clean up the gear box
C. Check the final transmission mechanism
   1. Check the wearing condition of the driving shaft and gears.

   2. Check the wearing condition of the idle gear shaft and idle gears.

   3. Check the wearing condition of the final reduction gear.

   4. Check the wearing condition of the oil seal and bearing.

D. Assemble the final transmission mechanism: please follow the opposite procedures of disassembling. After locking the drain bolt, refill 110c.c of gear oil, SAE 140.

<table>
<thead>
<tr>
<th>Locking torque: M6:</th>
<th>1.0~1.2 kg-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>M10:</td>
<td>3.5~4.0 kg-m</td>
</tr>
<tr>
<td>Drain bolt:</td>
<td>M8: 1.8 kg-m</td>
</tr>
</tbody>
</table>
(8) Crankcase, Crankshaft:
A. Disassembling diagram
B. Troubleshooting.

   Engine noise:
   1. The bearing of final transmission mechanism is loose.
   2. Crank pin bearing is loose.
   3. The bearing of gear box is loose.

C. Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
<th>Limit of use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearance of connecting rod big end (Parallel direction to rod)</td>
<td>0.20-0.50</td>
<td>0.76</td>
</tr>
<tr>
<td>Clearance of connecting rod big end (Perpendicular direction to rod)</td>
<td>-</td>
<td>0.04</td>
</tr>
<tr>
<td>Swingness of the crank shaft journal</td>
<td>0.03</td>
<td>0.10</td>
</tr>
</tbody>
</table>
D. Dismantle the crankcase and crankshaft.
   1. Remove the engine from the chassis.

2. Remove left E/G case, driving pulley (driving plate) clutch and belt.
3. Remove air cleaner.
4. Remove carburetor.

5. Remove intake manifold and reed valve.

6. Remove oil pump, fan cowl and fan cover.
7. Remove cylinder, AC flywheel magneto.

8. Remove the left and right crankcase with special puller.

9. Remove center stand, separate RH/LH crankcase, take out crankshaft.
E. Check crankshaft:
1. Measure the clearance between crank shaft and co-rod big end. (Parallel direction to rod)

Limit of use: change it when above 0.76mm

2. Check the looseness on X.Y. axis of the connecting rod big end (Perpendicular directions to rod)

Limit of use: change it when above 0.04mm
3. Measure the swingness of crankshaft neck.

<table>
<thead>
<tr>
<th>Limit of use</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>B</strong></td>
<td></td>
</tr>
<tr>
<td>Change it when</td>
<td>Change it when</td>
<td></td>
</tr>
<tr>
<td>Above 0.1mm</td>
<td>Above 0.1mm</td>
<td></td>
</tr>
</tbody>
</table>

4. Check the slackness of crankshaft bearing, if it is slack, change a new one.

F. Assemble the crankcase.

1. To assemble the crankcase, please reverse the procedures of disassembling.
2. The locking torque value for bolts and nuts are all described in the previous chapters Please refer.
(9) Carburetor, Reed Valve and Auto cock

A. Fuel system diagram

Fuel tank    fuel gauge    autocock

Fuel supplied to Carburetor
B: Carburetor dismantling diagram
C. Troubleshooting:

a. Engine can not be started.
   1. No fuel in the fuel tank.
   2. Fuel pipe is blocked.
   3. There is too much fuel in the cylinder.
   4. Air cleaner is blocked.

b. Engine idling (RPM) unsteady, running not smoothly
   1. Improper adjustment of the carburetor idling.
   2. Ignition disorder.
   3. Compression pressure is too low.
   4. Air mixture is too thick.
   5. Air mixture is too lean.
   6. Air cleaner is blocked.
   7. Air injection is not in good function.
   8. Fuel is dirty.

c. Air mixture is too lean.
   1. Carburetor main jet is blocked
   2. The ventilation hole of the fuel tank cover is blocked.
   3. Fuel filter is blocked.
   4. Fuel pipe bended, squeezed or blocked.
   5. Float valve is abnormal.
   6. Fuel level is too low.
   7. Air pipe is blocked.

d. Air mixture is too thick
   1. Float valve is abnormal.
   2. Fuel level is too high.
   3. Air jet is blocked.
D. Dismantling carburetor
1. Remove the luggage box.
2. Loose the hose clamp between the carburetor and the air cleaner. Then remove the air cleaner.
3. Unscrew the fuel draining screw of the carburetor. Drain off the fuel inside the carburetor.
4. Remove the fuel pipe and the vacuum pipe on the carburetor.
5. Remove the oil pile on the carburetor.
6. Remove the bolts on the intake manifold and carburetor.

E. Dismantling float, nozzle

Note:
The auto choke has been properly adjusted already. Please do not adjust it further. When there is blockage in the carburetor, please clean it by air compressor.
F. Reed valve

1. Dismantling reed valve.
   (1) Take off the luggage box
   (2) Remove the air cleaner
   (3) Remove the carburetor.
   (4) Unscrew the locking screw of the manifold intake.
   (5) Remove the manifold intake.
   (6) Remove the reed valve.

2. Checking for the reed valve.
   - Change a new one when the reed valve is worn out or distorted.
   - Change a new one too when the base of the reed valve is cracked, injured or distorted.
G. Check the auto cock

1. When the engine stops, remove the fuel pipe from carburetor and check if there is fuel flow out or not.
   It means auto cock functions well if the residue fuel (for the amount of 5-10cc) flows out from the auto cock and fuel pipe. However, if it continues to flow out, it means that the vacuum pipe is blocked. Please clean it.

2. Remove the vacuum pipe from the carburetor and suck it to produce a vacuum to have the fuel flow out from the fuel pipe. The fuel will stop flowing out if the vacuum disappears. If the fuel does not flow out by the above operation, please check the followings:
   (a) Clean out blockage in the vacuum pipe.
   (b) Blow air into the inlet pipe of the auto cock.

3. Note:
   Please remember to use a bowl to catch the flow-out at the end of the fuel pipe. Keep away from fire or even spark during operation.
(10) Steering column, front wheel, frt disc brake comp, front fork:

A. Troubleshooting

1. Steering handlebar is abnormal, too tight.
   a. Steering mechanism; washer of conical bush locked too tightly.
   b. Steering mechanism; steel ball is cracked.
   c. Steering mechanism; steel ball base and washer of conical base is injured.

2. Steering handlebar is aslant.
   a. Left and right damper are not even.
   b. Front fork is crooked.
   c. The axle of front fork is crooked or the wheel is aslant.

3. Front wheel swings.
   a. Wheel rim is distorted.
   b. Bearing of front axle is loose.
   c. Wheel spoke is distorted.
   d. Tire worn out.
   e. The wheel axle is improperly assembled.

4. Front damper is too soft, or spring fatigue.

5. Noise in front damper.
   a. Noise comes from the shock absorber tube.
   b. Locking screw of damper is loose.

B. Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
<th>Limit of use (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lining of frt brake pad</td>
<td>4.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Disk of frt brake</td>
<td>3.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Swingness of frt/rr wheel</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>The lining of frt/rr Brake</td>
<td>4.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>
C. Change speedometer cable:
1. Remove the front handle cover.

2. Remove the nut of the speedometer cable.

3. Remove the fixed screw of the speedometer cable on the front wheel.
4. Pull out the damaged speedometer cable.
5. To assemble the new cable, please follow the opposite of dismantling procedures.

Note: Put some grease onto the inner cable before assembling.
D. Steering handlebar.
   1. Remove the LH/RH back mirrors.
   2. Remove the front handle cover.
   3. Remove the rear handle cover, the speedometer and plugs of switch.

   4. Remove the terminal of rear brake and the switch plug of the rear brake lamp.
   5. Loose the throttle cable pulley’s cover.
   6. Remove the throttle cable and RH grip assembly.
   7. Remove the locking blot of the front brake’s master cylinder on the steering, handlebar,
      Then remove front brake’s master cylinder.
8. Remove the bolts and nuts fixed the handlebar on the front damper.
9. Remove the steering handlebar.
10. To assemble the handlebar, please follow the opposite dismantling procedures.
    - Locking torque:
      M6: 1.0 - 2kg-m
      M10: 3.0 - 4.0kg-m
11. Before assembling, please put the grease onto the cables.
F. Front wheel:
1. Remove the locking nut of front wheel on the right side.

2. Pull out the axle of front wheel. Remove the spacer ring and take off the gear sets of the speedometer.
3. Remove the front wheel assembly.
4. To assemble, please reverse the procedures of dismantling.
   Locking torque: M10: 3.0~4.0 kg-m

Note:
1. Put the movement-stop block of the speedometer gear assy above extruded block of the front fork.
2. Please put the grease onto the gear sets of the speedometer before assembling.
5. Checking front axle
   a. Check the bending degree of the front axle.
   b. Limit of use: change it when above 0.22mm

6. Check the front wheel bearing. Rotate the wheel. If any noise or slackness is found,
   Please change a new one.

7. Front wheel rim checking.
   (a) check the swingness of the front wheel rim.
   (b) Limit of use:
      • Horizontal direction: change a new one when above 2.0mm.
      • Vertical direction: change a new one when above 2.0mm.
F. Front Brake

1. Disassembling and assembling the front brake comp.
   a. Remove the two bolts fixed on the frt brake comp from the front fork.
   b. To assemble the frt. brake comp, please reverse the dismatling procedures.

   ![Locking torque: M8:2.0~3.0kg-m](image1)

2. The releasing of air from the frt brake comp.
   The procedures:
   a. Fill in the appropriate brake fluid to the storage tank.
   b. When assembling the master cylinder cover, do not let the brake fluid overflow from the master cylinder of storage tank.
   c. Put the spanner upon the drain screw of the caliper.
   d. Lock and unlock the screw repeatedly to drain off the bubble.
   e. Operate slowly the brake lever several times.
   g. Loose the drain screw, then release the lever fully opened.
   h. Lock the drain screw when the lever is fully opened.
   i. Repeat the above procedures until all air within the brake system is released completely.

   ![Locking torque of leaking screw:0.6kg-m](image2)
4. Disassembling and assembling the front brake disk.
   a. Remove the front wheel.
   b. Remove the three nuts on the disk.
   c. Remove the disk.
   d. To assemble the disk, please reverse the disassembling procedure.
      Locking torque M8: 2.0~3.0kg-m

5. Checking for the front brake-disk. Standard thickness: 3.6mm

   Limit of use:
   Replace a new one when below 3.1mm

6. Check the front brake lining.
   a. Standard thickness: 4.0mm.
      Limit of use: Replace a new one when the thickness is below 2.0mm.

   Note: No grease allowed on the lining.
G. Front fork
1. Front fork system diagram.

2. Checking front fork:
   Please change a new one if it is distorted.

3. Checking front damper:
   Check the guiding rod of damper if it is bended. Also check if there is abnormal worn out or damage.

   Change a new guiding rod if it is bended
(11) Rear wheel, rear brake, rear damper:

A. Troubleshooting.

1. Rear wheel swings.
   a. Wheel rim is distorted.
   b. Tire worn out.
   c. The wheel axle is improperly assembled.

2. Rear damper is too soft.
   a. Spring fatigue.

3. Bad braking
   a. The adjustment of brake is not proper.
   b. The brake lining is dirty.
   c. The brake lining worn out.
   d. The cam of brake lining is worn out.
   e. The brake cam lever worn out.
   f. The wheel hub worn out or damage.
   g. The operation on the brake arm tooth is not good.

B. Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value(mm)</th>
<th>Limit of use(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The swingness of rear wheel</td>
<td>-</td>
<td>2.0</td>
</tr>
<tr>
<td>Wheel hub inner diameter</td>
<td>110</td>
<td>111.0</td>
</tr>
<tr>
<td>Thickness of brake lining</td>
<td>4.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>
C. Disassembling and assembling the rear wheel.
   1. Remove the rear mudguard.
   2. Remove the muffler.
   3. Remove the nut on the rear wheel.
   4. Remove the rear wheel.
   5. Assemble the rear wheel please reverse the dismantling procedure.

D. Checking the rear wheel
   - check the swingness of rear wheel.
   - vertical direction:
     change it when above 2.0mm
   - horizontal direction:
     change it when above 2.0mm

<table>
<thead>
<tr>
<th>Locking torque: M6</th>
<th>0.7-1.1 kg-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>M14</td>
<td>8.0-10.0 kg-m</td>
</tr>
</tbody>
</table>
E. Rear brake:

1. Rear brake disassembling diagram.
   (1) Checking rear brake hub:
      a. Measure the inner diameter of rear brake hub.
      b. Limit of use: change it when above 111.0mm

   (2) Checking brake lining:
      a. Measure the thickness of rear brake lining.
      b. Limit of use: As the thickness is less than 2mm, change it.
F. Rear damper

1. Rear damper disassembling diagram:
(12) Fuel tank, oil tank:
A. Troubleshooting.
   1. Engine can't start:
      a. No fuel in fuel tank.
      b. Fuel pipe is blocked.
      c. Auto cock and fuel filter is blocked.
      d. The membrane of fuel cock over-extended.
   2. The mixture is too lean.
      a. Ventilation hole is blocked.
      b. Fuel pipe is crooked, squeezed, or blocked.
      c. Auto cock and fuel filter is dirty.
B. Fuel tank disassembling diagram.
C. Fuel tank dismantling and assembling
   1. Remove the rear carrier (rear protector)

   2. Remove luggage box.

   3. Remove front body cover.
4. Remove the side cover.

5. Remove the rear cover.
6. Remove the fuel tank cover.

7. Remove the vacuum pipe and fuel pipe from the fuel tank and carburetor to drain off the fuel.
8. Remove the fixing bolts from fuel tank.
9. Remove the fuel tank.
D. Oil tank disassembling diagram:

Dismantling and assembling oil tank:
1. Drain the oil off.
2. Disconnect plug of oil gauge.
3. Remove oil tank.
4. Clean the oil tank.
5. To assemble the oil tank, please reverse the procedures of dismantling.
5. Electric equipment:

(1) Troubleshooting
(2) Battery
   1. recharge
   2. check specific gravity of electrolyte

(3) Recharge system
   1. the wiring diagram of recharge system
   2. check A.C. flywheel magneto.
   3. Check regulator/rectifier.

(4) Ignition system
   1. the wiring of ignition
   2. check spark plug
   3. check H.T. cable and H.V. coil
   4. check C.D.I. set

(5) Starting system
   1. the wiring of starting
   2. checking the starter
   3. dismantling the starting motor
   4. checking the starting motor
(1) Troubleshooting:

A. Recharge system:
• No power:
  1. Battery over discharging
     ① No electrolyte in battery.
     ② Battery is bleached
     ③ Short circuit in Battery.
     ④ Regulator malfunction
  2. The battery wires are disconnected.
  3. Fuse is broken.
  4. Ignition switch is abnormal.
• Voltage is too low:
  1. Battery recharges insufficiently.
  2. The bad connection on wiring system.
  3. Recharge system is abnormal.
  4. Regulator malfunction.

B. Ignition system:
• The sparking of spark plug is abnormal:
  1. Spark plug is dead.
  2. Wire connections is broken or short Circuit.
     ① between A.C. generator and CDI sets
     ② between CDI sets and High Voltage coil.
     ③ between CDI sets and main switch.
     ④ between main switch and spark plug.
  3. Main switch is out of order.
  4. H.V. coil is not in good function.
  5. CDI sets is out of order.
  6. A.C. generator is not in good function.

C. Starting system:
• Starting motor can’t rotated:
  1. The fuse is broken.
  2. Battery recharges insufficiently.
  3. Main switch is out of order.
  4. Starting motor switch is out of order.
  5. Front/rear brake switch is out of order.
  6. Starter relay is out of order.
  7. Wire disconnects or broken.
  8. Starting motor is out of order.

• Currency is broken:
  1. The wiring of batter connection is not good.
  2. Ignition system connection is not good.
  3. Ignition system is short circuit.
  4. Lamp system connection is not good or short circuit.
• Abnormal recharge system:
  1. The plug connection is not good.
     The wire broken or short circuit.
  2. Rectifier is out of order.
  3. A.C. flywheel magneto is abnormal.

D. Engine running unsmoothly:
• Starting motor runs weakly.
  1. Battery recharges insufficiently.
  2. Wiring system disconnects.
  3. The alien objects drop in the motor or gear.
• Starting motor can rotate, but engine can’t start up.
  1. Starting gear is abnormal.
  2. Starting motor is reversedly rotating.
  3. Battery is out of order.
(2) Battery:
Always remove the battery negative Cable(-) first, then remove positive Cable(+). But connect the positive Cable(+) first, then connect the Negative cable(-) when assembling.

1. Recharge
   • Connection procedure:
   connect the positive cable(+) of the recharger to the positive cable(+) of the battery, and the negative cable(-) of the recharge to the negative cable(-) of the battery.
   • Recharging currency:
   Please recharge (12V) according to the following currency and time.
   Standard: 0.5A X 10 Hr or Rapid: 5A X 30 min

   NOTICE:
   This battery is totally sealed. Do not remove seal bolt when recharging.

   Notice:
   • Keep away from fire when recharging.
   • The “ON” or “OFF” of recharging currency must be operated by the switch of recharge. It will cause spark or explosive if plug or unplug the cable directly.
2. Testing the recharging performance

- This test needs to be done when the battery is fully recharged.
- This test needs to be done after engine is warm-up.

a. Disconnect the orange cable of regulator.
b. Open the fuse box, to remove the white cable.
c. Connect currency meter between red/white cable and fuse.

| While testing, the red wire cable must not touch the frame. |

- Set the head lamp switch at “OFF”, engine revolution is at 2000 rpm while testing. Then increase the rpm slowly.

<table>
<thead>
<tr>
<th>Head Lamp Switch</th>
<th>Recharging rpm</th>
<th>2,500rpm</th>
<th>6,000rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF(DAY)</td>
<td>Under 2,000 rpm</td>
<td>Over 0.6A</td>
<td>1.5A(MIN)</td>
</tr>
<tr>
<td>ON(NIGHT)</td>
<td>Under 2,000 rpm</td>
<td>Over 0.6A</td>
<td>1.5A(MIN)</td>
</tr>
</tbody>
</table>

e. If the testing result does not match the standard value, check the regulator.
(3) Recharge system:
   1. Recharge system diagram
2. Check A.C. Generator
   a. Open the seat and remove the luggage box.
   b. Measure the resistance value of terminals.

   | Yellow/black | 0.1-1.0 |
   | White/black  | 0.2-2.0 |

3. Check regulator
   Measure the resistance value between each terminal,
   It should be in the specified range, otherwise change a new one.
(4) Ignition system:

1. the wiring or ignition

2. check spark plug.
3. Check H.V. cable and H.V. coil.
   - Check with CDI tester, follow the instruction manual.
4. check CDI sets.
   - Check with CDI tester and follow the instruction manual.
   - If CDI test failed, please change a new one.
The starting system:

1. The wiring of starting

- Starting button
- Safety switch
- Main switch
2. check the starter
   • Connect green/white cable to positive pole of battery, connect black cable of negative pole of battery. It means starter is function well if above connection and both Red/Black cable of staring motor have currency passing through.

3. Dismantling the starting motor
   (a) Remove 2 screws on starting motor.
   (b) Remove starting motor cables.

4. Checking the starting motor
   • Check the function by connecting the starting motor to battery.
   (Check if it is rotating counterclockwise)

   Do not operate starting motor for a long time.