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</tr>
</tbody>
</table>
# 1. SPECIFICATIONS

## SPECIFICATIONS

<table>
<thead>
<tr>
<th>Name &amp; Model</th>
<th>BA10AB.AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length (mm)</td>
<td>1850</td>
</tr>
<tr>
<td>Overall width (mm)</td>
<td>685</td>
</tr>
<tr>
<td>Overall height (mm)</td>
<td>1075</td>
</tr>
<tr>
<td>Wheel base (mm)</td>
<td>1270</td>
</tr>
<tr>
<td>Engine type</td>
<td>Air cooled 2-stroke</td>
</tr>
<tr>
<td>Displacement (cc)</td>
<td>49.5 cc</td>
</tr>
<tr>
<td>Net weight (kg)</td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>37</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>58.5</td>
</tr>
<tr>
<td>Total</td>
<td>95.5</td>
</tr>
<tr>
<td>Seating capacity</td>
<td>2 riders (110kg)</td>
</tr>
<tr>
<td>Gross weight (kg)</td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>79</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>126.5</td>
</tr>
<tr>
<td>Total</td>
<td>205.5</td>
</tr>
<tr>
<td>Tires</td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>70/90-16 42J</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>90/90-16 54J</td>
</tr>
<tr>
<td>Ground clearance (mm)</td>
<td>175</td>
</tr>
<tr>
<td>Braking distance (m) (Initial speed Km/h)</td>
<td>4.4m (30km/h)</td>
</tr>
<tr>
<td>Min. turning radius (mm)</td>
<td>1900</td>
</tr>
<tr>
<td>Starting system</td>
<td>Starting motor &amp; kick starter</td>
</tr>
<tr>
<td>Fuel type</td>
<td>Gasoline, 2-stroke motor oil</td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>Single cylinder, flat</td>
</tr>
<tr>
<td>Combustion chamber type</td>
<td>Semi-sphere</td>
</tr>
<tr>
<td>Valve arrangement</td>
<td>Reed valve &amp; piston</td>
</tr>
<tr>
<td>Bore x stroke (mm)</td>
<td>39 x 41.4</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>10.3:1 ±0.2</td>
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<tr>
<td>Compression pressure (kg/cm² ≤ rpm)</td>
<td>11.8 kg/cm² ±2</td>
</tr>
<tr>
<td>Max. output (kw/r/min)</td>
<td>1.765/5400 kw/r/min</td>
</tr>
<tr>
<td>Max. torque (kg m/rpm)</td>
<td>0.33/4600 kg m/rpm</td>
</tr>
<tr>
<td>Port timing</td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>Open Automatic controlled</td>
</tr>
<tr>
<td></td>
<td>Close Automatic controlled</td>
</tr>
<tr>
<td>Exhaust</td>
<td>Open —</td>
</tr>
<tr>
<td></td>
<td>Close —</td>
</tr>
<tr>
<td>Scavenge</td>
<td>Open —</td>
</tr>
<tr>
<td></td>
<td>Close —</td>
</tr>
<tr>
<td>Idle speed (rpm)</td>
<td>2000±100</td>
</tr>
<tr>
<td>Lubrication type</td>
<td>Separate type</td>
</tr>
<tr>
<td>Oil pump type</td>
<td>Plunger type</td>
</tr>
<tr>
<td>Oil filter type</td>
<td>Full-flow filtration</td>
</tr>
</tbody>
</table>

### Lubrication oil capacity
- (liter): 1.1

### Air cleaner type & No.
- Wet, single

### Fuel capacity (liter)
- 5.8

### Carburetor
- Type: Plunger type
- Piston dia. (mm): —
- Venturi dia. (mm): 16

### Ignition system type
- CDI electromagnetic Ignition

### Ignition timing F mark
- 8 ~14 ±1.5 BTDC/2000 rpm

### Spark plug
- NGK BR8HSA
- ND

### Spark plug gap (mm)
- 0.6 ~ 0.7

### Battery capacity
- 12V4AH

### Power to transmission gear
- Power–transmission gear–clutch

### Reduction ratio of power to transmission
- —

### Clutch type
- Dry multi-disc clutch

### Transmission gear operation type
- Automatic centrifugal type

### Transmission ratio
- 1 speed: —

### Reduction gear
- Type: Two-stage reduction
- 1st reduction ratio: 3.113~0.895
- 2nd reduction ratio: 14.69

### Transmission gear type
- Non-stage transmission

### Tire pressure (kg/cm²)
- Front: 1.75 kg/cm²
- Rear wheel: 2.0 kg/cm²

### Turning angle
- Right & left 45

### Brake system type
- Front: Expanding/hydraulic
- Rear wheel: Expanding

### Suspension type
- Front: Telescope
- Rear wheel: Unit swing

### Shock absorber type
- Front: Telescope
- Rear wheel: Unit swing

### Frame type
- Pipe under bone
2. GENERAL INFORMATION

ENGINE SERIAL NUMBER/IDENTIFICATION ...................... 2-1
SERVICE PRECAUTIONS.................................................. 2-2
SERVICE INFORMATION.................................................. 2-10
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2. GENERAL INFORMATION

ENGINE SERIAL NUMBER/IDENTIFICATION

Location of Engine Serial Number
2. GENERAL INFORMATION

SERVICE PRECAUTIONS

- Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling.

- When tightening bolts or nuts, begin with larger-diameter to smaller ones at several times, and tighten to the specified torque diagonally.

- Use genuine parts and lubricants.

- When servicing the motorcycle, be sure to use special tools for removal and installation.

- After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.
2. GENERAL INFORMATION

- Apply or add designated greases and lubricants to the specified lubrication points.

- After reassembly, check all parts for proper tightening and operation.

- When two persons work together, pay attention to the mutual working safety.

- Disconnect the battery negative (-) terminal before operation.
- When using a spanner or other tools, make sure not to damage the motorcycle surface.

- After operation, check all connecting points, fasteners, and lines for proper connection and installation.
- When connecting the battery, the positive (+) terminal must be connected first.
- After connection, apply grease to the battery terminals.
- Terminal caps shall be installed securely.
2. GENERAL INFORMATION

- If the fuse is burned out, find the cause and repair it. Replace it with a new one according to the specified capacity.

- After operation, terminal caps shall be installed securely.

- When taking out the connector, the lock on the connector shall be released before operation.

- Hold the connector body when connecting or disconnecting it.
- Do not pull the connector wire.

- Check if any connector terminal is bending, protruding or loose.
2. GENERAL INFORMATION

- The connector shall be inserted completely.
- If the double connector has a lock, lock it at the correct position.
- Check if there is any loose wire.

- Before connecting a terminal, check for damaged terminal cover or loose negative terminal.

- Check the double connector cover for proper coverage and installation.

- Insert the terminal completely.
- Check the terminal cover for proper coverage.
- Do not make the terminal cover opening face up.

- Secure wire harnesses to the frame with their respective wire bands at the designated locations.
  Tighten the bands so that only the insulated surfaces contact the wire harnesses.
2. GENERAL INFORMATION

- After clamping, check each wire to make sure it is secure.

- Do not squeeze wires against the weld or its clamp.

- After clamping, check each harness to make sure that it is not interfering with any moving or sliding parts.

- When fixing the wire harnesses, do not make it contact the parts which will generate high heat.

- Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws.
- Route wire harnesses passing through the side of bolts and screws. Avoid the projected ends of bolts and screws.
2. GENERAL INFORMATION

- Route harnesses so they are neither pulled tight nor have excessive slack.

- Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.

- When rubber protecting cover is used to protect the wire harnesses, it shall be installed securely.

- Do not break the sheath of wire. If a wire or harness is with a broken sheath, repair by wrapping it with protective tape or replace it.

- When installing other parts, do not press or squeeze the wires.
2. GENERAL INFORMATION

- After routing, check that the wire harnesses are not twisted or kinked.

- Wire harnesses routed along with handlebar should not be pulled tight, have excessive slack or interfere with adjacent or surrounding parts in all steering positions.

- When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.

- Be careful not to drop any parts.

- When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.

Do you understand the instrument? Is the instrument set correctly?

Remove Rust.
2. GENERAL INFORMATION

Symbols:
The following symbols represent the servicing methods and cautions included in this service manual.

- : Apply engine oil to the specified points. (Use designated engine oil for lubrication.)

- : Apply grease for lubrication.

- : Use special tool.

- * : Caution

- : Warning
## 2. GENERAL INFORMATION

### SERVICE INFORMATION

<table>
<thead>
<tr>
<th>ENGINE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Standard (mm)</td>
<td>Service Limit (mm)</td>
<td></td>
</tr>
<tr>
<td>Cylinder head warpage</td>
<td>—</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Piston O.D.(5mm from bottom of piston)</td>
<td>38.970</td>
<td>38.955</td>
<td>38.90</td>
</tr>
<tr>
<td>Cylinder-to-piston clearance</td>
<td></td>
<td>0.10</td>
<td></td>
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<tr>
<td>Piston pin hole I.D.</td>
<td>12.002</td>
<td>12.008</td>
<td>12.03</td>
</tr>
<tr>
<td>Piston pin O.D.</td>
<td>11.994</td>
<td>12.0</td>
<td>11.98</td>
</tr>
<tr>
<td>Piston-to-piston pin clearance</td>
<td>←</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Piston ring end gap (top/second)</td>
<td>0.10</td>
<td>0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>Connecting rod small end I.D.</td>
<td>17.005</td>
<td>17.017</td>
<td>17.03</td>
</tr>
<tr>
<td>Cylinder bore</td>
<td>39.0</td>
<td>39.025</td>
<td>39.05</td>
</tr>
<tr>
<td>Drive belt width</td>
<td>18</td>
<td></td>
<td>17</td>
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<tr>
<td>Drive pulley collar O.D.</td>
<td>20.01</td>
<td>20.025</td>
<td>←</td>
</tr>
<tr>
<td>Movable drive face ID.</td>
<td>20.035</td>
<td>20.085</td>
<td>19.97</td>
</tr>
<tr>
<td>Weight roller O.D.</td>
<td>13.0</td>
<td></td>
<td>12.4</td>
</tr>
<tr>
<td>Clutch outer I.D.</td>
<td>107</td>
<td>107.2</td>
<td>107.5</td>
</tr>
<tr>
<td>Driven face spring free length</td>
<td>87.9</td>
<td></td>
<td>82.6</td>
</tr>
<tr>
<td>Driven face O.D.</td>
<td>←</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Movable driven face I.D.</td>
<td>←</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Connecting rod big end side clearance</td>
<td>←</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Connecting rod big end radial clearance</td>
<td>←</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Crankshaft runout A/B</td>
<td></td>
<td>←</td>
<td>←</td>
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### CARBURETOR

<table>
<thead>
<tr>
<th></th>
<th>BA10AB.AC</th>
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<tr>
<td>Venturi dia.</td>
<td>14mm</td>
<td></td>
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<td>Identification number</td>
<td>PB058[A]</td>
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<tr>
<td>Float level</td>
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<td>Main jet</td>
<td>#85</td>
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<tr>
<td>Slow jet</td>
<td>#35</td>
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<tr>
<td>Air screw opening</td>
<td>1±</td>
<td></td>
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<tr>
<td>Idle speed</td>
<td>2000±100rpm</td>
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<tr>
<td>Throttle grip free play</td>
<td>2</td>
<td>6mm</td>
</tr>
<tr>
<td>Jet needle clip notch</td>
<td>1st notch</td>
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</table>
## 1. SPECIFICATIONS

### FRAME

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm) BA10AB.AC.</th>
<th>Service Limit (mm) BA10AB.AC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle shaft runout</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Front wheel rim runout</td>
<td>Radial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Axial</td>
<td></td>
</tr>
<tr>
<td>Front shock absorber spring free length</td>
<td>200.0</td>
<td>182.8</td>
</tr>
<tr>
<td>Rear wheel rim runout</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Brake drum I.D.</td>
<td>Front/rear</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>111</td>
</tr>
<tr>
<td>Brake lining thickness</td>
<td>Front/rear</td>
<td>4.0/4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.0/2.0</td>
</tr>
<tr>
<td>Brake disk runout</td>
<td>Front/rear</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.30</td>
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<tr>
<td>Rear shock absorber spring free length</td>
<td>235.7</td>
<td>218.7</td>
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### ELECTRICAL EQUIPMENT

<table>
<thead>
<tr>
<th>Battery</th>
<th>Capacity BA10AB.AC</th>
<th>Voltage 12V4AH</th>
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<tbody>
<tr>
<td></td>
<td>12V4AH</td>
<td>13.0 V</td>
</tr>
<tr>
<td></td>
<td>0.4A/5H</td>
<td>13.2V</td>
</tr>
<tr>
<td></td>
<td>4A/0.5H</td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>(NGK) BR8HSA</td>
<td></td>
</tr>
<tr>
<td>Spark plug gap</td>
<td>0.6_ 0.7mm</td>
<td></td>
</tr>
<tr>
<td>Ignition coil resistance</td>
<td>Primary coil 0.153_ 0.187Ω</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary coil (with plug cap) 6.99_ 10.21KΩ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary coil (without plug cap) 3.24_ 3.96KΩ</td>
<td></td>
</tr>
<tr>
<td>Pulser coil resistance (20°C)</td>
<td>80_ 160Ω</td>
<td></td>
</tr>
<tr>
<td>Ignition timing</td>
<td>8 ~14 ±1.5 BTDC/2000rpm</td>
<td></td>
</tr>
</tbody>
</table>
## TORQUE VALUES

### ENGINE

<table>
<thead>
<tr>
<th>Item</th>
<th>Thread dia. (mm)</th>
<th>Torque (kg-m)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder head bolt</td>
<td>BF7x115</td>
<td>1.5_ 1.7</td>
<td>(cold)</td>
</tr>
<tr>
<td>Clutch drive plate nut</td>
<td>10</td>
<td>3.5_ 4.0</td>
<td></td>
</tr>
<tr>
<td>Clutch outer nut</td>
<td>NH10</td>
<td>3.5_ 4.5</td>
<td></td>
</tr>
<tr>
<td>Drive face nut</td>
<td>NH12</td>
<td>5.0_ 6.0</td>
<td></td>
</tr>
<tr>
<td>Oil check bolt</td>
<td>10</td>
<td>1.0_ 1.5</td>
<td></td>
</tr>
<tr>
<td>Engine mounting bolt</td>
<td>BF10x95</td>
<td>4.5_ 5.5</td>
<td></td>
</tr>
<tr>
<td>Engine hanger bracket bolt</td>
<td>BF10x50</td>
<td>3.5_ 4.5</td>
<td></td>
</tr>
<tr>
<td>Exhaust muffler joint lock nut</td>
<td>NC6mm</td>
<td>1.0_ 1.4</td>
<td></td>
</tr>
<tr>
<td>Exhaust muffler lock bolt</td>
<td>BF8x35</td>
<td>3.0_ 3.6</td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td></td>
<td>1.1_ 1.7</td>
<td>(cold)</td>
</tr>
</tbody>
</table>

### FRAME

<table>
<thead>
<tr>
<th>Item</th>
<th>Thread dia. (mm)</th>
<th>Torque (kg-m)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handlebar lock nut</td>
<td>10</td>
<td>4.5_ 5.0</td>
<td>Flange bolt/U-nut</td>
</tr>
<tr>
<td>Steering stem lock nut</td>
<td>25.4</td>
<td>8.0_ 12.0</td>
<td></td>
</tr>
<tr>
<td>Steering top cone race</td>
<td>25.4</td>
<td>0.5_ 1.3</td>
<td></td>
</tr>
<tr>
<td>Front axle nut</td>
<td>12</td>
<td>5.0_ 7.0</td>
<td>Flange U-nut</td>
</tr>
<tr>
<td>Rear axle nut</td>
<td>16</td>
<td>11.0_ 13.0</td>
<td>Flange U-nut</td>
</tr>
<tr>
<td>Rear brake arm bolt</td>
<td></td>
<td></td>
<td>Flange nut</td>
</tr>
<tr>
<td>Front shock absorber:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper mount bolt</td>
<td>8</td>
<td>3.3</td>
<td>Flange bolt/U-nut</td>
</tr>
<tr>
<td>lower mount bolt</td>
<td></td>
<td>3.3</td>
<td>Cross head</td>
</tr>
<tr>
<td>hex bolt</td>
<td></td>
<td>1.5_ 3.0</td>
<td>Apply locking agent</td>
</tr>
<tr>
<td>Front damper nut</td>
<td>8</td>
<td>1.5_ 3.0</td>
<td></td>
</tr>
<tr>
<td>Front pivot arm bolt</td>
<td></td>
<td></td>
<td>Flange screw/U-nut</td>
</tr>
<tr>
<td>Rear shock absorber:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper mount bolt</td>
<td>10</td>
<td>3.5_ 4.5</td>
<td>Flange nut</td>
</tr>
<tr>
<td>lower mount bolt</td>
<td>8</td>
<td>2.4_ 3.0</td>
<td></td>
</tr>
<tr>
<td>lower joint nut</td>
<td>8</td>
<td>1.5_ 2.5</td>
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</tr>
</tbody>
</table>

Torque specifications listed above are for important fasteners. Others should be tightened to standard torque values below.

### STANDARD TORQUE VALUES

SH bolt: 8mm  Flange 6mm bolt

<table>
<thead>
<tr>
<th>Item</th>
<th>Torque (kg-m)</th>
<th>Item</th>
<th>Torque (kg-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5mm bolt, nut</td>
<td>0.45_ 0.6</td>
<td>5mm screw</td>
<td>0.35_ 0.5</td>
</tr>
<tr>
<td>6mm bolt, nut</td>
<td>0.8_ 1.2</td>
<td>6mm screw, SH bolt</td>
<td>0.7_ 1.1</td>
</tr>
<tr>
<td>8mm bolt, nut</td>
<td>1.8_ 2.5</td>
<td>6mm flange bolt, nut</td>
<td>1.0_ 1.4</td>
</tr>
<tr>
<td>10mm bolt, nut</td>
<td>3.0_ 4.0</td>
<td>8mm flange bolt, nut</td>
<td>2.4_ 3.0</td>
</tr>
<tr>
<td>12mm bolt, nut</td>
<td>5.0_ 6.0</td>
<td>10mm flange bolt, nut</td>
<td>3.5_ 4.5</td>
</tr>
</tbody>
</table>
## 1. SPECIFICATIONS

### SPECIAL TOOLS

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>Tool No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal bearing puller</td>
<td></td>
<td>Crankshaft bearing removal</td>
</tr>
<tr>
<td>Lock nut wrench, 39mm</td>
<td></td>
<td>Drive pulley disassembly/assembly</td>
</tr>
<tr>
<td>Lock nut socket wrench</td>
<td></td>
<td>Top cone race holding</td>
</tr>
<tr>
<td>Lock nut wrench, 39mm</td>
<td></td>
<td>Stem lock nut tightening</td>
</tr>
<tr>
<td>Crankcase puller</td>
<td></td>
<td>Crankcase disassembly</td>
</tr>
<tr>
<td>Bearing remover set, 12mm</td>
<td></td>
<td>Drive shaft bearing removal/installation</td>
</tr>
<tr>
<td>(Spindle assy, 15mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Remover weight)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing remover set, 15mm</td>
<td></td>
<td>Drive shaft bearing removal/installation</td>
</tr>
<tr>
<td>(Spindle assy, 15mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Remover head, 15mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Remover shaft, 15mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bearing outer driver, 28x30mm</td>
<td></td>
<td>Bearing installation</td>
</tr>
<tr>
<td>Bearing remover</td>
<td></td>
<td>Driven pulley outer bearing installation</td>
</tr>
<tr>
<td>Clutch spring compressor</td>
<td></td>
<td>Driven pulley disassembly/assembly</td>
</tr>
<tr>
<td>Crankcase assembly collar</td>
<td></td>
<td>Driven shaft, crankshaft &amp; crankcase assembly</td>
</tr>
<tr>
<td>Crankcase assembly tool</td>
<td></td>
<td>Crankshaft &amp; crankcase assembly</td>
</tr>
<tr>
<td>Rear shock absorber remover</td>
<td></td>
<td>Front shock absorber disassembly/assembly</td>
</tr>
<tr>
<td>Ball race remover</td>
<td></td>
<td>Steering stem bearing races</td>
</tr>
<tr>
<td>Rear shock absorber compressor</td>
<td></td>
<td>Rear shock absorber disassembly/assembly</td>
</tr>
<tr>
<td>Float level gauge</td>
<td></td>
<td>Carburator fuel level check</td>
</tr>
<tr>
<td>Lock nut socket wrench, 32mm</td>
<td></td>
<td>One-way clutch lock nut removal/ installation</td>
</tr>
<tr>
<td>Universal holder</td>
<td></td>
<td>Flywheel holding</td>
</tr>
<tr>
<td>Flywheel puller</td>
<td></td>
<td>Flywheel removal</td>
</tr>
<tr>
<td>Pilot, 12mm</td>
<td></td>
<td>Drive shaft bearing installation</td>
</tr>
<tr>
<td>Bearing outer driver, 32x35mm</td>
<td></td>
<td>Drive shaft bearing installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final shaft bearing installation</td>
</tr>
</tbody>
</table>
## 2. GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>Tool No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing outer driver, 37x40mm</td>
<td></td>
<td>Drive shaft bearing installation Final shaft bearing installation Crankshaft bearing installation</td>
</tr>
<tr>
<td>Outer driver, 24x26mm</td>
<td></td>
<td>Driven pulley bearing installation</td>
</tr>
<tr>
<td>Pilot, 10mm</td>
<td></td>
<td>Front wheel bearing installation</td>
</tr>
<tr>
<td>Bearing driver pilot, 17mm</td>
<td></td>
<td>Drive shaft bearing installation</td>
</tr>
<tr>
<td>Snap ring pliers (close)</td>
<td></td>
<td>Circlip removal/installation</td>
</tr>
<tr>
<td>Bearing outer driver, 42x47mm</td>
<td></td>
<td>Crankshaft bearing installation</td>
</tr>
<tr>
<td>Pilot, 20mm</td>
<td></td>
<td>Crankshaft bearing installation</td>
</tr>
<tr>
<td>Bearing outer driver handle A</td>
<td></td>
<td>Bearing installation Drive in ball race</td>
</tr>
<tr>
<td>Bearing puller head, 10mm</td>
<td></td>
<td>Front wheel bearing removal</td>
</tr>
<tr>
<td>Universal bearing puller</td>
<td></td>
<td>Crankshaft bearing removal</td>
</tr>
<tr>
<td>Bearing puller</td>
<td></td>
<td>Front wheel bearing removal</td>
</tr>
<tr>
<td>Pressure tester set</td>
<td></td>
<td>Cylinder compression gauge</td>
</tr>
</tbody>
</table>
LUBRICATION POINTS

ENGINE

<table>
<thead>
<tr>
<th>NO.</th>
<th>Lubrication Points</th>
<th>Lubricant</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crankcase sliding &amp; movable parts</td>
<td>JASO-FC or API-TC</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cylinder movable parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Transmission gear (final gear)</td>
<td>SAE-90#</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Kick starter spindle bushing</td>
<td>Grease</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Drive pulley movable parts</td>
<td>Grease</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Starter pinion movable parts</td>
<td>Grease</td>
<td></td>
</tr>
</tbody>
</table>

FRAME

Apply clean engine oil or grease to cables and movable parts not specified. This will avoid abnormal noise and rise the durability of the motorcycle.
2. GENERAL INFORMATION

BA10AB.AC. WIRING DIAGRAM

<table>
<thead>
<tr>
<th>B</th>
<th>Black</th>
<th>Br</th>
<th>Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Yellow</td>
<td>O</td>
<td>Orange</td>
</tr>
<tr>
<td>L</td>
<td>Blue</td>
<td>Sb</td>
<td>Light blue</td>
</tr>
<tr>
<td>G</td>
<td>Green</td>
<td>Lg</td>
<td>Light green</td>
</tr>
<tr>
<td>R</td>
<td>Red</td>
<td>P</td>
<td>Pink</td>
</tr>
<tr>
<td>W</td>
<td>White</td>
<td>Gr</td>
<td>Gray</td>
</tr>
</tbody>
</table>
CABLE & HARNESS ROUTING

- Front Brake Reservoir
- Throttle Cable
- Ignition Switch
- Starter Relay
- Ground
- Horn
- Front Brake Fluid Tube
- Rear Brake Cable
- Speedometer Cable
- Regulator/Rectifier
1. SPECIFICATIONS

TROUBLESHOOTING

ENGINE WILL NOT START OR IS HARD TO START

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check if fuel reaches carburetor by loosening drain screw.</td>
<td>Fuel reaches carburetor</td>
<td>Empty fuel tank</td>
</tr>
<tr>
<td></td>
<td>Fuel does not reach carburetor</td>
<td>Clogged float valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clogged charcoal canister</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clogged fuel filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty auto fuel valve</td>
</tr>
<tr>
<td>Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.</td>
<td>Spark jumps</td>
<td>Faulty spark plug</td>
</tr>
<tr>
<td></td>
<td>Weak or no spark</td>
<td>Fouled spark plug</td>
</tr>
<tr>
<td>Test cylinder compression.</td>
<td>Normal compression</td>
<td>Faulty CDI unit</td>
</tr>
<tr>
<td></td>
<td>Low or no compression</td>
<td>Faulty A.C. generator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Broken or shorted ignition coil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Broken or shorted exciter coil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty ignition switch</td>
</tr>
<tr>
<td>Start engine by following normal starting procedure.</td>
<td>Engine does not fire</td>
<td>Burned or worn cylinder piston</td>
</tr>
<tr>
<td></td>
<td>Engine fires but does not start</td>
<td>Faulty reed valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blown cylinder head gasket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaking crankcase seal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty crankcase oil seal</td>
</tr>
<tr>
<td>Remove spark plug and inspect again.</td>
<td>Dry spark plug</td>
<td>Incorrectly adjusted idle speed</td>
</tr>
<tr>
<td></td>
<td>Wet spark plug</td>
<td>Air leaking through intake pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incorrect ignition timing</td>
</tr>
<tr>
<td>Wait for 30 minutes and then remove the carburetor auto choke circuit hose and blow the hose with mouth.</td>
<td>Not clogged</td>
<td>Flooded carburetor</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td>Throttle valve excessively open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty auto bystarter</td>
</tr>
</tbody>
</table>
2. GENERAL INFORMATION

ENGINE STOPS IMMEDIATELY AFTER IT STARTS

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check if fuel reaches carburetor by loosening drain screw.</td>
<td>Fuel reaches carburetor</td>
<td>① Empty fuel tank</td>
</tr>
<tr>
<td></td>
<td>Fuel does not reach carburetor</td>
<td>② Clogged float valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>③ Clogged charcoal canister</td>
</tr>
<tr>
<td></td>
<td></td>
<td>④ Clogged fuel filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⑤ Faulty auto fuel valve</td>
</tr>
<tr>
<td>Remove spark plug.</td>
<td>Plug not fouled or discolored</td>
<td>① Fouled spark plug</td>
</tr>
<tr>
<td></td>
<td>Plug fouled or discolored</td>
<td>② Incorrect spark plug</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incorrect heat range plug</td>
</tr>
<tr>
<td>Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.</td>
<td>Good spark</td>
<td>① Fouled spark plug</td>
</tr>
<tr>
<td></td>
<td>Weak or intermittent spark</td>
<td>② Faulty CDI unit</td>
</tr>
<tr>
<td>Test cylinder compression (using a compression gauge).</td>
<td>Normal compression</td>
<td>③ Faulty A.C. generator</td>
</tr>
<tr>
<td></td>
<td>Abnormal compression</td>
<td>④ Faulty ignition coil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⑤ Broken or shorted high tension wire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⑥ Faulty ignition switch</td>
</tr>
<tr>
<td>Check carburetor for clogging.</td>
<td>Not Clogged</td>
<td>① Worn cylinder and piston rings</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td>② Blown cylinder head gasket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>③ Flaws in cylinder head</td>
</tr>
<tr>
<td></td>
<td></td>
<td>④ Faulty reed valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⑤ Seized piston</td>
</tr>
<tr>
<td>Check ignition timing.</td>
<td>Correct timing</td>
<td>① Clogged carburetor jets</td>
</tr>
<tr>
<td></td>
<td>Incorrect timing</td>
<td>② Faulty CDI unit or A.C. generator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>③ A.C.G. flywheel not aligned</td>
</tr>
<tr>
<td>Check carburetor air screw adjustment.</td>
<td>Correctly adjusted</td>
<td>① Mixture too rich (turn screw out)</td>
</tr>
<tr>
<td></td>
<td>Incorrectly adjusted</td>
<td>② Mixture too lean (turn screw in)</td>
</tr>
</tbody>
</table>
Check carburetor gasket for air leaks.

Remove auto bystarter connecting wire and check if bypass fuel line is clogged.

Connect auto bystarter wire to battery. Wait for 5 minutes, then connect a hose to fuel enriching circuit and then blow the hose with mouth.

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check carburetor gasket for air leaks.</td>
<td>No air leak</td>
<td>① Carburetor not securely tightened</td>
</tr>
<tr>
<td></td>
<td>Air leaks</td>
<td>② Faulty intake manifold gasket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>③ Deformed or broken carburetor O-ring</td>
</tr>
<tr>
<td></td>
<td>Not clogged</td>
<td>① Broken cable</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td>② Dirty auto bystarter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>③ Faulty auto bystarter</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td>① Faulty auto bystarter</td>
</tr>
<tr>
<td></td>
<td>Not Clogged</td>
<td>① Faulty auto bystarter</td>
</tr>
</tbody>
</table>
### ENGINE LACKS POWER

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start engine and accelerate lightly for observation.</td>
<td>Engine speed increases</td>
<td>1. Clogged air cleaner</td>
</tr>
<tr>
<td></td>
<td>Engine speed does not increase sufficiently</td>
<td>2. Clogged fuel filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Clogged exhaust muffler</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Faulty auto bystarter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Faulty charcoal canister</td>
</tr>
<tr>
<td>Check ignition timing (using a timing light).</td>
<td>Correct timing</td>
<td>1. Faulty CDI unit</td>
</tr>
<tr>
<td></td>
<td>Incorrect timing</td>
<td>2. Faulty A.C. generator</td>
</tr>
<tr>
<td>Test cylinder compression (using a compression gauge)</td>
<td>Normal compression</td>
<td>1. Worn cylinder and piston rings</td>
</tr>
<tr>
<td></td>
<td>Abnormal compression</td>
<td>2. Blown cylinder head gasket</td>
</tr>
<tr>
<td>Check carburetor for clogging</td>
<td>Not Clogged</td>
<td>3. Faulty reed valve</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td>1. Clogged carburetor jets</td>
</tr>
<tr>
<td>Remove spark plug and inspect</td>
<td>Plug not fouled or discolored</td>
<td>1. Fouled spark plug</td>
</tr>
<tr>
<td></td>
<td>Plug fouled or discolored</td>
<td>2. Incorrect heat range plug</td>
</tr>
<tr>
<td>Check if engine overheats</td>
<td>Engine does not overheat</td>
<td>1. Mixture too lean</td>
</tr>
<tr>
<td></td>
<td>Engine overheats</td>
<td>2. Poor quality fuel</td>
</tr>
<tr>
<td>Rapidly accelerate or run at high speed</td>
<td>Engine does not knock</td>
<td>3. Excessive carbon build-up in combustion chamber</td>
</tr>
<tr>
<td></td>
<td>Engine knocks</td>
<td>4. Ignition timing too early</td>
</tr>
</tbody>
</table>

1. Clogged carburetor jets  
2. Fouled spark plug  
3. Incorrect heat range plug  
4. Mixture too lean  
5. Poor quality fuel  
6. Excessive carbon build-up in combustion chamber  
7. Ignition timing too early
POOR PERFORMANCE (ESPECIALLY AT IDLE AND LOW SPEEDS)

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check ignition timing</td>
<td>Correct timing</td>
<td>① Faulty CDI unit ② Faulty A.C. generator</td>
</tr>
<tr>
<td></td>
<td>Incorrect timing</td>
<td></td>
</tr>
<tr>
<td>Check carburetor air screw adjustment</td>
<td>Correctly adjusted</td>
<td>① Mixture too rich (turn screw out) ② Mixture too lean (turn screw in)</td>
</tr>
<tr>
<td></td>
<td>Incorrectly adjusted</td>
<td>① Mixture too rich (turn screw out) ② Mixture too lean (turn screw in)</td>
</tr>
<tr>
<td>Check carburetor gasket for air leaks.</td>
<td>No air leak</td>
<td>① Carburetor not securely tightened ② Faulty intake manifold gasket ③ Deformed carburetor O-ring</td>
</tr>
<tr>
<td></td>
<td>Air leaks</td>
<td></td>
</tr>
<tr>
<td>Remove spark plug and install it into spark plug cap to test spark by connecting it to engine ground.</td>
<td>Good spark</td>
<td>① Faulty or fouled spark plug ② Faulty CDI unit ③ Faulty A.C. generator ④ Faulty ignition coil ⑤ Broken or shorted high tension wire ⑥ Faulty ignition switch</td>
</tr>
<tr>
<td></td>
<td>Weak or intermittent spark</td>
<td></td>
</tr>
<tr>
<td>Remove auto bystater connecting wire and check if bypass fuel line is clogged.</td>
<td>Not clogged</td>
<td>① Broken auto bystater wire ② Faulty auto bystater</td>
</tr>
<tr>
<td></td>
<td>Clogged</td>
<td></td>
</tr>
<tr>
<td>Connect auto bystater wire to battery. Wait for 5 minutes, then connect a hose to fuel enriching circuit and then blow the hose with mouth.</td>
<td>Clogged</td>
<td>① Broken auto bystater wire ② Faulty auto bystater</td>
</tr>
<tr>
<td></td>
<td>Not clogged</td>
<td></td>
</tr>
</tbody>
</table>
POOR PERFORMANCE (AT HIGH SPEED)

**Inspection/Adjustment**
- Check ignition timing.
- Check auto fuel valve for fuel supply.
- Check carburetor jets for clogging.

**Symptom**
- Correct timing
- Incorrect timing
- Fuel flows freely
- Fuel flow
- Not clogged
- Clogged

**Probable Cause**
- Faulty CDI unit
- Loose A.C.G. stator
- Faulty A.C. generator
- Empty fuel tank
- Clogged fuel tube or filter
- Clogged charcoal canister
- Clean and unclog
- Broken auto bystarter connecting wire
- Faulty auto bystarter
- Faulty auto bystarter
1. SPECIFICATIONS

CLUTCH, DRIVE AND DRIVEN PULLEYS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine starts but motor-cycle does not move</td>
<td>1. Worn or slipping drive belt</td>
</tr>
<tr>
<td></td>
<td>2. Broken ramp plate</td>
</tr>
<tr>
<td></td>
<td>3. Broken driven face spring</td>
</tr>
<tr>
<td></td>
<td>4. Separated clutch lining</td>
</tr>
<tr>
<td></td>
<td>5. Damaged driven pulley shaft splines</td>
</tr>
<tr>
<td></td>
<td>6. Damaged final gear</td>
</tr>
<tr>
<td></td>
<td>7. Seized final gear</td>
</tr>
<tr>
<td>Motorcycle creeps or engine starts but soon stops or seems to rush out</td>
<td>1. Broken shoe spring</td>
</tr>
<tr>
<td>(Rear wheel rotates when engine idles)</td>
<td>2. Clutch outer and clutch weight stuck</td>
</tr>
<tr>
<td></td>
<td>3. Seized pivot</td>
</tr>
<tr>
<td>Engine lacks power at start of a grade (poor slope performance)</td>
<td>1. Worn or slipping drive belt</td>
</tr>
<tr>
<td></td>
<td>2. Worn weight rollers</td>
</tr>
<tr>
<td></td>
<td>3. Seized drive pulley bearings</td>
</tr>
<tr>
<td></td>
<td>4. Weak driven face spring</td>
</tr>
<tr>
<td></td>
<td>5. Worn or seized driven pulley bearings</td>
</tr>
<tr>
<td>Engine lacks power at high speed</td>
<td>1. Worn or slipping drive belt</td>
</tr>
<tr>
<td></td>
<td>2. Worn weight rollers</td>
</tr>
<tr>
<td></td>
<td>3. Worn or seized driven pulley bearings</td>
</tr>
<tr>
<td>There is abnormal noise or smell while running</td>
<td>1. Oil or grease fouled drive belt</td>
</tr>
<tr>
<td></td>
<td>2. Worn drive belt</td>
</tr>
<tr>
<td></td>
<td>3. Weak driven face spring</td>
</tr>
<tr>
<td></td>
<td>4. Worn or seized driven pulley bearings</td>
</tr>
<tr>
<td>STEERING HANDLEBAR DOES NOT TRACK STRAIGHT</td>
<td>(Front and rear tire pressures are normal)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering is heavy</td>
<td>1. Steering stem nut too tight</td>
</tr>
<tr>
<td></td>
<td>2. Broken steering steel balls</td>
</tr>
<tr>
<td>Front or rear wheel is wobbling</td>
<td>1. Excessive wheel bearing play</td>
</tr>
<tr>
<td></td>
<td>2. Bent rim</td>
</tr>
<tr>
<td></td>
<td>3. Loose axle nut</td>
</tr>
<tr>
<td>Steering handlebar pulls to one side</td>
<td>1. Misaligned front and rear wheels</td>
</tr>
<tr>
<td></td>
<td>2. Bent front fork</td>
</tr>
</tbody>
</table>
2. GENERAL INFORMATION

POOR SUSPENSION PERFORMANCE

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspension is too soft</td>
<td>1. Weak shock spring</td>
</tr>
<tr>
<td></td>
<td>2. Excessive load</td>
</tr>
<tr>
<td></td>
<td>3. Shock damper oil leaking</td>
</tr>
<tr>
<td>Suspension is too hard</td>
<td>1. Bent fork tube or shock rod</td>
</tr>
<tr>
<td></td>
<td>2. Fork slider and tube binding</td>
</tr>
<tr>
<td>Suspension is noisy</td>
<td>1. Fork tube and spring binding</td>
</tr>
<tr>
<td></td>
<td>2. Fork slider and tube binding</td>
</tr>
</tbody>
</table>

(Front and rear tire pressures are normal)

POOR BRAKE PERFORMANCE

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index mark on brake panel aligns with wear</td>
<td>1. Worn brake linings</td>
</tr>
<tr>
<td>indicator arrow</td>
<td>2. Worn brake cam contacting area on brake shoes</td>
</tr>
<tr>
<td></td>
<td>3. Worn brake cam</td>
</tr>
<tr>
<td></td>
<td>4. Worn brake drum</td>
</tr>
<tr>
<td>Brake squeaks</td>
<td>1. Worn brake linings</td>
</tr>
<tr>
<td></td>
<td>2. Foreign matter on brake linings</td>
</tr>
<tr>
<td></td>
<td>3. Rough brake drum contacting area</td>
</tr>
<tr>
<td>Brake performance is poor</td>
<td>1. Sluggish or elongated brake cables</td>
</tr>
<tr>
<td></td>
<td>2. Brake shoes improperly contact brake drum</td>
</tr>
<tr>
<td></td>
<td>3. Water and mud in brake system</td>
</tr>
<tr>
<td></td>
<td>4. Oil or grease on brake linings</td>
</tr>
<tr>
<td>Expanding Brake</td>
<td>1. Faulty brake master cylinder</td>
</tr>
<tr>
<td></td>
<td>2. Faulty brake caliper</td>
</tr>
<tr>
<td></td>
<td>3. Oil or grease on brake disk</td>
</tr>
<tr>
<td></td>
<td>4. Deformed brake disk</td>
</tr>
<tr>
<td></td>
<td>5. Leaking brake fluid tube</td>
</tr>
</tbody>
</table>
1. Motor oil indicator light does not come on when there is no motor oil (Ignition switch ON)

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
</table>
| Check battery circuit by operating turn signals. | Signals operate properly | 1. Burned out fuse  
2. Weak or dead battery  
3. Faulty ignition switch  
4. Loose or disconnected connector  
5. Broken wire harness |
| Connect indicator light bulb to battery for bulb inspection. | Signals dim, remain on or don’t | ① Burned out bulb |
| Check connectors for proper operation. | Bulb lights | ① Loose wire connector 
③ Broken wire harness 
⑤ Incorrectly connected wire |
| Remove oil meter and check operation of indicator light by moving float | Good | ① Faulty float 
② Broken or shorted wire in meter |
| Float up = Light off  
Float down = Light on | Good | ① Faulty float 
② Broken or shorted wire in meter |
| | Faulty | ① Broken or shorted wire in meter |

2. Motor oil is sufficient but the indicator light remains on (Ignition switch ON)

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
</table>
| Check connectors for proper connection. | Good | ① Loose or disconnected connector 
② Broken wire harness 
③ Incorrectly connected wire |
| Remove oil meter and check operation of indicator light by moving float | Good | ① Faulty float 
② Broken or shorted wire in meter |
| Float up = Light off  
Float down = Light on | Good | ① Damaged oil tank 
② Foreign matters in oil tank |
2. GENERAL INFORMATION

FUEL GAUGE

1. Pointer does not register correctly (Ignition switch ON)

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check battery circuit by operating turn signals.</td>
<td>Signals operate properly</td>
<td>Signals dim, remain on or don’t</td>
</tr>
<tr>
<td>Remove fuel unit and check operation of pointer by moving float up and down.</td>
<td>Pointer does not move</td>
<td>Pointer moves</td>
</tr>
<tr>
<td>Check operation of pointer by opening and shorting fuel unit terminal on wire harness side.</td>
<td>Pointer does not move</td>
<td>Pointer moves</td>
</tr>
<tr>
<td>Check connectors for proper connection.</td>
<td>Good</td>
<td>Faulty</td>
</tr>
</tbody>
</table>

Probable Cause:

1. Burned out fuse
2. Weak or dead battery
3. Faulty ignition switch
4. Loose or disconnected connector
5. Broken wire harness

6. Faulty float
7. Broken or shorted fuel unit wire
8. Loose or disconnected connector
9. Incorrectly connected connector
10. Broken or shorted wire in fuel gauge

2. Pointer fluctuates or swings (Ignition switch ON)

<table>
<thead>
<tr>
<th>Inspection/Adjustment</th>
<th>Symptom</th>
<th>Probable Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check battery circuit by operating turn signals and horn.</td>
<td>Signals operate properly</td>
<td>Signals dim, remain on or don’t</td>
</tr>
<tr>
<td>Remove fuel unit and check operation of pointer by moving float up and down.</td>
<td>Pointer moves</td>
<td>Pointer does not move</td>
</tr>
<tr>
<td>Move float up and down rapidly (1 round/sec.) to check the operation of pointer.</td>
<td>Pointer moves in accordance with float</td>
<td>Pointer does not move in accordance with float</td>
</tr>
<tr>
<td>Check connectors for proper connection.</td>
<td>Good</td>
<td>Faulty</td>
</tr>
</tbody>
</table>

Probable Cause:

1. Burned out fuse
2. Weak or dead battery
3. Faulty ignition switch
4. Loose or disconnected connector
5. Broken wire harness

6. Poor contact in fuel unit
7. Insufficient damping oil in fuel gauge
8. Loose or disconnected connector
9. Broken or shorted wire in fuel gauge
1. SPECIFICATIONS

STARTER MOTOR

1. Starter motor won’t turn

- **Probable Cause**
  - ① Burned out fuse
  - ② Weak or dead battery
  - ③ Faulty stop switch
  - ④ Loose or disconnected connector
  - ⑤ Broken or shorted ignition switch wire

- **Symptom**
  - Stoplight comes
  - Stoplight does not come on

- **Inspection/Adjustment**
  - Check operation of stop switch by applying brake.

- **Probable Cause**
  - ① Faulty or weak battery

- **Symptom**
  - Signals operate properly
  - Signals dim, remain on or don’t

- **Inspection/Adjustment**
  - Check operation of starter relay by depressing starter button.

- **Probable Cause**
  - ① Poor starter button connection
  - ② Faulty starter relay

- **Symptom**
  - Relay operates properly
  - Relay does not operate

- **Probable Cause**
  - ③ Loose or disconnected connector

- **Inspection/Adjustment**
  - Connect starter motor directly to battery.

- **Probable Cause**
  - ① Faulty starter motor
  - ① Faulty wire harness

2. Starter motor turns slowly or idles

- **Probable Cause**
  - ① Weak or dead battery

- **Symptom**
  - Signals operate properly
  - Signals dim, remain on or don’t

- **Probable Cause**
  - ① Loose or disconnected starter motor cable

- **Inspection/Adjustment**
  - Check battery circuit by operating turn signals.

- **Symptom**
  - Starter motor turns slowly
  - Starter motor turns normally

- **Probable Cause**
  - ② Faulty starter relay

- **Inspection/Adjustment**
  - Connect starter motor directly to battery.

- **Symptom**
  - Turns easily
  - Hard to turn

- **Probable Cause**
  - ① Seized cylinder

3. Starter motor does not stop turning

- **Probable Cause**
  - ① Faulty starter pinion

- **Symptom**
  - Not stopped
  - Stopped

- **Probable Cause**
  - ① Starter relay shorted or stuck closed

- **Inspection/Adjustment**
  - Turn ignition switch OFF.
3. INSPECTION/ADJUSTMENT

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BRAKE SYSTEM ....................................................... 3-4
MOVING DEVICE ....................................................... 3-6
DAMPING DEVICE ..................................................... 3-7
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ENGINE ................................................................. 3-9
OTHERS ................................................................. 3-12
## INSPECTION AND MAINTENANCE SCHEDULE

(Note) 1. ○ means time for inspection.

2. ★ means regular replacement for the specified parts.

This inspection and maintenance schedule is based upon average riding conditions. Machines subjected to serve use, or ridden in unusually dusty areas, require more frequent servicing.

<table>
<thead>
<tr>
<th>Inspection &amp; Maintenance Item</th>
<th>Frequency</th>
<th>Judgment Standards</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preride</td>
<td>1st month</td>
<td>Every 6 months</td>
</tr>
<tr>
<td>Steering handlebar</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Check for looseness and vertical play</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating performance</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Right/left turning angle</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Suspension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front fork</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for front fork pivot installation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check front fork pivot for looseness and abnormal noise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brake lever</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Front/rear brake lever free play</td>
<td></td>
<td></td>
<td>Free play: 10 - 20 mm</td>
</tr>
<tr>
<td>Brake lever operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brake performance</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Brake System</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Brake drum/shoe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Looseness, abnormal noise and damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drum-to-lining clearance</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Brake shoe and lining wear</td>
<td></td>
<td></td>
<td>★</td>
</tr>
<tr>
<td>Brake drum wear and damage</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tire</td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Tire pressure</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Tire pressure</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Moving Device

<table>
<thead>
<tr>
<th>Tire</th>
<th>Frequency</th>
<th>Judgment Standards</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>70/90-16</td>
<td>1.50 kg/cm</td>
<td>1.75 kg/cm</td>
</tr>
<tr>
<td>90/80-16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

3-1
### 3. INSPECTION/ADJUSTMENT

<table>
<thead>
<tr>
<th>Inspection &amp; Maintenance Item</th>
<th>Frequency</th>
<th>Judgment Standards</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preride</td>
<td>1st month</td>
<td>Every 6 months</td>
</tr>
<tr>
<td>Tire crack and damage</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Tire groove and abnormal wear</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Imbedded objects, gravel, etc.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Axle nut looseness</td>
<td></td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Check wheel rim, rim edge and spoke plate for damage</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Check front wheel bearing for excessive play and abnormal noise</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Check front wheel bearing for excessive play and abnormal noise</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Frame Spring Damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspension arm Connecting parts looseness and arm damage</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock absorber Oil leakage and damage</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Shock absorber Assembly parts looseness abnormal noise</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Power Drive System Clutch Operation</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Transmission case Oil leakage and oil level</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Ignition device Spark plug condition</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Battery Terminal connection</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wires Loose connection and damage</td>
<td>O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Groove Depth: Front: 0.8mm Rear: 0.8mm
- Torque Values:
  - Front axle nut: 5.0~7.0kg-m
  - Rear axle nut: 11.0~13.0kg-m
- Rim runout at rim end:
  - Front: Axial 2.0mm Radial 2.0mm
  - Rear: Axial 2.0mm Radial 2.0mm
- Shock spring free length
- Oil level: Oil check bolt hole at lower hole edge
- Rear wheel transmission case
- Plug gap: 0.6~0.7mm
### 3. INSPECTION/ADJUSTMENT

<table>
<thead>
<tr>
<th>Inspection &amp; Maintenance Item</th>
<th>Frequency</th>
<th>Judgment Standards</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preride</td>
<td>1st month</td>
<td>Every 6 months</td>
</tr>
<tr>
<td>Body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance and abnormal noise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions at low and high speeds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust smoke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil quality and quantity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil leakage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check oil filter for clogging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel leakage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carburetor, throttle valve and auto bystarter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check fuel filter for clogging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel level replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel tube replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lights &amp; Winker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winking action, dirt and damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buzzer &amp; Steering Lock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rearview Mirror &amp; Reflector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rearview mirror position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflector &amp; License Plate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dirt and damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust Muffler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint looseness and damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust muffler performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body &amp; Frame</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Looseness and damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal Conditions Happened Last Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check if the abnormal conditions occur again</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal Conditions Happened Last Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove carbon deposits on combustion chamber, breather hole and exhaust muffler</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. INSPECTION/ADJUSTMENT

BRAKE SYSTEM
BRAKE LEVER

Free Play

Measure the front and rear brake lever free plays.

**Free Play:**

- Front: 10 \_ 20mm
- Rear: 10 \_ 20mm

If the free plays do not fall within the limits, turn the right and left adjusting nuts for adjustment.

Front 10 \_ 20mm

Rear 10 \_ 20mm

<\text{Rear}> “Δ” Marks

Adjusting Nuts
3. **INSPECTION/ADJUSTMENT**

**BRAKE DRUM/SHOE**

*Brake Shoe Wear*
Replace the brake shoes if the arrow on the brake arm aligns with reference mark “Δ” on the brake panel when the brake is fully applied.

*Brake Drum Wear/Damage*
Check the brake drum appearance for damage. Check if the brake lining wear is within the specified service limit. Check the brake operation for abnormal noise and brake drum inside for wear or damage.

**BRAKE DISK/LINING**

*Brake Disk Surface and Brake Pad Wear*
Check the brake disk surface for scratch. Check if the brake pad wear is within the specified service limit.

*Brake Disk Runout Inspection*
Jack the motorcycle wheels off the ground and check if the brake disk runout is within the specified service limit.

**BRAKE FLUID LEVEL INSPECTION**

*Brake Master Cylinder Fluid Level Inspection*
Turn the steering handlebar upright and check if the front brake fluid level is within the specified limits through the front brake master cylinder check hole.
3. INSPECTION/ADJUSTMENT

MOVING DEVICE

TIRES

« Tire Pressure »
Check the tire pressure.

* Tire pressure should be checked when tires are cold.

Tire Pressure (one rider)
Front: 1.50 kg/cm_
Rear: 1.75 kg/cm_

Tire Size

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>70/90 – 16</td>
</tr>
<tr>
<td>Rear</td>
<td>90/80 – 16</td>
</tr>
</tbody>
</table>

« Axle Nut/Axle Shaft Looseness »
Check the front and rear axle nuts for looseness.
If the axle nuts are loose, tighten them to the specified torques.
Torques:
Front: 5.0_ 7.0kg-m
Rear: 11.0_ 13.0kg-m

« Wheel Rim/Spoke Plate Damage »
Check the wheel rim and spoke plate for wear or damage and measure the rim runout.
DAMPING DEVICE
SHOCK ABSORBERS

Oil Leak/Damage
Fully apply the front brake and check the action of the front shock absorber by compressing it several times. Check the entire shock absorber assembly for looseness or damage. Check the action of the rear shock absorber by compressing it several times. Check the entire shock absorber assembly for looseness or damage.

POWER DRIVE SYSTEM
TRANSMISSION CASE

Check the rear wheel transmission case surrounding area for oil leaks. Stop the engine and remove the oil check bolt.

* Place the motorcycle on its main stand on level ground.

The gear oil level shall be at the oil check bolt hole. If the oil level is low, add the specified oil to the proper level.

* Specified Gear Oil: SAE10W90#
* Install and tighten the oil check bolt.
* Torque: 1.0 1.5kg-m
Start the engine and check for oil leaks.
3. INSPECTION/ADJUSTMENT

ELECTRICAL EQUIPMENT

IGNITION APPARATUS

Spark Plug

Remove the frame center cover.
Remove the spark plug cap and spark plug.
Check the spark plug for wear, fouling and carbon deposits.
Remove the fouling and carbon deposits with a spark plug cleaner or wire brush.

Specified Spark Plug

<table>
<thead>
<tr>
<th>NGK</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA10AB.AC.</td>
</tr>
<tr>
<td>BR8HSA</td>
</tr>
</tbody>
</table>

Spark Plug Gap: 0.6 - 0.7mm

Ignition Apparatus

* The CDI ignition timing is not adjustable. If the timing is incorrect, check the CDI unit, ignition coil and A.C. generator and replace any faulty parts.

Remove the right side rail. (⇒12-4)
Remove the A.C. generator fan cover. (⇒7-3)
Remove the four bolts attaching the fan and then remove the fan.
Warm up the engine and check the ignition timing with a timing light.

When the engine is running at the specified rpm, the ignition timing is correct if the “F” mark on the flywheel aligns with the index mark on the crankcase within ±1.5°.

Ignition Timing:
BA10AB.AC.:
8 ~ 14 ±1.5 BTDC/2000rpm
3. INSPECTION/ADJUSTMENT

ENGINE

BODY

« At High and Low Speeds »

* The engine must be warm for accurate idle speed adjustment.

Adjust the idle speed to the specified range by turning the throttle stop screw and air screw.

Idle Speed:

BA10AB.AC.50: 2000±100rpm

« Air Cleaner »

Remove the air cleaner cover by removing the five bolts cleaner cover screws.
Remove the air cleaner element.
3. INSPECTION/ADJUSTMENT

Wash the air cleaner element in detergent oil, squeeze out and allow to dry.

Never use gasoline or organic vaporable oil with acid or alkali for washing.

After washing, soak the element in clean engine oil SAE 15W-40# and squeeze out excess oil. Reinstall the element.

**Cylinder Compression**

Warm up the engine before compression test.

Remove the spark plug and insert a compression gauge. Open the throttle valve fully and push the starter button for 7-8 seconds to test the compression.

Compression:

BA10AB.AC.50: 11.8kg/cm

If the compression is low, check for the following:

- Leaking cylinder head gasket
- Worn piston/cylinder

If the compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and the piston head.

**LUBRICATION SYSTEM**

**Oil Filter Cleaning**

Disconnect the oil tube at the oil pump side and allow oil to drain into a clean container. Remove the tube clip at the oil tank side and disconnect the oil tube. Remove the oil filter.
3. INSPECTION/ADJUSTMENT

Clean the oil filter screen with compressed air. Install the oil filter in the reverse order of removal and fill the oil tank with specified oil up to the proper level. Bleed air from the oil pump and oil lines.

* Connect the oil tubes securely. Install the tube clip at the oil tank side and also install the clip to the lower oil tube that goes to the oil pump. Check for oil leaks.

Oil Pump Condition

Adjust oil pump control cable after the throttle grip free play is adjusted.

Open the throttle valve fully and check that the index mark on the pump body aligns with the aligning mark on the oil pump control lever. Reference tip alignment within 1mm of index mark on open side is acceptable. Start and idle the engine, then slowly open the throttle to increase engine rpm and check the operation of the oil pump control lever. If adjustment is necessary, adjust the oil pump control cable by loosening the control cable lock nut and turning the adjusting nut. After adjustment, tighten the lock nut.

Reference tip alignment within 1mm of index mark on open side is acceptable. However, the aligning mark on the control lever must never be on the closed side of the index mark, otherwise engine damage will occur because of insufficient lubrication.

If the oil pump is not synchronized properly, the following will occur:

- Excessive white smoke or hard starting due to pump control lever excessively open
- Seized piston due to pump control lever insufficiently open
FUEL SYSTEM

Throttle Grip Free Play

Measure the throttle grip free play.
Free Play: 2_ 6mm

If the throttle grip free play does not fall within the specified range, adjust by loosening the lock nut and turning the adjusting nut.

OTHERS

LIGHTS

Headlight

Adjust the headlight beam by loosening the headlight adjusting bolt and moving the adjusting bolt forward and backward to a proper position. Tighten the adjusting bolt.
LUBRICATION SYSTEM

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OIL PUMP REMOVAL ............................................................ 4-3
OIL PUMP INSPECTION......................................................... 4-3
OIL PUMP INSTALLATION....................................................... 4-4
OIL PUMP BLEEDING............................................................ 4-5
OIL TANK ............................................................................. 4-6
LUBRICATION SYSTEM
SERVICE INFORMATION

GENERAL INSTRUCTIONS
Use care when removing and installing the oil pump not to allow dust and dirt to enter the engine and oil line.
Do not attempt to disassemble the oil pump.
Bleed air from the oil pump if there is air between the oil pump and oil line.
If the oil is disconnected, refill the oil line with motor oil before connecting it.

SPECIFICATIONS
Recommended Motor Oil: SAE20W20# 2-stroke Motor Oil
Oil Capacity : 1.1 liter
Light comes on : 0.5 liter

TROUBLESHOOTING

Excessive white smoke or carbon deposits on spark plug
Oil pump not properly synchronized (excessive oil)
Poor quality oil

Engine overheating
Oil pump not properly adjusted (insufficient oiling)
Poor quality oil

Seized piston
No oil in tank or clogged oil line
Oil pump not properly adjusted (insufficient oiling)
Air in oil line
Faulty oil pump

Oil not flowing out of tank to engine
Clogged oil tank cap breather hole
Clogged oil filter
4. LUBRICATION SYSTEM

**OIL PUMP REMOVAL**

* Do not allow foreign matters to enter the crankcase. Before removing the oil pump, clean the oil pump and crankcase surfaces.

Remove the met-in box. (⇒ 12-4)

Disconnect the oil pump control cable from the pump body.
Disconnect the oil inlet line from the oil pump.
Then, disconnect the oil outlet line.

* Before disconnecting the oil line, clip the oil line to avoid oil flowing out and then plug the oil line after it is disconnected.

Remove the oil pump control cable plate bolt.
Remove the oil pump from the crankcase.

**OIL PUMP INSPECTION**

Remove the oil pump and inspect the following items:

- Weakened O-ring
- Damage to crankcase mating surface
- Damage to pump body
- Control lever operation
- Oil leaks through oil seals
- Worn or damaged pump pinion

* Do not disassemble the oil pump which cannot be used after disassembly.
OIL PUMP INSTALLATION

Install the oil pump onto the crankcase.

Install the oil pump control cable plate. Connect the oil inlet line and oil outlet line properly. Connect the oil pump control cable. Bleed air from the oil pump.

Lubricate the O-ring with grease or engine oil before installation. Make sure that the oil pump is inserted into the crankcase. Apply molybdenum disulfide or grease to the pump pinion.

Grease or Engine Oil

Bolt

Control Cable Plate

Control Cable

Oil Outlet Line
4. LUBRICATION SYSTEM

OIL PUMP BLEEDING

Air in the oil lines will block oil flow and result in severe engine damage. Bleed air from the oil lines and oil pump whenever the oil lines or pump have been removed or there is air in the oil lines.

OIL INLET LINE/OIL PUMP BLEEDING

Fill the oil tank with recommended oil. Place a shop towel around the oil pump. Disconnect the oil inlet line from the oil pump and clip it. Fill the oil pump with oil by squirting clean oil through the joint. (About 3cc) Fill the oil line with oil and connect it to the oil pump.

Bleed air from the oil inlet line first, then bleed air from the oil outlet line.

OIL OUTLET LINE BLEEDING

1. Disconnect the oil outlet line and bend it into U shape. Force air out of the tube by filling it with oil.
2. Start the engine and allow it to idle with the oil control lever in the fully open position. Visually check the oil flow.
3. If there is no oil flowing out within 1 minute, bleed air from the oil inlet line and oil pump.

Never run the engine in a closed area. Do not increase the engine speed at will.
4. LUBRICATION SYSTEM

OIL TANK

OIL TANK REMOVAL
Remove the met-in box. (⇒ 12-5)
Remove the frame body cover. (⇒ 12-5)
Remove the rear carrier. (⇒ 12-5)
Remove the two bolts, four nuts attaching the stay comp fuel tank.
Remove the oil meter connector.
Remove the two bolts attaching the oil tank.
Disconnect the oil inlet line.
Drain the oil inside the oil tank into a clean container.
Remove the oil tank.
The installation sequence is the reverse of removal.

* Connect the oil line properly.
Bleed air from the oil pump after installation.
The oil tube clip (at the oil tank side) must be locked from inside of the oil tube joint.
ENGINE REMOVAL/INSTALLATION

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

Parts requiring engine removal for servicing:
Crankcase
Crankshaft

TORQUE VALUES

<table>
<thead>
<tr>
<th>Part</th>
<th>Torque Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine mounting bolt</td>
<td>4.5</td>
</tr>
<tr>
<td>Rear shock absorber lower mount bolt</td>
<td>2.4</td>
</tr>
<tr>
<td>Engine hanger bracket bolt</td>
<td>3.5</td>
</tr>
</tbody>
</table>

5.5kg-m
ENGINE REMOVAL

Remove the frame body cover. (⇒ 12-5)
Remove the two bolts attaching the air cleaner case.
Loosen the band between the air cleaner and carburetor to remove the air cleaner case.
Remove the carburetor cap.

Disconnect the oil pump control cable from the pump body.
Disconnect the oil inlet line from the oil pump.

* After the oil inlet line is disconnected, plug the oil line opening to prevent oil from flowing out.

Disconnect the auto bystarter, A.C. generator and starter motor wire connectors.

Remove the spark plug cap.
ENGINE REMOVAL/INSTALLATION

Remove the rear brake adjusting nut and disconnect the brake cable from the crankcase.
Remove the rear brake cable clamp and rear brake cable.
Remove the cooling air tube band on the left crankcase cover and disconnect the cooling air tube.
Remove the rear shock absorber lower mount bolt.

Remove the right and left engine mounting nuts.
Take out the right and left engine mounting bolts.
Lift the frame upward to separate it from the engine and be careful not to damage the rear fender.

ENGINE HANGER BRACKET REMOVAL
Remove the engine hanger bracket bolt and engine hanger bracket.
The installation sequence is the reserve of removal.
**Torque:** 3.5 4.5kg-m
5. ENGINE REMOVAL/INSTALLATION

ENGINE HANGER BRACKET

INSPECTION
Inspect the stopper rubbers and bushings for damage and replace with new ones if necessary.

ENGINE INSTALLATION
Install the engine in the reverse order of removal.

* Cables and wires should be routed properly.

Torque Values:
Engine mounting bolt: 4.5_ 5.5kg-m
Rear shock absorber lower mount bolt:
: 2.4_ 3.0kg-m

Perform the following inspections and adjustments after installation.
Throttle cable
Oil pump control cable (3-11)
Rear brake cable (3-5)
Oil pump bleeding (3-11)
6. CYLINDER HEAD/CYLINDER/PISTON

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CYLINDER/PISTON ............................................................... 6-6
6. CYLINDER HEAD/CYLINDER/PISTON

Torque: 1.5  1.7kg-m

Torque: 1.1  1.7kg-m (cold)

Torque: 0.8  1.2kg-m
6. CYLINDER HEAD/CYLINDER/PISTON

SERVICE INFORMATION

GENERAL INSTRUCTIONS

The cylinder head, cylinder and piston can be serviced with the engine installed in the frame. Before disassembly, clean the engine to prevent dust from entering the engine. Remove all gasket material from the mating surfaces. Do not use a driver to pry between the cylinder and cylinder head, cylinder and crankcase. Do not damage the cylinder inside and the piston surface. After disassembly, clean the removed parts before inspection. When assembling, apply the specified engine oil to movable parts.

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>Standard (mm)</th>
<th>Service Limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>BA10AB.AC.50</td>
<td>BA10AB.AC.50</td>
</tr>
<tr>
<td>Cylinder head warpage</td>
<td></td>
<td>0.10</td>
</tr>
<tr>
<td>Piston O.D.(5mm from bottom of piston)</td>
<td>38.970_ 38.955</td>
<td>38.90</td>
</tr>
<tr>
<td>Cylinder-to-piston clearance</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Piston pin hole I.D.</td>
<td>12.002_ 12.008</td>
<td>12.03</td>
</tr>
<tr>
<td>Piston pin O.D.</td>
<td>11.994_ 12.0</td>
<td>11.98</td>
</tr>
<tr>
<td>Piston-to-piston pin clearance</td>
<td>←</td>
<td>←</td>
</tr>
<tr>
<td>Piston ring end gap (top/second)</td>
<td>0.10_ 0.25</td>
<td>0.40</td>
</tr>
<tr>
<td>Connecting rod small end I.D.</td>
<td>17.005_ 17.017</td>
<td>17.03</td>
</tr>
<tr>
<td>Cylinder bore</td>
<td>39.0_ 39.025</td>
<td>39.05</td>
</tr>
</tbody>
</table>

TORQUE VALUES

- Cylinder head bolt 1.5_ 1.7kg-m
- Exhaust muffler joint lock nut 1.0_ 1.4kg-m
- Exhaust muffler lock bolt 3.0_ 3.6kg-m
- Spark plug 1.1_ 1.7kg-m

● TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed
- Leaking cylinder head gasket
- Loose spark plug
- Worn, stuck or broken piston and piston rings
- Worn or damaged cylinder and piston

Abnormal noisy piston
- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod small end bearing

Compression too high, overheating or knocking
- Excessive carbon build-up in cylinder head or on piston head

Abnormal noisy piston rings
- Worn, stuck or broken piston rings
- Worn or damaged cylinder
CYLINDER HEAD

REMOVAL

Remove the rear carrier.
Remove the frame body cover. (⇒ 12-5)

Remove the spark plug cap.
Remove the three bolts attaching the fan cover to remove the fan cover.
Remove the two joint lock nuts on the front of the exhaust muffler and then remove the two exhaust muffler lock bolts.
Remove the bolt attaching the engine hood to remove the engine hood.
The installation sequence is the reverse of removal.

* When installing the exhaust muffler, first tighten the two nuts on the front and then tighten the two bolts.

Remove the spark plug.
Remove the cylinder head bolts and the cylinder head.

* Loosen the bolts diagonally in 2 or 3 times.

Remove the cylinder head gasket.
6. CYLINDER HEAD/CYLINDER/PISTON

COMBUSTION CHAMBER
DECARBONIZING

Remove the carbon deposits from the combustion chamber

* Avoid damaging the combustion chamber wall and cylinder mating surface.

CYLINDER HEAD INSPECTION

Check the cylinder head for warpage with a straight edge and feeler gauge.

Service Limit:
BA10AB.AC.50: 0.10mm replace if over

CYLINDER HEAD INSTALLATION

Install the cylinder head on the cylinder properly.

* Be careful not to damage the mating surfaces.

Install a new cylinder head gasket onto the cylinder.
6. CYLINDER HEAD/CYLINDER/PISTON

Cylinder Head Bolts Installation
Install and tighten the cylinder head bolts diagonally in 2 or 3 times.
**Torque**: 1.5_1.7kg-m
Install the spark plug.
**Torque**: 1.1_1.7kg-m

Engine Hood Installation
Install the engine hood. (⇒6-3)
Install the spark plug cap. (⇒6-3)
Perform the following inspections after installation:
- Compression test
- Abnormal engine noise
- Cylinder air leaks
6. CYLINDER HEAD/CYLINDER/PISTON

CYLINDER/PISTON

CYLINDER REMOVAL
Remove the met-in box and seat.
Remove the frame body cover.
Remove the cylinder head.
Remove the two exhaust muffler joint lock nuts and two exhaust muffler lock bolts.
Remove the exhaust muffler.
Remove the cylinder.
Remove the cylinder gasket.

* Do not pry between the cylinder and crankcase or strike the fins.

PISTON REMOVAL
Remove the piston pin clip to remove the piston pin and piston.

* Do not damage or scratch the piston.
Do not apply side force to the connecting rod when removing the piston pin.
Place clean shop towels in the crankcase to keep the piston pin clip from falling into the crankcase.

Spread each piston ring and remove by lifting it up at a point just opposite the gap.
Remove the expander.

Piston Pin Clip
Piston Pin
Piston
Joint Lock Nuts
Exhaust Muffler Lock Bolts
Cylinder
6. CYLINDER HEAD/CYLINDER/PISTON

CYLINDER/PISTON INSPECTION
Check the cylinder and piston for wear or damage.
Clean carbon deposits from the exhaust port area.

* Be careful not to damage the cylinder inside wall.

Measure the cylinder bore at three levels of A, B and C in both X and Y directions. Avoid the port area. Take the maximum figure measured to determine the cylinder bore.

**Service Limit:**
BA10AB.AC.50: 39.05mm replace if over

Inspect the top of the cylinder for warpage.

**Service Limit:**
BA10AB.AC.50: 0.10mm replace if over
6. CYLINDER HEAD/CYLINDER/PISTON

* The cylinder has an A mark or no mark on it. When replacing the cylinder with a new one, use a cylinder having the same mark as the old one.

Measure the piston O.D. at a point 5mm from the bottom of the piston skirt.

**Service Limit:**

BA10AB.AC.50: 38.90mm replace if below

Measure the piston-to-cylinder clearance.

**Service Limit:**

BA10AB.AC.50: 0.10mm replace if over

Measure the piston pin hole I.D.

**Service Limit:**

BA10AB.AC.50: 12.03mm replace if over

Measure the piston pin O.D.

**Service Limit:**

BA10AB.AC.50: 11.98mm replace if below

Measure the piston-to-piston pin clearance.

**Service Limit:**

BA10AB.AC.50: 0.03mm replace if over
6. CYLINDER HEAD/CYLINDER/PISTON

PISTON RING INSPECTION
Measure each piston ring end gap.
Service Limits: Top/Second
BA10AB.AC.50: 0.40mm replace if over

* Set each piston ring squarely into the cylinder using the piston and measure the end gap.

CONNECTING ROD SMALL END INSPECTION
Install the piston pin and bearing in the connecting rod small end and check for excessive play.
Measure the connecting rod small end I.D.
Service Limit:
BA10AB.AC.50: 17.03mm replace if over

PISTON/CYLINDER INSTALLATION
First install the expander in the second ring groove.
Then install the top and second rings in their respective ring grooves.
The piston rings should be pressed into the grooves with even force.
After installation, check and make sure that each ring is flush with the piston at several points around the ring.
A ring that will not compress means that the ring groove has carbon deposits in it and should be cleaned.
Install a new cylinder gasket on the mating surface between the cylinder and crankcase.

Make sure that the ring end gaps are aligned with the piston ring pins in the ring grooves.
Lubricate the cylinder inside and piston rings with engine oil and install the piston into the cylinder while compressing the piston rings.

* Be careful not to damage the piston.

Install the cylinder head.
Torque: 1.5_ 1.7kg-m
Install the exhaust muffler and tighten the exhaust muffler joint lock nuts.
Torque: 1.0_ 1.4kg-m
Tighten the exhaust muffler lock bolts.
Torque: 3.0_ 3.6kg-m
Install the frame covers.
Install the met-in box.
The installation sequence is the reverse of removal.
7. A.C. GENERATOR

A.C. GENERATOR

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7. A.C. GENERATOR

Torque: 3.5 \( F \times 4.0 \text{kg-m} \)
Torque: 0.8 \( F \times 1.2 \text{kg-m} \)
Torque: 0.6 \( F \times 1.0 \text{kg-m} \)
Torque: 0.8 \( F \times 1.2 \text{kg-m} \)

3.5 ~ 4.0 \text{kg-m}
0.6 ~ 1.0 \text{kg-m}
0.8 ~ 1.2 \text{kg-m}
Service Information

General Instructions

All A.C. generator maintenance and inspection can be made with the engine installed. Refer to Section 15 for A.C. generator inspection.

Torque Value

Flywheel nut : 3.5\_\_ 4.0kg-m

Special Tools

Flywheel puller
Universal holder
A.C. GENERATOR REMOVAL

Remove the three bolts attaching the fan cover to remove the fan cover.

Remove the cooling fan by removing the four bolts.

Hold the flywheel with an universal holder and then remove the 10mm flywheel nut.
Remove the A.C. generator flywheel using the flywheel puller.

Remove the A.C. generator wire connector.

Remove the two pulser coil bolts and pulser coil from the right crankcase.
Remove the pulser coil wire clamp from the right crankcase.
Remove the two bolts attaching the A.C. generator stator.

* Be careful not to damage the disconnected wire.

A.C. GENERATOR INSTALLATION
Install the A.C. generator stator and pulser coil wire clamp onto the right crankcase, and then install the pulser coil.
Connect the A.C. generator wire connector.

Clean the taper hole in the flywheel off any burrs and dirt.
Install the woodruff key in the crankshaft keyway.

Install the flywheel onto the crankshaft with the flywheel groove aligned with the crankshaft woodruff key.
Hold the flywheel with the universal holder and install the 10mm flywheel flange nut.
**Torque:** 3.5 \( \text{F} \) 4.0kg-m
Start the engine and check the ignition timing. (\( \leftrightarrow \) 3-8)
Install other removed parts in the reserve order of removal.
KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

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DRIVE PULLEY............................................................. 8-10
STARTER ONE-WAY CLUTCH DRIVE GEAR .................. 8-12
CLUTCH/DRIVEN PULLEY ............................................. 8-15
MODEL BA10AB.AC.

Torque: 3.5_ 4.0kg-m
Torque: 3.5_ 4.5kg-m
Torque: 5.0_ 6.0kg-m
SERVICE INFORMATION

GENERAL INSTRUCTIONS

Avoid getting grease and oil on the drive belt and pulley faces.

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>BA10AB.AC.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Standard (mm)</td>
</tr>
<tr>
<td>Drive pulley collar O.D.</td>
<td>20.01_ 20.025</td>
</tr>
<tr>
<td>Movable drive face I.D.</td>
<td>20.035_ 20.085</td>
</tr>
<tr>
<td>Weight roller O.D.</td>
<td>13.0</td>
</tr>
<tr>
<td>Clutch outer I.D.</td>
<td>107_ 107.2</td>
</tr>
<tr>
<td>Driven face spring free length</td>
<td>87.9</td>
</tr>
<tr>
<td>Driven face O.D.</td>
<td>33.965_ 33.985</td>
</tr>
<tr>
<td>Movable driven face I.D.</td>
<td>34.0_ 34.25</td>
</tr>
<tr>
<td>Drive belt width</td>
<td>18</td>
</tr>
</tbody>
</table>

TORQUE VALUES

Drive face nut 3.5_ 4.0kg-m
Clutch outer nut 3.5_ 4.5kg-m
Clutch drive plate nut 5.0_ 6.0kg-m

SPECIAL TOOLS

Lock nut wrench, 39mm
Clutch spring compressor
Bearing outer driver 37x40mm
One-way clutch puller

Universal holder
Clutch spring compressor
Bearing outer driver 37x40mm

TROUBLESHOOTING

Engine starts but motorcycle won't move
- Worn drive belt
- Broken ramp plate
- Worn or damaged clutch lining

Engine stalls or motorcycle creeps
- Broken clutch weight spring

Poor performance at high speed or lack of power
- Worn drive belt
- Weak driven face spring
- Worn weight roller
- Faulty driven face

Broken clutch weight spring
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

KICK STARTER

LEFT CRANKCASE COVER REMOVAL
Remove the drive belt cooling air tube connector circlip.
Remove the nine left crankcase cover bolts, left crankcase cover and dowel pins.
Inspect the left crankcase cover seal rubber for damage or deterioration.

KICK STARTER SPINDLE REMOVAL
Remove the kick lever from the kick starter spindle.
Remove the circlip and washer from the kick starter spindle.
Slightly rotate the kick starter spindle to remove the kick starter driven gear together with the friction spring.
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Remove the kick starter spindle and return spring from the left crankcase cover. Remove the kick starter spindle bushing.

**KICK STARTER SPINDLE INSPECTION**
Inspect the kick starter spindle and gear for wear or damage.
Inspect the return spring for weakness or damage.
Inspect the kick starter spindle bushing for wear or damage.

Check the kick starter driven gear for wear or damage.
Check the friction spring for wear or damage.
Inspect the kick starter spindle and driven gear forcing parts for wear or damage.

**KICK STARTER INSTALLATION**

Install the kick starter spindle bushing and return spring onto the left crankcase cover.

*If the hooks of the return spring can not be installed properly, use a screw driver to press them into their locations respectively.*

Properly install the kick starter driven gear and friction spring as the figure shown.
First install the washer and then the circlip onto the kick starter spindle. Install the kick lever.

LEFT CRANKCASE COVER INSTALLATION
First install the dowel pins and then the seal rubber.

Install the left crankcase cover and tighten the ten bolts diagonally. Connect the drive belt cooling air tube and install the circlip.

* For drum brake, note the location of the brake cable clamp and install the rear brake cable in place with the clamp.
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

DRIVE BELT
Remove the left crankcase cover.

INSPECTION
Check the drive belt for cracks, separation or abnormal or excessive wear. Measure the drive belt width. 
**Service Limit:**
BA10AB.AC.50: 16.5mm replace if below

* Use specified genuine parts for replacement.

REPLACEMENT
Remove the ten left crankcase cover bolts and left crankcase cover. (⇌8-4)
Hold the clutch outer with the universal holder and remove the 10mm clutch outer nut and clutch outer.

Hold the drive pulley with the holder and remove the 12mm drive face nut.
Remove the starting ratchet. Remove the drive pulley face.
Remove the drive belt from the clutch/driven pulley.

**DRIVE BELT INSTALLATION**

Turn the driven pulley clockwise and lift it up to expand the drive belt groove and then install a new drive belt.

Set the drive belt on the drive pulley. Install the drive pulley face, starting ratchet and 12mm washer, then tighten the drive face nut.

**Torque:** 3.5  4.0kg-m

*When installing the drive face nut, make sure that the tooth spaces of the drive pulley face and starting ratchet align with the teeth of the crankshaft.*
**DRIVE PULLEY**

**REMOVAL**
Hold the drive pulley with the holder and remove the 12mm drive face nut. Remove the starting ratchet, 12mm washer and drive pulley face.

**MOVABLE DRIVE FACE DISASSEMBLY**
Remove the movable drive face and drive pulley collar from the crankshaft.

Remove the ramp plate.
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Remove the weight rollers.

MOVABLE DRIVE FACE INSPECTION
Check each weight roller for wear or damage.
Measure each roller O.D.
Service Limit:
BA10AB.AC.50: 12.4mm replace if below

DRIVE PULLEY INSTALLATION
Install the drive pulley collar and movable drive face onto the crankshaft.
Install the drive belt on the crankshaft.
Install the drive face, starting ratchet and washer, then tighten the 12mm drive face nut.

**Torque:** 3.5 F 4.0kg-m

*Keep grease or oil off the drive belt and drive pulley faces.*

---

**STARTER PINION REMOVAL**
Remove the left crankcase cover. (⇒ 8-4)
Remove the drive pulley. (⇒ 8-8)
Remove the starter pinion.

---

**INSPECTION**
Inspect the starter pinion seat for wear.  
Inspect the starter pinion for smooth operation.  
Inspect the starter pinion shaft forcing parts for wear and damage.

**INSTALLATION**
Apply a small amount of grease to the starter pinion teeth.  
Install the starter pinion in the reverse order of removal.
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

CLUTCH/DRIVEN PULLEY

CLUTCH/DRIVEN PULLEY REMOVAL
Remove the drive pulley. (⇒ 8-8)
Hold the clutch outer with the universal holder and remove the 10mm clutch outer nut.
Remove the clutch outer.

Remove the clutch/driven pulley.
Remove the drive belt from the clutch/driven pulley.

CLUTCH/DRIVEN PULLEY DISASSEMBLY
Compress the clutch/driven pulley spring with the clutch spring compressor and remove the 28mm drive plate nut.
Remove the driven face spring.

Universal Holder
Clutch Outer

10mm Clutch Outer Nut

Clutch/Driven Pulley

Lock Nut Wrench, 39mm

Clutch Spring Compressor
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Remove the seal collar.

Pull out the guide roller pins from the driven pulley and then remove the O-rings and oil seal from the driven pulley.

CLUTCH/DRIVEN PULLEY INSPECTION
Inspect the clutch outer for wear or damage.
Measure the clutch outer I.D.
Service Limit:
BA10AB.AC.50: 107.5mm replace if below
Check the clutch shoes for wear or damage.
Measure the clutch lining thickness.
**Service Limit:** 2.0mm replace if below

Measure the driven face spring free length.
**Service Limit:**
BA10AB.AC.50: 82.6mm replace if below

Check the driven face assembly for wear or damage.
Measure the driven face O.D.
**Service Limit:** 33.94mm replace if below
Check the movable driven face for wear or damage.
Measure the movable driven face I.D.
**Service Limit:** 34.06mm replace if below
Check the guide roller pins for stepped wear.
DRIVEN PULLEY FACE BEARING REPLACEMENT
Check the needle bearings in the driven face and replace them if they have excessive play, damage or abnormal noise. Drive the inner bearing out of the driven pulley face.

Remove the snap ring and drive the outer bearing out of the driven face.

Drive a new outer bearing into the driven face with the sealed end facing up. Seat the snap ring in its groove.

* Pack all bearing cavities with 5.0_ 5.6g grease.
  Specified grease: 230°C Heat-resistant grease
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Drive in a new needle bearing into the driven face with the mark facing up.

CLUTCH/DRIVEN PULLEY ASSEMBLY
First install the movable driven face onto the driven face. Then, install the guide roller pins, O-rings and a new oil seal.

Install the seal collar.
8. KICK STARTER/DRIVE PULLEY/CLUTCH/DRIVEN PULLEY

Set the driven pulley, driven face spring and clutch assembly onto the clutch spring compressor. Compress the tool and install the 28mm drive plate nut. Tighten the 28mm nut to the specified torque.

**Torque:** 5.0_ 6.0kg-m

CLAUH/DRIVEN PULLEY INSTALLATION

Install the drive belt on the clutch/driven pulley and then install the clutch/driven pulley onto the drive shaft.

Install the clutch outer. Hold the clutch outer with the universal holder. Install and tighten the 10mm clutch outer nut.

**Torque:** 3.5_ 4.5kg-m

Install the left crankcase cover. (⇐8-7)
9. FINAL REDUCTION

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FINAL REDUCTION DISASSEMBLY........................................... 9-3
FINAL REDUCTION INSPECTION.............................................. 9-3
FINAL REDUCTION ASSEMBLY............................................... 9-6
9. FINAL REDUCTION
SERVICE INFORMATION

Specified Oil: SAE90#
At disassembly: 0.12 liter
At change: 0.1 liter

SPECIAL TOOLS

Bearing remover set, 12mm
Bearing remover set, 15mm
Crankcase assembly collar
Crankcase assembly shaft
Bearing outer driver, 37x40mm
Bearing outer driver, 32x35mm
Bearing driver pilot, 17mm
Bearing driver pilot, 15mm
Bearing driver pilot, 12mm
Bearing outer driver handle A

TROUBLESHOOTING

Engine starts but motorcycle won't move
   Damaged transmission
   Seized or burnt transmission

Abnormal noise
   Worn, seized or chipped gears
   Worn bearing

Oil leaks
   Oil level too high
   Worn or damaged oil seal
9. FINAL REDUCTION

FINAL REDUCTION DISASSEMBLY

Remove the rear wheel. (⇒ 14-3)
Remove the left crankcase cover. (⇒ 8-4)
Remove the clutch/driven pulley. (⇒ 8-15)
Drain the transmission gear oil into a clean container.
Remove the transmission case cover attaching bolts.
Remove the transmission case cover.
Remove the gasket and dowel pins.

Remove the final gear and countershaft.

FINAL REDUCTION INSPECTION

Inspect the countershaft and gear for wear or damage.
Inspect the final gear and final shaft for wear, damage or seizure.

Check the left crankcase bearings for excessive play and inspect the oil seal for wear or damage.

Inspect the drive shaft and gear for wear or damage. Check the transmission case cover bearings for excessive play and inspect the final shaft bearing oil seal for wear or damage.

* Do not remove the transmission case cover except for necessary part replacement. When replacing the drive shaft, also replace the bearing and oil seal.
9. FINAL REDUCTION

**BEARING REPLACEMENT**
*(Transmission Case Cover)*
Remove the transmission case cover bearings using the bearing remover. Remove the final shaft oil seal.

Drive new bearings into the transmission case cover.

**BEARING REPLACEMENT (Left Crankcase Cover)**
Remove the drive shaft. Remove the drive shaft oil seal. Remove the left crankcase bearings using the bearing remover.
9. FINAL REDUCTION

Drive new bearings into the left crankcase. Install a new drive shaft oil seal.

FINAL REDUCTION ASSEMBLY
Install the drive shaft into the left crankcase.

Install the final gear and final shaft into the left crankcase.
9. FINAL REDUCTION

Install the countershaft and gear into the left crankcase.
Install the resin washer onto the countershaft.
Install the dowel pins and a new gasket.

Install the transmission case cover.

Install and tighten the transmission case cover bolts.
Install the clutch/driven pulley. (⇒8-20)
Install other removed parts in the reverse order of removal.
After installation, fill the transmission case with the specified oil.

* Place the motorcycle on its main stand on level ground.
Check the sealing washer for wear or damage.

**Specified Gear Oil:** SAE90#

**Oil Capacity:**
- **at disassembly:** 0.12 liter
- **at change:** 0.09 liter

Install and tighten the oil check bolt.

**Torque:** 1.0 1.5kg-m

Start the engine and check for oil leaks.
Check the oil level from the oil check bolt hole and add the specified oil to the proper level if the oil level is low.
Torque: 0.8 \text{ kg-m}
SERVICE INFORMATION

GENERAL INSTRUCTIONS

This section covers crankcase separation to service the crankshaft.
The following parts must be removed before separating the crankcase.
Engine (⇒ Section 5) Driven pulley (⇒ Section 9)
Carburetor (⇒ Section 11) A.C. generator (⇒ Section 7)
Oil pump (⇒ Section 4) Cylinder head/cylinder (⇒ Section 6)
Reed valve (⇒ Section 11)

When the left crankcase must be replaced, remove the following part in addition to the above.
Final reduction removal

Special tools must be used for crankshaft and crankcase assembly. When separating the
crankcase, the bearing will remain in the crankcase and it should be removed. When, assembling,
drive a new bearing into the crankcase and install a new oil seal.

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
<th>Service Limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting rod big end side clearance</td>
<td>—</td>
<td>0.60</td>
</tr>
<tr>
<td>Connecting rod big end radial clearance</td>
<td>—</td>
<td>0.04</td>
</tr>
<tr>
<td>Crankshaft runout A/B</td>
<td>—</td>
<td>0.15/0.10</td>
</tr>
</tbody>
</table>

SPECIAL TOOLS

Crankcase puller Bearing outer driver handle A
Universal bearing puller Bearing outer driver, 42x47mm
Crankcase assembly collar Bearing driver pilot, 20mm
Crankcase assembly tool Bearing outer driver, 37x40mm
Bearing driver pilot, 17mm

TROUBLESHOOTING

Abnormal engine noise

Excessive crank journal bearing play
Excessive crankpin bearing play
Excessive transmission bearing play
10. CRANKCASE/CRANKSHAFT

CRANKCASE SEPARATION
Remove the crankcase attaching bolts.

Attach the crankcase puller on the right crankcase and remove the right crankcase from the left crankcase.

CRANKSHAFT REMOVAL
Attach the crankcase puller on the left crankcase and remove the crankshaft from the left crankcase.

* When removing the crankshaft, do it slowly and gently.
Remove the remaining bearing on the crankshaft side using the universal bearing puller.

* When separating the crankcase, the oil seals must be removed. Replace the oil seals with new ones.

CRANKSHAFT INSPECTION

Measure the connecting rod big end side clearance.

Service Limit: 0.6mm replace if over

Measure the connecting rod big end radial clearance at two points in the X and Y directions.

Service Limit: 0.04mm replace if over
Measure the crankshaft runout.

<table>
<thead>
<tr>
<th>Service Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>0.150mm</td>
</tr>
<tr>
<td>replace if over</td>
</tr>
</tbody>
</table>

Check the crankshaft bearings for excessive play. The bearings must be replaced if they are noisy or have excessive play.

**CRANKSHAFT INSTALLATION**

Wash the crankshaft in cleaning solvent and then check for cracks or other faults.

* After check, apply clean engine oil to all moving and sliding parts.
Remove all gasket material from the crankcase mating surfaces. Dress any roughness or irregularities with an oil stone.
10. CRANKCASE/CRANKSHAFT

Drive a new crankshaft bearing into the right crankcase.

Drive a new crankshaft bearing into the left crankcase.

Install the crankshaft into the left crankcase.

* Apply KYMCO ULTRA motor oil or molybdenum disulfide to the crankshaft bearings and connecting rod big end.
* Apply grease to the lip of the oil seal and then install it.
10. CRANKCASE/CRANKSHAFT

CRANKCASE ASSEMBLY

Install the dowel pins and a new gasket to the crankcase mating surface.

Assemble the crankcase halves.

The distance between the right crankcase oil seal and crankcase surface is about 12.5±0.5 mm.

* When installing the oil seal, be careful to press it with even force.
The distance between the left crankcase oil seal and crankcase surface is about 1.0mm.

Install and tighten the crankcase attaching bolts.

* After assembly, check the crankshaft for smooth operation.
11. CARBURETOR

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THROTTLE VALVE INSTALLATION ........................... 11-4
CARBURETOR REMOVAL ........................................ 11-5
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11. CARBURETOR
11. CARBURETOR

SERVICE INFORMATION

GENERAL INSTRUCTIONS

✧ When working with gasoline, keep away from sparks and flames.
✧ Note the locations of O-rings when disassembling and replace them with new ones during assembly.
✧ All cables, fuel lines and wires must be routed and secured at correct locations.
✧ Bleed air from the oil lines whenever they are disconnected.

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>BA10AB.AC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venturi dia.</td>
<td>14mm</td>
</tr>
<tr>
<td>Identification number</td>
<td>PB058 A</td>
</tr>
<tr>
<td>Float level</td>
<td>8.6mm</td>
</tr>
<tr>
<td>Main jet</td>
<td>#85</td>
</tr>
<tr>
<td>Slow jet</td>
<td>#35</td>
</tr>
<tr>
<td>Air screw opening</td>
<td>1° ± Ω</td>
</tr>
<tr>
<td>Idle speed</td>
<td>2000±100rpm</td>
</tr>
<tr>
<td>Throttle grip free play</td>
<td>2_ 6mm</td>
</tr>
</tbody>
</table>

SPECIAL TOOL

Float level gauge

TROUBLESHOOTING

Engine does not start                  Lean mixture                                    Rich mixture
No fuel in tank                         Clogged fuel jets                            Faulty float valve
Too much fuel getting to cylinder      Clogged fuel cap vent                          Float level too low
Clogged fuel filter                    Clogged fuel filter                            Clogged air cleaner
Clogged air cleaner                    Bent, kinked or restricted fuel line

Engine idles roughly, stalls or runs poorly
Incorrect idle speed                   Clogged air cleaner                            Faulty float valve
Ignition malfunction                   Intake air leaks                                Float level too high
Compression too low                    Fuel contaminated                               Clogged air jets
Incorrectly adjusted air screw         Faulty reed valve                               
Incorrect float level                  Clogged fuel jets
11. CARBURETOR

THROTTLE VALVE DIS-ASSEMBLY

Remove the rear carrier. (⇒ 12-5)
Remove the met-in box. (⇒ 12-4)
Loosen the carburetor cap and remove the throttle valve.

Disconnect the throttle cable from the throttle valve.

Remove the throttle valve spring, carburetor cap and rubber seal.
11. CARBURETOR

Remove the jet needle by removing the needle clip.
Check the jet needle and throttle valve for wear or damage.

THROTTLE VALVE INSTALLATION

Install the jet needle on the throttle valve and secure with the needle clip.

Install the rubber seal on the throttle cable and then install the carburetor cap and throttle valve spring.

Connect the throttle cable to the throttle valve.
11. CARBURETOR

Install the throttle valve by aligning the groove in the throttle valve with the throttle stop screw.

Tighten the carburetor cap.
After installation, perform the following adjustments and inspections.
Throttle cable free play (⇒ 3-12)
Idle speed adjustment (⇒ 3-11)
Install the met-in box.

CARBURETOR REMOVAL
Remove the met-in box. (⇒ 12-4)
Remove the air cleaner by removing the air cleaner band screw and attaching bolts.
Disconnect the fuel tube.
Loosen the drain bolt to drain fuel from the carburetor.
Disconnect the auto bystarter wire connector.
Remove the two carburetor lock nuts.
11. CARBURETOR

Remove the carburetor.

AUTO BYSTARTER
AUTO BYSTARTER INSPECTION

Measure the resistance between the auto bystarter wire terminals.

Resistance: 5Ω (10 minutes minimum after stopping the engine)

If the resistance exceeds 5Ω, replace the auto bystarter with a new one.

After the engine stops for 30 minutes, connect a hose to the fuel enriching circuit and blow the hose with mouth.
If air cannot be blown into the hose (clogged), the auto bystarter is faulty. Replace it with a new one.
11. CARBURETOR

Connect the auto bystarter yellow wire to the battery positive (+) terminal and green/black wire to the battery negative (-) terminal and wait 5 minutes. Connect a hose to the fuel enriching circuit and blow the hose with mouth. If air can be blown into the hose, the auto bystarter is faulty and replace it with a new one.

AUTO BYSTARTER REMOVAL

Remove the auto bystarter cover.
Remove the two auto bystarter set plate screws to remove the auto bystarter.

Check the auto bystarter valve and needle for wear or damage.
Check the O-ring for wear or damage.
11. CARBURETOR

AUTO BYSTARTER INSTALLATION
Install the auto bystarter into the carburetor body until it bottoms.
Install the set plate and then tighten the two screws.

FLOAT CHAMBER
Remove the two float chamber screws and the float chamber.

Remove the screw and O-ring.
Remove the float pin, float and float valve.
11. CARBURETOR

FLOAT/FLOAT VALVE INSPECTION
Inspect the float for damage or fuel inside the float.
Check the float valve seat for wear or damage.

JETS/SCREWS REMOVAL
Before removing the throttle stop screw or air screw, record the number of rotations until it seats lightly. Then, remove them.

* Do not force the air screw against its seat to prevent damage.

Remove the main jet and needle jet holder.

CARBURETOR PASSAGES CLEANING
Blow compressed air through all passages of the carburetor body with an air gun.
FLOAT CHAMBER ASSEMBLY
Install the main jet and needle jet holder. Install the air screw and throttle stop screw according to the rotations recorded.

* If the air screw must be replaced, be sure to perform the air screw adjustment again.

Install the float valve, float and float pin. Tighten the float screw securely.

FLOAT LEVEL INSPECTION
Slightly tilt the carburetor and measure the float level with the float valve just connecting the float arm.

**Float Level:** 8.6mm
Replace the float if the level is out of the specified level range.
Install the O-ring.
Check the operation of the float and install the float chamber.
Tighten the screws.
CARBURETOR INSTALLATION

* When installation, do not allow foreign particles to enter the carburetor.

Check the carburetor insulator and O-ring for wear or damage.
Install the carburetor and insulator onto the intake manifold and tighten the two lock nuts.
Connect the fuel tube and auto bystarter wire connector.

* Route the auto bystarter wire correctly and properly.

Install the carburetor cap. (⇒ 11-4)
Install the air cleaner onto the carburetor and tighten the band screw.
Install the met-in box. (⇒ 12-4)

AIR SCREW ADJUSTMENT

Remove the met-in box. (⇒ 12-4)

* Warm up the engine before air screw adjustment.

Turn the air screw clockwise until it seats lightly and back it to the specification given.

Air Screw Opening:
BA10AB.AC.50: 1° ± Ω turns

Start the engine and turn the air screw in or out slowly to obtain the highest engine speed.

* Do not force the air screw against its seat to prevent damage.

Turn the throttle stop screw to obtain the specified idle speed.

Idle Speed:
BA10AB.AC.50 : 2000±100rpm

Slightly increase the engine speed and make sure that the engine does not miss or run erratic.
If the adjustment of the air screw within the range of ±Ω turn makes no difference to the engine performance, check other related items.

When installation, do not allow foreign particles to enter the carburetor.
Route the auto bystarter wire correctly and properly.
Install the carburetor cap. (⇒ 11-4)
Install the air cleaner onto the carburetor and tighten the band screw.
Install the met-in box. (⇒ 12-4)
11. CARBURETOR

REED VALVE

REMOVAL
Remove the rear carrier.
Remove the frame body cover.
Remove the four intake manifold bolts and gasket.
Remove the reed valve and gasket.

INSPECTION
Check the reed valve for damaged or weak reeds.
Check the reed valve seat for cracks, damage or clearance between the seat and reed.
Replace the valve if necessary.

* Do not disassemble or bend the reed stopper. To do so can cause loss of engine power and engine damage. If any of the stopper, reed or valve seat is faulty, replace them as a unit.

INSTALLATION
Install the reed valve in the reverse order of removal.

* Install a new gasket with the gasket indentation aligned with the reed valve.
  After installation, check for intake air leaks.
11. CARBURETOR

FUEL TANK

REMOVAL
Remove the met-in box. (➾ 12-4)
Remove the frame body cover. (➾ 12-5)
Remove the rear carrier. (➾ 12-5)
Disconnect the fuel tube and vacuum tube at the auto fuel valve.
Disconnect the fuel unit wire connector.
Remove the fuel tank mounting bolts and fuel tank.
Inspect the fuel unit. (➾ 16-2)
Replace the fuel unit if necessary. (➾ 16-2)
12. FRAME COVERS

FRAME COVERS

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12. FRAME COVERS

SERVICE INFORMATION

When removing frame covers, use care not to pull them by force because the cover joint claws may be damaged.

Items Related for Removal

Handlebar front cover — Headlight wire
Front cover —
Handlebar rear cover — Speedometer cable and instrument light wire connectors, etc.
Frame body cover — Met-in box, rear carrier, rear fender.
Floor board — frame body cover.
Front tool box — Front cover, battery, floor board.
12. FRAME COVERS

FRAME COVERS REMOVAL

FRONT COVER REMOVAL
Remove the screw the front cover.
Remove the two screws on the back of the front cover.
Push the two inside claws of the downside front cover to float the front cover.
Remove the front cover downward.
The installation sequence is the reverse of removal.

* During removal, be careful not to pull the joint claws forcibly.

HANDLEBAR FRONT/REAR COVER REMOVAL
First remove the one screws attaching the handlebar front cover.
Remove the handlebar front cover.
Disconnect the headlight wire connector.
Remove the handlebar rear cover:
Remove the four screws and bolt attaching the handlebar rear cover.
Disconnect the speedometer cable and instrument light wire connectors.
Remove the handlebar rear cover.
The installation sequence is the reverse of removal.
12. FRAME COVERS

FLOOR BOARD REMOVAL
Remove the rear carrier. (⇒ 12-5)
Remove the frame body cover. (⇒ 12-6)
Remove the front cover. (⇒ 12-3)
Remove the four bolts attaching and six screws the floor board to remove the floor board. The installation sequence is the reverse of removal.

FRONT TOOL BOX REMOVAL
Remove the rear carrier. (⇒ 12-5)
Remove the frame body cover. (⇒ 12-6)
Remove the floor board. (⇒ 12-4)
Open the front tool box and remove the battery.
Remove the switch covers.
Remove the nut attaching and six screws the front tool box.
Remove the front tool box.
The installation sequence is the reverse of removal.

* When removing the battery, first disconnect the battery negative (-) cable and then the positive (+) cable. When taking the front tool box, pull them up and backward from downside not to damage the claws.

BOTTOM COVER REMOVAL
Remove the flood board. (⇒ 12-4)
Remove the three screws each side of the bottom cover.
Remove the bolt attaching the side stand.
Remove the bottom cover.
The installation sequence is the reverse of removal.
12. FRAME COVERS

MET-IN BOX REMOVAL:
Open the seat.
Remove the two bolts, two nuts attaching the met-in box.
Remove the oil tank cap, rubber packing and fuel tank cap.
Remove the met-in box.
The installation sequence is the reverse of removal.

REAR CARRIER REMOVAL
Remove the three bolts attaching the rear carrier.
Remove the rear carrier.
The installation sequence is the reverse of removal.

REAR FENDER REMOVAL
Remove the two screws the rear fender.
Remove the rear fender.
The installation sequence is the reverse of removal.
12. FRAME COVERS

FRAME BODY COVER REMOVAL
Remove the rear carrier. (☞ 12-5)
Remove the rear fender. (☞ 12-5)
Remove the met-in box. (☞ 12-4)
Remove the rear brake cable.
Remove the bolt attaching the front center cover of the frame body cover.
Remove the frame body cover.
The installation sequence is the reverse of removal.

FRONT FENDER REMOVAL
Remove the floor board. (☞ 12-4)
Remove the front tool box. (☞ 12-4)
Remove the handlebar. (☞ 13-3)
Remove the front fork. (☞ 13-19)
Remove two bolts attaching each side of the front fender.
Remove the front fender.
The installation sequence is the reverse of removal.

FRONT LOWER COVERS REMOVAL
Remove the rear brake cable.
Remove the frame body cover. (☞ 12-5)
Remove the front tool box. (☞ 12-4)
Remove the handlebar. (☞ 13-3)
Remove the front fork. (☞ 13-19)
First remove the front cover. (☞ 12-3)
Remove the right and left bottom cover removing the two screws for each rail.
Remove the two bolts attaching each of the right and left front lower covers.
Remove the front lower covers.
The installation sequence is the reverse of removal.
STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

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SERVICE INFORMATION

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
<th>Service Limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle shaft runout</td>
<td>—</td>
<td>0.2</td>
</tr>
<tr>
<td>Front wheel rim runout</td>
<td>Radial</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Axial</td>
<td>2.0</td>
</tr>
<tr>
<td>Front shock absorber spring free length</td>
<td>200</td>
<td>182.8</td>
</tr>
<tr>
<td>Brake disk thickness</td>
<td>35_</td>
<td>3.0</td>
</tr>
<tr>
<td>Brake disk runout</td>
<td>—</td>
<td>0.30</td>
</tr>
<tr>
<td>Brake master cylinder I.D.</td>
<td>12.700_</td>
<td>12.743</td>
</tr>
<tr>
<td>Brake master cylinder piston O.D.</td>
<td>12.657_</td>
<td>12.684</td>
</tr>
<tr>
<td>Brake caliper piston O.D.</td>
<td>25.400_</td>
<td>25.405</td>
</tr>
<tr>
<td>Brake caliper piston I.D.</td>
<td>25.318_</td>
<td>25.368</td>
</tr>
</tbody>
</table>

TORQUE VALUES

- Handlebar lock nut 4.0_ 5.0kg-m
- Steering stem lock nut 8.0_ 12.0kg-m
- Steering top cone race 0.5_ 1.3kg-m
- Front damper nut 1.5_ 3.0kg-m
- Front axle nut 5.0_ 7.0kg-m
- Brake arm bolt 0.4_ 0.7kg-m

SPECIAL TOOLS

- Lock nut wrench
- Lock nut socket wrench
- Outer driver, 37x40mm
- Outer driver, 28x30mm
- Pilot, 10mm
- Rear shock absorber remover
- Bearing puller
- Rear shock absorber compressor
- Snap ring pliers (close)
- Ball race remover
- Damper compressor

TROUBLESHOOTING

**Hard steering (heavy)**
- Excessively tightened steering stem top cone race
- Broken steering balls
- Insufficient tire pressure

**Steers to one side or does not track straight**
- Broken clutch weight spring
- Bent front fork
- Bent front axle or uneven tire

**Poor brake performance**
- Incorrectly adjusted brake
- Worn brake linings
- Contaminated brake lining surface
- Worn brake cam
- Worn brake drum
- Poorly connected brake arm

**Poor brake performance (disk brake)**
- Air in brake system
- Deteriorated brake fluid
- Contaminated brake disk or disk pad
- Worn brake bushing
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake caliper

**Front wheel wobbling**
- Bent rim
- Loose front axle
- Bent spoke plate
- Faulty tire
- Improperly tightened axle nut

**Soft front shock absorber**
- Weak shock springs
- Insufficient damper oil

**Front shock absorber noise**
- Slider bending
- Loose fork fasteners
- Lack of lubrication
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

STEERING HANDLEBAR

REMOVAL
Remove the handlebar front and rear covers. (⇒ 12-3)
Remove two bolts attaching the left brake lever holder.
Remove two bolts attaching the brake master cylinder (disk brake) to the right brake lever.

Remove the two right handlebar switch housing bolts and separate the housing.
Disconnect the throttle cable and then remove the throttle pipe from the handlebar.

Remove the handlebar lock nut to remove the handlebar.
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

**INSTALLATION**

Install the handlebar, aligning the tabs of the handlebar with the grooves in the steering stem. Install and tighten the handlebar lock nut.

**Torque:** 4.5 - 5.0kg-m

Lubricate the throttle pipe front end with grease.

Install the throttle grip and connect the throttle cable.

The installation sequence is the reverse of removal.

Install the rear brake lever holder.

Install the front brake master cylinder (disk brake).
FRONT WHEEL

REMOVAL
(DISK BRAKE)
Jack the motorcycle front wheel off the ground.
Remove the speedometer cable set screw and disconnect the speedometer cable.
Remove the front axle nut and pull out the axle.
Remove the front wheel.
Remove the brake panel side collar.

INSPECTION
Set the axle in V blocks and measure the runout.
The actual runout is _ of the total indicator reading.
Service Limit: 0.2mm replace if over.

Check the wheel rim runout.
Service Limits:
Radial: 2.0mm replace if over
Axial: 2.0mm replace if over
Turn the wheel bearings and replace them if they have excessive play or noise.

**DISASSEMBLY**

Remove the dust seal.

Remove the wheel bearings and distance collar.

---

**Radial Play**

**Axial Play**
ASSEMBLY

Pack all bearing cavities with grease.
Drive in the left bearing.
Install the distance collar.
Drive in the right bearing.

* Drive the bearing squarely with the sealed end facing out.

Apply grease to the dust seal lip and install the dust seal.
Install the side collar.
13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/FRONT FORK

FRONT WHEEL INSTALLATION
(Disk Brake)
Install the front wheel, aligning the speedometer gear tab with the front fork groove.
Connect the speedometer cable.
**Torque: 5.0 - 7.0kg-m**

HYDRAULIC BRAKE (FRONT BRAKE)
Brake Fluid Replacement/Air Bleeding
Check the brake fluid level on level ground.

<table>
<thead>
<tr>
<th>When operating the brake lever, the brake reservoir cap must be tightened securely to avoid spill of brake fluid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage caused by spill of brake fluid.</td>
</tr>
</tbody>
</table>

Brake Fluid Bleeding
In order to avoid spill of brake fluid, connect a transparent hose to the bleed valve.

**Warning**

| Brake fluid spilled on brake pads or brake disk will reduce the braking effect. |
| Clean the brake pads and brake disk with a high quality brake degreaser. |

Fully apply the brake lever and then loosen the brake caliper bleed valve to drain the brake fluid until there is no air bubbles in the brake fluid. Then, tighten the bleed valve. Repeat these steps until the brake system is free of air.

Brake Fluid Refilling
Add DOT-3 brake fluid to the brake reservoir.

| When bleeding, be careful not to allow air in the brake reservoir flowing into the brake system. |
| When using a brake bleeder, follow the manufacturer's instructions. |
| Never use dirty or unspecified brake fluid or mix different brake fluids because it will damage the brake system. |

Make sure to bleed air from the brake system.
13. STEERING HANDLEBAR/Front Wheel/FRONT BRAKE/Front Shock Absorber/Front Fork

Brake Pad/Disk Replacement

* The brake pads must be replaced as a set to ensure the balance of the brake disk.

Remove the two bolts attaching the brake caliper.
Remove the brake caliper.
Remove the brake pads.

Install the brake pads in the reverse order of removal.
Torque: 1.5_ 2.0kg-m

* Keep grease or oil off the brake pads to avoid brake failure.

Brake Disk
Measure the brake disk thickness.
Service Limit: 3.0mm
Measure the brake disk runout.
Service Limit: 0.3mm
BRAKE MASTER CYLINDER

Removal
First drain the brake fluid from the hydraulic brake system.

* When servicing the brake system, use shop towels to cover rubber and plastic parts and coated surfaces to avoid being contaminated by brake fluid.
When removing the brake fluid pipe bolt, be sure to plug the pipe to avoid brake fluid leakage.

Disassembly
Remove the piston rubber cover and snap ring from the brake master cylinder.

Remove the washer, main piston and spring from the brake master cylinder. Clean the inside of the master cylinder and brake reservoir with brake fluid.
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

Inspection
Measure the brake master cylinder I.D.
**Service Limit**: 12.75mm
Inspect the master cylinder for scratch or crack.

Measure the brake master cylinder piston O.D.
**Service Limit**: 12.6mm
Before assembly, inspect the 1st and 2nd rubber cups for wear.

Assembly
Before assembly, apply brake fluid to all removed parts.
Install the spring together with the 1st rubber cup.

*During assembly, the main piston and spring must be installed as a unit without exchange.
When assembling the piston, soak the cups in brake fluid for a while.
Install the cups with the cup lips facing the correct direction.*

Install the main piston, spring and snap ring.
Install the rubber cover.
Install the brake lever.
13. STEERING HANDLEBAR/FRONT WHEEL/FRONT BRAKE/FRONT SHOCK ABSORBER/Front FORK

Place the brake master cylinder on the handlebar and install the holder with “up” mark facing up. Be sure to align the punch mark with the holder joint. First tighten the upper bolt and then tighten the lower bolt.

**Torque**: 1.0  1.4kg-m

Install the brake fluid pipe with the attaching bolt and two sealing washers.

Install the handlebar covers. (⇨ 12-3)
Fill the brake reservoir with recommended brake fluid to the upper limit and bleed air according to the method stated in 13-12.

**BRAKE CALIPER (FRONT)**

**Removal**
Remove the brake caliper. (⇨ 13-13)
Place a clean container under the brake caliper and disconnect the brake fluid pipe from the caliper.

*Do not spill brake fluid on any coated surfaces.*
Disassembly
Remove the brake caliper seat from the brake caliper.

Remove the piston from the brake caliper. If necessary, use compressed air to squeeze out the piston through the brake fluid inlet opening and place a shop towel under the caliper to avoid contamination caused by the removed piston. Check the piston cylinder for scratch or wear and replace if necessary.

Push the piston oil seal outward to remove it. Clean the oil seal groove with brake fluid.

* Be careful not to damage the piston surface.
Check the piston for scratch or wear. Measure the piston O.D. with a micrometer.  
**Service Limit: 25.45mm**

Check the caliper cylinder for scratch or wear and measure the cylinder bore.  
**Service Limit: 25.30mm**

**Assembly**

Clean all removed parts.  
Apply silicon grease to the piston and oil seal. Lubricate the brake caliper cylinder inside wall with brake fluid. 
Install the brake caliper piston with grooved side facing out. 

* Install the piston with its outer end 5mm protruding beyond the brake caliper.  

Wipe off excessive brake fluid with a clean shop towel. Apply silicon grease to the brake caliper seat pin and caliper inside. 
Install the brake caliper seat.
Installation
Install the brake caliper and tighten the two bolts.
**Torque:** 2.9 3.5kg-m

Connect the brake fluid pipe to the brake caliper and tighten the fluid pipe bolt.
**Torque:** 3.0 4.0kg-m
Fill the brake reservoir with recommended brake fluid and bleed air from the brake system. (⇒13-12)
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

**Front Shock Absorber Removal**
Remove the front wheel. (⇒ 13-5)
Remove the front fender. (⇒ 12-6)
Remove the front shock absorber upper mount bolts.
Loosen the lower mount bolts to remove the front shock absorbers.

**Left Front Shock Absorber Disassembly**
Remove the dust boot.
Remove the circlip.

Use a vise to hold the front shock absorber and remove the shock absorber tube, hex bolt and copper washer from the front shock absorber.
Use a vise to hold the front shock absorber tube and remove the damper from the shock absorber tube.

* When holding the shock absorber tube, place a shop towel under it and do not apply too much force.

Measure the front shock absorber spring free length.
**Service Limit:** Right : 200mm
Left : 200mm
Install the damping spring to the damper and then install them into the front shock absorber tube. Install the front shock absorber spring and tighten the damper nut.

* Install the front shock absorber spring with the loosely wound coils facing up.

Use a vise to hold the front shock absorber. Tighten the hex bolt. (Apply locking agent to the washer and socket hex bolt and install them together.)

**Torque:** 1.5 ± 3.0kg-m

**Specified Oil:** ss#8

**Oil Capacity:** 61cc

Install the circlip.
Install the dust boot.
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

INSTALLATION
Install the front shock absorbers onto the steering stem.
Install and tighten the front shock absorber upper mount bolts.
Tighten the lower mount bolts.
Install the front fender.
Install the front wheel. (⇒13-8)

FRONT FORK
REMOVAL
Remove the steering handlebar. (⇒13-3)
Disconnect the speedometer cable and front brake fluid pipe and remove the front brake caliper.
Remove the front wheel. (⇒13-5)
Hold the steering stem top cone race and remove the steering stem lock nut.

Remove the top cone race and remove the front fork.

* Be careful not to lose the steel balls (26 on top race and 19 on bottom race).

Inspect the ball races, cone races and steel balls for wear or damage. Replace if necessary.
13. STEERING HANDLEBAR/FRONT WHEEL/FRON T BRAKE/FRON T SHOCK ABSORBER/FRON T FORK

BOTTOM CONE RACE REPLACEMENT
Remove the bottom cone race using a chisel. Drive a new bottom cone race into place with a proper driver.

* Be careful not to damage the steering stem and front fork.

BALL RACE REPLACEMENT
Drive out the ball races.

Drive in new ball races.

* Be sure to drive the ball races into place completely.
13. STEERING HANDLEBAR/Front Wheel/Front Brake/Front Shock Absorber/Front Fork

INSTALLATION

Apply grease to top and bottom ball races and install 26 steel balls on the top ball race and 29 steel balls on the bottom ball race. Apply grease to the ball races again and then install the front fork.

Apply grease to the top cone race and install it. Tighten the top cone race and then turn the steering stem right and left several times to make steel balls contact each other closely.

* Check that the steering stem rotates freely without vertical play.

Install the steering stem lock nut and tighten it while holding the top cone race.

**Torque:** 8.0 12.0kg-m

Install the handlebar. (⇒ 13-4)
Install the speedometer cable.
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

- 2.7kg-m
- 1.2kg-m
- 4.0kg-m
- 2.5kg-m
- 0.6kg-m
- 11.0kg-m
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

SERVICE INFORMATION

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
<th>Service Limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear wheel rim runout</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Rear brake drum I.D.</td>
<td>110</td>
<td>111</td>
</tr>
<tr>
<td>Rear brake lining thickness</td>
<td>4.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Rear shock absorber spring free length</td>
<td>235.7</td>
<td>218.7</td>
</tr>
</tbody>
</table>

TORQUE VALUES

- Rear axle nut 11.0 F 13.0kg-m
- Rear shock absorber upper mount bolt 3.5 F 4.5kg-m
- Rear shock absorber lower mount bolt 2.4 F 3.0kg-m
- Rear shock absorber lower joint nut 3.5 F 4.5kg-m (apply locking agent)

SPECIAL TOOL

- Rear shock absorber remover
- Rear shock absorber compressor

TROUBLESHOOTING

Rear wheel wobbling
- Bent rim
- Faulty tire
- Axle not tightened properly

Soft rear shock absorber
- Weak shock absorber spring

Poor brake performance
- Brake not adjusted properly
- Contaminated brake linings
- Worn brake linings
- Worn brake shoes at cam contacting area
- Worn brake cam
- Improper engagement between brake arm and wear indicator plate
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

REAR WHEEL
REMOVAL
Remove the two exhaust muffler joint lock nuts.
Remove the two exhaust muffler lock bolts.
Remove the exhaust muffler.
Remove the rear axle nut to remove the rear wheel.

INSPECTION
Measure the rear wheel rim runout.
Service Limits:
Radial : 2.0mm replace if over
Axial : 2.0mm replace if over

INSTALLATION
Install the rear wheel and apply SAE30# engine oil to the axle threads. Then, tighten the rear axle nut.
Torque values:
Rear axle nut: 11.0  13.0kg-m
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

REAR BRAKE
Remove the rear wheel. (➔ 14-3) Inspect the rear brake drum. Measure the rear brake drum I.D.
Service Limit: 95.5mm replace if over

BRAKE LINING INSPECTION
Measure the brake lining thickness. Service Limit: 2.0mm replace if below

Keep oil or grease off the brake linings.

REAR BRAKE DISASSEMBLY
Remove the rear brake adjusting nut and disconnect the rear brake cable. Remove the rear brake shoes.
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

Remove the brake cam bolt to remove the brake arm, wear indicator plate and felt seal. Remove the brake arm.

REAR BRAKE ASSEMBLY
Apply grease to the anchor pin and brake shoe moving parts. Apply grease to the brake cam and install it.

Apply engine oil to the felt seal and install it to the brake cam.

*Install the wear indicator plate.
Align the wide tooth of the wear indicator plate with the wide groove on the brake cam.

*Install the brake arm onto the brake cam.
Align the punch mark on the brake arm with the scribed line on the brake cam.

Install and tighten the brake arm bolt. Install the brake arm return spring. Install the brake shoes.
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

Install the brake arm pin.
Connect the brake cable and install the adjusting nut.
Install the rear wheel. (⇒ 14-3)
Adjust the rear brake lever free play.
(⇒ 3-4)
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

REAR SHOCK ABSORBER REMOVAL
Remove the front cover. (➔ 12-6)
Remove the met-in box. (➔ 12-5)
Remove the air cleaner case. (➔ 5-2)
Remove the rear shock absorber upper and lower mount bolts to remove the rear shock absorber.

DISASSEMBLY
Install the rear shock absorber compressor as the figure shown.

* Install the rear shock absorber lower joint into the rear shock absorber compressor.

Compress the rear shock absorber spring.

Loosen the lower joint lock nut. Remove the lower joint. Remove the lock nut, rubber and damper.
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

INSPECTION
Inspect the damper rod for bending or damage.
Inspect the damper for oil leaks.
Inspect the damper rubber for deterioration or damage.

Measure the rear shock absorber spring free length.
**Service Limit:** 232mm replace if below

ASSEMBLY
Assemble the rear shock absorber in the reverse order of disassembly.

* Install the shock absorber spring with loosely wound coils facing down.
  Apply locking agent to the lock nut thread and then install and tighten the lock nut.

Tighten the lock nut.
**Torque:** 3.5 4.5kg-m
14. REAR WHEEL/REAR BRAKE/REAR SHOCK ABSORBER

INSTALLATION

Install the rear shock absorber.
Install the rear shock absorber upper mount bolt and then install the lower mount bolt.

Torque:
Upper Mount Bolt: 3.5_ 4.5kg-m
Lower Mount Bolt: 2.4_ 3.0kg-m

Install the frame body cover. (☞12-5)
15. ELECTRICAL EQUIPMENT

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BATTERY.............................................................................. 15-4
IGNITION SYSTEM................................................................. 15-7
STARTING SYSTEM................................................................. 15-11
15. ELECTRICAL EQUIPMENT

SERVICE INFORMATION

GENERAL INSTRUCTIONS

It is not necessary to check the battery electrolyte or fill with distilled water.
Remove the battery from the motorcycle for charging. Do not remove the electrolyte cap.
Do not quick charge the battery. Quick charging should only be done in an emergency.
Charge the battery according to the charging current and time specified on the battery.
When charging, check the voltage (open voltage) with an electric tester.
When replacing the battery, do not use a traditional battery.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Battery</th>
<th>Capacity</th>
<th>Voltage</th>
<th>Charging current</th>
<th>Spark plug (NGK)</th>
<th>Spark plug gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12V4AH</td>
<td>13.0V- 13.2V</td>
<td>0.4A/5H</td>
<td>BR8HSA</td>
<td>0.6-0.7mm</td>
</tr>
</tbody>
</table>

| Spark plug gap   | 0.6-0.7mm     |
| Ignition coil resistance | Primary coil | 0.2-0.3Ω       |
|                  | Secondary coil (with plug cap) | 7.0-8.4KΩ     |
|                  | Secondary coil (without plug cap) | 2.5-3.2KΩ     |
| Pulser coil resistance (20°C) | 80-160Ω       |
| Ignition timing  | 8-14 ±1.5 BTDC/2000rpm |

TROUBLESHOOTING

CHARGING SYSTEM

No power
Dead battery
Disconnected battery cable
Fuse burned out
Faulty ignition switch

Intermittent power
Loose battery cable connection
Loose charging system connection
Loose connection or short circuit in ignition system
Loose connection or short circuit in lighting system

Low power
Weak battery
Loose battery connection
Charging system failure
Faulty regulator/rectifier

Charging system failure
Loose, broken or shorted wire or connector
Faulty regulator/rectifier
Faulty A.C. generator
IGNITION SYSTEM

No spark at plug
- Faulty spark plug
- Poorly connected, broken or shorted wire
- Between A.C. generator and CDI unit
- Between CDI unit and ignition coil
- Between CDI unit and ignition switch
- Between ignition coil and spark plug
- Faulty ignition switch
- Faulty ignition coil
- Faulty CDI unit
- Faulty A.C. generator

Engine starts but turns poorly
- Ignition primary circuit
- Faulty ignition coil
- Poorly connected wire or connector
- Ignition secondary circuit
- Faulty ignition coil
- Faulty spark plug
- Poorly insulated plug cap
- Improper ignition timing
- Battery voltage too low (6V max.)
- Faulty CDI unit

STARTING SYSTEM

Starter motor won’t turn
- Fuse burned out
- Weak battery
- Faulty ignition switch
- Faulty starter switch
- Faulty front or rear stop switch
- Faulty starter relay
- Poorly connected, broken or shorted wire
- Faulty starter motor

Lack of power
- Weak battery
- Loose wire or connection
- Foreign matter stuck in starter motor or pinion

Starter motor rotates but engine does not start
- Faulty starter pinion
- Starter motor rotates reversely
- Faulty starter clutch
- Weak battery
BATTERY

BATTERY REMOVAL
Remove the front tool box cover.
Disconnect the battery cables.

* First disconnect the battery negative (-) cable and then the positive (+) cable.

Remove the bolt and battery bracket.
Remove the battery.
The installation sequence is the reverse of removal.

BATTERY CHARGING (OPEN CIRCUIT VOLTAGE) INSPECTION
Remove the battery cover and disconnect the battery cables.
Measure the voltage between the battery terminals.
Fully charged: 13.0V to 13.2V
Undercharged: 12.3V max.

* Battery charging inspection must be performed with an electric tester.

CHARGING METHOD
Connect the charger positive (+) cable to the battery positive (+) cable.
Connect the charger negative (-) cable to the battery negative (-) cable.

* Keep flames and sparks away from a charging battery.
  Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery.
  Charge the battery according to the current specified on the battery surface.

Charging current: Standard: 0.4A  Quick: 4A
Charging time: Standard: 5 hours  Quick: 0.5 HOUR
After charging: Open circuit voltage: 12.8V min.

* Quick charging should only be done in an emergency.
  During quick charging, the battery temperature should not exceed 45°C.
  Measure the voltage 30 minutes after the battery is charged.
PERFORMANCE TEST
Warm up the engine.
Remove the floor mat and front tool box cover.

* Use a fully charged battery to check the charging system output.

Stop the engine and open the fuse box. Disconnect the wire lead from the fuse terminal. Connect an ammeter between the wire lead and fuse terminal as shown. Connect the battery positive (+) terminal to the voltmeter positive (+) probe and battery negative (-) terminal to the voltmeter negative (-) probe. Start the engine, gradually increase engine speed to test the output:

<table>
<thead>
<tr>
<th>RPM</th>
<th>Position</th>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500</td>
<td></td>
<td>1.3A min.</td>
<td>1.0A min.</td>
</tr>
<tr>
<td>6000</td>
<td></td>
<td>2.0A min.</td>
<td>2.0A min.</td>
</tr>
</tbody>
</table>

**Charging Limit Voltage:** 14.5±0.5V/8000rpm
If the limit voltage is not within the specified range, check the regulator/rectifier.

A.C. GENERATOR (CHARGING COIL) INSPECTION

* Inspect with the engine installed.

Remove the met-in box. (⇒12-4) Disconnect the A.C. generator connector. Measure the resistances between the charging coil terminals (white-green) and lighting coil terminals (yellow-green).

**Resistances:**

<table>
<thead>
<tr>
<th></th>
<th>white-green</th>
<th>0.2Ω</th>
<th>1.2Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charging coil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting coil</td>
<td>yellow-green</td>
<td>0.3Ω</td>
<td>1.0Ω</td>
</tr>
</tbody>
</table>

Refer to 7-3 for A.C. generator removal.
15. ELECTRICAL EQUIPMENT

RESISTOR INSPECTION
Remove the frame front cover. (☞12-3)
Measure the resistance between the resistor
B pink wire and ground.
Measure the resistance between the resistor
A green/black wire and ground.

Resistances:
Resistor A: 9.9 12.0 2
Resistor B: 5.6 7.2 2

* Faulty resistor is the cause of faulty
operation of the auto bystarter.

REGULATOR/RECTIFIER INSPECTION
Remove the front cover. (☞12-3)
Disconnect the regulator/rectifier wire
coupler and remove the bolt to remove the
regulator/rectifier.

Measure the resistances between the
terminals.
Replace the regulator/rectifier if the readings
are not within the specifications in the table
below.

* Due to the semiconductor in circuit, it
is necessary to use a specified tester
for accurate testing. Use of an
improper tester in an improper range
may give false readings.
Use a Sanwa Electric Tester (07208-
0020000) or Kowa Electric Tester
(TH-5H). The proper range for
testing is listed below.

<table>
<thead>
<tr>
<th>Model</th>
<th>Brand</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP-10D</td>
<td>Sanwa</td>
<td>KΩ</td>
</tr>
<tr>
<td>TH-5H</td>
<td>Kowa</td>
<td>100Ω</td>
</tr>
</tbody>
</table>

Probe Test

<table>
<thead>
<tr>
<th>Prob</th>
<th>A (R)</th>
<th>B (W)</th>
<th>C (Y)</th>
<th>D (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (R)</td>
<td>20-35KΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B (W)</td>
<td>8-20KΩ</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
</tr>
<tr>
<td>C (Y)</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
<td></td>
</tr>
<tr>
<td>D (G)</td>
<td>∞</td>
<td>∞</td>
<td>∞</td>
<td>6.5-35KΩ</td>
</tr>
</tbody>
</table>
IGNITION COIL INSPECTION
Continuity Test

This test is to inspect the continuity of ignition coil.

Remove the met-in box. (⇒ 12-4)
Measure the resistance between the ignition coil primary coil terminals.
**Resistance** (20°C): 0.153_ 0.187Ω

Measure the secondary coil resistance between the spark plug cap and the primary coil terminal as Figure A shown.
**Resistance** (20°C) (with plug cap):
7.0_ 8.4KΩ

Measure the secondary coil resistance between the ignition coil terminal and the primary coil terminal as Figure B shown.
**Resistance** (20°C) (without plug cap):
2.5_ 3.2KΩ
Performance Test
Remove the ignition coil.

Inspect the ignition coil with an ignition coil tester.

- Follow the ignition coil tester manufacturer's instructions.

1. Turn the changeover switch to 12V and connect the ignition coil to the tester.
2. Turn the power switch ON and check the spark from the watch window.
   - Good: Normal and continuous spark
   - Faulty: Weak or intermittent spark

* The test is performed at both conditions that the ignition coil is cold and hot.

A.C. GENERATOR

Exciter Coil/Pulser Coil Inspection

- This test is performed with the stator installed in the engine.

Remove the met-in box. (⇒ 12-4)
Disconnect the A.C. generator wire connector.
Measure the pulser coil resistance between the blue/yellow wire and ground.

Resistance (20°C): 100_150Ω
15. ELECTRICAL EQUIPMENT

CDI UNIT INSPECTION
Remove the battery cover.
Disconnect the CDI coupler and remove the CDI unit.

CDI CIRCUIT INSPECTION
Measure the resistance between the terminals.
Replace the CDI unit if the readings are not within the specifications in the table below.

* Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
Use a Sanwa Electric Tester or Kowa Electric Tester (TH-5H).
In this table, “Needle swings then returns” indicates that there is a charging current applied to a condenser. The needle will then remain at “∞” unless the condenser is discharged.

Use the x KΩ range for the Sanwa Tester.
Use the x 100Ω range for the Kowa Tester.

<table>
<thead>
<tr>
<th>Unit: KΩ</th>
<th>Black</th>
<th>Blue/Yellow</th>
<th>Green</th>
<th>Black/Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe (–)Probe</td>
<td>Black</td>
<td>Blue/Yellow</td>
<td>Green</td>
<td>Black/Yellow</td>
</tr>
<tr>
<td>Black</td>
<td>∞</td>
<td>13～16</td>
<td>∞</td>
<td></td>
</tr>
<tr>
<td>Blue/Yellow</td>
<td>33～40</td>
<td>18～22</td>
<td>∞</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>8～10</td>
<td>∞</td>
<td>∞</td>
<td></td>
</tr>
<tr>
<td>Black/Yellow</td>
<td>14～17</td>
<td>2.5～3.0</td>
<td>∞</td>
<td></td>
</tr>
</tbody>
</table>
15. ELECTRICAL EQUIPMENT

STARTER RELAY INSPECTION
Remove the front cover.
Disconnect the starter relay coupler and then remove the starter relay.

Connect the starter relay green/yellow terminal to the 12V battery positive (+) terminal and the relay yellow/red terminal to the battery negative (-) terminal. Check for continuity between the starter relay red and red/white terminals. The relay is normal if there is continuity.

STARTER MOTOR REMOVAL
Disconnect the starter motor cable. Remove the two bolts attaching the starter motor and remove the starter motor. The installation sequence is the reverse of removal.
15. ELECTRICAL EQUIPMENT

STARTER MOTOR INSPECTION
Connect a battery across the starter motor and check for its operation.

* 1. Do not turn the starter motor for a long time.
   2. This inspection should be done with a fully charged battery.
16. INSTRUMENT/SWITCHES/LIGHTS

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TROUBLESHOOTING .............................................................. 16-1
FUEL UNIT ............................................................................. 16-2
OIL METER ............................................................................. 16-3
SWITCHES ............................................................................. 16-5
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BULB REPLACEMENT .............................................................. 16-7
INSTRUMENT/HEADLIGHT ...................................................... 16-8
SERVICE INFORMATION

GENERAL INSTRUCTIONS

Wires should be connected to other wires of the same color. Couplers must be connected to other couplers of the same color.
All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
After installation of each switch, a continuity check must be performed.

TROUBLESHOOTING

Lights do not come on when ignition switch is “ON”
Burned bulb
Faulty switch
Broken or shorted wire
Fuse burned out
Weak battery
Poorly connected wire
Faulty winker

Motor oil indicator light does not come on (when motor oil is insufficient)
Fuse burned out
Dead battery
Faulty ignition switch
Faulty instrument
Faulty oil meter

Motor oil indicator light winks
Loose wire connection
Broken wire
Faulty oil meter

Fuel gauge pointer does not register correctly
Disconnected wire or connector
Broken wire
Faulty float
Faulty fuel unit
Faulty instrument

Fuel gauge pointer fluctuates or swings
Loose wire connection
Faulty fuel unit
Faulty instrument
FUEL UNIT

- No Smoking!

REMOVAL
Remove the frame body cover. (\(\Rightarrow 12-5\))
Disconnect the fuel unit wire connectors.
Remove the three bolts attaching from the fuel unit retainer.
- Do not damage the fuel unit wire.

Remove the fuel unit.
- Be careful not to bend or damage the fuel unit float arm.

INSPECTION
Remove the fuel unit.
Measure the resistance between the fuel unit wire terminals with the float at upper and lower positions.

<table>
<thead>
<tr>
<th>Wire Terminals</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>G_ Y/W</td>
<td>36Ω</td>
<td>700Ω</td>
</tr>
<tr>
<td>G_ L/W</td>
<td>550Ω</td>
<td>160Ω</td>
</tr>
<tr>
<td>Y/W_ L/W</td>
<td>600Ω</td>
<td>600Ω</td>
</tr>
</tbody>
</table>

FUEL GAUGE INSPECTION
Connect the fuel unit wire connectors and turn the ignition switch “ON”.

- Before performing the following test, operate the turn signals to determine that the battery circuit is normal.

Check the fuel gauge needle for correct indication by moving the fuel unit float up and down.

<table>
<thead>
<tr>
<th>Float Position</th>
<th>Needle Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>“F” (Full)</td>
</tr>
<tr>
<td>Lower</td>
<td>“E” (Empty)</td>
</tr>
</tbody>
</table>
16. INSTRUMENT/SWITCHES/LIGHTS

**INSTALLATION**
The installation sequence is the reverse of removal.

* Align the groove on the fuel unit with the flange on the fuel tank.

**OIL METER**

**INSPECTION**
Remove the met-in box. (⇒12-4)
Remove the frame body cover. (⇒12-4)
Disconnect the oil meter wire connectors and remove the oil meter. Keep the oil meter float at the lower position.
Measure the resistances between the wire terminals as ① and ② shown in the left figure.

<table>
<thead>
<tr>
<th>Wire Terminals</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green/Red(+)  Black(-)</td>
<td>46Ω</td>
</tr>
<tr>
<td>Green(-)  Black(+)</td>
<td>∞</td>
</tr>
</tbody>
</table>

* Before removing the oil meter, be sure to drain the motor oil and do not allow sparks or flames near the working area.

**Oil Meter Operation Inspection**
Connect the oil meter wire connectors and turn the ignition switch ON.
Measure the resistance between the wire terminals with the float at upper position.

<table>
<thead>
<tr>
<th>Wire Terminals</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green/Red(+)  Black(-)</td>
<td>About 300Ω</td>
</tr>
</tbody>
</table>

* Before performing the following test, operate the turn signals to determine that the battery circuit is normal.
Move the oil meter float up and down to see if the oil indicator light will go out and come on.

If the oil indicator light does not light, check for burned bulb, loose wire or connector. After correction, check again according to the method mentioned above.

SWITCHES
IGNITION SWITCH INSPECTION
Remove the front cover. (⇒12-3)
Disconnect the ignition switch wire couplers and check for continuity between the wire terminals.

<table>
<thead>
<tr>
<th>Color</th>
<th>Red</th>
<th>Black/White</th>
<th>Green</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>BAT1</td>
<td>IG</td>
<td>E</td>
<td>BAT2</td>
</tr>
<tr>
<td>LOCK</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
</tr>
<tr>
<td>OFF</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
</tr>
<tr>
<td>ON</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
<td>〇</td>
</tr>
</tbody>
</table>

IGNITION SWITCH REPLACEMENT
Remove the front cover. (⇒12-3)
Disconnect the ignition switch wire couplers.
Remove the two mounting bolts and remove the ignition switch.
The installation sequence is the reverse of removal.
16. INSTRUMENT/SWITCHES/LIGHTS

HEADLIGHT SWITCH INSPECTION
Remove the handlebar front cover. (⇒ 12-3) Disconnect the headlight switch wire coupler and check for continuity between wire terminals.

<table>
<thead>
<tr>
<th>Color</th>
<th>Blue/White</th>
<th>Yellow</th>
<th>Brown</th>
<th>Pink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>HL</td>
<td>CI</td>
<td>TL</td>
<td>RE</td>
</tr>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DIMMER SWITCH INSPECTION
Check for continuity between wire terminals.

<table>
<thead>
<tr>
<th>Color</th>
<th>Blue/White</th>
<th>Blue</th>
<th>White</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>HL</td>
<td>HI</td>
<td>LO</td>
<td>BAT</td>
</tr>
<tr>
<td>HI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASSING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TURN SIGNAL SWITCH INSPECTION
Check for continuity between the wire terminals.

<table>
<thead>
<tr>
<th>Color</th>
<th>Light Blue</th>
<th>Orange</th>
<th>Gray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>R</td>
<td>L</td>
<td>WR</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16. INSTRUMENT/SWITCHES/LIGHTS

STARTER SWITCH INSPECTION
Check for continuity between wire terminals.
Push the starter button when measuring.

<table>
<thead>
<tr>
<th>Color</th>
<th>Yellow/Red</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>ST</td>
<td>E</td>
</tr>
<tr>
<td>FREE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUSH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HORN SWITCH INSPECTION
Check for continuity between wire terminals.
Push the horn button when measuring.

<table>
<thead>
<tr>
<th>Color</th>
<th>Light Green</th>
<th>Brown/Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>HO</td>
<td>BAT</td>
</tr>
<tr>
<td>FREE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUSH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STOP SWITCH INSPECTION
Remove the handlebar front cover. (⇒ 12-3)
Disconnect the front and rear stop switch wire couplers.
Check for continuity between the wire terminals when the front/rear brake lever is applied.
HORN INSPECTION
Remove the frame front cover. (⇒ 12-3) Disconnect the horn wire couplers. The horn is normal if it sounds when a 12V battery is connected across the horn wire terminals.

FRONT TURN SIGNAL LIGHT REPLACEMENT
Remove the met-in box. (⇒ 12-5) Remove the floor board. (⇒ 12-4) Remove the front tool box. (⇒ 12-4) Remove two screws attaching the turn signal light shell and the bulb. Replace with new ones.

* Replace with new bulbs of the same specifications.

TAILLIGHT/STOP LIGHT/REAR TURN SIGNAL LIGHT BULB REPLACEMENT
Taillight Shell Removal:
- Remove two screws attaching the taillight shell.
- Remove the taillight shell and stop light bulb.
- Remove screws attaching the rear turn signal light.
- Remove the rear turn signal light bulbs.
The installation sequence is the reverse of removal.
16. INSTRUMENT/SWITCHES/LIGHTS

INSTRUMENT

Instrument Bulbs Replacement
Remove the handlebar rear cover. (☞12-3)
Remove the bulbs and replace with new ones.

SPEEDOMETER REMOVAL
Disconnect the speedometer cable.
Disconnect the speedometer wire connector.
Remove the three screws attaching the speedometer.
Remove the speedometer.
The installation sequence is the reverse of removal.

HEADLIGHT

REMOVAL/BULB REPLACEMENT
Remove the handlebar front cover. (☞12-3)
Remove the bulb sockets and bulbs.

* The model adopts krypton gas bulb.
When installing, do not directly touch the bulb glass with fingers.
Use bulbs of the same specifications for replacement.
The installation sequence is the reverse of removal.