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<td>FLOW CHART</td>
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</tr>
</tbody>
</table>
VIEW OF SUZUKI SP370

Left Side

Right Side
## SPECIFICATIONS

### DIMENSIONS AND WEIGHT
- Overall length: 2200 mm (86.6 in.)
- Overall width: 850 mm (33.5 in.)
- Overall height: 1180 mm (46.5 in.)
- Wheelbase: 1420 mm (55.9 in.)
- Ground clearance: 240 mm (9.4 in.)
- Dry weight: 123 kg (271 lbs)

### ENGINE
- **Type:** Four-stroke cycle, air-cooled, OHC
- **Number of cylinder:** 1
- **Bore:** 85.0 mm (3.346 in.)
- **Stroke:** 65.2 mm (2.567 in.)
- **Piston displacement:** 369 cm³ (22.5 cu.in.)
- **Compression ratio:** 8.9:1
- **Carburetor:** MIKUNI VM32SS, single
- **Air cleaner:** Polyurethane foam element
- **Starter system:** Primary kick
- **Lubrication system:** Wet sump

### TRANSMISSION
- **Clutch:** Wet multi-plate type
- **Transmission:** 5-speed constant mesh
- **Primary reduction:** 3.045 (67/22)
- **Final reduction:** 2.800 (42/15)
- **Gear ratios, Low:** 2.636 (29/11)
- **2nd:** 1.750 (28/16)
- **3rd:** 1.294 (22/17)
- **4th:** 1.000 (20/20)
- **Top:** 0.818 (18/22)
- **Drive chain:** DAIDO #520DS, 100 links

### CHASSIS
- **Front suspension:** Telescopic, oil dampened
- **Rear suspension:** Swinging arm, gas/oil dampened, spring 5-way adjustable
- **Steering angle:** 43° (right and left)
- **Caster:** 58°
- **Trail:** 146 mm (5.75 in.)
- **Turning radius:** 2.3 m (7.5 ft)
- **Front brake:** Internal expanding
- **Rear brake:** Internal expanding
- **Front tire size:** 3.00-21-4PR
- **Rear tire size:** 4.00-18-4PR
- **Front tire pressure:** See page 10-13
- **Rear tire pressure:** See page 10-13

### ELECTRICAL
- **Ignition type:** Magneto
- **Ignition timing:**
  - 10° B.T.D.C. below 1500 rpm and 35° B.T.D.C. above 3500 rpm
- **Spark plug:** NGK DB6A or NIPPON DENSO X24ES-U for other market than Canada, NGK DR8ES-L for Canada
- **Battery:** 6V 4AH/10 Hours
- **Generator:** Flywheel magneto
- **Fuse:** 15A

### CAPACITIES
- **Fuel tank including reserve:** 8.5 lit (2.2/1.9 US/Imp gal.)
- **Engine oil:** 1.8 lit (1.9/1.6 US/Imp qt.)
- **Front fork oil:** 1.6 lit (1.7/1.4 US/Imp qt.)
- **FUEL TYPE:** Unleaded or lowlead gasoline
- **OIL TYPE:** SAE 10W/40
- **FRONT FORK OIL:** SAE 10W/20

* Specifications are subject to change without notice.
GENERAL INFORMATION

IDENTIFICATION TABLE
SERIAL NUMBER LOCATION
The frame serial number ① is stamped on the steering head pipe. The engine serial number ② is located on the left side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.

Fig. 1-1.

Fig. 1-2.

FUEL, OILS AND BREAKING-IN PROCEDURE

FUEL
Gasoline used should be graded 85 ~ 95 octane or higher. An unleaded or low-lead gasoline type is recommended.

ENGINE OIL
Be sure that the engine oil you use comes under API classification of SE or SD and that its viscosity rating is SAE 10W-40. If SAE 10W-40 motor oil is not available, select the oil viscosity according to the following chart:

<table>
<thead>
<tr>
<th>SAE</th>
<th>40</th>
<th>30</th>
<th>20W-50</th>
<th>10W-40</th>
<th>10W-30</th>
<th>10W-20</th>
<th>10W</th>
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</thead>
<tbody>
<tr>
<td>Temp.</td>
<td>-20</td>
<td>-10</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>

Fig. 1-3.

FRONT FORK OIL

SAE 10W/20

BREAKING-IN PROCEDURE
During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

1. Keep to these break-in engine speed limits:

<table>
<thead>
<tr>
<th>Initial</th>
<th>500 miles (800 km)</th>
<th>Below 4,500 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to</td>
<td>1,000 miles (1,600 km)</td>
<td>Below 5,500 rpm</td>
</tr>
<tr>
<td>Over</td>
<td>1,000 miles (1,600 km)</td>
<td>Below 8,000 rpm</td>
</tr>
</tbody>
</table>

2. Upon reaching an odometer reading of 1,000 miles (1,600 km), you can subject to motorcycle to full throttle operation. However, do not exceed 8,000 rpm at any time.
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<td>CYLINDER, PISTON AND CRANKSHAFT</td>
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<tr>
<td>CARBURETOR AND AIR CLEANER</td>
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<td>TRANSMISSION AND GEAR SHIFTING</td>
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<td>OIL PUMP AND CLUTCH</td>
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<tr>
<td>ELECTRICAL EQUIPMENTS AND FUNCTIONS</td>
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<td>SUSPENSION</td>
<td>2-8</td>
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<tr>
<td>BRAKES AND WHEELS</td>
<td>2-9</td>
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<tr>
<td>TIGHTENING TORQUE</td>
<td>2-10</td>
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</table>
## CYLINDER HEAD, CAM SHAFT AND VALVE

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>STD (mm)</th>
<th>STD (in.)</th>
<th>SERVICE LIMIT (mm)</th>
<th>SERVICE LIMIT (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve Clearance - (Cold Engine)</td>
<td>1/8 turn-back (0.08)</td>
<td>1/8 turn-back (0.0031)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>2</td>
<td>Valve Stem Dia O.D.</td>
<td>IN 6.990~6.975</td>
<td>0.2834~0.2746</td>
<td>6.90</td>
<td>0.2717</td>
</tr>
<tr>
<td></td>
<td>EX 6.995~6.960</td>
<td>0.2838~0.2740</td>
<td>6.80</td>
<td>0.2677</td>
<td></td>
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<tr>
<td>3</td>
<td>Valve Stem Axial Runout</td>
<td>IN 0.01</td>
<td>0.0004</td>
<td>0.05</td>
<td>0.0019</td>
</tr>
<tr>
<td></td>
<td>EX 0.01</td>
<td>0.0004</td>
<td>0.05</td>
<td>0.0019</td>
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<td>4</td>
<td>Valve Head Dia.</td>
<td>IN 42.0</td>
<td>1.650</td>
<td>—</td>
<td>—</td>
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<tr>
<td></td>
<td>EX 36.0</td>
<td>1.420</td>
<td>—</td>
<td>—</td>
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<tr>
<td>5</td>
<td>Valve Seat Width</td>
<td>IN 1.0~1.2</td>
<td>0.040~0.047</td>
<td>1.5</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>EX 1.0~1.4</td>
<td>0.040~0.055</td>
<td>0.5</td>
<td>0.020</td>
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<tr>
<td>6</td>
<td>Valve Margin</td>
<td>IN 6.995~7.015</td>
<td>0.2754~0.2761</td>
<td>7.1</td>
<td>0.2795</td>
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<tr>
<td></td>
<td>EX 6.995~7.015</td>
<td>0.2754~0.2761</td>
<td>7.1</td>
<td>0.2795</td>
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<tr>
<td>7</td>
<td>Valve Guide I.D.</td>
<td>IN 0.020~0.050</td>
<td>0.0008~0.0019</td>
<td>0.19</td>
<td>0.0074</td>
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<tr>
<td></td>
<td>EX 0.035~0.070</td>
<td>0.0014~0.0027</td>
<td>0.30</td>
<td>0.0118</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Valve Stem/Guide Clearance</td>
<td>IN 36.95</td>
<td>1.455</td>
<td>35.5</td>
<td>1.3976</td>
</tr>
<tr>
<td></td>
<td>OUT 43.0</td>
<td>1.693</td>
<td>41.5</td>
<td>1.6388</td>
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</tr>
<tr>
<td>9</td>
<td>Valve Spring Free Length</td>
<td>IN 24.2~27.8 kg/23 mm</td>
<td>53~61 lbs/0.9 in.</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>OUT 50.4~58.3 kg/27 mm</td>
<td>111~129 lbs/1.06 in.</td>
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<td>—</td>
<td></td>
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<td>10</td>
<td>Valve Spring Tension</td>
<td>IN 0.03</td>
<td>0.0012</td>
<td>0.1</td>
<td>0.0039</td>
</tr>
<tr>
<td></td>
<td>EX 0.03</td>
<td>0.0012</td>
<td>0.1</td>
<td>0.0039</td>
<td></td>
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<tr>
<td>12</td>
<td>Valve Rocker Arm I.D.</td>
<td>12.000~12.018</td>
<td>0.4725~0.4731</td>
<td>12.050</td>
<td>0.4744</td>
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<tr>
<td>13</td>
<td>Rocker Arm Shaft O.D.</td>
<td>11.992~11.995</td>
<td>0.4722</td>
<td>11.963</td>
<td>0.4699</td>
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<tr>
<td>14</td>
<td>Rocker Arm Shaft Runout</td>
<td>0.005</td>
<td>0.0002</td>
<td>0.06</td>
<td>0.0024</td>
</tr>
<tr>
<td>15</td>
<td>Valve Rocker Arm/Shaft Clearance</td>
<td>0.005~0.026</td>
<td>0.0002~0.0010</td>
<td>0.10</td>
<td>0.0040</td>
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<tr>
<td>16</td>
<td>Cam Base Circle Dia.</td>
<td>33.0</td>
<td>1.299</td>
<td>—</td>
<td>—</td>
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<tr>
<td>17</td>
<td>Valve Lift</td>
<td>9.0</td>
<td>0.354</td>
<td>—</td>
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<tr>
<td>18</td>
<td>Cam Lobe Height</td>
<td>39.880~39.920</td>
<td>1.5701~1.5716</td>
<td>39.78</td>
<td>1.5661</td>
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<tr>
<td>19</td>
<td>Camshaft Bearing Surface O.D.</td>
<td>25.000~25.021</td>
<td>0.9843~0.9850</td>
<td>24.970</td>
<td>0.9831</td>
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<tr>
<td>20</td>
<td>Camshaft Journal I.D.</td>
<td>24.959~24.980</td>
<td>0.9826~0.9834</td>
<td>—</td>
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<tr>
<td>21</td>
<td>Camshaft Journal Clearance</td>
<td>0.020~0.062</td>
<td>0.0006~0.0024</td>
<td>0.15</td>
<td>0.0059</td>
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<tr>
<td>22</td>
<td>Camshaft Deflection</td>
<td>0.03</td>
<td>0.0012</td>
<td>0.1</td>
<td>0.0039</td>
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<td>23</td>
<td>Camshaft Chain Size</td>
<td>DID219FTS</td>
<td>—</td>
<td>—</td>
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<tr>
<td>24</td>
<td>Number of Chain Links</td>
<td>—</td>
<td>—</td>
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## CYLINDER, PISTON AND CRANKSHAFT

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<th>NO</th>
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<th>STD (mm)</th>
<th>STD (in.)</th>
<th>SERVICE LIMIT (mm)</th>
<th>SERVICE LIMIT (in.)</th>
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<tr>
<td></td>
<td>Compression Pressure</td>
<td>10 ~ 13 kg/cm²</td>
<td>142 ~ 184 psi</td>
<td>7.0 kg/cm²</td>
<td>100 psi</td>
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<td>2</td>
<td>Cylinder Bore Dia.</td>
<td>85.000 ~ 85.015</td>
<td>3.3465 ~ 3.3470</td>
<td>85.10</td>
<td>3.3504</td>
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<td>3</td>
<td>Cylinder Bore Taper</td>
<td>0.005</td>
<td>0.0002</td>
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<td>4</td>
<td>Cylinder Bore Out-of-Roundness</td>
<td>0.005</td>
<td>0.0002</td>
<td></td>
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<tr>
<td>5</td>
<td>Cylinder Warpage</td>
<td>0.03</td>
<td>0.0012</td>
<td>0.1</td>
<td>0.0039</td>
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<td>6</td>
<td>Cylinder Head Warpage</td>
<td>0.03</td>
<td>0.0012</td>
<td>0.2</td>
<td>0.0078</td>
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<tr>
<td>7</td>
<td>Piston Dia/Measured at 15 mm (0.59 in.) above Skirt End</td>
<td>84.935 ~ 84.950</td>
<td>3.3439 ~ 3.3444</td>
<td>84.90</td>
<td>3.343</td>
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<tr>
<td>8</td>
<td>Piston/Cylinder Clearance</td>
<td>0.060 ~ 0.070</td>
<td>0.0024 ~ 0.0027</td>
<td>0.120</td>
<td>0.0047</td>
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<td>9</td>
<td>Piston Ring Free End Gap</td>
<td>7.0</td>
<td>0.276</td>
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<td>0.197</td>
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<tr>
<td></td>
<td>1st</td>
<td>7.5</td>
<td>0.295</td>
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<td>0.256</td>
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<tr>
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<td>2nd</td>
<td>0.4 ~ 0.7</td>
<td>0.0157 ~ 0.0275</td>
<td>0.8</td>
<td>0.0315</td>
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<td>10</td>
<td>Piston Ring End Gap</td>
<td>1.17 ~ 1.19</td>
<td>0.0461 ~ 0.0468</td>
<td>1.10</td>
<td>0.043</td>
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<tr>
<td></td>
<td>2nd</td>
<td>1.47 ~ 1.49</td>
<td>0.0579 ~ 0.0586</td>
<td>1.40</td>
<td>0.055</td>
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<td>11</td>
<td>Piston Ring Thickness</td>
<td>1.22 ~ 1.24</td>
<td>0.0480 ~ 0.0488</td>
<td>1.30</td>
<td>0.051</td>
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<tr>
<td></td>
<td>2nd</td>
<td>1.51 ~ 1.53</td>
<td>0.0594 ~ 0.0602</td>
<td>1.60</td>
<td>0.063</td>
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<tr>
<td></td>
<td>Oil</td>
<td>2.81 ~ 2.83</td>
<td>0.1106 ~ 0.1114</td>
<td>2.90</td>
<td>0.114</td>
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<tr>
<td>12</td>
<td>Piston Ring/Ring Groove Clearance</td>
<td>0.03 ~ 0.07</td>
<td>0.0012 ~ 0.0027</td>
<td>0.17</td>
<td>0.0069</td>
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<tr>
<td></td>
<td>2nd</td>
<td>0.02 ~ 0.06</td>
<td>0.0008 ~ 0.0023</td>
<td>0.16</td>
<td>0.00629</td>
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<td>13</td>
<td>Piston Pin O.D.</td>
<td>19.995 ~ 20.000</td>
<td>0.7872 ~ 0.7874</td>
<td>19.960</td>
<td>0.7858</td>
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<td>14</td>
<td>Piston Pin Bore I.D.</td>
<td>20.002 ~ 20.008</td>
<td>0.7875 ~ 0.7877</td>
<td>20.060</td>
<td>0.7898</td>
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<tr>
<td>15</td>
<td>Piston Pin/Bore Clearance</td>
<td>0.0002 ~ 0.0013</td>
<td>0.0001 ~ 0.0005</td>
<td>0.1</td>
<td>0.0039</td>
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<tr>
<td>16</td>
<td>Con Rod Small End Bore</td>
<td>20.012 ~ 20.020</td>
<td>0.7879 ~ 0.7881</td>
<td>20.060</td>
<td>0.7898</td>
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<tr>
<td>17</td>
<td>Piston Pin/Rod Bore Clearance</td>
<td>0.012 ~ 0.025</td>
<td>0.0006 ~ 0.0009</td>
<td>0.05</td>
<td>0.0019</td>
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<tr>
<td>18</td>
<td>Con Rod Deflection Std./Limit</td>
<td></td>
<td></td>
<td>0.16</td>
<td>0.0063</td>
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<td>19</td>
<td>Con Rod Side Clearance</td>
<td>0.1 ~ 0.55</td>
<td>0.0039 ~ 0.0216</td>
<td>1.0</td>
<td>0.0394</td>
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<td>20</td>
<td>Crankshaft Runout</td>
<td>0.05</td>
<td>0.0019</td>
<td>0.05</td>
<td>0.0020</td>
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<td>21</td>
<td>Crankshaft Width/Wheel to Wheel</td>
<td>70.9 ~ 71.1</td>
<td>2.7913 ~ 2.7992</td>
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## CARBURETOR AND AIR CLEANER

<table>
<thead>
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<th>NO.</th>
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<th>SPECIFICATIONS</th>
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<tbody>
<tr>
<td>1</td>
<td>Idle RPM</td>
<td>1.300 r.p.m.</td>
</tr>
<tr>
<td>2</td>
<td>Carb. Type</td>
<td>MIKUNI VM32SS</td>
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<tr>
<td>3</td>
<td>Carb. I.D. Number</td>
<td>32410</td>
</tr>
<tr>
<td>4</td>
<td>Bore Size</td>
<td>32 mm (1.260 in.)</td>
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<td>5</td>
<td>Float Level Dry Measure</td>
<td>22.5 mm (0.886 in.)</td>
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<tr>
<td>6</td>
<td>Float Level Wet Measure</td>
<td>5 mm (0.197 in.)</td>
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<td>7</td>
<td>Air Screw</td>
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<td>8</td>
<td>Pilot Screw</td>
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<td>9</td>
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<td>15</td>
<td>Throttle Cable Free Play</td>
<td>1.0<del>1.5 mm (0.04</del>0.06 in.)</td>
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<tr>
<td>16</td>
<td>Air Filter-Type</td>
<td>Polyurethane foam element filter</td>
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<tr>
<td>17</td>
<td>Recommended Filter Oil Amount</td>
<td>18.0<del>22.0g (0.64</del>0.77 oz.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20<del>25 cc (0.68</del>0.84 US oz)</td>
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</table>
## Transmission and Gear Shifting

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>STD (mm)</th>
<th>STD (in.)</th>
<th>SERVICE LIMIT</th>
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<tbody>
<tr>
<td>1</td>
<td>Shift Pawl Return Spring Free Length</td>
<td></td>
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<tr>
<td>2</td>
<td>Cam Stopper Spring Free Length</td>
<td></td>
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<tr>
<td>3</td>
<td>Gear I.D.</td>
<td>A 19.985~22.006</td>
<td>0.7868~0.8663</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B 19.985~22.006</td>
<td>0.7868~0.8663</td>
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<tr>
<td></td>
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<td>C 19.985~22.006</td>
<td>0.7868~0.8663</td>
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<tr>
<td></td>
<td></td>
<td>D 19.985~22.006</td>
<td>0.7868~0.8663</td>
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</tr>
<tr>
<td>4</td>
<td>Shaft O.D.</td>
<td>A 19.939~19.960</td>
<td>0.7868~0.8663</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>B 19.939~19.960</td>
<td>0.7868~0.8663</td>
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<tr>
<td></td>
<td></td>
<td>C 19.939~19.960</td>
<td>0.7868~0.8663</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D 19.939~19.960</td>
<td>0.7868~0.8663</td>
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<tr>
<td>5</td>
<td>Countershaft Deflection</td>
<td>0.03</td>
<td>0.0011</td>
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<td>6</td>
<td>Driveshaft Deflection</td>
<td>0.03</td>
<td>0.0011</td>
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<td>7</td>
<td>Shift Fork Shaft Deflection</td>
<td>0.03</td>
<td>0.0011</td>
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<tr>
<td>8</td>
<td>Shift Fork Shaft O.D.</td>
<td>9.957~9.984</td>
<td>0.3920~0.3930</td>
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<td>9</td>
<td>Shift Fork Bore I.D.</td>
<td>10.000~10.022</td>
<td>0.3937~0.3945</td>
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<tr>
<td>10</td>
<td>Shift Fork/Shift Shaft Clearance</td>
<td>0.038~0.065</td>
<td>0.0015~0.0025</td>
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<tr>
<td>11</td>
<td>Shift Fork Thickness</td>
<td>3.95~4.05</td>
<td>0.1555~0.1594</td>
<td>3.85</td>
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<td>12</td>
<td>Shift Fork to Gear Groove Clearance</td>
<td>0.20~0.40</td>
<td>0.0079~0.0157</td>
<td>0.60</td>
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<tr>
<td>13</td>
<td>Drivechain - Max. Stretch @20 pins</td>
<td>317.5</td>
<td>12.5</td>
<td>323.0</td>
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<td>14</td>
<td>Drivechain Size and Length</td>
<td>#520 x 100%</td>
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## OIL PUMP AND CLUTCH

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<th>NO.</th>
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<tbody>
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<td></td>
<td></td>
<td>(mm)</td>
<td>(in.)</td>
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<tr>
<td>1</td>
<td>Oil Pump Output Pressure/</td>
<td>0.20~0.45 kg/cm²</td>
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<tr>
<td></td>
<td>60°C (140°F)</td>
<td>2.8~6.4 psi</td>
<td>0.20~0.45 kg/cm²</td>
</tr>
<tr>
<td>2</td>
<td>Operational Speed (Reduction Ratio)</td>
<td>500 r.p.m. (5:0:1)</td>
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<tr>
<td>3</td>
<td>Tip Clearance</td>
<td>0.03~0.06</td>
<td>0.0012~0.0023</td>
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<tr>
<td>4</td>
<td>Pump Body Clearance</td>
<td>0.055~0.136</td>
<td>0.0022~0.0053</td>
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<tr>
<td>5</td>
<td>Pump End Clearance</td>
<td>0.035~0.085</td>
<td>0.0014~0.0033</td>
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<td>6</td>
<td>Clutch Drive Plate Thickness</td>
<td>3.4~3.6</td>
<td>0.134~0.141</td>
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<tr>
<td>7</td>
<td>Clutch Drive Plate Warpage</td>
<td>0.1</td>
<td>0.0039</td>
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<tr>
<td>8</td>
<td>Clutch Driven Plate Thickness</td>
<td>1.94~2.06</td>
<td>0.076~0.081</td>
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<tr>
<td>9</td>
<td>Clutch Driven Plate Warpage</td>
<td></td>
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<tr>
<td>10</td>
<td>Spring Length/Free Length</td>
<td>40.5</td>
<td>1.594</td>
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<td>11</td>
<td>Spring Pressure</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>Primary Drive/Driven Gear Backlash</td>
<td>0.02</td>
<td>0.00078</td>
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<tr>
<td>13</td>
<td>Primary Driven Gear Lateral Movement</td>
<td>0.2~0.3</td>
<td>0.0079~0.0118</td>
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# ELECTRICAL EQUIPMENTS AND FUNCTIONS

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<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>SERVICE DATA</th>
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<tbody>
<tr>
<td>1</td>
<td>Ignition Timing Degrees and mm</td>
<td>(10^3/1500) r.p.m. (0.754)</td>
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<tr>
<td>2</td>
<td>Mechanical Advance Character</td>
<td>As shown</td>
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<tr>
<td>3</td>
<td>Spark Plug Heat Range/Size/Type</td>
<td></td>
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<tr>
<td>4</td>
<td>Spark Plug Gap</td>
<td>0.6<del>0.7 mm (0.024</del>0.028 in.)</td>
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<tr>
<td>5</td>
<td>Contact Point Gap</td>
<td>0.3<del>0.4 mm (0.012</del>0.016 in.)</td>
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<tr>
<td>6</td>
<td>Contact Point Dwell</td>
<td>295° @ Camshaft</td>
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<tr>
<td>7</td>
<td>Spark Performance</td>
<td>Over 12 kV @ 1 atm</td>
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<tr>
<td>8</td>
<td>Condenser Capacity Mfd.</td>
<td>0.20~0.24 (\mu)F</td>
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<tr>
<td>9</td>
<td>Ignition Coil Resistance (Primary)</td>
<td>0.75(\Omega)</td>
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<tr>
<td>10</td>
<td>Ignition Coil Resistance (Secondary)</td>
<td>5.7 (k\Omega)</td>
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<tr>
<td>11</td>
<td>Spark Plug Cap Resistance</td>
<td>10 (k\Omega)</td>
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<tr>
<td>12</td>
<td>Charging Performance</td>
<td>As shown</td>
</tr>
<tr>
<td>13</td>
<td>Battery Capacity/Code Number Specific Gravity</td>
<td>6N4B-2A, 6V4AH 1.26 @20°C</td>
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<tr>
<td>14</td>
<td>Fuse Size</td>
<td>15A</td>
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<tr>
<td>15</td>
<td>Magneto (Primary Coil Resistance)</td>
<td>2.3(\Omega)</td>
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<td>16</td>
<td>Magneto (Lighting Coil Resistance)</td>
<td>0.24(\Omega)</td>
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<td>17</td>
<td>Magneto (Charging Coil Resistance)</td>
<td>0.16(\Omega)</td>
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<tr>
<td>18</td>
<td>Rectifier - Type</td>
<td>Half-wave Rectification</td>
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<tr>
<td>19</td>
<td>Headlight Max Voltage</td>
<td>9V/8,000 r.p.m.</td>
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<td>20</td>
<td>Turn Signal Relay - Number of Clicks/Minute</td>
<td>85 C/M</td>
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<tr>
<td>NO.</td>
<td>ITEM</td>
<td>STD (mm)</td>
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<td>-------------------------------------------</td>
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<tr>
<td>1</td>
<td>Swing arm deflection on frame axle shaft</td>
<td>0.5</td>
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<td>2</td>
<td>Fork Fluid Viscosity</td>
<td>SAE10W/20</td>
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<td>3</td>
<td>Fork Fluid Capacity Drain/Overhaul (one leg)</td>
<td>252 cc</td>
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<td>4</td>
<td>Fork Spring Free Length</td>
<td>578.5</td>
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<td>5</td>
<td>Front Fork Travel</td>
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<td>Rear Shock Spring Free Length</td>
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<td>7</td>
<td>Rear Shock Length</td>
<td>340</td>
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<td>8</td>
<td>Fork Oil Level (max. compression)</td>
<td>181</td>
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<td>9</td>
<td>Rear Wheel Stroke</td>
<td>131</td>
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<td>10</td>
<td>Front Fork Inner Tube Runout</td>
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<tr>
<td>11</td>
<td>Front Fork Inner Tube Piston Dia.</td>
<td>28.0</td>
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<tr>
<td>12</td>
<td>Front Fork Outer Tube Inner Dia.</td>
<td>36.0</td>
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<tr>
<td>13</td>
<td>Swing Arm Pivot Bushing Inner Dia.</td>
<td>14.000~14.040</td>
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<tr>
<td>14</td>
<td>Swing Arm Spacer Outer Dia.</td>
<td>14.2</td>
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# BRAKES AND WHEELS

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<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>STD (mm)</th>
<th>STD (in.)</th>
<th>SERVICE LIMIT (mm)</th>
<th>SERVICE LIMIT (in.)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Front Brake Drum Dia</td>
<td>150</td>
<td>5.906</td>
<td>150.7</td>
<td>5.933</td>
</tr>
<tr>
<td>2</td>
<td>Rear Brake Drum Dia</td>
<td>150</td>
<td>5.906</td>
<td>150.7</td>
<td>5.933</td>
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<tr>
<td>3</td>
<td>Brake Lining</td>
<td>149.7</td>
<td>5.894</td>
<td>146.0</td>
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<td>4</td>
<td>Wheel Rim Runout Axial, Lateral</td>
<td>1.50</td>
<td>0.0590</td>
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<td>0.08</td>
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<td>5</td>
<td>Axle Runout</td>
<td>0.15</td>
<td>0.0059</td>
<td>0.25</td>
<td>0.098</td>
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<tr>
<td>6</td>
<td>Front Wheel Tread Depth</td>
<td>8.0</td>
<td>0.315</td>
<td>1.6</td>
<td>0.06</td>
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<td>7</td>
<td>Rear Wheel Tread Depth</td>
<td>11.0</td>
<td>0.433</td>
<td>2.0</td>
<td>0.08</td>
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<td>8</td>
<td>Drive Chain Length (20 Pitches)</td>
<td>317.5</td>
<td>12.5</td>
<td>323.0</td>
<td>12.7</td>
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<td>9</td>
<td>Drive Chain</td>
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<td>TYPE: DID 5200S</td>
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<td>SIZE: #520</td>
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<td>Tire Size</td>
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<td>FRONT: 3.00-21-4PR</td>
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<td>REAR: 4.00-18-4PR</td>
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<td>11</td>
<td>Tire Pressure</td>
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<td>See page 10-13</td>
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### Tightening Torque

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<tr>
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<th>ITEM</th>
<th>N.m</th>
<th>kg-m</th>
<th>lb-ft</th>
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<tbody>
<tr>
<td>1</td>
<td>Cylinder Head Cover Bolt</td>
<td>9~10</td>
<td>0.9~1.0</td>
<td>7.0</td>
</tr>
<tr>
<td>2</td>
<td>Tappet Adjusting Nut</td>
<td>12~15</td>
<td>1.2~1.5</td>
<td>9.0~10.5</td>
</tr>
<tr>
<td>3</td>
<td>Advance Governor Bolt</td>
<td>6~9</td>
<td>0.6~0.9</td>
<td>4.5~6.5</td>
</tr>
<tr>
<td>4</td>
<td>Cam Shaft Sprocket Bolt</td>
<td>8~11</td>
<td>0.8~1.1</td>
<td>6.0~7.5</td>
</tr>
<tr>
<td>5</td>
<td>Cylinder Head Nut (10 mm)</td>
<td>35~40</td>
<td>3.5~4.0</td>
<td>25.5~28.5</td>
</tr>
<tr>
<td>6</td>
<td>Spark Plug</td>
<td>15~20</td>
<td>1.5~2.0</td>
<td>11.0~14.0</td>
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<tr>
<td>7</td>
<td>Cylinder Nut</td>
<td>7~11</td>
<td>0.7~1.1</td>
<td>5.5~7.5</td>
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<tr>
<td>8</td>
<td>Flywheel Magneto Nut</td>
<td>55~65</td>
<td>5.5~6.5</td>
<td>40.0~47.0</td>
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<tr>
<td>9</td>
<td>Primary Drive Gear Nut</td>
<td>80~100</td>
<td>8.0~10.0</td>
<td>58.0~72.0</td>
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<tr>
<td>10</td>
<td>Clutch Sleeve Hub Nut</td>
<td>40~60</td>
<td>4.0~6.0</td>
<td>29.0~43.0</td>
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<tr>
<td>11</td>
<td>Clutch Spring Bolt</td>
<td>11~13</td>
<td>1.1~1.3</td>
<td>8.0~9.0</td>
</tr>
<tr>
<td>12</td>
<td>Engine Sprocket Nut</td>
<td>40~60</td>
<td>4.0~6.0</td>
<td>29.0~43.0</td>
</tr>
<tr>
<td>13</td>
<td>Neutral Cam Stopper Plug</td>
<td>18~28</td>
<td>1.8~2.8</td>
<td>13.5~20.0</td>
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<tr>
<td>14</td>
<td>Oil Drain Plug</td>
<td>18~20</td>
<td>1.8~2.0</td>
<td>13.5~14.0</td>
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<tr>
<td>15</td>
<td>Exhaust Pipe Bolt</td>
<td>9~12</td>
<td>0.9~1.2</td>
<td>6.5~8.5</td>
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<tr>
<td>16</td>
<td>1st, 2nd Muffler Bolt</td>
<td>9~12</td>
<td>0.9~1.2</td>
<td>6.5~8.5</td>
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</table>
## Tightening Torque

<table>
<thead>
<tr>
<th>NO.</th>
<th>Item</th>
<th>N.m</th>
<th>kg-m</th>
<th>lb-ft</th>
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<tbody>
<tr>
<td>1</td>
<td>Front Axle Nut</td>
<td>36~52</td>
<td>3.6~5.2</td>
<td>26.0~37.5</td>
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<tr>
<td>2</td>
<td>Steering Stem Lower Bolt (A)</td>
<td>15~25</td>
<td>1.5~2.5</td>
<td>11.0~18.0</td>
</tr>
<tr>
<td>3</td>
<td>Steering Stem Lower Bolt (B)</td>
<td>20~30</td>
<td>2.0~3.0</td>
<td>14.5~21.5</td>
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<tr>
<td>4</td>
<td>Steering Stem Head Bolt (A) (8 mm)</td>
<td>15~25</td>
<td>1.5~2.5</td>
<td>11.0~18.0</td>
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<tr>
<td>5</td>
<td>Handlebar Holder Bolt</td>
<td>12~20</td>
<td>1.2~2.0</td>
<td>9.0~14.5</td>
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<tr>
<td>6</td>
<td>Steering Stem Head Bolt</td>
<td>35~50</td>
<td>3.5~5.0</td>
<td>25.5~36.0</td>
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<tr>
<td>7</td>
<td>Engine Mounting Bolt</td>
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</tr>
<tr>
<td></td>
<td>10 mm</td>
<td>45~55</td>
<td>4.5~5.5</td>
<td>33.0~39.5</td>
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<tr>
<td></td>
<td>8 mm</td>
<td>25~32</td>
<td>2.5~3.2</td>
<td>18.5~23.0</td>
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<td></td>
<td>6 mm</td>
<td>6~9</td>
<td>0.6~0.9</td>
<td>4.5~6.5</td>
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<tr>
<td>8</td>
<td>Rear Swinging Arm Shaft</td>
<td>50~60</td>
<td>5.0~6.0</td>
<td>36.5~43.0</td>
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<tr>
<td>9</td>
<td>Rear Shock Absorber Nut</td>
<td>20~30</td>
<td>2.0~3.0</td>
<td>14.5~21.5</td>
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<tr>
<td>10</td>
<td>Rear Sprocket Bolt</td>
<td>15~25</td>
<td>1.5~2.5</td>
<td>11.0~18.0</td>
</tr>
<tr>
<td>11</td>
<td>Rear Axle Nut</td>
<td>50~80</td>
<td>5.0~8.0</td>
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<td>4~5</td>
<td>0.4~0.5</td>
<td>3.0~3.5</td>
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<td>13</td>
<td>Rear Brake Cam Lever Bolt</td>
<td>5~8</td>
<td>0.5~0.8</td>
<td>4.0~5.5</td>
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<tr>
<td>14</td>
<td>Rear Torque Link Bolt</td>
<td>2~3</td>
<td>2.0~3.0</td>
<td>14.5~21.5</td>
</tr>
<tr>
<td>15</td>
<td>Front Brake Cam Lever Bolt</td>
<td>5~8</td>
<td>0.5~0.8</td>
<td>4.0~5.5</td>
</tr>
</tbody>
</table>
PERIODIC MAINTENANCE

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# PERIODIC MAINTENANCE SCHEDULE

## MAINTENANCE CHART

The maintenance schedule, which follows, is based on philosophy. It is timed by odometer indication, and is calculated to achieve the ultimate goal of motorcycle maintenance in the most economical manner.

<table>
<thead>
<tr>
<th>Item</th>
<th>Interval</th>
<th>Initial 1 000 km (600 miles)</th>
<th>Every 3 000 km (2000 miles)</th>
<th>Every 6 000 km (4000 miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery (Specific gravity of electrolyte)</td>
<td>—</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Cylinder head nuts, exhaust pipe bolts and muffler connectors</td>
<td>Retighten</td>
<td>Retighten</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>—</td>
<td>Clean</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Cam drive chain</td>
<td>Adjust</td>
<td>Adjust</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Valve clearance</td>
<td>Adjust</td>
<td>Adjust</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Spark plug</td>
<td>—</td>
<td>Clean and adjust gap</td>
<td>Replace</td>
<td>Replace</td>
</tr>
<tr>
<td>Fuel line</td>
<td>Replace every two years</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Contact breaker point</td>
<td>Inspect</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Ignition timing</td>
<td>Inspect</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Engine oil</td>
<td>Change</td>
<td>Change</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Engine oil filter</td>
<td>Clean</td>
<td>Clean</td>
<td>Replace</td>
<td>Replace</td>
</tr>
<tr>
<td>Carburetor idle rpm</td>
<td>Adjust</td>
<td>Adjust</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Clutch</td>
<td>Inspect</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drive chain</td>
<td>—</td>
<td>Inspect and lubricate</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Brakes</td>
<td>—</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Tire</td>
<td>Inspect</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Steering</td>
<td>Inspect</td>
<td>Inspect</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Chassis nuts and bolts</td>
<td>Retighten</td>
<td>Retighten</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

## LUBRICATION CHART

<table>
<thead>
<tr>
<th>Item</th>
<th>Interval</th>
<th>Every 3 000 km (2 000 miles)</th>
<th>Every 6 000 km (4 000 miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake cam shaft</td>
<td>—</td>
<td>—</td>
<td>Grease</td>
</tr>
<tr>
<td>Brake cable</td>
<td>Motor oil</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Clutch cable</td>
<td>Motor oil</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drive chain</td>
<td>Motor oil</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Throttle cable</td>
<td>Motor oil</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Throttle grip</td>
<td>—</td>
<td>—</td>
<td>Grease</td>
</tr>
</tbody>
</table>
PERIODIC MAINTENANCE PROCEDURES

This section describes the service procedures for each section of Periodic Maintenance.

BATTERY

Inspect every 3 000 km

1. Remove left side frame cover to check battery.
2. Confirm that the breather pipe is secured tight, free of damage, and routed as shown below.
3. Check level and specific gravity of electrolyte. Add distilled water, if necessary, to keep the surface of the electrolyte above the LOWER level line and below the UPPER level line.

Breather pipe

Fig. 3-1.

To determine state of charge, check specific gravity with a hydrometer.

| Standard specific gravity | 1.260 at 20°C |

A specific gravity reading of 1.220 (at 20°C) or under means that the battery needs recharging. Take it down and connect it to a charger. Charging the battery in the place will cause rusting and may even rupture the rectifier.

CYLINDER HEAD NUTS, EXHAUST PIPE BOLTS AND MUFFLER CONNECTORS

Retighten at initial 1 000 km and every 5 000 km

Cylinder head
Remove the fuel tank and seat. Tighten the three 10-mm nuts to the specified torque with a torque wrench, when engine is cold.

Cylinder head tightening torque:

35 ~ 40 N.m
(3.5 ~ 4.0 kg-m, 25.5 ~ 28.5 lb-ft)

Fig. 3-3.
3-4 PERIODIC MAINTENANCE

After tightening the three nuts, tighten the two 6-mm nuts (indicated as ①) to the torque value below:

Cylinder tightening torque:

\[
7 \sim 11 \text{ N.m} \\
(0.7 \sim 1.1 \text{ kg-m}, 5.5 \sim 7.5 \text{ lb-ft})
\]

3. Immerse the element in a pan of motor oil, and squeeze excess oil out of the element so that it is slightly oily.

CAUTION:
Before and during the cleaning operation, examine the element to see if it has any ruptures or fissures. A ruptured or fissured element must be replaced.

Exhaust pipe bolts and muffler connectors
Tighten the exhaust pipe bolts and muffler connections to the specified torque with a torque wrench.

Exhaust pipe bolt and muffler connectors tightening torque:

\[
9 \sim 12 \text{ N.m} \\
(0.9 \sim 1.2 \text{ kg-m}, 6.5 \sim 8.5 \text{ lb-ft})
\]

Fig. 3-5.

AIR CLEANER

Clean every 3 000 km

Wash the element as follows:
1. Fill a suitable sized washing pan with non-flammable cleaning solvent. Immerse the element in the solvent and wash it clean.
2. Squeeze the solvent off the washed element by pressing it between the palms of both hands. Do not twist and wring the element or it will develop fissures.
3. Loosen lock nut ① on chain adjuster, and run back adjusting screw ②. This will cause the tensioner push rod to press further on the chain, i.e., tense the chain.
4. Tighten adjusting screw ② (to hold adjuster push rod in the pressed position), and secure the screw by tightening lock nut ①.

CAM DRIVE CHAIN

Adjust at initial 1 000 km and every 3 000 km

The chain which drives the valve actuating cams must be at the correct tension to avoid chain noise and disturbing ignition timing. A chain tensioner is provided for this purpose. The steps for chain adjustment are as follows:
1. Remove generator cover and spark plug, and turn over generator rotor anti-clockwise one turn by hand (in the direction of engine rotation).
2. Loosen lock nut ① on chain adjuster, and run back adjusting screw ②. This will cause the tensioner push rod to press further on the chain, i.e., tense the chain.
3. Tighten adjusting screw ② (to hold adjuster push rod in the pressed position), and secure the screw by tightening lock nut ①.
NOTE:
If the chain is still noisy after the tensioner has been re-set as above, the cause is very likely a stickly push rod. To remedy, take out the tensioner and service it to smoothen push rod movement.

Fig. 3-6
Fig. 3-7

VALVE CLEARANCE

Adjust at initial 1000 km and every 3000 km

Too much valve clearance results in valve chatter and excessively, small valve clearance causes damage to the valve or reduces power output. Check the clearance periodically and make sure it is adjusted to the specified value.

NOTE:
The valve clearance is specified for a cold engine. Check it when the engine is cold.

Valve clearance adjustment

<table>
<thead>
<tr>
<th>Valve clearance specification (inlet and exhaust valves)</th>
<th>Turn adjusting screw back by 1/8 rotation or 45 degrees from lock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.08 mm (0.0031 in.)</td>
</tr>
</tbody>
</table>

Check and adjust both valves when the piston is at top dead center (T.D.C.) of compression stroke. It is not necessary to use a thickness gauge; merely turn in adjusting screw all the way to lock and turn it back by 1/8 rotation or 45°. This will produce the specified clearance.

To set the piston at T.D.C. of compression stroke, proceed as follows:
1. Remove generator cover, timing inspection cap and spark plug.
2. Turn over flywheel by hand to bring "T" mark ① (on flywheel) to the index mark ② (on crankcase).
   If the contact points are apart, it means that the piston is on the compression stroke; if the points are closed, it means that the piston is on the exhaust stroke. In the latter case, turn over flywheel one complete rotation (360°) to bring the piston to T.D.C. on the compression stroke.

To adjust clearance, proceed as follows:
1. Remove valve adjusting hole caps of both inlet and exhaust valves.
2. At each valve, loosen lock nut ③ and tighten adjusting screw ④ all the way.
3. From that position of the screw, turn it back 1/8 of a turn (45°), hold the screw there, and tighten the nut.
4. You may use a feeler gauge to check the clearance but this is not necessary; just apply a fingertip and confirm the presence of a gap.
SPARK PLUG

Clean and adjust gap every 3 000 km, replace every 6 000 km

After first 6 000 km, remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.6 ~ 0.7 mm (0.024 ~ 0.028 in.), measuring with a thickness gauge.

Replace the plug every 12 000 km, and remove the carbon deposits and adjust the gap every 6 000 km after replacing the plug.

When removing carbon deposits, be sure to observe the appearance of the plug, noting the color of the carbon deposits. The color observed indicates whether the standard plug is suitable or not. If the standard plug is apt to get wet, a hotter plug should be used. If the standard plug is apt to overheat (porcelain is whitish in appearance), replace with a colder one.

<table>
<thead>
<tr>
<th></th>
<th>HOT TYPE</th>
<th>STANDARD</th>
<th>COLD TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGK</td>
<td>D7EA (DR7ES-L for Canada)</td>
<td>D8EA (DR8ES-L for Canada)</td>
<td>D9EA (DR8ES for Canada)</td>
</tr>
<tr>
<td>ND</td>
<td>X22ES-U</td>
<td>X24ES-U</td>
<td>X27ES-U</td>
</tr>
</tbody>
</table>

0.6 ~ 0.7 mm
(0.024 ~ 0.028 in.)

Fig. 3-12.  Fig. 3-13.

FUEL LINE

Replace the fuel hose every two years.

Fig. 3-14.

CONTACT BREAKER POINT

Inspect at initial 1 000 km and every 3 000 km

Inspect the contact surfaces for dirt, burning and wear. If the faces are dirty, clean; if roughened, smoothen by grinding with a file or oil stone. Points worn beyond repair must be replaced.

Fig. 3-15.

IGNITION TIMING

Inspect at initial 1 000 km and every 3 000 km

<table>
<thead>
<tr>
<th>Point gap (standard)</th>
<th>0.3 ~ 0.4 mm  (0.012 ~ 0.016 in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark plug gap</td>
<td>0.6 ~ 0.7 mm  (0.024 ~ 0.028 in.)</td>
</tr>
<tr>
<td>Ignition timing</td>
<td>10° BTDC: 1 500 rpm and below</td>
</tr>
<tr>
<td></td>
<td>35° BTDC: 3 500 rpm and above</td>
</tr>
</tbody>
</table>
Timing adjustment
First, adjust the contact point gap to the value specified, and then adjust the ignition timing; correct timing will not be obtained if this order is reversed.

Adjust contact point gap as follows:
1. Remove generator cover and timing inspection cap.
2. Remove the spark plug.
3. Turn over generator rotor anti-clockwise to obtain widest point gap.
4. Measure the gap with a feeler gauge; the gap should be between 0.3 ~ 0.4 mm (0.012 ~ 0.016 in.); if not, loosen screws ① securing the base ②, and displace base ② to increase or decrease the gap so that it is within range.
5. Tighten screws ①, and recheck the gap.

Procedure for adjusting ignition timing
1. Turn on ignition switch, and confirm engine stop switch is in "RUN" position.
2. Hook up the timing tester (09900-27003), with ② probe placed on the ② point of the breaker and ② probe grounded.
3. Turn over generator rotor anti-clockwise to check if the tester buzzer starts sounding just when "F" mark ① (on generator rotor) comes to the index mark ② (on crankcase); if so, the ignition timing is correct.

NOTE:
The buzzer starts sounding just when the contact points separate, and this moment of separation must occur when "F" mark moves through the index mark. Thus, obviously, steps 2 and 3 above are meaningful only when the piston is at or near T.D.C. on the compression stroke. To determine whether the piston is on compression or exhaust stroke has already been explained.

4. If buzzer starts sounding too early or too late, loosen the two screws ③ securing the breaker base and angularly displace the base to obtain the correct. Displace the base anti-clockwise to advance or clockwise to retard the timing, by an amount necessary to obtain concurrence of the meeting of the two marks and the start of buzzer sounding.
5. After tightening the two base securing screws, recheck the timing because tightening may have disturbed it.
6. Turn off ignition switch.
Checking the ignition timing with the timing light
After setting the contact points by adjusting in the above manner, check the performance of the timing mechanism using the electro tester (09900-28106). Illuminate the generator rotor with the timing light of this tester and vary the engine speed to see if the ignition is correctly timed or not. The procedure is as follows:
1. Run the engine within a speed range not exceeding 1,500 rpm. Under this condition, "F" mark ① and timing mark ② should be in perfect alignment.
   If not, readjust the breaker for correct timing.

2. Run the engine in a speed range above 3,500 rpm; and similarly observe the position of mark ③ relative to mark ②. If the two marks are in alignment, it means that the ignition is properly advanced.

ENGINE OIL
Change at initial 1,000 km and every 3,000 km
The oil should be changed when the engine is hot. The procedure is as follows:
1. Support the motorcycle upright by placing a jack or block under the engine.
2. Drain the oil by removing the drain plug ① and filler cap ②.

3. Insert drain plug ① securely and add fresh oil through the filler. The capacity of oil pan is about 1,600 cc (3.4 pt). Use API SE or SD oil with SAE 10W-40 viscosity.
4. Start the engine and allow it to run for several seconds at idling speed.
5. Shut down the engine and wait about one minute, then check the oil level in the level gauge ③. If the level is below the "F" mark, add oil.
ENGINE OIL FILTER

Clean at initial 1 000 km and every 3 000 km. Replace every 6 000 km.

Clean or replace the oil filter in the following manner:
1. Drain engine oil by removing the drain plug ①.
2. Remove the three screws ② holding down the filter cap ③.
3. Take off the cap ③, and pull out the filter ④.
4. Wash the filter ④ in cleaning solvent, and dry out the filter with compressed air. Or replace the filter with a new one.
5. After inserting the filter, replace cap ③ and secure it tightly.

CARBURETOR IDLE RPM

Adjust at initial 1 000 km and every 3 000 km

1. Start the engine and warm it up by running it at 1 500 rpm for 10 minutes in summer (when ambient temperature is about 30°C (86°F)) or for 20 minutes in winter (when ambient temperature is about -5°C (23°F)).
2. When the engine has warmed up, turn the throttle stop screw ① in or out so that engine runs at 1 300 rpm.

CAUTION:
No adjustment other than the procedure above is necessary because calibration is performed by the carburetor manufacturer.

Throttle cable
Check the throttle cable play on both the pull side and return side cables. The prescribed play is 1.0 ~ 1.5 mm (0.04 ~ 0.06 in.) for both cables.
The amount of play should be measured when the throttle grip rests at its home position for the pull side cable and when the grip is twisted all the way in the case of return side cable.
To adjust the play, turn the cable adjuster ①. After completing the check or adjusting as above, make sure that the lock nut ② is secured and that the grip turns smoothly.

3. Tighten lock nut ①. At the same time, lubricate the clutch cable with motor oil.

DRIVE CHAIN

Inspect and lubricate every 3,000 km

Visually inspect the drive chain for the below-listed possible malconditions. (Lift the rear wheel and place a jack or block under the engine, and turn the rear wheel slowly by hand, with the transmission in NEUTRAL.)

1. Loose pins
2. Damaged rollers
3. Rusted links
4. Twisted or seized links
5. Excessive wear

If any defects are found, the drive chain must be replaced.

At intervals of 1,000 km (600 miles), clean and lubricate the chain as follows:

1. Wash the chain in cleaning solvent. If the chain tends to rust faster, the interval must be shortened.
2. After washing and drying the chain, lubricate it with chain lube or motor oil.

Check the drive chain for wear and adjust the chain tension as follows:

1. Loosen axle and sleeve nuts ① after pulling out cotter pin ②.
2. Tense the drive chain fully by tightening the adjusters ③ after loosening lock nuts ④.
3. Remove the chain case. Using a caliper rule, measure the center-to-center distance between two pins 20 pitches apart (19 pins in between the two). If the distance exceeds 323.0 mm (12.7 in.), replace the chain with a new one. The standard distance is 317.5 mm (12.5 in.).

Fig. 3-32.

4. Loosen the adjuster ③ until the chain has 15 ~ 20 mm (0.6 ~ 0.8 in.) of sag at the middle between engine and rear sprockets. The mark⑤ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

Fig. 3-33.

5. After adjusting the drive chain, tighten the sleeve and axle nuts ① securely and lock with cotter pin ②. Always use a new cotter pin.

BRAKES

Inspect every 3,000 km

Front brake

Measure the distance between the front brake lever and throttle grip. The distance ① should be 20 ~ 30 mm (0.8 ~ 1.2 in.). If adjustment is necessary, turn the front brake adjuster ② in or out after loosening lock nut ③.

Fig. 3-34.

Rear brake

To adjust brake pedal travel, first set the pedal at a position for comfortable riding by turning the brake pedal stopper, and then adjust the free travel ① to 20 ~ 30 mm (0.8 ~ 1.2 in.) If adjustment is necessary, turn the rear brake adjuster ② in or out after loosening lock nut ③.

Fig. 3-35.
Brake lining wear limit

This motorcycle is equipped with brake lining wear limit indicators on both front and rear brakes. As shown in Fig. 3-38, at the condition of normal lining wear, an extended line from the index mark on the brake camshaft should be within the range embossed on the brake panel with brake on. To check wear of the brake lining, follow the steps below.

1. First check if the brake system is properly adjusted.
2. While operating the brake, check to see that the extension line from the index mark is within the range on the brake panel.
3. If the index mark is outside the range as shown in the Fig. 3-39, the brake shoe assembly should be replaced to ensure safe operation.

Tires

Inspect at initial 1,000 km and every 3,000 km

Inspect the tires for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>1.6 mm (0.06 in.)</td>
</tr>
<tr>
<td>Rear</td>
<td>2.0 mm (0.08 in.)</td>
</tr>
</tbody>
</table>
Check the tire pressure, and examine the valve for evidence of air leakage.

TIRE INFLATION PRESSURE (To be measured when tire is cold condition)

<table>
<thead>
<tr>
<th>COLD INFLATION TIRE PRESSURE</th>
<th>FRONT</th>
<th>REAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLO RIDING</td>
<td>SOLO RIDING</td>
<td></td>
</tr>
<tr>
<td>Normal riding</td>
<td>150 kPa (21 psi)</td>
<td>150 kPa (21 psi)</td>
</tr>
<tr>
<td>Continuous high speed riding</td>
<td>175 kPa (25 psi)</td>
<td>200 kPa (28 psi)</td>
</tr>
</tbody>
</table>

Tightening torque:

- Steering stem head bolt: 35 ~ 50 N.m
  (3.5 ~ 5.0 kg-m, 25.5 ~ 30.0 lb-ft)
- Handlebar clamp bolt: 12 ~ 20 N.m
  (1.2 ~ 2.0 kg-m, 9.0 ~ 14.0 lb-ft)
- Front fork upper bracket bolt: 15 ~ 25 N.m
  (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
- Front fork lower bracket bolt: 15 ~ 25 N.m
  (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
- Front fork upper bracket rear bolt: 15 ~ 25 N.m
  (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
- Front fork lower bracket rear bolt: 20 ~ 30 N.m
  (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)

If a rattle is still heard with these bolts properly tightened, disassemble the steering stem and inspect the following items and replace the defective parts.

1. Wear of the inner and outer races
2. Wear or damage of steel balls
3. Number of steel balls
4. Distortion of steering stem

**STEERING**

Inspect at initial **1 000 km** and every **3 000 km**

Check the steering system by shaking the handlebar sideways, and up and down. If rattling is heard, the following bolts should be checked to determine whether they are properly tightened or not.

1. Steering stem head bolt
2. Handlebar clamp bolts
3. Upper and lower bracket bolts
4. Upper and lower bracket rear bolts

Fig. 3-41
CHASSIS NUTS AND BOLTS

1,000; 6,000; 12,000; 18,000; 24,000 km
600; 4,000; 7,500; 11,000; 15,000 miles

The nuts and bolts listed below are important parts, and they must be in good condition for safety. They must be retightened, as necessary, to the specified torque with a torque wrench.

1. Handlebar clamp bolt .................. 12 ~ 20 N.m
   (1.2 ~ 2.0 kg-m, 9.0 ~ 14.0 lb-ft)
2. Steering head bolt ..................... 35 ~ 50 N.m
   (3.5 ~ 5.0 kg-m, 25.5 ~ 36.0 lb-ft)
3. Front fork upper bracket bolt
   (R and L) .................................. 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
4. Front fork upper bracket
   rear bolt .................................. 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
5. Brake lever holder bolt .................. 5 ~ 8 N.m
   (0.5 ~ 0.8 kg-m, 4.0 ~ 5.5 lb-ft)
6. Brake cam lever bolt
   (Front and Rear) ......................... 5 ~ 8 N.m
   (0.5 ~ 0.8 kg-m, 4.0 ~ 5.5 lb-ft)
7. Front fork lower bracket bolt
   (R and L) .................................. 15 ~ 25 N.m
   (1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)
8. Front fork lower bracket
   rear bolt .................................. 20 ~ 30 N.m
   (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
9. Rear torque link nut ..................... 20 ~ 30 N.m
   (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
10. Rear shock absorber nut ............... 20 ~ 30 N.m
    (2.0 ~ 3.0 kg-m, 14.5 ~ 21.5 lb-ft)
11. Rear axle nut ............................ 50 ~ 80 N.m
    (5.0 ~ 8.0 kg-m, 36.5 ~ 57.5 lb-ft)
12. Swinging arm pivot nut ............... 50 ~ 60 N.m
    (5.0 ~ 6.0 kg-m, 36.5 ~ 43.0 lb-ft)
13. Front axle nut .......................... 36 ~ 52 N.m
    (3.6 ~ 5.2 kg-m, 26.5 ~ 37.5 lb-ft)
14. Engine mount nut
    (6 mm) .................................. 6 ~ 9 N.m
    (0.6 ~ 0.9 kg-m, 4.5 ~ 6.5 lb-ft)
    (8 mm) .................................. 25 ~ 32 N.m
    (2.5 ~ 3.2 kg-m, 18.5 ~ 23.0 lb-ft)
    (10 mm) .................................. 45 ~ 55 N.m
    (4.5 ~ 5.5 kg-m, 33.0 ~ 39.5 lb-ft)

Figs. 3-42, 3-43, 3-44.
The materials listed below are needed for maintenance work on the SP370, and should be kept on hand for use. Additions to standard materials are cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

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The tools listed hereunder are special ones, designed to facilitate maintenance work — disassembly, reassembly, servicing, checking, etc. — on the SP370, and protect the parts and components of the motorcycle against damage. Each shop is advised to have these special tools as standard shop equipment.

<p>| | | | |</p>
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## TROUBLE SHOOTING

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TROUBLE SHOOTING

When trouble occurs with a motorcycle, it is important to find the source of the trouble as rapidly as possible. It is also necessary to perform only the work required to repair the machine and not bother with parts which are functioning correctly. The list of possible trouble and their causes given below should help the serviceman to repair motorcycles quickly without loss of time.

ENGINE

IF ENGINE IS HARD TO START
Check fuel in the fuel tank first. When a proper amount of fuel is in the tank, check the following points.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
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</table>
| 1.  | Check that fuel flows into carburetor. | * If fuel does not enter into carburetor.  
1. Fuel strainer clogged.  
2. Fuel pipe clogged or damaged.  
Clean or replace.  
Clean. |
| 2.  | Check that spark jumps in spark plug (turn engine with kick starter). | * If blue or hot spark jumps in the spark plug, check the following points.  
1. Ignition timing.  
2. Fuel.  
3. Carburetor float.  
Adjust or replace.  
See specifications and adjust. |
|     | * If the spark is weak. | 1. Damage in spark plug.  
2. Incorrect spark plug gap.  
3. Damage in spark plug cap.  
4. Dirty contact breaker point.  
5. Bad insulation in condenser.  
6. Damage in ignition coil or primary coil. | Replace.  
Adjust.  
Replace.  
Clean and adjust.  
Replace.  
Replace. |
|     | * If there is no spark | 1. Damage in spark plug.  
2. Dirty or wet spark plug.  
3. Incorrect spark plug gap.  
4. Dirty or incorrect contact breaker gap.  
5. Bad insulation in condenser.  
6. Damage in ignition coil.  
7. Damage in ignition switch  
8. Damage in wiring harnesses. | Replace.  
Clean.  
Adjust.  
Clean and adjust.  
Replace.  
Replace.  
Replace.  
Repair or replace. |
| 3.  | Check that engine compression is proper. (Turn engine with kick starter.) | * If engine compression is improper.  
1. Improperly adjusted valve clearance.  
2. Worn valve guides or valves seating poorly.  
3. Improper valve timing.  
Repair or replace.  
Adjust.  
Repair or replace. |
<table>
<thead>
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<th>No.</th>
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<th>Action</th>
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<tbody>
<tr>
<td>5.</td>
<td>Stiff piston ring on piston.</td>
<td></td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>7.</td>
<td>Damaged piston.</td>
<td></td>
<td>Replace.</td>
</tr>
<tr>
<td>8.</td>
<td>Improperly tightened spark plug.</td>
<td></td>
<td>Tighten securely.</td>
</tr>
<tr>
<td>10.</td>
<td>Damaged cylinder or cylinder head.</td>
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<td>Replace.</td>
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These three things — fuel, spark and compression — are basic points for engine operation. To find engine trouble, first check these points.

### IF ENGINE DOES NOT RUN SMOOTHLY

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<td>1.</td>
<td>Turning throttle grip, check that engine rpm increase.</td>
<td>• Engine rpm increase, but motorcycle speed does not increase. 1. Clutch slippage.</td>
<td>Adjust or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If engine rpm does not increase.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Improperly adjusted carburetor.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Clogged exhaust pipe and muffler.</td>
<td>Clean.</td>
</tr>
<tr>
<td>2.</td>
<td>Turning throttle grip, check that engine runs smoothly.</td>
<td>When rapidly accelerated, engine does not run smoothly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Improper ignition timing.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Improperly working contact breaker.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Improperly adjusted carburetor.</td>
<td>Clean and adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Engine does not run smoothly at low rpm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Too early ignition.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Dirty contact breaker.</td>
<td>Clean and adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Dirty or improperly adjusted spark plug.</td>
<td>Clean and adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Clogged or damaged fuel line.</td>
<td>Clean or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Improperly working contact breaker.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Engine does not run smoothly at high rpm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Clogged or damaged fuel line.</td>
<td>Clean or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Dirty or improperly adjusted spark plug.</td>
<td>Clean and adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Improperly working contact breaker.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Improperly adjusted carburetor.</td>
<td>Adjust.</td>
</tr>
</tbody>
</table>
### 6-4 TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Check that engine compression is correct.</td>
<td>See &quot;If engine is hard to start&quot; section.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Defective oil pump or clogged oil circuit.</td>
<td>Repair or clean.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Carbon deposit in exhaust pipe and muffler.</td>
<td>Clean.</td>
</tr>
</tbody>
</table>

### IF ABNORMAL NOISE IS HEARD IN ENGINE

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2. Weakened or broken valve springs.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Tension adjustor not working.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Too much play in piston ring side clearance.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Worn connecting rod big end.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td><strong>Intermittent noises:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>If noise is heard during rapid acceleration:</td>
<td>1. Valve clearance too large.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Weakened or broken valve springs.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Tension adjustor not working.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Too big clearance between piston and cylinder.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Worn connecting rod big end.</td>
<td>Replace crankshaft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Too much lateral movement of spacer on primary driven gear shaft.</td>
<td>Repair spacer.</td>
</tr>
</tbody>
</table>
**Occasional noises:**

1. If noise is heard when starting the engine:
   - 1. Valve clearance too large.
   - 2. Weakened or broken valve springs.
   - 4. Worn sprocket.
   - 5. Tension adjustor not working.
   - 6. Too big clearance between piston and cylinder.
   - 7. Worn connecting rod big end.
   - 8. Too much lateral movement of spacer on primary driven gear shaft.
   
   **Action**
   - Adjust.
   - Replace.
   - Replace.
   - Replace.
   - Repair or replace.
   - Repair or replace.
   - Replace crankshaft.
   - Repair spacer.

2. If noise is heard at high rpm:
   - 1. Valve clearance too large.
   - 2. Stretched chain.
   - 3. Worn sprocket.
   - 4. Tension adjustor not working.
   - 5. Too big clearance between piston and cylinder.
   - 6. Worn connecting rod big end.
   - 7. Too much lateral movement of spacer on primary driven gear shaft.
   
   **Action**
   - Adjust.
   - Replace.
   - Replace.
   - Repair or replace.
   - Repair or replace.
   - Replace crankshaft.
   - Repair spacer.
   - Repair or replace.

**Continual noise:**

1. Worn or damaged main bearings.
2. Damaged piston rings.
3. Defective transmission gears.
4. Defective primary pinion and primary gear.

**IF ENGINE OVERHEATS**

If engine overheats at high speed running after it is run in, check to see if a brake is dragging, or cylinder cooling fins are dirty. Inspect the following points.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Check to see if engine oil lower than &quot;L&quot; level.</td>
<td></td>
<td>Add oil.</td>
</tr>
<tr>
<td>2.</td>
<td>Check condition of engine oil.</td>
<td></td>
<td>Replace.</td>
</tr>
</tbody>
</table>
| 3.  | Check if engine oil compression is lower than service limit. | *Too low compression.  
   1. Defective oil pump.  
   2. Defective oil strainer.  
   3. Defective oil gallery cap. | Replace.  
   Clean or replace.  
   Repair or replace. |
## 6-6 TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
</table>
| 4.  | Check if engine compression is higher than service limit.                    | • Too high compression.  
1. Carbon deposits in combustion chamber.  
2. Too thin cylinder head gasket. | Remove the carbon deposits.  
Replace. |
| 5.  | Check carbon deposits.                                                       | • Check for carbon deposits in muffler, exhaust pipe, exhaust port and combustion chamber. | Disassemble and remove the carbon deposits. |
| 6.  | Check that piston rings move smoothly in grooves.                           | • Piston rings stiff because of carbon deposit.                              | Remove carbon deposits.                     |
| 8.  | Check that the clutch works properly.                                       | Clutch slippage causes overheating of engine.                               | Adjust.                                     |
| 9.  | Check that the ignition timing is correct.                                  |                                                                              | Adjust.                                     |
## ELECTRICAL

### IGNITION SYSTEM

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No sparking or poor sparking.</td>
<td>1. Defective ignition coil.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Defective spark plugs.</td>
<td>Replace.</td>
</tr>
<tr>
<td>2.</td>
<td>Contact points burn or pit prematurely.</td>
<td>Defective condenser.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Spark plugs too cold.</td>
<td>Replace by hot type plug.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Pistons or cylinders worn.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Too much clearance of valve stems in valve guides.</td>
<td>Replace.</td>
</tr>
<tr>
<td>5.</td>
<td>Spark plug electrodes overheat or burn.</td>
<td>1. Spark plug is too hot.</td>
<td>Replace by cold type plug.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. The engine overheats.</td>
<td>Tune up.</td>
</tr>
</tbody>
</table>

### CHARGE SYSTEM

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Magneto does not charge.</td>
<td>1. Open or short in lead wires, or loose lead connections.</td>
<td>Repair or replace or retighten. Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Shorted, grounded or open generator coils.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Silicon diodes punctured.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Shorted regulator lead wire.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Magneto does charge, but charging rate is below the specification.</td>
<td>1. Lead wires shorting intermittently or open-circuited or loosely connected at terminals.</td>
<td>Repair or retighten.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Grounded or open-circuited stator coils of generator.</td>
<td>Replace.</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Check Points</td>
<td>Action</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>3.</td>
<td>Battery overcharges</td>
<td>1. Internal short-circuit in battery.</td>
<td>Replace the battery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Regulator damaged or defective.</td>
<td>Replace the regulator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. The regulator poorly grounded.</td>
<td>Clean and tighten ground connection.</td>
</tr>
<tr>
<td>4.</td>
<td>Unstable charging</td>
<td>1. Lead wire insulation frayed due to vibration, presenting condition of intermittent short.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Defective regulator.</td>
<td>Replace.</td>
</tr>
<tr>
<td>5.</td>
<td>Battery &quot;sulfation&quot;</td>
<td>1. Charging rate too low or too high. (A battery out of use should be recharged at least once a month to avoid sulfation.)</td>
<td>Replace the battery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Battery electrolyte too much or too little, or its specific gravity too high or too low.</td>
<td>Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions. Replace the battery if badly sulfated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. The battery left out of use too long in cold climate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Impurities in the electrolyte or electrolyte specific gravity is too high.</td>
<td>Change the electrolyte by consulting the battery maker’s directions.</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Check Points</td>
<td>Action</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1.</td>
<td>If handle feels too heavy.</td>
<td>1. Steering stem overtightened.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Broken steel balls on steering stem.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Distorted steering stem.</td>
<td>Replace.</td>
</tr>
<tr>
<td>2.</td>
<td>If wobble in handle.</td>
<td>1. Loose steering stem nut.</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Loss of balance between right and left cushions.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Distorted front fork.</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Distorted front axle or cocked tire.</td>
<td>Replace.</td>
</tr>
<tr>
<td>3.</td>
<td>If wobble in front and rear wheels.</td>
<td>1. Frame nuts. and bolts are loosened.</td>
<td>Retighten.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Distorted wheel rim.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Worn-down front wheel bearings.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Loose wheel spokes.</td>
<td>Retighten.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Defective or improper tire.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Defective fork oil.</td>
<td>Replace.</td>
</tr>
<tr>
<td>5.</td>
<td>If front cushions too stiff.</td>
<td>1. Damper oil too viscous.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Too much damper oil.</td>
<td>Remove excess oil.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Defective fork oil.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Loose nuts on cushions.</td>
<td>Retighten.</td>
</tr>
<tr>
<td>7.</td>
<td>If wobble in rear wheel.</td>
<td>1. Distorted wheel rim.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Worn-down rear wheel bearings.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Loose wheel spokes.</td>
<td>Retighten.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Defective or improper tire.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Loose axle nut.</td>
<td>Retighten.</td>
</tr>
<tr>
<td>8.</td>
<td>If rear cushions too soft.</td>
<td>1. Weakened springs.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Rear cushion adjustors set improperly.</td>
<td>Adjust.</td>
</tr>
</tbody>
</table>
Defective brakes
First check the play in the front brake lever and the rear brake pedal. Inspect the following points.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Check Points</th>
<th>Action</th>
</tr>
</thead>
</table>
# ENGINE

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<td>7-23</td>
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<td>Valve Rocker Arm</td>
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</tr>
</tbody>
</table>
The compression pressure of a cylinder is a good indicator of its internal conditions. The decision to overhaul the cylinders is often based on the results of a compression pressure test, and many a cautious rider conducts this test himself at regular intervals and logs his readings to form a case history to which he may refer later to tell when to overhaul his engine.

Compression pressure

<table>
<thead>
<tr>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 ~ 1300 kPa</td>
<td>700 kPa</td>
</tr>
<tr>
<td>(10 ~ 13 kg/cm², 142 ~ 185 psi)</td>
<td>(7 kg/cm², 100 psi)</td>
</tr>
</tbody>
</table>

A low compression pressure means any of the following malconditions:
- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings stuck in the grooves
- Poor seating contact of valves
- Ruptured or otherwise defective cylinder head gasket

When the compression pressure noted is down to or below the value indicated above, the remedy is to overhaul the engine, with these five malconditions in mind.

Compression pressure test procedure:

- **NOTES:**
  1) Before testing the engine for compression pressure, make sure that the cylinder head nuts and bolts are tightened to specified torque values.
  2) Have the engine warmed up by idling before testing it.

1. Remove spark plug.
2. Fit the compression gauge (special tool: 09915-64510) to the plug holes, taking care to make the connection absolutely tight.
3. Twist the throttle grip into wide-open position.
4. Crank the engine several times with the kick starter, and read the highest gauge indication as the compression of the cylinder.
ENGINE PROPER

DISMOUNTING

1. Wash dirt off the engine.

2. Drain engine oil.

3. Remove frame cover at the right and left sides.

NOTE:
If muffler ① is hot, take care not to get burnt.

4. Remove seat lower cover at the right and left sides.

NOTE:
Seat lower cover is fitted as shown in Fig. 7-5. If it is removed roughly, it will break. Remove it carefully following the procedure below.

Fig. 7-2.

Fig. 7-3.

Fig. 7-4.

Fig. 7-5.

a. Place fingers into the upper part of rear shock absorber and unhook ① by drawing lightly toward you as shown in Fig. 7-6.

Fig. 7-6.
b. Pull the rear fender of seat lower cover gently toward you and remove the insert 2.

6. Turn fuel cock lever to “OFF” position and disconnect fuel hose from carburetor and then, remove fuel tank.

Fig. 7-10.

7. Disconnect tachometer cable.

Fig. 7-11.

8. Disconnect clutch cable.

Fig. 7-12.

c. Finally, remove the seat cover by extracting it backward at a slant.

Fig. 7-8.

5. Remove seat mounting bolt 1 and nut 2, and take off seat.

Fig. 7-9.
9. Remove brake pedal ①, right front footrest ② and rear stop lamp switch assembly ③.

12. Remove magneto cover ① and gear shifting lever ②.


Fig. 7-13.

Fig. 7-16.


11. Disconnect exhaust pipe.

Fig. 7-14.

Fig. 7-17.

14. Disconnect contact-point lead wire ① and magneto lead wire ②.

Fig. 7-15.

Fig. 7-18.
15. Remove engine mount bolts.

16. The engine is now ready for removal. Use both hands, and carry it off the chassis, taking it out from the right-hand side.

**REMOVING**

Engine is mounted in the reverse order to removal. Pay attention to the following items.

1. Mount the engine to the frame.

**NOTE:**

When the clearance between the frame and engine exceeds the specified limit, adjust the clearance with shims.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Remarks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>09169-08022</td>
<td>9 x 1.0 mm (0.35 x 0.039 in.)</td>
<td></td>
</tr>
<tr>
<td>09169-08023</td>
<td>9 x 0.6 mm (0.35 x 0.024 in.)</td>
<td></td>
</tr>
<tr>
<td>09169-10011</td>
<td>11 x 1.0 mm (0.43 x 0.039 in.)</td>
<td></td>
</tr>
<tr>
<td>09169-10012</td>
<td>11 x 0.6 mm (0.43 x 0.024 in.)</td>
<td></td>
</tr>
</tbody>
</table>

Clearance limit:

Within 0.6 mm (0.023 in.)

**Fig. 7-19.**

2. Prior to tightening the engine mounting nuts and bolts, fit the drive chain. The chain joint clip (1) must be fitted correctly as shown in Fig. 7-22.

**Fig. 7-21.**

3. The engine mounting nuts are self-lock nuts. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.

**Tightening torque:**

- 6 mm................................. 6~9 N.m (0.6~0.9 kg-m, 4.5~6.5 lb-ft)
- 8 mm................................. 25~32 N.m (2.5~3.2 kg-m, 18.5~23.0 lb-ft)
- 10 mm............................... 45~55 N.m (4.5~5.5 kg-m, 33.0~39.5 lb-ft)
4. Install magneto leads as shown in Fig. 7-24, and fit clamp ①.

**NOTE:**
The leads must not touch the muffler ②.

5. Fit clutch release arm ① and then, clutch cable adjuster ② and clutch cover.

6. Before mounting carburetor, connect blow-by gas breather hose ①. Check the blow-by gas breather hose for damage and then, fit clip ② correctly.

7. Disconnect air inlet hose. After carburetor has been fitted, confirm that throttle valve ② opens fully using a hand mirror ①. If the adjustment is defective, readjust with a full throttle stopper ③.

8. Check play in throttle cable ① when throttle grip is fully closed, and play in throttle cable ② when throttle grip is fully opened.

Fig. 7-23.
Fig. 7-24.
Fig. 7-25.
Fig. 7-26.
Fig. 7-27.
Fig. 7-28.
If the cables have too much play in them, adjust in the following manner.
a. Loosen lock nuts 1.
b. To adjust play in cable, turn adjuster 2 in or out to obtain the correct play: 1.0 ~ 1.5 mm (0.04 ~ 0.06 in.).
c. After adjusting the play, tighten the lock nuts 1.

Finally, tighten bolts 1 of 1st and 2nd mufflers securely.
Exhaust pipe and muffler tightening torque:

<table>
<thead>
<tr>
<th>Torque (N.m)</th>
<th>(kg-m)</th>
<th>(lb-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.9 ~ 1.2</td>
<td>6.5 ~ 8.5</td>
</tr>
</tbody>
</table>

NOTE:
Insert air vent pipe 1 of carburetor into the frame correctly as shown in Fig. 7-30. Confirm that the air vent pipe is not bent at any place.

Fig. 7-30.

9. Connect exhaust pipe 2, keeping mounting bolts 1 of 1st and 2nd mufflers loose. If exhaust pipe connector 3 is found to be damaged, be sure to replace it with new one, otherwise exhaust leakage will occur. After tightening the exhaust pipe clamping bolts 4 to the specified torque, tighten exhaust pipe clamping bolt 5.

Fig. 7-29.

10. After mounting fuel tank and seat, fit seat lower cover. The installation procedure is as follows:
First, place part 1 on rear fender and then, part 2 on frame, and finally, install part 3 correctly holding it gently.

Fig. 7-31.

11. Attach clutch cable end to clutch lever and then, adjust the play following the procedure below.
The play in the clutch should be 2 ~ 3 mm (0.08 ~ 0.12 in.) as measured at the clutch lever holder before the clutch begins to disengage.

Fig. 7-32.
a. Loosen clutch cable adjuster lock nut \(^1\).
b. Turn the clutch cable adjuster \(^2\) to provide the specified play.
c. Tighten the lock nut \(^1\).

2 ~ 3 mm
(0.08 ~ 0.12 in.)

Fig. 7-33.

Fig. 7-34.

12. Supplying engine oil.
"Oil filling" is an operation consisting of the following steps:

a. Remove the filler cap \(^1\).
b. Reset drain plug securely and add fresh oil through the filler. About 1600 cc (3.4 pt) of oil will be enough to fill the oil pan.

Fig. 7-35.

13. Adjust carburetor idling in the following manner.
a. Start the engine and warm it by running it at 1500 rpm for 10 minutes in summer (when ambient temperature is 30°C (86°F) or thereabouts) or for 20 minutes in winter (when ambient temperature is down to -5°C (23°F) or thereabouts.)
b. After engine warms up, turn the throttle stop screw \(^1\) in or out so that engine runs at 1,300 rpm.

CAUTION:
No adjustment except the procedure mentioned above is necessary because calibration is performed by carburetor manufacturer.
4. Bring the piston to top dead center. Rotate the flywheel magneto rotor and align the crankcase match mark with the "T" mark on the flywheel magneto rotor, with the knock pin 1 on the camshaft upper most.

NOTE:
When removing cylinder head cover, piston must be at top dead center.

5. Loosen the cylinder head cover bolts in the order indicated in Fig. 7-43 and detach the cylinder head cover.

---

1. Remove chain tensioner assembly 1.

2. Remove spark plug 1 and contact breaker cover 2.

3. Remove contact breaker 1 and advance governor assembly 2.
CAMSHAFT DRIVE SPROCKET AND CAMSHAFT

To remove camshaft from cylinder head, remove camshaft driven sprocket bolts using an L-type hexagon wrench (09911-70110). The camshaft can then be removed easily.

NOTE:
Do not drop camshaft drive chain and sprocket into cylinder head.

CAMSHAFT
Camshaft works to open and close intake and exhaust valves through valve rocker arm. Fig. 7-45 below shows the valve timing.

2. After removing the rocker arm shaft cap setscrew, extract rocker arm shaft. Next, screw a 6 mm bolt into the rocker arm shaft and extract by pulling the bolt with pliers. The valve rocker arm can then be taken out.

CYLINDER HEAD
1. Cylinder head can be lifted off after removing the 4 nuts. Loosen these nuts diagonally.
DISASSEMBLY OF CYLINDER HEAD COMPONENT

Remove each valve in the following manner:

1. Using the valve lifter (09916-14510), compress the spring.

2. Take off the valve cotter from valve stem, using forceps.

3. Take out valve seat, inner spring and outer spring.

4. Pull out the valve from the other side.

5. Remove each valve guide as follows:
   b. Using the valve guide remover (09916-44510), drive the guide out toward cylinder head side.
TOP END — REASSEMBLY PROCEDURE

VALVE GUIDE, STEM SEAL AND VALVE

The reassembling procedure is as follows:

NOTE:
When reassembling valve mechanism, previously used parts must be restored to their original positions.

1. Re-finish the valve guide holes on cylinder head with a 12.2-mm reamer (09916-34530).

2. Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed in disassembly must be avoided. Bear in mind that the intake valve guide differs in shape from that of the exhaust valve.

3. Oil the stem hole of each valve guide and drive it into the guide hole with the valve guide installer (09916-57320, 09916-54530). Carry out this job at normal temperature.

4. After fitting all valve guides, re-finish their bores with a 7-mm reamer (09916-34520). Be sure to clean and oil the guides after reaming.

5. Install valve spring lower seats. Be careful not to confuse the lower seats with the upper ones.
6. Oil each stem seal, and install it by using the stem seal installer (09911-94530, 09916-57320).

Fig. 7-60.

7. Insert the valves, with their stems coated with a high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any gaps. Lubricate the lip (of stem seal) similarly.

CAUTION: When inserting each valve, take care not to damage the lip of the stem seal.

Fig. 7-61.

8. Install valve springs, making sure that the close-pitch end ① of each spring goes in foremost to rest on the head. The coil pitch of both the inner and outer springs vary: the pitch decreases from top to bottom, as shown below.

Fig. 7-64.

9. Fit upper spring seat, compress spring with a valve lifter (special tool) and insert cotter with forceps.

Fig. 7-62.

VALVE ROCKER ARM AND SHAFT

Prior to assembling the valve rocker arm and shaft, apply engine oil to the rocker arm and shaft, and then, insert the rocker arm and shaft with the stepped part turned inward.

Fig. 7-63.
Next, insert the rocker arm shaft cap and tighten the screw.

**NOTE:**
Use a new O-ring on the rocker arm shaft cap to prevent oil leakage and be careful not to break O-ring when inserting it. Apply screw lock to the threaded part of the screw to prevent loosening.

**CYLINDER HEAD**

1. Fit dowel pins ① to cylinder head and then, attach new gasket to cylinder head.

**NOTE:**
Use a new cylinder head gasket to prevent oil leakage. Do not use the old gasket.

2. Copper washers and crown nuts are used to secure the cylinder head. These parts must be fitted in the correct position.

**NOTE:**
Use new O-ring for cylinder head nut ① to prevent oil leakage.

3. With the head snugly seated on the cylinder, secure it by tightening the 4 nuts diagonally. Tighten each nut to the torque value specified below.

**Cylinder head nut tightening torque:**

\[
35 \sim 40 \text{ N.m} \\
(3.5 \sim 4.0 \text{ kg-m, } 25.5 \sim 28.5 \text{ lb-ft})
\]
2. Align "T" mark on flywheel magneto rotor with the convex mark on the crankcase keeping the camshaft drive chain pulled upward.

**NOTE:**
If work is done without drawing the camshaft drive chain upward, the chain will be caught between crankcase and cam chain drive sprocket and the crankshaft cannot be rotated.

3. Engage the chain on the camshaft driven sprocket, with the screw ① positioned as shown in the figure. When the sprocket is not positioned correctly, turn the sprocket.

**NOTE:**
Do not rotate camshaft and flywheel magneto rotor while doing this.

4. Tighten the cylinder head nuts to the specified torque and then, tighten cylinder nuts ①.

**CAMSHAFT**

1. Completely remove gasket material from cylinder head and cylinder head cover and thoroughly wipe off oil stains from the fitting surfaces.
4. Apply THREAD LOCK CEMENT to the Allen bolt and tighten the sprocket with an L-type hexagon wrench.

Tightening torque:

\[
8 \sim 11 \text{ N.m} \\
(0.8 \sim 1.1 \text{ kg-m, } 6.0 \sim 7.5 \text{ lb-ft})
\]

Fig. 7-77.

**CYLINDER HEAD COVER**

1. Remove tachometer driven gear from cylinder head cover.

**NOTE:**
If the cylinder head cover is tightened with the tachometer driven gear fitted, the cylinder head cover will break.

Fig. 7-78.

2. Thoroughly wipe off oil from the fitting surfaces of cylinder head and cover and fit dowel pin to the cylinder head side. Uniformly apply "SUZUKI BOND No. 1211" to the portion shown in Fig. 7-79.

**NOTE:**
SUZUKI BOND No. 1211 maintains its excellent sealing properties at high
temperatures. When the engine is running, the cylinder head becomes very hot. Therefore, under no circumstances is "SUZUKI BOND No. 4" to be used. This is for the crankcase fitting surface and if used on the cylinder cover oil leakage will occur.

3. Lightly tighten the cylinder head cover bolts diagonally and then, if everything is satisfactory, tighten securely with a torque wrench to the specified torque.

Tightening torque:

\[
9 \sim 10 \text{ N.m} \\
(0.9 \sim 1.0 \text{ kg-m, } 7.0 \text{ lb-ft})
\]

4. Apply engine oil to tachometer driven gear shaft and then, insert together with sleeve and fix with gear sleeve plate.

CAM DRIVE CHAIN TENSIONER

Install cam shaft tensioner following the procedure below.

1. After loosening lock nut ①, loosen screw ② one turn and fully insert push rod ③ into the chain tensioner. Lock the push rod ③ by tightening adjusting screw ②.

2. Mount the chain tensioner on the cylinder.
3. Loosen adjusting screw ②. This will cause the tensioner push rod to press further on the chain, i.e., increase chain tension.
4. Tighten adjusting screw ② (to hold adjuster push rod in the pressed position), and secure the screw by tightening the lock nut ①.
5. Turn over flywheel magneto rotor ① counterclockwise one turn by hand (in the direction of engine rotation).

2. Align mark on contact breaker with the arrow mark on the cylinder head cover and fit the contact breaker in position.

3. Tighten the advance governor to the specified torque.

**NOTE:**
Over-tightening of the bolt will adversely influence characteristic of the advance governor.

**Advance Governor and Contact Breaker**

Fit advance governor and contact breaker in the following manner.

1. Align pin ① fitted to camshaft with slot ② in the advance governor and fit correctly.

**Tightening torque:**

6 ~ 9 N.m  
(0.6 ~ 0.9 kg-m, 4.5 ~ 6.5 lb-ft)
CHECKING AND ADJUSTING VALVE CLEARANCE

With the cylinder head cover detached, clearance ① of inlet and exhaust valves must be adjusted, referring to page 3-5.

CHECKING AND ADJUSTING IGNITION TIMING

To check and adjust advance characteristic of advance governor and ignition timing, refer to page 3-8.
**CYLINDER HEAD COVER**

After removing gasket from the fitting surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a feeler gauge. Check points are shown in Fig. 7-89.

If the distortion exceeds the limit, replace the cylinder head set.

Cylinder head cover distortion specification.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 mm</td>
<td>0.2 mm</td>
</tr>
<tr>
<td>(0.0012 in.)</td>
<td>(0.0079 in.)</td>
</tr>
</tbody>
</table>

For clearance between camshaft and journal, refer to the camshaft item (page 7-26).

**ROCKER ARM SHAFT**

**ROCKER ARM SHAFT RUNOUT**

Support the rocker arm shaft on "V" blocks, as shown, and check runout with a dial gauge. The rocker arm shaft must be replaced if it exhibits a deflection exceeding the limit.

Valve stem runout specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.005 mm</td>
<td>0.06 mm</td>
</tr>
<tr>
<td>(0.0002 in.)</td>
<td>(0.0024 in.)</td>
</tr>
</tbody>
</table>

**WEAR OF ROCKER ARM SHAFT**

Measure diameter of rocker arm shaft with a micrometer. If wear is in excess of the limit, fit a new rocker arm shaft.

Rocker arm shaft diameter

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.992 ~ 11.995 mm</td>
<td>11.936 mm</td>
</tr>
<tr>
<td>(0.4722 in.)</td>
<td>(0.4699 in.)</td>
</tr>
</tbody>
</table>

**VALVE ROCKER ARM**

The valve rocker arm is made of chromium-molybdenum steel and the point where it comes in contact with the camshaft is plated to improve wear resistance.

When checking the valve rocker arm, the inside diameter of the valve rocker arm and wear of the camshaft contacting surface should be
checked. Check the inside diameter of rocker arm with a caliper gauge. If wear is in excess of the limit, fit a new rocker arm.

**ID of valve rocker arm**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.000 ~ 12.018 mm (0.4725 ~ 0.4731 in.)</td>
<td>12.050 mm (0.4744 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-92.**

**VALVE ROCKER ARM-TO-SHAFT CLEARANCE**

If clearance between valve rocker arm and shaft is in excess of the limit, fit a new spare part.

Valve rocker arm-to-shaft clearance

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.016 ~ 0.052 mm (0.0006 ~ 0.020 in.)</td>
<td>0.1 mm (0.0040 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-93.**

**CAMSHAFT**

The camshaft should be checked for deflection and also for wear of cams and journals if the engine has been noted to give abnormal noise or vibration or to lack output power. Any of these malconditions could be caused by camshaft worn down or distorted to the service limit.

**CAM WEAR**

Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power. The limit of cam wear is specified for both intake and exhaust cams in terms of cam height $H$ which is to be measured with a micrometer. Replace camshafts if found worn down to the limit.

**Cam height specification**

<table>
<thead>
<tr>
<th>Height $H$</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake and Exhaust cam</td>
<td>39.88 ~ 39.92 mm (1.5701 ~ 1.5716 in.)</td>
<td>39.78 mm (1.5661 in.)</td>
</tr>
</tbody>
</table>

**CAMSHAFT DEFLECTION**

Measure the deflection with a dial gauge. Replace the camshaft if the deflection exceeds the limit.

**Deflection specification**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 mm (0.0011 in.)</td>
<td>0.1 mm (0.0039 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-94.**

**JOURNAL WEAR**

Determine whether each journal is worn down to the limit or not by measuring camshaft journal clearance with the camshaft installed. Use plastigage to read the clearance, which is specified as follows:

**Clearance specification**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)</td>
<td>0.15 mm (0.0059 in.)</td>
</tr>
</tbody>
</table>
NOTE:
At the stage when gaskets have been removed from fitting surfaces of cylinder head and cover, and before SUZUKI BOND No. 1211 has been applied, fit the cylinder head cover and tighten to the torque specified below.

Tightening torque:

9 ~ 10 N.m
(0.9 ~ 1.0 kg-m, 7.0 lb-ft)

CYLINDER HEAD

1. Decarbon combustion chamber.
2. Check the gasketed surface of the cylinder head for flatness with a straightedge and feeler gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Cylinder head flatness specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 mm</td>
<td>0.20 mm</td>
</tr>
<tr>
<td>(0.0011 in.)</td>
<td>(0.0078 in.)</td>
</tr>
</tbody>
</table>

VALVE

VALVE FACE WEAR
Visually inspect each valve for seating face wear. Replace valve if found to have an abnormally worn face.

Valve margin decreases as the wear of the face advances. Measure valve margin and, if it is found to have decreased to the limit, replace it.

Valve margin specification

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN, EX</td>
<td>1.0 ~ 1.4 mm</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>valve</td>
<td>(0.040 ~ 0.055 in.)</td>
<td>(0.020 in.)</td>
</tr>
</tbody>
</table>

VALVE STEM DEFLECTION
Support the valve with "V" blocks, as shown, and check deflection with a dial gauge. The valve must be replaced if it exhibits a deflection exceeding the limit.
Valve stem deflection specification

<table>
<thead>
<tr>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 mm (0.0019 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-98.**

**VALVE-TO-GUIDE CLEARANCE**

Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by rigging up the dial gauge as shown. If the clearance measured exceeds the limit specified below, then determine whether the valve or the guide should be replaced to reduce the clearance to within the standard range:

Valve-to-guide clearance

<table>
<thead>
<tr>
<th>Valve</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>0.020 ~ 0.050 mm (0.0008 ~ 0.0019 in.)</td>
<td>0.19 mm (0.0075 in.)</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.035 ~ 0.070 mm (0.0014 ~ 0.0027 in.)</td>
<td>0.30 mm (0.0118 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-99.**

If the valve stem is worn down to the limit, when measured with a micrometer, and the clearance is found to be in excess of the limit indicated above, replace the valve; if the stem is within the limit, then replace the guide. After replacing valve or guide, be sure to recheck the clearance.

Valve stem diameter specification

<table>
<thead>
<tr>
<th>Valve</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>6.960 ~ 6.975 mm (0.2634 ~ 0.2746 in.)</td>
<td>6.9 mm (0.2717 in.)</td>
</tr>
<tr>
<td>Exhaust</td>
<td>6.945 ~ 6.960 mm (0.2636 ~ 0.2746 in.)</td>
<td>6.8 mm (0.2677 in.)</td>
</tr>
</tbody>
</table>

**Fig. 7-100.**

**VALVE SEATS**

**IMPORTANT:**

Before checking the seat widths and, as necessary, refacing seats, make sure that the valves and valve guides are in good condition.

**SEAT WIDTH MEASUREMENT**

Uniformly coat the valve seat with red lead paste. Fit the valve and tap it in a rotating manner, in order to get a clear impression of the seating contact between coated seat and valve face. Use the valve lapper to hold the valve head.
1. First make cuts at 15° and 75°, removing a minimum of stock.

2. Make a cut at 45°, to obtain a width of 1.0 ~ 1.2 mm (0.040 ~ 0.047 in.). The amount of stock removed in this cutting directly affects the valve position and valve clearance.

**NOTE:**
This is a delicate machining operation, and must be carried out cautiously, bearing in mind the possibility of raising the valve too much toward the rocker arm.

3. Lap the seat with two or three sizes of lapping compound. Use the coarse compound to produce contacting width by operating the valve lapper in the usual manner. Finish the seat width with the fine compound.
4. Clean the seat after lapping. Check the seat width with the valve in the manner outlined above, with the red-lead paste applied uniformly to the seat.

NOTE:
After servicing the valve seats, be sure to adjust the valve clearance when the cylinder head has been installed in reassembly.

### VALVE SPRINGS

The strength of the two coil springs dictates tightness of valve seating. Weakened springs result in reduced engine power output, and often causes the valve mechanism to make a chattering noise.

Check the strength of the springs by measuring their free lengths and also the force required to compress them. If the limit indicated below is exceeded by the free length reading or if the measured force is not within the range specified, replace the spring with one supplied by SUZUKI.

NOTE:
Replace two springs at a time, outer and inner, if either one of these is found to be beyond the limit.

### Spring rate specification

<table>
<thead>
<tr>
<th>Spring</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>INNER</td>
<td>24.2 ~ 27.8 kg/23 mm (53 ~ 61 lbs/0.91 in.)</td>
</tr>
<tr>
<td>OUTER</td>
<td>50.4 ~ 57.8 kg/27 mm (111 ~ 127 lbs/1.06 in.)</td>
</tr>
</tbody>
</table>

### Free length specification

<table>
<thead>
<tr>
<th>Spring</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>INNER</td>
<td>36.95 mm (1.455 in.)</td>
<td>35.50 mm (1.397 in.)</td>
</tr>
<tr>
<td>OUTER</td>
<td>43.00 mm (1.693 in.)</td>
<td>41.50 mm (1.634 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-106.
DISASSEMBLY

The cylinder can be removed by raising it with both hands, and at the same time trying to shake it. When the cylinder cannot be removed by this means, tap the side of the fins and then lift it in the same manner as above.

NOTE:
If tapping is necessary, do not break the fins.

REASSEMBLY

1. Before mounting the cylinder block, oil the big and small end of the connecting rod and also the sliding surface of the piston. Confirm that the "O" ring \( \textcircled{1} \) is accurately positioned in the groove.

NOTE:
When mounting the cylinder, after attaching camshaft drive chain \( \textcircled{1} \), keep the camshaft drive chain taut. The camshaft drive chain must not be caught between cam drive chain sprocket and crankcase when crankshaft is rotated.

2. Fit dowel pins \( \textcircled{1} \) to crankcase and then fit gasket.

NOTE:
To prevent oil leakage, do not use the old gaskets and O-rings again; always use new ones.

---

Fig. 7-107.

Fig. 7-108.

Fig. 7-109.

Fig. 7-110.
INSPECTION

To check the cylinder for wear, take I.D. readings and determine whether the cylinder needs reworking to the next oversize. For this purpose, use the cylinder gauge (09900-20508) and take a total of 6 readings at three elevations in longitudinal and transverse directions, two readings at each elevation.

If any of the readings exceeds the I.D. limit or if the difference between the maximum and the minimum reading exceeds the difference limit, or if the bore surface is found to be badly burned or scored, rebore the cylinder to the size for the oversize piston available.

<table>
<thead>
<tr>
<th>Limit on difference between maximum and minimum readings (max. allowable difference)</th>
<th>0.1 mm (0.0039 in.)</th>
</tr>
</thead>
</table>

**Cylinder I.D. specification**

<table>
<thead>
<tr>
<th>Standard I.D.</th>
<th>I.D. limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>85.000 ~ 85.015 mm</td>
<td>85.10 mm</td>
</tr>
<tr>
<td>(3.34646 ~ 3.34705 in.)</td>
<td>(3.35039 in.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oversize piston</th>
<th>0.5 mm, 1.0 mm</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Piston-to-cylinder clearance</th>
<th>0.060 ~ 0.070 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.0023 ~ 0.028 in.)</td>
<td></td>
</tr>
</tbody>
</table>
DISASSEMBLY

Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, remove the piston pin circlip with long-nose pliers.

Fig. 7-115.

Fit piston pin puller attachment 1 as shown in Fig. 7-116 and remove the piston pin.

Fig. 7-116.

INSTALLING TOP AND 2ND RINGS

The shape of the ring face of top ring and middle (2nd) ring differ. The face of the top ring is chrome-plated whereas that of the 2nd ring is not. The color of the 2nd ring appears darker than that of the top one.

Fig. 7-118.

REASSEMBLY

INSTALLING OIL RING

The first member to go into the ring groove is spacer 1. After placing the spacer, fit the two side rails 2. The spacer and side rails can be positioned either way.

Fig. 7-119.
Top and 2nd (middle) rings have the letter "T" marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.

3. When fitting the piston, turn arrow mark (1) on the piston head to exhaust side.

Fig. 7-120.

Distribute the gaps of the three rings as shown. Before inserting each piston into the cylinder, confirm that the gaps are located as shown.

Fig. 7-121.

FITTING PISTON
The following are reminders for piston installation:
1. Rub a small quantity of SUZUKI MOLY PASTE onto the piston pin.
2. Place a clean rag over the cylinder base to prevent piston pin circlip from dropping into crankcase and then, fit the piston pin circlip with long-nose pliers.

NOTE:
Use a new piston pin circlip to prevent drop-off which will occur with a bent one.

INSPECTION

DECARBONING
Using a soft-metal scraper, decarbon the crown of the piston. Clean the ring grooves similarly.

PISTON WEAR DETERMINATION
Measure the piston at the places and in the directions indicated. If the service limit is reached, replace the piston.

Piston diameter specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>84.935 ~ 84.950 mm</td>
<td>84.90 mm</td>
</tr>
<tr>
<td>(3.34390 ~ 3.34449 in.)</td>
<td>(3.34252 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-122.

PISTON RING CLEARANCE IN THE GROOVE
Check each ring with a thickness gauge. If the clearance limit is exceeded by any of the three rings, determine whether the ring or the piston should be replaced by measuring the ring thickness and the groove width. Limits are specified for the width and thickness below.
Fig. 7-124.

Ring-to-groove clearance specification

<table>
<thead>
<tr>
<th>Ring</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP</td>
<td>0.03 ~ 0.07 mm</td>
<td>0.17 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0012 ~ 0.0027 in.)</td>
<td>(0.0066 in.)</td>
</tr>
<tr>
<td>MIDDLE</td>
<td>0.02 ~ 0.06 mm</td>
<td>0.16 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0008 ~ 0.0024 in.)</td>
<td>(0.0062 in.)</td>
</tr>
<tr>
<td>OIL</td>
<td>—</td>
<td>0.15 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0059 in.)</td>
</tr>
</tbody>
</table>

Ring thickness specification

<table>
<thead>
<tr>
<th>Piston ring</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP</td>
<td>1.17 ~ 1.19 mm</td>
<td>1.10 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0461 ~ 0.0468 in.)</td>
<td>(0.043 in.)</td>
</tr>
<tr>
<td>MIDDLE</td>
<td>1.47 ~ 1.49 mm</td>
<td>1.40 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0579 ~ 0.0586 in.)</td>
<td>(0.0055 in.)</td>
</tr>
</tbody>
</table>

Ring groove width specification

<table>
<thead>
<tr>
<th>Ring groove</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP</td>
<td>1.22 ~ 1.24 mm</td>
<td>1.30 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0480 ~ 0.0488 in.)</td>
<td>(0.051 in.)</td>
</tr>
<tr>
<td>MIDDLE</td>
<td>1.51 ~ 1.53 mm</td>
<td>1.60 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0594 ~ 0.0602 in.)</td>
<td>(0.063 in.)</td>
</tr>
<tr>
<td>BOTTOM</td>
<td>2.81 ~ 2.83 mm</td>
<td>2.90 mm</td>
</tr>
<tr>
<td></td>
<td>(0.1106 ~ 0.1114 in.)</td>
<td>(0.114 in.)</td>
</tr>
</tbody>
</table>

**PISTON RING GAP**

Each piston ring, with the exception of oil rings, is required to have a ring gap within the specified range and must be replaced if the limit is exceeded. To measure the gap, fit the ring to the cylinder at its skirt portion near the end and measure the gap. The specification values indicated here refer to the gap measured in this manner.

When the elastic strength of a piston ring is reduced to the critical value it must be replaced. The limit is specified as the free-state ring gap, as follows.

**Free-state ring gap specification**

<table>
<thead>
<tr>
<th>Piston ring</th>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOP</td>
<td>7.0 mm</td>
<td>5.0 mm</td>
</tr>
<tr>
<td></td>
<td>(0.276 in.)</td>
<td>(0.197 in.)</td>
</tr>
<tr>
<td>MIDDLE</td>
<td>8.5 mm</td>
<td>6.5 mm</td>
</tr>
<tr>
<td></td>
<td>(0.335 in.)</td>
<td>(0.256 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-125.

Fig. 7-126.
OVERSIZE PISTON RINGS
The following information serves to distinguish standard piston rings from oversize ones.
Top and 2nd rings:
Top and 2nd rings have a number on the ring end indicated by the arrow, if they are oversize rings.

<table>
<thead>
<tr>
<th>Standard rings</th>
<th>No number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm oversize rings</td>
<td>&quot;50&quot;</td>
</tr>
<tr>
<td>1.0 mm oversize rings</td>
<td>&quot;100&quot;</td>
</tr>
</tbody>
</table>

OIL RING SIDE RAIL
The only way to tell an oversize side rail of an oil ring from a standard-size one is to measure its outside diameter.

<table>
<thead>
<tr>
<th>Standard side rails</th>
<th>85.0 mm in O.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm oversize side rails</td>
<td>85.5 mm in O.D.</td>
</tr>
<tr>
<td>1.0 mm oversize side rails</td>
<td>86.0 mm in O.D.</td>
</tr>
</tbody>
</table>

OIL RING SPACER
Oversize oil ring spacers have their end portions, to a length of 10 to 15 mm, painted rod or yellow.

<table>
<thead>
<tr>
<th>Standard spacers</th>
<th>No paint</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 mm oversize spacers</td>
<td>Painted RED</td>
</tr>
<tr>
<td>1.0 mm oversize spacers</td>
<td>Painted YELLOW</td>
</tr>
</tbody>
</table>
FLYWHEEL MAGNETO

1. To remove flywheel magneto rotor, hold the rotor with special tool ① and loosen nut ②.

Fig. 7-130.

2. Using the rotor remover (special tool: 09930-30101) ① and attachment (special tool: 09930-33710) ②, remove rotor ③.

Fig. 7-131.

3. Remove gear shifting switch body, contact and spring.

NOTE:
Don't loss neutral contact ① and spring ②.

Fig. 7-132.

4. Remove flywheel magneto stator.

Fig. 7-133.

ENGINE SPROCKET

To remove the engine sprocket, straighten washer with a chisel and then, holding the sprocket with special tool ①, loosen nut with a 30 mm wrench.

Fig. 7-134.
CLUTCH

1. Drain engine oil.

2. After kick starter lever assembly has been removed, remove the 12 clutch cover screws and detach clutch cover by tapping with a plastic hammer.

3. Loosen the 6 clamping bolts diagonally while holding the primary driven gear, and remove clutch pressure disk.

**NOTE:**
Do not allow camshaft drive chain to be caught between crankcase and camshaft drive sprocket.

4. After clutch drive and driven plate have been removed, straighten clutch sleeve hub nut washer with a chisel.

5. With clutch sleeve hub held with special tool, loosen clutch sleeve hub nut and then, remove the clutch sleeve hub and primary driven gear together.
PRIMARY DRIVE GEAR

After removing the primary drive gear, fit special tool to the underside of connecting rod and remove primary drive gear nut. Then, the primary drive gear and drive chain sprocket can be removed.

NOTE:
Fit special tool onto a gasket to prevent the cylinder base face from being damaged by contact with the special tool. The primary driven gear nut must have a left-hand thread.

ENGINE OIL FILTER

Engine oil filter is fitted to the bottom of the crankcase. To remove the filter, drain engine oil and remove oil filter. Drain engine oil and remove oil filter cap.

![Engine Oil Filter Diagram](image)

1. Engine oil strainer
2. Spring
3. O-ring
4. Cap
5. Bolt
6. Gasket
7. Drain plug

Fig. 7-142.

OIL PUMP

After removing primary driven gear, take off the oil pump assembly.

Fig. 7-143.

KICK STARTER DRIVE GEAR AND IDLE GEAR

Kick starter drive gear and idle gear can be removed easily after primary driven gear has been removed.
GEAR SHIFTING MECHANISM

CAM DRIVEN GEAR
To remove cam driven gear, first remove gear shifting shaft and loosen pawl lifter and cam guide screw ① with a shock screwdriver.

NOTE:
When removing cam driven gear do not lose gear shifting pawl ②, pin ③ and spring ④.

CRANKCASE
When replacing such internal parts of crankcase as crank shaft, transmission, etc., separate the crankcase halves in the following manner.

1. Remove neutral cam stopper.
   1. Neutral cam stopper
   2. Spring
   3. Washer
   4. Stopper plug
   5. Gear shifting cam

2. After removing the 12 crankcase setscrews, fit special tool as shown in Fig. 7-147 and separate the crankcase into 2 parts, right and left by tapping the crankcase with a plastic hammer.

NOTE:
Screw adapter thread more than 5 mm into the crankcase and make the special tool plate and end face of crankcase parallel with each other.
NOTE:
When tapping the crankcase with a plastic hammer, never tap the hatched part ①. This is the passage for the camshaft drive chain. If it is tapped with a plastic hammer, it will break or be deformed.

Fig. 7-150.

GEAR SHIFTING CAM AND FORK

Remove the gearshifting cam and fork in the following manner.

1. First, remove gear shifting cam stopper spring ① from crankcase and then, extract shifting fork shaft ②. Gear shifting fork ③ and gear shifting cam stopper ④ can then be taken out.

Fig. 7-151.

2. When the gear shifting fork shaft is moved in the direction of the arrow and it is kept drawn out about 10 mm, the shifting fork shaft and gear shifting fork can be removed in one piece.

Fig. 7-152.

3. Remove gear shifting cam.

TRANSMISSION
After the transmission has been removed from the crankcase, bind it with rubber bands, for convenience in reassembly.

Fig. 7-153.

KICK STARTER SHAFT
To remove the kick starter shaft, first remove circlip and spring guide, and then the spring. Then, extract kick starter shaft to the right side.

Fig. 7-154.
When removing crankshaft assembly be sure to use the special tool.

Fig. 7-155.

**NOTE:**
Screw the special tool bolt more than 5 mm into the crankcase, and fit the special tool so that the special tool plate is parallel with the end face of the crankcase.

Fig. 7-156.  
Fig. 7-157.

**NOTE:**
Absolutely avoid removing crankshaft by striking with a plastic hammer. Always use the special tool, otherwise crankshaft alignment accuracy will be affected.

Fig. 7-158.
CRANKSHAFT

1. Grease lip ① of crankshaft oil seal.

**NOTE:**
Replace the crankshaft oil seal with a new one every disassembly to prevent oil leakage.

2. Fit the crankshaft on the left crankcase side using the special tool as shown in Fig. 7-161.

**NOTE:**
Never fit the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool; otherwise crankshaft alignment accuracy will be affected.
KICK STARTER MECHANISM

1. Kick starter shaft
2. Spring guide
3. Circlip
4. Spring
5. Kick starter
6. Spring
7. Plate
8. Oil seal
9. Guide
10. Stopper
11. Bolt
12. Drive gear
13. Washer
14. Circlip
15. Spacer
16. Oil reservoir plate
17. Kick starter lever ass'y
18. Cover
19. Bolt

Fig. 7-163.

KICK STARTER SHAFT
Fit the kick starter shaft in the following manner.
1. Fit washer ① and circlip ② to the kick starter shaft before fitting kick starter ③.

NOTE:
When fitting the kick starter, be sure to align the punched marks ④.

Fig. 7-164.

Fig. 7-165.

3. When fitting kick return spring ①, hook part ② of return spring onto crankcase, turn it 1/2 a turn clockwise with pliers and fit part ③ of return spring into hole of kick shaft. Then, fit spring guide and circlip.

Fig. 7-166.

2. Fit spring ① and washer ② and insert the kick starter shaft into crankcase. Engage pawl ③ of kick starter on starter guide ④.
TRANSMISSION
For assembly of transmission, refer to Fig. 7-167.

NOTE:
Replace oil seals ① and ② of drive shaft with new ones every disassembly to prevent oil leakage. Also grease the oil seal lips. On installation, refer to Fig. 7-169 for correct position and direction.

NOTE:
The section of the oil seal spacer also serves as an oil passage to the drive shaft as illustrated in Fig. 7-170. If the spacer is inverted, no oil will be supplied to the drive shaft side. Assemble the spacer as shown in Fig. 7-170. Replace "O" ring with new one every disassembly.

GEAR SHIFTING MECHANISM

1. Gear shifting fork (1)
2. Gear shifting fork (2)
3. Gear shifting fork (3)
4. Fork shaft
5. Gear shifting cam
6. Cam driven gear
7. Pawl (1)
8. Pawl (2)
9. Pin
10. Sprung
11. Pawl lifter
12. Screw
13. Cam guide
14. Screw
15. Stopper
16. Spring
17. Cam neutral stopper
18. Stopper plug
19. Spring
20. Washer
21. Stopper plate
22. Pin
23. Gear shifting shaft
24. Spacer
25. Spring
26. Arm stopper
27. Oil seal
28. Gear shifting lever ass'y
29. Cover
30. Bolt
31. Gear shifting switch body
32. O-ring
33. Screw
34. Lock washer
35. Washer
36. Contact
37. Spring
GEAR SHIFTING CAM AND FORK
Fit the gear shifting cam on crankcase. Position the cam as shown in Fig. 7-173 so that the gear shifting fork can be installed easily.

Fig. 7-173.

After cam stopper and gear shifting fork have been fitted, hook cam stopper spring onto crankcase.

Fig. 7-174.

NOTE:
Three gear shifting forks are used. They resemble each other very closely in external appearance and configuration. Carefully examine Fig. 7-175 for correct individual installing positions and directions.

Fig. 7-175.

CRANKCASE
When reassembling the crankcase pay attention to the following.
1. Remove gasket on the fitting surfaces of right and left halves of crankcase and thoroughly remove oil stains.
2. Fit dowel pin (1) on the left half.
3. Apply engine oil to the big end of the crankshaft connecting rod and all parts of the transmission gears.

Fig. 7-176.

4. Apply SUZUKI BOND No. 1211 (99000-31070) uniformly to the fitting surface of the right half of the crankcase, and after waiting a few minutes, fit the right half on the left half.

NOTE:
Never use SUZUKI BOND No. 4 (99000-31030).

Fig. 7-177.
5. After the crankcase screws have been tightened, check if drive shaft ① and countershaft ② rotate smoothly.

If a large resistance is felt to rotation, adjust by tapping the drive shaft or countershaft with a plastic hammer as shown in Fig. 7-179.

GEAR SHIFTING CAM DRIVEN GEAR
Two types of gear shifting pawl are available and they greatly resemble each other. Take care to use the correct one. When fitting the pawls to the cam driven gear, set the side where dimension A is large to the outside as shown in Fig. 7-180.

Next, install cam guide and pawl lifter. Apply a small quantity of THREAD LOCK CEMENT to the threaded parts of the clamping screws.

THREAT LOCK CEMENT 99000-32040

GEAR SHIFTING SHAFT
Install the gearshift shafts, with the center of the gear on the shaft side matched to the center of the gearshift cam driven gear.
NOTE:
After the cam driven gear, cam guide and gear shifting shaft have been fitted, confirm that gear change is normal.
If gear change is not obtained, it means that assembly of gears or installation of gear shifting fork is incorrect. If this is the case, disassemble and trace the mistake.

OIL PUMP AND OIL FILTER

SP370 LUBRICATION
OIL PUMP
Before assembling the oil pump, apply engine oil to the sliding surfaces of the case, outer rotor, inner rotor and shaft.

NOTE:
After installing the oil pump in the crankcase, rotate the pump gear by hand to see if it turns smoothly.

ENGINE OIL FILTER
Wash the filter ① with cleaning solvent, and then blow compressed air through it to dry off solvent.

OIL PUMP DRIVE GEAR
The oil drive gear is sub-assembled on the primary driven gear. Usually, there is no need to remove the drive gear. However, if the gear is removed, reassemble it so that boss ① is brought to the primary driven gear side as illustrated in Fig. 7-186.
NOTE:
Refer to page 3-9 for the frequency of engine oil filter periodic inspection and replacement.

CAMSHAFT DRIVE CHAIN SPROCKET

Install the sprocket with the key slot turned to the outside.

Fig. 7-190.

PRIMARY DRIVE GEAR

Install the primary drive gear in the reverse order to removal, and tighten it with a torque wrench to the specified torque.

Tightening torque:

80 ~ 100 N.m
(8.0 ~ 10.0 kg-m, 58.0 ~ 72.0 lb-ft)

Fig. 7-191.

KICK STARTER DRIVE GEAR AND IDLE GEAR

Install kick idle gear and kick starter drive gear referring to Fig. 7-192 for the correct installing direction. Do not forget the washers.

Fig. 7-192.
CLUTCH

Assemble the clutch, in the reverse order to dis-assembly. Pay attention to the following points.

1. Washers on each side of the primary driven gear are of different sizes. Don't make a mistake over which washer goes on which side.

2. When inserting spacer on countershaft, apply a small quantity of engine oil to both inside and the outside of the spacer.

3. Tighten clutch sleeve hub nut using the special tool to the specified torque.

Tightening torque:

40 ~ 60 N.m
(4.0 ~ 6.0 kg-m, 29.0 ~ 43.0 lb-ft)
4. Bend washer to prevent the clutch sleeve hub nut from loosening.

5. Fit the clutch release bearing washer (1) as indicated in Fig. 7-198.

6. Tighten clutch spring bolts diagonally, to the specified torque.
   
   Tightening torque:
   
   11 ~ 13 N.m
   (1.1 ~ 1.3 kg-m, 8.0 ~ 9.0 lb-ft)

7. When installing the clutch cover, first, fit the clutch release rack notch as shown in Fig. 7-200. The clutch release will then engage the pinion, so that the cover can be fitted.

**FLYWHEEL MAGNETO**

Install the flywheel magneto in the following manner.

1. Fit key (1) in the key slot on the crankshaft.
2. Fit magneto stator on crankcase.
3. Fit spring and neutral contact in that order into the gear shifting cam hole and mount gear shifting switch. Then, clamp the magneto stator leads as shown in Fig. 7-202.

Fig. 7-202.

4. After fitting the flywheel magneto, hold flywheel magneto rotor with the special tool and tighten to the specified torque.

Tightening torque:

<table>
<thead>
<tr>
<th>40  ~ 60 N.m</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.0 ~ 6.0 kg-m, 28.5 ~ 43.0 lb-ft)</td>
</tr>
</tbody>
</table>

NOTE: Thoroughly wipe off oil from the tapered parts ① of crankshaft and rotor with rags.

Fig. 7-203.

ENGINE SPROCKET

To fit the engine sprocket, turn the stepped part in the sprocket to the outside, tighten the nut to the specified torque and bend the washer.

Tightening torque:

<table>
<thead>
<tr>
<th>40  ~ 60 N.m</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.0 ~ 6.0 kg-m, 28.5 ~ 43.0 lb-ft)</td>
</tr>
</tbody>
</table>

Fig. 7-204.
CRANKSHAFT

Check the following items.

CRANKPIN WEAR AND BIG END SIDE CLEARANCE
Check the wear of crankpin in terms of connecting rod movement using a square as shown.

| Deflection service limit | 3.0 mm (0.118 in.) |

Fig. 7-205.

Push the big end of the connecting rod to one side and measure its side clearance with a thickness gauge.

Big end side clearance specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 ~ 0.55 mm</td>
<td>1.0 mm</td>
</tr>
<tr>
<td>(0.0039 ~ 0.021 in.)</td>
<td>(0.0393 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-206.

Where the limit is exceeded, replace crankshaft assembly or reduce the deflection and the side clearance to within the limit by replacing the worn parts — connecting rod, big end bearing, crankpin and thrust washer, etc.

CRANKSHAFT RUNOUT
Support the crankshaft on surface plate with center as shown. Rig up the dial gauge, as shown, and rotate the crankshaft slowly and read the runout.

Repair the crankshaft if the runout is greater than the limit.

Crankshaft runout specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 0.05 mm</td>
<td>0.05 mm</td>
</tr>
<tr>
<td>(0 ~ 0.0020 in.)</td>
<td>(0 ~ 0.0020 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-207.

ENGINE OIL FILTER
Wash the filter ① with cleaning solvent, and then blow compressed air through it to dry off solvent.

Fig. 7-208.
NOTE:
Refer to page 3-9 for the frequency of engine oil filter periodic inspection and replacement.

OIL PUMP
There are three clearances to be checked in order to determine whether the oil pump should be replaced or not.

TIP CLEARANCE
This is the clearance between inner rotor and outer rotor. Use a thickness gauge.

| Tip clearance limit | 0.2 mm (0.008 in.) |

Fig. 7-209.

OUTER ROTOR CLEARANCE IN THE BODY
Use a thickness gauge.

| Outer rotor clearance limit | 0.25 mm (0.0098 in.) |

Fig. 7-210.

SIDE CLEARANCE
Put a straightedge on the pump and measure the clearance under the steel straight edge, as shown.
The oil pump must be replaced if any of these limits are exceeded.

| Side clearance limit | 0.15 mm (0.0059 in.) |

Fig. 7-211.

NOTE:
If the inner and outer rotors have been removed, on reassembly align punched marks 1 correctly as shown in Fig. 7-212.

Fig. 7-212.

ENGINE OIL PRESSURE TEST
When the oil pump is replaced or disassembled for service, be sure to check the oil pressure in the following procedure:
1. Adjust the oil level to between "F" 1 and "L" 2 marks in the inspection window, and
confirm that there is no sign of oil leakage at any part of the lubrication oil circuit. Make sure, also, that oil strainer is clean.

If pressure is too low, it means that the oil pump is worn internally or otherwise defective and needs to be overhauled. If inner parts are found to be worn beyond the limit, replace the whole oil pump as an assembly.

**DRIVE AND COUNTER-SHAFT**

When the drive shaft or countershaft has been replaced with a new one, inspect the lubricating oil ports ① let into the shaft before fitting gears.

If burrs are present remove with an oil stone.

---

**Gear shifting fork clearance in the groove**

Check each gear with a thickness gauge. If the clearance limit is exceeded by any of the three gears, determine whether the gear or the gear shifting fork should be replaced by measuring the thickness and the groove width. Limits are specified for the width and thickness.

---

**Table: Oil Pump Pressure**

| Oil pump pressure | 20～45 kPa  
|-------------------| 0.20～0.45 kg/cm²  
|                   | 2.8～6.4 psi |
SHIFT FORKS

"Gear misses" are often due to excessively worn shift forks. Measure each shift fork thickness and, if the limit has been reached, replace.

Fork thickness specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.95 ~ 4.05 mm</td>
<td>3.75 mm</td>
</tr>
<tr>
<td>(0.1555 ~ 0.1594 in.)</td>
<td>(0.148 in.)</td>
</tr>
</tbody>
</table>

CLUTCH

FREE LENGTH OF CLUTCH SPRINGS
Measure the free length of each coil spring with a caliper rule, and determine the elastic strength of each. Replace any spring not within the limit.

Clutch spring free length specification

<table>
<thead>
<tr>
<th>Standard (when new)</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.5 mm</td>
<td>39.1 mm</td>
</tr>
<tr>
<td>(1.5944 in.)</td>
<td>(1.5393 in.)</td>
</tr>
</tbody>
</table>

GEAR SHIFTING PAWL

With spring, pin and pawl fitted to the cam driven gear, hold the pawl 1 by hand and confirm that the pin moves smoothly. If it does not move smoothly, smooth gear changes will not be obtained. Check for burrs in the cam driven gear hole.

CLUTCH DRIVE PLATE WEAR
Measure the thickness of each drive plate with a caliper rule. Replace drive plates found to have worn down to the limit.

Drive plate thickness specification

<table>
<thead>
<tr>
<th>Standard (when new)</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4 ~ 3.6 mm</td>
<td>3.1 mm</td>
</tr>
<tr>
<td>(0.1339 ~ 0.1417 in.)</td>
<td>(0.1220 in.)</td>
</tr>
</tbody>
</table>
CLUTCH PLATE WARP
Check each plate for warp by placing it on a surface plate and inserting a thickness gauge under the clutch plate at several places. The warp limit in terms of clearance is the same for drive plates and driven plates, and is specified as follows:
Replace plates exceeding this limit.

| Clutch plate warp limit | 0.1 mm (0.004 in.) |

PLAY IN PRIMARY DRIVEN GEAR
Primary driven gear is composed as shown in Fig. 7-223:

1. Primary driven gear
2. Damper
3. Plate
4. Rivet
5. Clutch housing

Fig. 7-223.
If the internal damper (2) wears, play is generated between gear and housing, causing abnormal noise. If the play is extreme, replace the damper with a new one.

Fig. 7-224.

STEPPED WEAR IN CLUTCH SLEEVE HUB SPLINE
Stepped wear in clutch sleeve hub spline due to contact with clutch driven plate occurs after long operation, and results in poor clutch disengagement. If the clutch sleeve hub spline is found to be badly worn, replace it with a new one.

Fig. 7-222

PRIMARY DRIVEN GEAR LATERAL MOVEMENT
Measure primary driven gear lateral movement with a dial gauge placing the gear and spacer on a surface plate.

Fig. 7-225
If the lateral movement is too large, correct with an oil stone.
On the other hand, if the lateral movement is too small, clutch disengagement is poor. If this is the case, replace the spacer with a new one.

Gear lateral movement specification

| Gear lateral movement | 0.2 ~ 0.3 mm | 0.0079 ~ 0.0118 in. |

Fig. 7-226.

GEAR BACKLASH
After confirming that axial runout of primary driven gear is correct, fit the primary driven gear and clutch sleeve.

Drive gear and driven gear must be replaced if backlash exceeds the limit.

Gear backlash specification

<table>
<thead>
<tr>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02 mm</td>
<td>0.1 mm</td>
</tr>
<tr>
<td>(0.0008 in.)</td>
<td>(0.004 in.)</td>
</tr>
</tbody>
</table>

Fig. 7-227.
FUEL SYSTEM

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FUEL COCK AND FUEL TANK ........................................ 8-2
CARBURETOR ......................................................... 8-3
  IMPORTANT NOTE .............................................. 8-3
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  INSPECTION AND SERVICING ................................. 8-8
  REASSEMBLY .................................................... 8-9
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  REASSEMBLY .................................................... 8-12
  AIR CLEANER FILTER ........................................ 8-13
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REASSEMBLY ....................................................... 8-13
FUEL COCK AND FUEL TANK

1. Fuel tank
2. Emblem
3. Fuel tank cap ass'y
4. Bolt
5. Washer
6. Spacer
7. Rear cushion (2)
8. Rear cushion (1)
9. Fuel cock ass'y
10. Lever gasket
11. "O" ring
12. Cap
13. Screw
14. Gasket
15. Bolt
16. Clip
17. Fuel hose
18. Center cushion
19. Front cushion

DISASSEMBLY
1. Shut off the fuel cock, and take the fuel hose off the carburetor inlet.

2. Place a clean oil pan under the fuel cock assembly, unscrew the fuel cock clamping bolts, and take off the fuel cock assembly.

CLEANING
Rust from the fuel tank tends to build up in the filter, which, when the filter has been neglected for a long period, inhibits the flow of fuel. Remove the rust from the filter using compressed air.

REASSEMBLY
1. Place filter gasket on fuel cock, and fix the fuel cock on the fuel tank.

NOTE:
Gasket must be replaced with a new one to prevent leakage.
2. Attach fuel hose ① on the carburetor inlet, fix with clip ②, and then fill the tank with fuel.

**CARBURETOR**

**DESCRIPTION**
The model SP370 employs the VM32SS type carburetor. This carburetor, with an oval main-bore, has an excellent throttle response, and also supplies the appropriate mixture for all ranges of engine speed. The throttle valve is controlled forcibly by means of two control cables, which gives firmer control compared to the conventional automatic shut-off type which uses a throttle valve spring.

---

1. Float 29. Screw
2. Float pin 30. Bolt
3. Gasket 31. Plate
4. Needle valve ass'y 32. Gasket
5. Plate 33. Ring
6. Screw 34. Spring
7. Pilot jet 35. Screw
8. Drain plug 36. Lock washer
9. O-ring 37. Screw
10. Main jet 38. Lock washer
12. O-ring 40. Nut
13. Needle jet 41. Throttle stop screw
14. Clip 42. Spring
15. Jet needle 43. Ball
16. Spring 44. Spring
17. Washer 45. Screw
18. Ring 46. Lock washer
19. Throttle valve 47. Ring
20. Bracket 48. Seal
21. Plate 49. Ring
22. Screw 50. Washer
23. Lock washer 51. Nut
24. Spring 52. Air pilot screw
25. Connector 53. O-ring
26. Pin 54. Spring
27. Pin 55. Hose
28. Plate 56. Hose
**OPERATION**

**Starter system (See Fig. 8-9)**
When the starter plunger is pulled up, the fuel metered by the starter jet is mixed with air and separated into tiny particles in the emulsion tube and the mixture then flows into the plunger area, mixes again with air coming from the starter air hole and jets into the throat.

**Main metering system (See Fig. 8-10)**
The fuel passes through the main jet and mixes with air metered by the air jet. The mixture then jets into the main bore after being metered by the clearance between the needle jet and the jet needle.
Idle system (See Fig. 8-11)
The fuel metered by the pilot jet is mixed with the proper amount of air metered by the air screw and is separated into fine particles. The mixture then jets into the throat through the pilot outlet. The pilot screw controls the amount of mixture. When the throttle valve opens a little, the mixture jets through the by-pass and the pilot outlet.

Fig. 8-11.

Float system
A float and needle valve assembly which keep the level of fuel constant while the engine is firing are installed in the float chamber. Fuel flows into the float chamber through the gap between the tapered end of the needle valve ① and the valve seat ② from the fuel tank via the fuel cock and fuel line.
When the fuel in the float chamber reaches a given level, the float ③ rises and the float tongue ④ pushes the needle valve upward, making its tapered end fit in the needle valve seat so that the fuel stops flowing into the float chamber.
As the fuel in the float chamber is consumed by the engine, the float and needle valve lower, permitting fuel to enter the float chamber again. Thus the fuel consumed is replenished.
While the engine is firing, this up and down movement of the float and needle valve is repeated to keep the fuel level correct.

Fig. 8-12.
The standard fuel level is 36.5 mm (1.437 in.) from the center line of the main bore, or 5 mm (0.197 in.) from the brim of the float chamber body.

Fig. 8-13.

REMOVAL
1. Shut off the fuel cock, and take the fuel hose off the carburetor inlet.

Fig. 8-14.
2. Loosen the clamp screws on the air inlet hose and intake pipe, then take off the carburetor.

3. Loosen lock nuts 1. and screw them along the cable adjusters 2. to the ends of the threads.

4. Remove throttle cables 1. from throttle lever 2.

5. Remove lock nuts 1. from cable adjuster 2. then take throttle cables 3. off the carburetor 4.

NOTE: With equipment of coercive open-and-close carburetor, there are two throttle cables, opening and closing. Place an identification label on each cable as shown in Fig. 8-19.
OVERHAUL

1. Unscrew and remove the carburetor top cover.

4. Remove four fitting screws with a cross head screw driver and separate the float chamber body from the mixing chamber body.

Fig. 8-20.

2. Remove throttle valve arm bolt ①, then take out throttle lever ② and throttle valve arm ③ together.

Fig. 8-21.

Fig. 8-22.

5. The float can be removed from the mixing chamber body by removing the float pin. Be careful not to bend or raise the float tongue which contacts the needle valve and controls closing and opening of the fuel passage, as change in the float tongue angle causes an incorrect fuel level, resulting in maladjusted carburation. Remove the needle valve together with float.

3. Take out the throttle valve upward as shown in Fig. 8-23.

Fig. 8-23.

Fig. 8-24.

Fig. 8-25.
6. Remove the needle valve seat plate with a cross head screw driver, and remove needle valve seat.

7. Remove the main jet with a screw driver.

8. Remove the needle jet with an 8-mm wrench.

9. Remove the pilot jet with a small screw driver.

**INSPECTION AND SERVICING**

1. Wash all parts with cleaning solvent and dry.

2. Blow compressed air through all jets and passages to make sure they are not clogged. Do not use wire, etc. to clean them, as this can damage the parts.

3. Check the float chamber gasket for damage and wear, and replace if needed.

4. Insert the throttle valve in the mixing chamber and check for play to see if the throttle valve is worn. Replace a worn, scored or scratched throttle valve.

5. Check the needle valve tapered end for wear. As the needle valve repeatedly contacts the valve seat to keep the fuel level correct, the tapered end of the needle valve is apt to wear. If the needle valve is worn, there will be a gap between the valve seat and needle valve even when the float tongue pushes the needle valve. Fuel will flow into the carburetor continuously and overflow. Check to see if the needle valve contacts the valve seat properly when disassembling the carburetor. Replace the needle valve if needed. To check, refit the valve seat, needle valve and float to the mixing chamber body, and then connect the fuel line to the fuel cock. Push the float with a finger until the tongue pushes the needle valve. Turn on the fuel cock. If fuel flows into the carburetor, the needle valve is worn. In most cases, however, fuel overflow is caused by foreign material caught between the valve seat and needle valve. The filter net of the fuel cock must always be kept in good condition.
6. A damaged float also causes fuel overflow. Shake the float to see if there is fuel inside. If there is, the float leaks and must be replaced.

CABLES AND ADJUSTMENT

Refer to page 3-9 for throttle cable adjustment and idling adjustment.

A: 1.0 ~ 1.5 mm
(0.04 ~ 0.06 mm)

Fig. 8-32.

Fig. 8-33.

1. Adjuster
2. Lock nut
3. Throttle stop screw
1. Air cleaner ass'ly
2. Filter ass'ly
3. Filter
4. Holder
5. Snap pin
6. Drain tube
7. Clip
8. Screw
9. Screw
10. Washer
11. Breather hose
12. Clip
13. Air inlet hose
14. Clamp
15. Clamp
16. Intake pipe
17. O-ring
18. Screw
19. Lock washer
20. Clamp
DESCRIPTION
The air cleaner filters impurities out of the air before it is inhaled into the carburetor. The resin processed air cleaner element covered with air cleaner case is mounted the center of the frame with cross screws. The air cleaner filters air to prevent dust entering the carburetor.
The air cleaner element made of polyurethane foam is inserted in an air cleaner case, and accommodated within the frame.
The air cleaner outlet is connected to the carburetor by a rubber tube.
Blowby gas is led through the air cleaner, mixed with fresh mixture, then recycled to the combustion chamber as illustrated in Fig. 8-34.

Fig. 8-34.

DISASSEMBLY
The procedure for removing the air cleaner assembly is as follows:
1. Remove right and left frame covers.

NOTE:
Protect the hands when the muffler ① is hot.

2. Remove right and left seat covers, referring to page 7-5.
3. Unscrew seat fixing bolts ①, and remove the seat.

4. Loosen exhaust pipe clamping bolts and second muffler fixing bolts.

5. Loosen clamp ①, unscrew first muffler clamping bolt ②, then the first muffler can be taken off to the right and rear.

6. Remove air inlet hose clamping screws ① and air cleaner clamping screws ②, then the air cleaner assembly can be taken off to the right.

7. Loosen air inlet hose clamping screw ① and remove air inlet hose.
REAASSEMBLY
The procedure for reassembling is the reverse of disassembling.
Special notes are as follows:
1. Attach drain tube ① to the air cleaner as shown in Fig. 8-43.

Fig. 8-43.

2. When mounting the first muffler, check connector ①, and replace it with a new one if it is damaged.

Fig. 8-44.

3. When mounting first ① and second ② mufflers, be sure to use washer ③, cushion ④, and spacer ⑤. Tighten each clamping bolt by hand, then tighten them in the order of exhaust pipe ⑥, second muffler, and first muffler, to the specified clamping torque.

Fig. 8-45.

Exhaust pipe and muffler tightening torque:

9 ~ 12 N.m
(0.9 ~ 1.2 kg-m, 7.0 ~ 8.5 lb-ft)

NOTE:
Heated mufflers could cause a short circuit if they touch wiring. Confirm that wiring is not touching mufflers when mounting them.

Fig. 8-46.
AIR CLEANER FILTER

DISASSEMBLY
1. Remove the seat, referring to page 7-5.
2. Pull off the air cleaner cover ①.

3. Disconnect the air cleaner breather pipe ①.
4. Pull out the snap pin ②.

5. Take out the filter assembly ① and remove three screws ②.
6. Take off the polyurethane filter ③.

CLEANING OF AIR CLEANER FILTER

Refer to page 3-4 for air filter cleaning.

REASSEMBLY

The procedure for assembling is the reverse of disassembling.
The following should be noted:
1. Be sure to assemble the upper section of the filter as shown in Fig. 8-50.

If the filter is assembled as shown in Fig. 8-51, air is taken into the engine without first being filtered by ①, which will shorten the life of the engine.
ELECTRICAL SYSTEM

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IGNITION SYSTEM

The ignition system is the usual magneto ignition system, consisting of a magneto, a contact breaker, an ignition coil, an ignition switch, an advance governor and spark plug. The contact breaker is operated by the camshaft above the cylinder head. The camshaft makes one revolution for two of the crankshaft. The ignition system circuit diagram is shown in Fig. 9-1.

IGNITION SYSTEM DATA

<table>
<thead>
<tr>
<th>Spark plugs</th>
<th>Type</th>
<th>NGK ......... D8EA DR8ES-L (for Canada) DENSO ... X24ES-U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap</td>
<td>0.6 ~ 0.7 mm</td>
<td>(0.024 ~ 0.028 in.)</td>
</tr>
<tr>
<td>Three-needle sparking distance of ignition coil</td>
<td>7 mm (0.28 in.) minimum</td>
<td></td>
</tr>
<tr>
<td>Contact point gap</td>
<td>0.3 ~ 0.4 mm</td>
<td>(0.012 ~ 0.016 in.)</td>
</tr>
<tr>
<td>Condenser capacitance: (NIPPON DENSO)</td>
<td>0.20 ~ 0.24 μF</td>
<td></td>
</tr>
</tbody>
</table>

SPARK ADVANCER:
- Advance angle: 25°
- Beginning of advance: 1500 rpm
- End of advance: 3500 rpm

INSPECTION

IGNITION COIL
Using the electro tester, test ignition coil for sparking performance. Test connection is as indicated. Make sure that the three-needle sparking distance is at least 7 mm (0.28 in.).

SPARK PLUG
Clean the plug in a plug cleaner or with a wire brush and pin. Use the pin to prick out carbon, taking care not to damage the porcelain.
CHECKING ADVANCING ACTION
Upon starting up the engine, check the engine speeds at which the ignition begins to advance and stops advancing. To do this, use the electro tester (09900-28104).

CONTACT BREAKER
Check and adjust the contact points as outlined in page 3-6. Inspect the contact points for wear and burning. If the point faces are dirty, wipe them off with a clean, dry cloth.

CONDENSER
Using the tester, check the performance of the capacitor.

| Electro static capacity | 0.20 ~ 0.24µF |
IGNITION TIMING INSPECTION AND ADJUSTMENT
For ignition timing inspection and adjustment, see page 3-7.

Fig. 9-9.

CHARGING SYSTEM
The charging system is the conventional half-wave rectification system consisting of a magneto, a rectifier and a battery.

![Diagram of charging system]

Fig. 9-10.

WIRE COLOR
- White with Blue tracer
- Pink
- Black

CHARGING RATE SPECIFICATION

<table>
<thead>
<tr>
<th></th>
<th>CHARGING RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY</td>
<td>More than 0.4A/2 000 rpm, less than 3.5A/8 000 rpm</td>
</tr>
<tr>
<td>NIGHT</td>
<td>More than 0.5A/2 000 rpm, less than 3.5A/8 000 rpm</td>
</tr>
</tbody>
</table>

NOTE:
1. Charging current measurement in reference to the above listed value is valid when (1) the battery is in fully charged state, (2) neutral lamp is off (meaning that the gear has been shifted), and (3) the engine is carrying rated load.
2. In Canadian and Norway specifications, the charging rate slightly differ from those for standard specification listed above due to difference of head lamp and tail lamp, etc.
INSPECTION
When the charging rate is low, check the rectifier, magneto and battery, and connections for contacting condition.
Measure rectifier resistance with the ER resistance meter. If the measured values are as shown in the following table, the rectifier is OK.

\[
\begin{array}{c}
\text{Resistance: } = \\
\text{Resistance: Approx. } 8\Omega \\
\end{array}
\]

MAGNETO
Check the stator coil for continuity (between White/Blue and Ground: Pink and Ground). If the meter indicates approx. 0Ω, the coil is OK.

BATTERY
Check electrolyte level, and be sure the battery is in fully charged state.

BATTERY

Battery specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>6N4B-2A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>6V, 4Ah</td>
</tr>
<tr>
<td>Voltage</td>
<td>6V</td>
</tr>
<tr>
<td>Electrolyte S.G.</td>
<td>1.260 at 20°C</td>
</tr>
</tbody>
</table>

1. Confirm that the vent pipe is secured tight, free of damage, and routed as shown.
2. Add distilled water, as necessary, to keep the surface of the electrolyte above the LOW level mark. Do not exceed the HIGH level mark.
3. If the electrolyte surface falls rapidly, requiring frequent addition of distilled water, check the charging system and determine the reason for the low charging rate.
4. Periodically, check the specific gravity of the electrolyte using a hydrometer to find the state of charge. After adding distilled water, run the machine to recharge the battery.

Fig. 9-11.

Fig. 9-12.
IGNITION SWITCH
Circuit continuity should be obtained in accordance with the chart below, when the ignition switch is checked with a tester.

Ignition circuit test chart

<table>
<thead>
<tr>
<th>Switch position</th>
<th>B/W</th>
<th>B/Y</th>
<th>O</th>
<th>R</th>
<th>Br</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td>O</td>
<td></td>
<td>Br</td>
<td>Br</td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
<td>R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B/W .... Black with White tracer
B/Y .... Black with Yellow tracer
O ....... Orange
R ....... Red
Br ....... Brown

For others

<table>
<thead>
<tr>
<th>Switch position</th>
<th>BLACK/WHITE</th>
<th>BLACK/YELLOW</th>
<th>RED</th>
<th>ORANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REAR BRAKE LAMP SWITCH
Place tester probes on WHITE ① and ORANGE ② leads, and check switch function and circuit continuity by measuring resistance when the brake pedal is depressed and released: values should be 0Ω and ∞, respectively.

NOTE:
To make the switch more sensitive to slight pressure on the brake pedal, move the switch upward. Lowering has the opposite effect.
HORN
Use a tester to check continuity of the horn circuit. Check the horn itself, by connecting a 6V battery across it. If the horn sound is not correct, replace the horn.

LIGHTING SWITCH
Continuity should be obtained, in accordance with the chart below, when lighting switch ① is checked with a circuit tester.

TURN SIGNAL SWITCH
Disconnect the lead wires from the turn signal switch ① and check circuit by placing the probes of the tester on LIGHT GREEN ② and LIGHT BLUE ③ leads (for right-hand switch) and to LIGHT BLUE and BLACK leads (for left-hand switch).

Lighting circuit test chart
For Netherlands and West Germany

<table>
<thead>
<tr>
<th>Switch position</th>
<th>Br/W</th>
<th>Gr</th>
<th>Y/W</th>
<th>W/R</th>
<th>G/W</th>
<th>O</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Br/W .... Brown with White tracer
Gr ......... Gray
Y/W ....... Yellow with White tracer
W/R ....... White with Red tracer
G/W ....... Green with White tracer
O ......... Orange
Br ......... Brown

For others

<table>
<thead>
<tr>
<th>Switch position</th>
<th>GRAY</th>
<th>RED/ YELLOW</th>
<th>WHITE/ YELLOW</th>
<th>RED/ WHITE</th>
<th>GREEN/ WHITE</th>
<th>ORANGE</th>
<th>BROWN</th>
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</thead>
<tbody>
<tr>
<td>OFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
KILL SWITCH
Check this switch in the same way that the lighting switch is checked.

Kill switch

<table>
<thead>
<tr>
<th>Switch position</th>
<th>WHITE/BLACK</th>
<th>YELLOW/BLACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FOR BELGIUM, ENGLAND, FINLAND, FRANCE AND SWEDEN

WIRE COLOR

- B: Black
- BI: Blue
- Br: Brown
- Gr: Green
- Lt.: Light Blue
- Lg: Light Green
- P: Pink
- W: White
- W/R: White with Red tracer
- W/Bl: White with Blue tracer
- W/B/W: White with Blue and White tracer
- B/W: Black with White tracer
- B/Y: Black with Yellow tracer
- G/W: Green with White tracer
- Y/R: Yellow with Red tracer
- Y/W: Yellow with White tracer

LAMP LOAD

- Headlamp: 6V 36/36W
- Tail/Brake lamp: 6V 5/21W
- Turn signal lamp: 6V 21W
- Speedometer lamp: 6V 3W
- Tachometer lamp: 6V 3W
- Neutral indicator lamp: 6V 3W
- High beam indicator lamp: 6V 1.7W
- Turn signal lamp: 6V 3W
- Parking lamp: 6V 6W

For France:
- Headlamp: 6V 36/36W
- Tail/Brake lamp: 6V 5/21W
- Turn signal lamp: 6V 21W
- Speedometer lamp: 6V 3W
- Tachometer lamp: 6V 3W
- Neutral indicator lamp: 6V 3W
- High beam indicator lamp: 6V 1.7W
- Turn signal lamp: 6V 3W
- Parking lamp: 6V 6W

For England and France:
- Headlamp: 6V 36/36W
- Tail/Brake lamp: 6V 5/21W
- Turn signal lamp: 6V 21W
- Speedometer lamp: 6V 3W
- Tachometer lamp: 6V 3W
- Neutral indicator lamp: 6V 3W
- High beam indicator lamp: 6V 1.7W
- Turn signal lamp: 6V 3W
- Parking lamp: 6V 6W

For Finland, Sweden, and Belgium:
- Headlamp: 6V 36/36W
- Tail/Brake lamp: 6V 5/21W
- Turn signal lamp: 6V 21W
- Speedometer lamp: 6V 3W
- Tachometer lamp: 6V 3W
- Neutral indicator lamp: 6V 3W
- High beam indicator lamp: 6V 1.7W
- Turn signal lamp: 6V 3W
- Parking lamp: 6V 6W
## CHASSIS

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<td>10-31</td>
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</table>
**CHASSIS**

**FRONT WHEEL**

1. Wheel hub
2. Front hub flange, RH
3. Screw
4. Hub bearing holder, RH
5. Bolt
6. Lock washer
7. Front axle
8. Spacer
9. Spacer, RH
10. Washer
11. Nut
12. Cotter pin
13. Bearing
14. Bearing
15. Front tire
16. Inner tube
17. Inner tube protector
18. Wheel rim
19. Spoke set
20. Wheel balancer
21. Bead stopper
22. Nut
23. Washer

**DISASSEMBLY**

1. Raise the front wheel, and place a stand (09940-81611) under the frame at the position shown in Fig. 10-2.

**NOTE:**
Place the stand correctly to keep the motorcycle balanced during work.

2. Remove screw ① clamping the brake calibe.

**Fig. 10-1.**

**Fig. 10-2.**

**Fig. 10-3.**
3. Pull off cotter pin ① and remove axle nut ②. Draw out the axle shaft.

4. Take off front wheel.

5. Disconnect speedometer cable at the wheel.

6. Remove wheel bearing ①.

**REASSEMBLY**
Reverse the disassembling procedure. Make sure that brake shoes, hub drum bore and other brake parts are clean of dust and grease. Additional instructions are given below.

1. To install the ball bearing, grease the bearing and hub in advance. Put in the spacer first, and fit the bearing as shown.

Special tool:

| Bearing and oil seal installing tool | 09913-75820 |

2. Place front brake panel ① and bush ② on the hub, then mount the hub in the fork, and tighten to the specified torque.
3. Insert cotter pin ① into the axle correctly.

NOTE:
Always use a new cotter pin.

Tightening torque:

36 〜 52 N.m
(3.6 〜 5.2 kg-m, 26.0 〜 37.5 lb-ft)

4. Adjust the front brake, referring to page 3-11.

FRONT BRAKE

1. Wheel hub
2. Brake shoe
3. Spring
4. Brake cam
5. Panel
6. "O" ring
7. Washer
8. Brake cam lever
9. Bolt
DISASSEMBLY
Take off the front wheel referring to page 10-2.

1. Pull off cotter pin ① and remove front brake cable pin ②.

Fig. 10-12.

2. Spread out brake shoes ①, and take the shoes off, complete with shoe springs ②.

Fig. 10-13.

3. Remove 6-mm bolt ① and take off brake cam lever ② and cam ③.

Fig. 10-14.

REASSEMBLY

1. Apply small amount of grease to the brake cam as shown in Fig. 10-15, and insert into the brake panel.
Next, place the brake cam lever on the brake panel, positioning it at the correct angle as shown in Fig. 10-16.

Tightening torque:

5 ~ 8 N.m
(5.0 ~ 8.0 kg-m, 36.5 ~ 57.5 lb-ft)

Fig. 10-15.  Fig. 10-16.

2. Place the brake shoes, with the springs stretched between them, into the brake panel.

NOTE:
Handle shoes with clean hands. Take care not to smear shoe linings with grease, etc.

Fig. 10-17.

3. Mount the front wheel, with the brake panel fitted to it, on the fork.
Refer to page 10-3 for assembling.
4. Adjust the front brake in the following manner:
   a. Inspect the distance between the front brake lever and throttle grip. The Distance \(1\) should be 20 \(\sim\) 30 mm (0.8 \(\sim\) 1.2 in.).

   b. If adjustment is necessary, turn the front brake adjuster \(2\) in or out after loosening the lock nut \(3\).

**Fig. 10-18.**

**REAR WHEEL**

1. Hub
2. Hub cushion
3. Sprocket holder
4. Rear axle
5. Spacer
6. Bearing
7. Tire
8. Inner tube
9. Protector
10. Rim
11. Spoke set
12. Bead stopper
13. Nut
14. Washer

**Fig. 10-19.**

**Fig. 10-20.**
DISASSEMBLY

1. Raise the rear wheel, and place stands under the frame at the position shown in Fig. 10-21.

**NOTE:**
Place the stand correctly to keep the motorcycle balanced during the work.

Fig. 10-21.

2. Unscrew torque link nut ① and bolt ②.

Fig. 10-22.

3. Pull off cotter pin ①, and remove brake cable pin ②.

4. Loosen lock nut ③, and take brake cable adjuster ④ off the brake panel.

Fig. 10-23.

5. Pull off cotter pin ① and remove axle nut ②. Draw out the axle shaft.

Fig. 10-24.

6. Take off rear wheel.

Fig. 10-25.
7. Remove wheel bearings ①.

Fig. 10-26.

REASSEMBLY
Reverse the disassembling procedure. Make sure that brake shoes, hub drum bore and other brake parts are clean of dust and grease. Additional instructions are given below.

1. To install the ball bearing, grease the bearing and hub in advance. Put in the spacer first, and fit the bearing as shown.

Special tool:

Bearing and oil seal installing tool 09914-79610

Fig. 10-27.

2. Place right chain adjuster ② on the swinging arm ①.

Fig. 10-28.

3. Place sprocket mounting drum ③, hub panel ④, left spacer ⑤, and right spacer on hub ②. Then mount the hub and swinging arm ① on rear axle ⑥.

NOTE:
Tighten the rear axle nut ⑦ temporarily.

Fig. 10-29.

4. Place drive chain ① on rear sprocket ②, and fit chain joint clip ③ as shown in Fig. 10-30.

NOTE:
Chain joint clip ③ must be fixed on the chain, with its open end facing in the opposite direction to chain movement.
5. Fit torque link ①, and clamp nut ② temporarily.

6. After connecting the rear brake cable to the brake pedal, fit the cam lever and a split pin securely.

7. Confirm that marks ② on both chain adjusters are set to the same scale reading ① on each side of the rear swinging arm.

Also confirm that chain sag is 15 ～ 20 mm (0.6 ～ 0.8 in.) ③.
If these settings are not correct, adjust them referring to page 3-10.

Fig. 10-33.

8. Tighten axle nut ① to the specified torque, then insert cotter pin ② correctly.

NOTE:
Always use a new cotter pin.

Tightening torque:

50 ～ 80 N.m
(5.0 ～ 8.0 kg-cm, 36.5 ～ 57.5 lb-ft)

Fig. 10-35.

9. Tighten the torque link nut to the specified torque.

Tightening torque:

20 ～ 30 N.m
(2.0 ～ 3.0 kg-m, 14.5 ～ 21.5 lb-ft)

10. Adjust the rear brake, referring to page 3-12.
REAR BRAKE

DISASSEMBLY
Take off the rear wheel referring to page 11-7.
1. Spread out brake shoes ①, and take the shoes off, complete with shoe springs ②.

2. Remove 6-mm bolt ① and take off brake cam lever ② and cam ③.

REASSEMBLY
1. Apply a small amount of grease to the brake cam as shown in Fig. 10-39, and insert into the brake panel. Next, place the brake cam lever on the brake panel, positioning it at the correct angle as shown in Fig. 10-40.

Tightening torque:

| 5 ～ 8 N.m  |
| 0.5 ～ 0.8 kg-m, 4.0 ～ 5.5 lb-ft |

2. With the springs mounted to the brake shoes, mount the brake shoes to the brake panel.
NOTE:
Handle shoes with clean hands. Take care not to smear shoe linings with grease, etc.

3. With the rear panel mounted to the rear wheel, mount the rear wheel to the rear swinging arm. Refer to page 10-8 for assembling.
4. Adjust the rear brake in the following manner:
   Turn adjuster 2 to obtain a pedal free travel 1 of 20 ~ 30 mm (0.8 ~ 1.2 in.), then tighten lock nut 3.

**CHECKING FRONT AND REAR WHEELS**

**RIM RUNOUT**
Make sure that rim runout, checked as shown, does not exceed the service limit. Excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce runout, adjust the tension of the spokes and, if this proves to be ineffective, replace the rim.

<table>
<thead>
<tr>
<th></th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face runout</td>
<td>2.0 mm (0.08 in.)</td>
</tr>
<tr>
<td>Radial runout</td>
<td>2.0 mm (0.08 in.)</td>
</tr>
</tbody>
</table>

2. Confirm that all nipples are tight, and retighten them as necessary using special tool (09940-60112). Loose spoke nipples are likely to result in spoke damage or in rim distortion.

Tightening torque:

4 ~ 5 N.m
(0.4 ~ 0.5 kg-m, 3.0 ~ 3.5 lb-ft)

3. Visually inspect the wheel hub bore, from which the bearings have been extracted, for evidence of abnormal wear caused by possible creeping of bearing outer races.
CHECKING WHEEL BEARING
1. Raise the front or rear wheel, placing a stand \( \text{①} \) under the frame at the position shown in Fig. 10-46, 10-47.

Fig. 10-46.

Fig. 10-47.

2. Check looseness of wheel bearings by hand as shown in Fig. 10-48, 10-49.

Fig. 10-47.

Fig. 10-49.

3. If looseness \( \text{①} \), as shown in the figure, is larger than the limit value, the bearings must be replaced with new ones.

Limit of wheel bearing looseness:

| Service limit | 3.0 mm (0.12 in.) |

Fig. 10-50.

TIRE WEAR LIMIT
Inspect the tire for wear and damage; and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>1.6 mm (0.06 in.)</td>
</tr>
<tr>
<td>Rear</td>
<td>2.0 mm (0.08 in.)</td>
</tr>
</tbody>
</table>

Fig. 10-51.

Fig. 10-52.

AXLE SHAFT
Check axle shaft \( \text{①} \) for deflection with dial gauge \( \text{②} \), and if deflection is in excess of the limit, replace axle shaft.

Front, rear axle shaft deflection

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15 mm (0.006 in.)</td>
<td>0.25 mm (0.010 in.)</td>
</tr>
</tbody>
</table>

Fig. 10-53.
TIRE PRESSURE
Be sure that pressure is correct at all times. If the tire pressure is too high, the machine will tend to bounce up and down. Conversely, if the pressure is too low, steering will be adversely affected. Therefore, maintain the correct tire pressure for good roadability, or shorter tire life will result.
Operating the motorcycle with the excessively worn tires will decrease riding stability and consequently invite a dangerous situation.

TIRE INFLATION PRESSURE (to be measured when tire is cold condition.)

<table>
<thead>
<tr>
<th>COLD INFLATION PRESSURE</th>
<th>FRONT</th>
<th>REAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SOLO RIDING</td>
<td>DUAL RIDING</td>
</tr>
<tr>
<td>Normal riding</td>
<td>150 kPa (5.5 psi)</td>
<td>150 kPa (5.5 psi)</td>
</tr>
<tr>
<td>Continuous high speed</td>
<td>175 kPa (7.9 psi)</td>
<td>175 kPa (7.9 psi)</td>
</tr>
</tbody>
</table>

Fig. 10-54.

2. Measure the wear of brake shoes when they are set in the brake panel.
Measure the wear twice, once before disassembling, and then after assembling (even though brake shoes have been replaced with new ones).

NOTE:
Replace the brake shoes by a set, otherwise braking performance will be adversely affected.

CHECKING FRONT AND REAR BRAKES

1. Measure the brake drum inside diameter.
If the diameter is larger than the limit written inside the brake drum, the drum must be replaced with a new one.

NOTE:
Measurement of brake drum inside diameter is required only when the brake panel is disassembled to change the brake shoes, since the wear can be checked by means of the brake lining wear limit indicator on the brake panel.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Service limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>149.7 mm (5.89 in.)</td>
<td>146.0 mm (5.75 in.)</td>
</tr>
</tbody>
</table>

Fig. 10-55.

Brake shoe
3. Visually check contact of the brake shoes and brake drum. Irregular contact may make the brake noisy. Modify the contact surface using #100 sandpaper. If the brake shoes are smeared with oil or grease, braking performance will be lowered, and the brake shoes must be replaced with new ones.

REAR SPROCKET, DRIVE CHAIN AND MOUNTING DRUM

Fig. 10-56.

1. Bearing
2. Nut
3. Washer
4. Rear sprocket
5. Sprocket mounting drum
6. Hub cushion
7. Sprocket holder
8. Bolt

Fig. 10-57.

DIASSEMBLY
Take off the rear wheel referring to page 11-6.
1. Separate sprocket from the sprocket mounting drum by removing the 6 nuts ①.

Fig. 10-58.

2. Remove bearing from the sprocket mounting drum.

Fig. 10-59.

Special tool:

Bearing installing tool 09913-70122

NOTE:
The removed bearing should be replaced with a new one.
3. Remove the drive chain joint clip ① and take out the drive chain.

Fig. 10-60.

INSPECTION
Rear sprocket wear
Sprockets that have become excessively worn cause chain noise and greatly accelerate chain and sprocket wear. The sprockets should be checked for wear when the chain is removed. Visually inspect the sprocket teeth. If they are worn as illustrated, replace the sprocket.

Fig. 10-61.

Checking drive chain
Inspect the drive chain for the abnormalities listed below (lift the rear wheel, place a jack or block under the engine, and turn the rear wheel slowly by hand, with the transmission in NEUTRAL position):
1. Loose pins
2. Damaged rollers
3. Rust
4. Twisted or bound links
5. Excessive wear
If any of the above conditions are found, the drive chain must be replaced.

Measure drive chain elongation
Remove the chain case. Using a caliper rule, measure the center-to-center distance between two pins 20 pitches apart 19 pins in between the two points. If the distance exceeds 323.0 mm (12.7 in), replace the chain with a new one. The standard distance is 317.5 mm (12.5 in.).

NOTE:
Measure elongation of the drive chain using a prop stand, while strongly pressing the chain as shown in Fig. 10-63.

Oiling drive chain
Wash the chain in cleaning solvent. After washing and drying the chain, lubricate it with chain lube or motor oil.
REASSEMBLY

1. Before installing the ball bearing, grease the bearing and fit the bearing as shown.

Special tool:

Bearing installing tool 09913-70122

the 6 nuts by bending the tongues of washer 1 firmly against the nut flats.

Tightening torque:

15 ～ 25 N.m
(1.5 ～ 2.5 kg-m, 11.0 ～ 18.0 lb-ft)

2. After securing the sprocket, be sure to lock

3. Fit the rear wheel referring to the item: Rear Wheel. Adjust the rear brake properly referring to page 10-11.

HANDLEBAR

Fig. 10-66.

1. Throttle grip
2. Right handle switch
3. Brake lever ass'y
4. Handlebar
5. Front brake cable
6. Clutch cable
7. Clutch lever ass'y
8. Left handle switch ass'y
9. Left grip
10. Throttle cable
DISASSEMBLY

1. Take front brake cable ① off brake lever ②.

Remove screws from the right handle switch box, and take off throttle cables ① and ②.

NOTE:
By the employment of coercive open-and-close carburetor, there are two throttle cables.
To identify these cables, place labels on each cable as shown in Fig. 10-70.

Fig. 10-67.

2. Take clutch cable ① off clutch lever ②.

Fig. 10-68.

3. Take off head lamp ①, and disconnect the wiring inside the headlamp housing.

Fig. 10-69.

5. Disconnect wiring ① from the right handle switch at the back of the headlamp housing.

Fig. 10-70.

Fig. 10-71.
6. Unscrew handlebar holder bolts ①, and take off handlebar ②.

7. Remove left grip ①, left handle switch ②, clutch lever ③, and brake lever from the handlebar.

**NOTE:**
To fix the left grip ④, apply adhesive to handlebar ⑤.

---

**REASSEMBLY**
1. Assemble in the order of brake lever ①, clutch lever ②, left handle switch ③, and left grip ④ on the handlebar.

---

**NOTE:**
Place the handlebar, so that punch mark ① is located as shown in Fig. 10-76. Tighten bolts ③, leaving an equal clearance at front and back of holder ②, then tighten the bolts using a torque wrench.

**Tightening torque:**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.m</td>
<td>12 ~ 20</td>
</tr>
<tr>
<td>kg-m</td>
<td>1.2 ~ 2.0</td>
</tr>
<tr>
<td>lb-ft</td>
<td>9.0 ~ 1.4</td>
</tr>
</tbody>
</table>
3. Fit wiring harness band ① on the handlebar correctly as shown in Fig. 10-77, then connect the wiring. Fix the wiring in the headlamp housing with clamps ②.

4. Mount the headlamp.
5. Fit the clutch and brake cables on each lever.

NOTE:
Fit the clutch and brake cables correctly, referring to Fig. 10-78.

6. Attach opening ① and closing ② throttle cables correctly.

NOTE:
Thread throttle cable properly referring to Fig. 10-79.

7. Finally, adjust the play in the clutch, brake and throttle cables.
   For throttle cable, see page 3-9.
   For clutch cable, see page 3-10.
   For brake cable, see page 3-11.
HEADLAMP AND HEADLAMP HOUSING

Fig. 10-80.

DISASSEMBLY
1. Unscrew headlamp screws ①, and take off the headlamp.
   Next, disconnect wiring ② in the housing.

Fig. 10-81.

2. Unscrew housing clamping bolts ①, and remove housing ②.

Fig. 10-82.

REASSEMBLY
To assemble reverse the order of disassembly.

NOTE:
Connect the wiring correctly, and fix it with clamp ①.

Fig. 10-83.

ADJUSTMENT
Check and adjust the headlamp main beam angle, if the headlamp housing has been taken off.
FRONT SUSPENSION

REMVAL
1. Remove the front wheel referring to the Item: Front Wheel.
   Remove the handle bar ass'y referring to the Item: Handlebar.
2. Take off the speedometer and tachometer cables, then remove the meter assembly.

3. Loosening clamping bolt ① and nuts ②, take off the steering stem head.

Fig. 10-84.

1. Outer tube, RH
2. Outer tube, LH
3. Oil seal
4. Washer
5. Snap ring
6. Dust seal
7. Inner tube
8. Cylinder
9. Piece, oil lock
10. Bolt
11. Gasket
12. Screw
13. Gasket
14. Spring
15. "O" ring
16. Cap
17. Cap
18. Headlamp housing bracket, RH
19. Headlamp housing bracket, LH
20. Gasket
21. Steering stem
22. Steering shaft
23. Outer race
24. Steering stem
25. Bolt
26. Washer
27. Handle holder
28. Bolt
29. Lock washer
30. Bolt
31. Bolt
32. Bolt
33. Washer
34. Lock washer
35. Nut
36. Nut
37. Clip
38. Screw
39. Lock washer
40. Clip

Fig. 10-85.

Fig. 10-86.

4. Remove the headlamp housing bracket ①.

Fig. 10-87.

Fig. 10-88.
5. Remove the front fender ① and front brake cable guide ②.

**NOTE:**
Do not lose spacer ③ and washer ④ when removing the front fender.

3. Broken cables and lead wires
4. Race wear and brinelling
5. Worn or damaged steel balls ①
6. Distortion of steering stem and handle stoppers, right and left.

Fig. 10-89.

6. Unscrew steering stem nut ① with the special tool (09940-101222), then the front fork can be taken off downward.

**NOTE:**
Do not lose steel balls ② when taking off the fork.

Fig. 10-90.

**REASSEMBLY**
Reassembly is generally the reverse of disassembly, but the following additional steps must be taken:
1. Grease the inner race ① before fitting the steel balls.

Number of steel balls

<table>
<thead>
<tr>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

Fig. 10-91.

**INSPECTION**
Inspect and check the removed parts for the following malconditions:
1. Handlebar distortion
2. Handle holder wear at the inside surface in contact with the handlebar.

Fig. 10-92.

2. Use the special tool to tighten stem nut to secure the stem after passing it through the frame head pipe and fitting the outer race.
Special tool:

Steering stem lock nut wrench 09940-10122

NOTE:
While tightening the stem nut with the special tool, turn the stem right and left to feel its "heaviness" and stop tightening before it becomes too heavy.

3. Mount the steering head ①, and tighten nut ②.

NOTE:
Check that the inner tube is positioned against the steering stem as shown in Fig. 10-94. If not, loosen bolts ③ at the bottom of the steering stem, and adjust the inner tube position.

4. Fig. 10-96 indicates important clamping bolts and nuts. Confirm that they are tightened to the specified torque.

Tightening torque:

<table>
<thead>
<tr>
<th></th>
<th>12~20 N.m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1.2<del>2.0 kg-m, 9.0</del>14.0 lb-ft)</td>
</tr>
<tr>
<td>1</td>
<td>35~50 N.m</td>
</tr>
<tr>
<td></td>
<td>(3.5<del>5.0 kg-m, 25.5</del>36.6 lb-ft)</td>
</tr>
<tr>
<td>2</td>
<td>15~25 N.m</td>
</tr>
<tr>
<td></td>
<td>(1.5<del>2.5 kg-m, 11.0</del>18.0 lb-ft)</td>
</tr>
<tr>
<td>3</td>
<td>15~25 N.m</td>
</tr>
<tr>
<td></td>
<td>(1.5<del>2.5 kg-m, 11.0</del>18.0 lb-ft)</td>
</tr>
<tr>
<td>4</td>
<td>15~25 N.m</td>
</tr>
<tr>
<td></td>
<td>(1.5<del>2.5 kg-m, 11.0</del>18.0 lb-ft)</td>
</tr>
<tr>
<td>5</td>
<td>20~30 N.m</td>
</tr>
<tr>
<td></td>
<td>(2.0<del>3.0 kg-m, 14.5</del>21.5 lb-ft)</td>
</tr>
</tbody>
</table>

5. Mount the front wheel, referring to page 10-3.
REPLACEMENT OF STEERING STEM RACES

Disassembly
1. Remove the steering stem.
2. Remove the two inner races fitted to the top and bottom ends of the head pipe.

Fig. 10-97.

Installing the races
1. Grease the replacement inner races and force each inner race into the head pipe with the special tool 1. Be sure to push the race all the way into the pipe, that is, until the jacking bolt of the special tool refused to turn any further.
2. Reassemble in the reverse order to dis-assembly, with the replacement outer races properly fitted. Load the races with steel balls as already outlined.

Special tool:

Steering inner race and swing arm bearing installer 09941-34510

Operate the special tool in the manner illustrated:

Fig. 10-98.

3. The outer race on the steering stem can be taken off with a chisel and puller.

Fig. 10-99.

4. Remove the steering lock after taking out the front fork.

Fig. 10-101.
The model SP370 employs a telescopic oleo damper of the long stroke motorcross type for the front suspension, providing an excellent damping performance.

A variable rate coil spring, with the characteristics shown in Fig. 10-103, is used as the fork spring. Aluminum outer tubes which decrease the unsprung weight and inner tubes (36 mm (1.41 in.) in dia.) made of high tension steel which reinforce front fork rigidity are employed.

**DISASSEMBLY**

1. Remove the front wheel assembly, referring to page 10-2.
2. With the upper and lower tightening of the fork sufficiently loosened, remove the front fork by drawing it out.

**FRONT FORK OIL SEAL**

The front fork oil seal can be easily removed in the following manner:

**Disassembly**

1. Remove front fork caps ① and ②, then take off fork spring ③.
2. From the bottom end of each fork, remove the hexagon socket head bolt by torquing it with "L" type hexagon wrench ① which has a "T" handle ②. This is accomplished by clamping the outer tube in a vice and using the fork assembling tool (09940-34511), as shown.

Special tool:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;L&quot; type hexagon wrench</td>
</tr>
<tr>
<td>2</td>
<td>Front fork assembling tool</td>
</tr>
<tr>
<td>3</td>
<td>&quot;T&quot; handle</td>
</tr>
<tr>
<td>4</td>
<td>Attachment G</td>
</tr>
</tbody>
</table>

Fig. 10-111.

FRONT DAMPER ASSEMBLY
Reverse the sequence of disassembling. Observe the following instructions.

1. Use of THREAD LOCK CEMENT (99000-32040) is prescribed for the hexagon socket head bolt ①. Be sure to tighten this bolt to the following torque value.

Tightening torque:

15 ~ 25 N.m  
(1.5 ~ 2.5 kg-m, 11.0 ~ 18.0 lb-ft)

Fig. 10-113.

2. For the fork oil, use SAE 10W/20 motor oil.

Fork oil capacity (one leg)

252 cc (8.52/8.87 US/Imp oz)

Fork oil level (maximum compression)

181 mm (7.13 in.)

Fig. 10-114.

INSPECTION

Inner tubes
Inspect the sliding surface of each inner tube for wear or damage. A tube in badly worn or damaged condition must be replaced.

Fig. 10-112.
3. Fit the inner tube to the steering stem, positioning the top end as shown in Fig. 10-115.

Fig. 10-115.

REAR SUSPENSION

Fig. 10-116.

A high-pressure nitrogen gas-oil shock absorber is used for the rear suspension. By employment of TRU-TRAC suspension in which the shock absorber is inclined forward, the rear wheel is provided with a long stroke vertical movement, preventing push-up at the rear to maintain stability when riding over a rough surface.

REAR SHOCK ABSORBER

The high-pressure nitrogen gas in the absorber is isolated by a free piston from the oil, so that no oil foaming occurs to reduce the damping performance. Since the oil is always pushed down by the high-pressure gas, the absorber as a whole responds, without any hesitation, even to small up-and-down movements of the rear wheel; and, because the absorber is of a single tube type, the heat generated in the oil is quickly dissipated. Long hours of sustained driving cannot weaken damping efficiency. This performance compares advantageously with the system employed in the SP370, which is of a conventional type using only oil as the damping fluid.
ASSEMBLY
1. Assemble in the reverse order to disassembling.

NOTE:
The number of washers on the top and bottom of the shock absorber is not the same.

2. Tighten to the torque specified:
Tightening torque:

\[
\begin{align*}
20 \sim 30 \text{ N.m} \\
(2.0 \sim 3.0 \text{ kg-m, } 14.5 \sim 21.5 \text{ lb-ft})
\end{align*}
\]

CAUTIONS:
Never throw away this absorber without depressurizing it when it becomes so used-up that it no longer serves its purpose. To depressurize it, place the gas tank in a plastic bag with a corner cut off, and drill into the tank at the location indicated, through the bag, using a 3-mm drill. The bag is for protection; it prevents the drill chips from flying off when the gas rushes out.

REAR SWINGING ARM

Fig. 10-118.

Fig. 10-119.

Fig. 10-120.

1. Rear swinging arm set
2. Bearing
3. Grease nipple
4. Pivot shaft
5. Nut
6. Spacer
7. Center spacer
8. Dust seal cover
9. Washer
10. Chain touch defense buffer
DISASSEMBLY
After removing the rear wheel and rear shock absorbers, proceed as follows:
Draw out pivot shaft 1, and remove swinging arm 2.

Swinging arm bearing
Remove the right and left bearings from the swinging arm.

NOTE:
Discard the removed bearings. Use replacement bearings in reassembly.

CHECKING
Inspect and check these items:
1. Swinging arm for distortion and damage.
2. Bearings for rattle (due to excessive wear of inner race).
3. Pivot shaft for distortion and wear.
4. Bearing dust seal cap for distortion.

ASSEMBLY
Reassembly is the reverse of disassembly. The following are additional instructions.
1. Install the right and left bearings with special tool 1 in the manner illustrated. Be sure to clean the bore by wiping, and apply grease to the periphery of each bearing before installing it. Remember, the stamp marked side 2 of the bearing comes to the outer side when the bearing is in place.

Special tool:

Steering inner race and swinging arm bearing installer 09941-34511
2. Place center spacer ①, spacer ②, washer ③, and dust seal cover ④ on the rear swinging arm, and measure the clearance as shown in Fig. 11-126. If the clearance is larger than the limit value, decrease the clearance using washers ⑤.

![Image of a rear swinging arm with components labeled](image)

**NOTE:**
If the clearance is left larger than the limit, running performance will be adversely affected.

Fit the washer for adjustment as indicated in Fig. 10-126.

Adjusting washer:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>61269-32900</td>
<td>14.5 × 40 × 1</td>
</tr>
</tbody>
</table>

Clearance limit:

| Within 1.0 mm (0.04 in.) |

---

**FRAME**

3. Apply a small amount of grease to the pivot shaft ① of the rear swinging arm, then insert the pivot shaft from the right side, and tighten it to the specified torque.

**Tightening torque:**

50 ~ 60 N.m
(5.0 ~ 6.0 kg-m. 36.5 ~ 43.0 lb-ft)

![Image of a frame with components labeled](image)

*Fig. 10-127.*

The semi-double cradle type frame is light in weight and yet has excellent rigidity. This outstanding rigidity makes the tubular frame ideal for the rough surfaces encountered in Motorcross riding.

*Fig. 10-128.*

---
REPLACEMENT
The replacement of the frame should be done as indicated in the flow chart on page 11-9. After assembling the frame, check rigidity and tighten if necessary.

NOTE:
Disassemble the frame only if absolutely necessary. Tie bolts and washers on the frame to avoid losing them.

To attach the wire harness correctly, mark the clamping positions with tape before taking off the wire harness.
REAR TURN SIGNAL LAMP, COMBINATION LAMP AND REAR FENDER

Right frame cover
Left frame cover
Seat lower cover R
Seat lower cover L

Rear turn signal lamp (L)
Seat ass'y
Rear combination lamp ass'y
Rear fender

Rear turn signal lamp (R)
Rear turn signal lamp bracket
FLOW CHART 11-11

FRONT WHEEL AND FRONT BRAKE

- Bearing
  - Front wheel ass'y
    - Front brake cable guide
    - Speedometer cable
    - Front brake cable pin
    - Brake shoe and spring
      - Brake cam and lever
      - Speedometer gear
      - Speedometer pinion
  - Panel
  - Front tire
    - Tube
    - Bead stopper
    - Rim
    - Bearing
    - Front hub
REAR SWINGING ARM

Rear wheel ass'y
  Rear shock absorber right
  Rear swinging arm set
    Spacer and center spacer
    Bearing
  Rear shock absorber left
  Rear torque link
  Chain case
  Chain guide
  Center spacer and spacer
    Rear swinging arm

REAR WHEEL AND REAR BRAKE

Jack up
  Rear brake cable pin
  Rear brake cable (panel side)
  Rear torque link
  Rear wheel ass'y and sprocket mounting drum
    Rear sprocket
      Bearing
      Sprocket mounting drum
    Brake shoe and shoe spring
      Brake cam lever and brake cam
        Bearing
        Brake panel
  Rear tire
    Tube
    Bead stopper
    Rim
    Bearing
    Rear hub