

# SERVICING INFORMATION

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## TROUBLESHOOTING

### ENGINE

| Complaint   | Symptom and possible causes  | Remedy   |
|---|--|--|
| <p><b>Engine will not start, or is hard to start.</b></p> | <p><b>Compression too low</b></p> <ol style="list-style-type: none"> <li>1. Valve clearance out of adjustment.</li> <li>2. Worn valve guides or poor seating of valves.</li> <li>3. Valves mistiming</li> <li>4. Piston rings excessively worn.</li> <li>5. Worn-down cylinder bore.</li> <li>6. Poor seating of spark plug.</li> <li>7. Starter motor cranks but too slowly.</li> </ol> <p><b>Plug not sparking</b></p> <ol style="list-style-type: none"> <li>1. Fouled spark plug.</li> <li>2. Wet spark plug.</li> <li>3. Defective ignition coil.</li> <li>4. Open or short circuit in high tension cord.</li> </ol> <p><b>No fuel reaching the carburetor</b></p> <ol style="list-style-type: none"> <li>1. Clogged hole in the fuel tank cap.</li> <li>2. Clogged or defective fuel cock.</li> <li>3. Defective carburetor float valve.</li> <li>4. Clogged fuel pipe.</li> </ol>   | <p>Adjust.<br/>Repair or replace.<br/>Adjust.<br/>Replace.<br/>Replace or rebore.<br/>Retighten.<br/>Consult "electrical complaints"</p> <p>Clean or replace.<br/>Clean and dry.<br/>Replace.<br/>Replace..</p> <p>Clean.<br/>Clean or replace.<br/>Replace.<br/>Clean or replace.</p> |
| <p><b>Engine stalls easily.</b></p>                       | <ol style="list-style-type: none"> <li>1. Fouled spark plug.</li> <li>2. Clogged fuel hose.</li> <li>3. Clogged jets in carburetor.</li> <li>4. Valve clearance out of adjustment.</li> </ol>  | <p>Clean.<br/>Clean.<br/>Clean.<br/>Adjust.</p>  |
| <p><b>Noisy engine.</b></p>                               | <p><b>Excessive valve chatter</b></p> <ol style="list-style-type: none"> <li>1. Valve clearance too large.</li> <li>2. Weakened or broken valve springs.</li> <li>3. Worn down camshaft.</li> </ol> <p><b>Noise appears to come from piston</b></p> <ol style="list-style-type: none"> <li>1. Piston or cylinder worn down.</li> <li>2. Weakened or broken valve springs.</li> <li>3. Worn down piston pin or piston pin bore.</li> <li>4. Piston rings or ring groove worn.</li> </ol> <p><b>Noise seems to come from timing chain</b></p> <ol style="list-style-type: none"> <li>1. Stretched chain.</li> <li>2. Worn sprockets.</li> <li>3. Tension adjuster not working.</li> </ol> <p><b>Noise seems to come from clutch</b></p> <ol style="list-style-type: none"> <li>1. Worn splines of countershaft or hub.</li> <li>2. Worn teeth of cluth plates.</li> <li>3. Distorted clutch plates, driven and drive.</li> </ol> <p><b>Noise seems to come from crankshaft</b></p> <ol style="list-style-type: none"> <li>1. Worn or broken bearings.</li> <li>2. Big-end bearings worn and broken.</li> <li>3. Thrust clearance too large.</li> </ol> | <p>Adjust.<br/>Replace.<br/>Replace.</p> <p>Replace.<br/>Replace.<br/>Replace.<br/>Replace.</p> <p>Replace.<br/>Replace.<br/>Repair or replace.</p> <p>Replace.<br/>Replace.<br/>Replace.</p> <p>Replace.<br/>Replace.<br/>Replace.</p>  |



### 7-3 SERVICING INFORMATION

| Complaint                  | Symptom and possible causes  | Remedy   |
|----------------------------|--|--|
| <b>Engine lacks power.</b> | <ol style="list-style-type: none"> <li>1. Loosen of valve clearance.</li> <li>2. Weakened valve springs.</li> <li>3. Valve timing out of adjustment.</li> <li>4. Worn piston ring or cylinder.</li> <li>5. Poor seating of valves.</li> <li>6. Fouled spark plug.</li> <li>7. Worn camshaft.</li> <li>8. Spark plug gap incorrect.</li> <li>9. Clogged jets in carburetor.</li> <li>10. Float-chamber fuel level out of adjustment.</li> <li>11. Clogged air cleaner element.</li> <li>12. Too much enging oil.</li> <li>13. Defective air intake pipe.</li> </ol> | Adjust.<br>Replace.<br>Adjust.<br>Replace.<br>Repair or replace.<br>Clean or replace.<br>Replace.<br>Adjust or replace.<br>Clean.<br>Adjust.<br>Clean.<br>Drain out excess oil.<br>Retighten or replace. |
| <b>Engine overheats.</b>   | <ol style="list-style-type: none"> <li>1. Heavy carbon deposit on piston head.</li> <li>2. Not enough oil in the engine.</li> <li>3. Defective oil pump or clogged oil circuit.</li> <li>4. Fuel level too low in float chamber.</li> <li>5. Air leak from intake pipe.</li> <li>6. Use of incorrect engine oil.</li> <li>7. Defective oil cooler.</li> </ol>  | Clean.<br>Add oil.<br>Repair or clean.<br>Adjust.<br>Retighten or replace.<br>change.<br>Clean or replace.   |

### CARBURETOR

| Complaint                                    | Symptom and possible causes   | Remedy   |
|--|---|--|
| <b>Trouble with starting.</b>                | <ol style="list-style-type: none"> <li>1. Starter jet is clogged.</li> <li>2. Starter pipe is clogged.</li> <li>3. Air leaking from a joint between starter body and carburetor.</li> <li>4. Starter plunger is not operating properly.</li> </ol>                                | Clean.<br>Clean.<br>Check starter body and carburetor for tightness, adjust and replace gasket.<br>Check and adjust. |
| <b>Idling or low-speed trouble.</b>          | <ol style="list-style-type: none"> <li>1. Pilot jet, pilot air jet are clogged or loose.</li> <li>2. Pilot outlet or bypass is clogged.</li> <li>3. Starter plunger is not fully closed.</li> </ol>   | Check and clean.<br>Check and clean.<br>Check and clean.   |
| <b>Medium or high speed trouble.</b>         | <ol style="list-style-type: none"> <li>1. Main jet or main air jet is clogged.</li> <li>2. Needle jet is clogged.</li> <li>3. Throttle valve is not operating properly.</li> <li>4. Filter is clogged.</li> </ol>   | Check and clean.<br>Check and clean.<br>Check throttle valve for operation.<br>Check and clean.                      |
| <b>Overflow and fuel level fluctuations.</b> | <ol style="list-style-type: none"> <li>1. Needle valve is worn or damaged.</li> <li>2. Spring in needle valve is borken.</li> <li>3. Float is not working properly.</li> <li>4. Foreign matter has adhered to needle valve.</li> <li>5. Fuel level is too high or low.</li> </ol> | Replace.<br>Replace.<br>Check and adjust.<br>Clean.<br>Adjust float height.  |

**ELECTRICAL**

| <b>Complaint</b>   | <b>Symptom and possible causes</b>   | <b>Remedy</b>  |
|--|--|--|
| <b>No sparking or poor sparking.</b>                                   | <ol style="list-style-type: none"> <li>1. Defective ignition coil.</li> <li>2. Defective spark plug.</li> <li>3. Defective CDI unit.</li> </ol>  | Replace.<br>Replace.<br>Replace.   |
| <b>Spark plug soon become fouled with carbon.</b>                      | <ol style="list-style-type: none"> <li>1. Mixture too rich.</li> <li>2. Idling speed set too high.</li> <li>3. Incorrect gasoline.</li> <li>4. Dirty element in air cleaner.</li> <li>5. Spark plug too cold.</li> </ol>   | Adjust carburetor.<br>Adjust carburetor.<br>Change.<br>Clean or replace.<br>Replace by hot type plug.                    |
| <b>Spark plug become fouled too soon.</b>                              | <ol style="list-style-type: none"> <li>1. Worn piston rings.</li> <li>2. Pistons or cylinder worn.</li> <li>3. Excessive clearance of valve stems in valve guides.</li> <li>4. Worn stem oil seal.</li> </ol>  | Replace.<br>Replace.<br>Replace.<br>Replace.   |
| <b>Spark plug electrodes overheat or burn.</b>                         | <ol style="list-style-type: none"> <li>1. Spark plug too hot.</li> <li>2. The engine overheats.</li> <li>3. Spark plug loose.</li> <li>4. Mixture too lean.</li> </ol>   | Replace by cold type plug.<br>Tune up.<br>Retighten.<br>Adjust carburetor.   |
| <b>Generator charge, but charging rate is below the specification.</b> | <ol style="list-style-type: none"> <li>1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals.</li> <li>2. Grounded or open-circuited stator coils of generator.</li> <li>3. Defective regulator/rectifier.</li> <li>4. Not enough electrolyte in the battery.</li> <li>5. Defective cell plates in the battery.</li> </ol> | Repair or retighten.<br><br>Replace.<br>Replace.<br>Add distilled water between the level lines.<br>Replace the battery. |
| <b>Generator overcharges.</b>  | <ol style="list-style-type: none"> <li>1. Internal short-circuit in the battery.</li> <li>2. Resistor element in the regulator/rectifier damaged or defective.</li> <li>3. Regulator/rectifier poorly grounded.</li> </ol>   | Replace the battery.<br>Replace.<br><br>Clean and tighten ground connection.   |
| <b>Unstable charging.</b>  | <ol style="list-style-type: none"> <li>1. Lead wire insulation frayed due to vibration resulting in intermittent shorting.</li> <li>2. Generator internally shorted.</li> <li>3. Defective regulator/rectifier.</li> </ol>   | Repair or replace<br><br>Replace.<br>Replace.  |
| <b>Starter switch is not effective.</b>                                | <ol style="list-style-type: none"> <li>1. Battery run down.</li> <li>2. Defective switch contacts.</li> <li>3. Brushes not seating properly on commutator in starter motor.</li> <li>4. Defective starter relay.</li> </ol>  | Recharge or replace.<br>Replace.<br>Repair or replace.<br>Replace.   |

## 7-5 SERVICING INFORMATION

### BATTERY

| Complaint   | Symptom and possible causes   | Remedy  |
|---|---|---|
| <p><b>“Sulfation” acidic white powdery substance or spots on surfaces of cell plates.</b></p> | <ol style="list-style-type: none"> <li>1. Not enough electrolyte.</li> <li>2. Battery case is cracked.</li> <li>3. Battery has been left in a run-down condition for a long time.</li> <li>4. Contaminated electrolyte. (Foreign matter has enters the battery and become mixed with the electrolyte.)</li> </ol>   | <p>Add distilled water, if the battery has not been damaged and “sulfation” has not advanced too far, and recharge.<br/>                     Replace the battery.<br/>                     Replace the battery or recharge.</p> <p>If “sulfation” has not advanced far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte specific gravity.</p>   |
| <p><b>Battery runs down quickly.</b></p>  | <ol style="list-style-type: none"> <li>1. The charging method is not correct.</li> <li>2. Cell plates have lost much of their active material as a result of over-charging.</li> <li>3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte specific gravity.</li> <li>4. Electrolyte specific gravity is too low.</li> <li>5. Contaminated electrolyte.</li> <li>6. Battery is too old.</li> </ol> | <p>Check the generator, regulator /rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation.<br/>                     Replace the battery, and correct the charging system.<br/>                     Replace the battery.</p> <p>Recharge the battery fully and adjust electrolyte specific gravity.<br/>                     Replace the electrolyte, recharge the battery and then adjust specific gravity.<br/>                     Replace the battery.</p> |
| <p><b>Reversed battery polarity.</b></p>  | <p>The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.</p>  | <p>Replace the battery and be sure to connect the battery properly.</p>   |
| <p><b>Battery “sulfation”</b></p>   | <ol style="list-style-type: none"> <li>1. Charging rate too low or too high. (When not in use, batteries should be recharged at least once a month to avoid sulfation.)</li> <li>2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low.</li> <li>3. The battery left unused for too long in cold climate.</li> </ol>  | <p>Replace the battery.</p> <p>Keep the electrolyte up to the prescribed level, or adjust the specific gravity by consulting the battery maker’s directions.<br/>                     Replace the battery, if badly sulfated.</p>   |
| <p><b>Battery discharges too rapidly.</b></p>   | <ol style="list-style-type: none"> <li>1. Dirty container top and sides.</li> <li>2. Impurities in the electrolyte or electrolyte specific gravity is too high.</li> </ol>  | <p>Clean.<br/>                     Change the electrolyte by consulting the battery maker’s directions.</p>   |

**CHASSIS**

| <b>Complaint</b>                          | <b>Symptom and possible causes</b>   | <b>Remedy</b>  |
|---|--|--|
| <b>Steering feels too heavy or stiff.</b> | <ol style="list-style-type: none"> <li>1. Steering stem nut overtightened.</li> <li>2. Worn bearing or race in steering stem.</li> <li>3. Distorted steering stem.</li> <li>4. Not enough pressure in tires.</li> </ol>  | Adjust.<br>Replace.<br>Replace.<br>Adjust.                               |
| <b>Steering oscillation.</b>              | <ol style="list-style-type: none"> <li>1. Loss of balance between right and left front suspensions.</li> <li>2. Distorted front fork.</li> <li>3. Distorted front axle or crooked tire.</li> </ol>   | Replace.<br>Repair or replace.<br>Replace.                               |
| <b>Wobbling front wheel.</b>              | <ol style="list-style-type: none"> <li>1. Distorted wheel rim.</li> <li>2. Worn-down wheel bearings.</li> <li>3. Defective or incorrect tire.</li> <li>4. Loosen nut on axle.</li> </ol>   | Replace.<br>Replace.<br>Replace.<br>Retighten.                           |
| <b>Front suspension too soft.</b>         | <ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Not enough fork oil.</li> </ol>  | Replace.<br>Refill.  |
| <b>Front suspension too stiff.</b>        | <ol style="list-style-type: none"> <li>1. Fork oil too viscous.</li> <li>2. Too much fork oil.</li> </ol>  | Replace.<br>Drain excess oil.  |
| <b>Noisy front suspension.</b>            | <ol style="list-style-type: none"> <li>1. Not enough fork oil.</li> <li>2. Loosen nuts on suspension.</li> </ol>   | Refill.<br>Retighten.  |
| <b>Wobbling rear wheel.</b>               | <ol style="list-style-type: none"> <li>1. Distorted wheel rim.</li> <li>2. Worn-down rear wheel bearing.</li> <li>3. Defective or incorrect tire.</li> <li>4. Loose nut on axle.</li> <li>5. Worn swing arm bushing or bearing.</li> <li>6. Loosen nut on the rear shock.</li> </ol> | Replace.<br>Replace.<br>Replace.<br>Retighten.<br>Replace.<br>Retighten. |
| <b>Rear suspension too soft.</b>          | <ol style="list-style-type: none"> <li>1. Weakened springs.</li> <li>2. Rear suspension adjuster improperly set.</li> </ol>  | Replace.<br>Adjust.  |
| <b>Rear suspension too stiff.</b>         | <ol style="list-style-type: none"> <li>1. Rear suspension adjuster improperly set.</li> <li>2. Worn swing arm bushing or bearing.</li> </ol>   | Adjust.<br>Replace.  |
| <b>Noisy rear suspension.</b>             | <ol style="list-style-type: none"> <li>1. Loosen nuts on suspension.</li> <li>2. Worn swing arm bushing or bearing.</li> </ol>   | Retighten.<br>Replace.   |

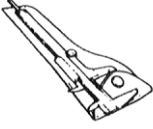

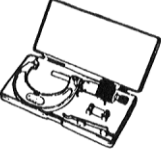


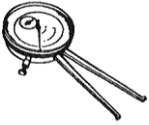

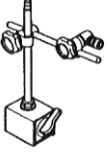
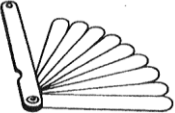
## 7-7 SERVICING INFORMATION


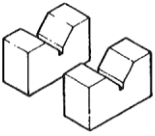





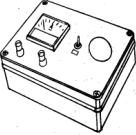
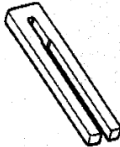
### BRAKES

| Complaint                            | Symptom and possible causes   | Remedy  |
|--------------------------------------|---|---|
| <b>Poor braking (FRONT and REAR)</b> | <ol style="list-style-type: none"><li>1. Not enough brake fluid in the reservoir.</li><li>2. Air trapped in brake fluid circuit.</li><li>3. Pads worn down.</li><li>4. Too much play on brake lever or pedal.</li><li>5. Shoes worn down.</li></ol>   | Refill to level mark.<br>Bleed air out.<br>Replace.<br>Adjust.<br>Replace.  |
| <b>Insufficient brake power.</b>     | <ol style="list-style-type: none"><li>1. Leakage of brake fluid from hydraulic system.</li><li>2. Worn pads.</li><li>3. Oil adhesion of engaging surface of pads.</li><li>4. Worn disk.</li><li>5. Air in hydraulic system.</li></ol>   | Repair or replace.<br>Replace.<br>Clean disk and pads.<br>Replace.<br>Bleed air.  |
| <b>Brake squeaking.</b>              | <ol style="list-style-type: none"><li>1. Carbon adhesion on pad surface.</li><li>2. Tilted pad.</li><li>3. Damaged wheel bearing.</li><li>4. Loosen front-wheel axle or rear-wheel axle.</li><li>5. Worn pads.</li><li>6. Foreign material in brake fluid.</li><li>7. Clogged return port of master cylinder.</li></ol> | Repair surface with sandpaper.<br>Modify pad fitting.<br>Replace.<br>Tighten to specified torque.<br>Replace.<br>Replace brake fluid.<br>Disassemble and clean master cylinder. |
| <b>Excessive brake lever stroke.</b> | <ol style="list-style-type: none"><li>1. Air in hydraulic system.</li><li>2. Worn brake lever cam.</li><li>3. Insufficient brake fluid.</li><li>4. Improper quality of brake fluid.</li></ol>   | Bleed air.<br>Replace brake lever.<br>Replenish fluid to specified level ; bleed air.<br>Replace with correct fluid.  |
| <b>Leakage of brake fluid.</b>       | <ol style="list-style-type: none"><li>1. Insufficient tightening of connection joints.</li><li>2. Cracked hose.</li><li>3. Worn piston and/or cup.</li></ol>  | Tighten to specified torque.<br>Replace.<br>Replace piston and/or cup.  |

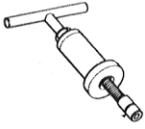
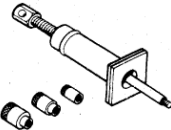
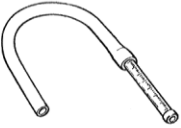
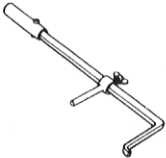
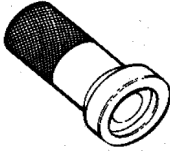

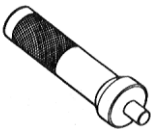
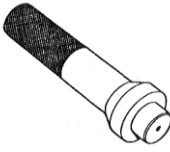
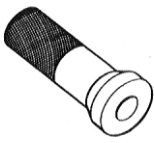



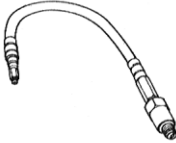



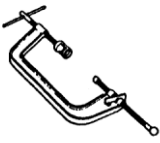


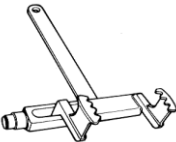
## SPECIAL TOOLS





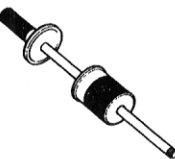
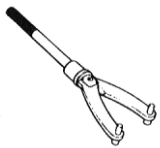
| Special tools   | Part Number · Part Name · Description  |
|---|--|
|    | 09900-20101<br>Vernier Caliper<br>Used to conveniently measure various dimensions.           |
|    | 09900-20201<br>Micrometer(0~25mm)<br>Used for precise measurement (00~25mm measure ranges).  |
|    | 09900-20202<br>Micrometer(25~50mm)<br>Used for precise measurement (25~50mm measure ranges). |
|   | 09900-20203<br>Micrometer(50~75mm)<br>Used for precise measurement (50~75mm measure ranges). |
|  | 09900-20508<br>Cylinder gauge set<br>Measure inside diameter of cylinder.                    |
|  | 09900-20605<br>Dial calipers<br>Measure width of conrod big-end.                             |
|  | 09900-20606<br>Dial gauge<br>Measure oscillation of wheel with using magnetic stand.         |
|  | 09900-20701<br>Magnetic stand<br>With using dial gauge.                                      |
|  | 09900-20806<br>Thickness gauge<br>Measure clearance of piston ring.                          |

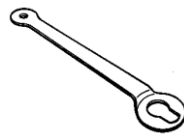

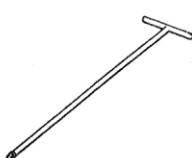


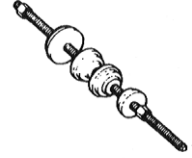
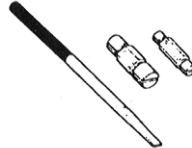
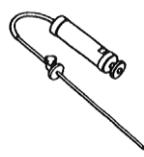
| Special tools  | Part Number · Part Name · Description   |
|--|---|
|    | 09900-21109<br>Torque wrench<br>Measure torque of tightening.                   |
|     | 09900-21304<br>V-block<br>With using magnetic stand.                            |
|     | 09900-22301<br>Plastigauge<br>Measure clearance of crankshaft thrust.           |
|   | 09900-22401<br>Small bore gauge<br>Measure inside diameter of conrod small-end. |
|   | 09900-25002<br>Pocket tester<br>Measure voltage, electric current, resistance.  |
|  | 09900-26006<br>Engine tachometer<br>Measure rotational frequency of engine.     |
|   | 09900-28107<br>Electro tester<br>Inspect ignition coil.                         |
|   | 09900-28500<br>Battery charger<br>Used to charge the discharged battery.        |
|   | 09910-20115<br>Conrod holder<br>Used to lock the crankshaft.                    |

## 7-9 SERVICING INFORMATION

| Special tools   | Part Number · Part Name · Description   |
|---|---|
|    | 09910-32812<br>Crankshaft installer<br>Used to install the crankshaft in the crankcase. |
|    | 09910-34510<br>Piston pin puller<br>Use to remove the piston pin.                       |
|    | 09913-10760<br>Fuel level gauge<br>Measure height of carburetor.                        |
|   | 09913-50121<br>Oil seal remover<br>Used to remove the oil seal.                         |
|  | 09913-70122<br>Bearing installer<br>Used to drive bearing in.                           |
|  | 09913-75520<br>Bearing installer<br>Used to drive bearing in.                           |
|  | 09913-75820<br>Bearing installer<br>Used to drive bearing in.                           |
|  | 09913-75830<br>Bearing installer<br>Used to install rear axle shaft oil seal.           |
|  | 09913-76010<br>Bearing installer<br>Used to drive crankshaft bearing in.                |

| Special tools  | Part Number · Part Name · Description   |
|--|---|
|     | 09913-80112<br>Bearing installer<br>Used to drive bearing in.                               |
|    | 09915-63310<br>Compression gauge adapter<br>Used with compression gauge.                    |
|    | 09915-64510<br>Compression gauge<br>Measure cylinder compression.                           |
|    | 09915-74510<br>Oil pressure gauge<br>Measure oil pressure of 4-stroke engine.               |
|   | 09915-74531<br>Oil pressure gauge hose attachment<br>Used with oil pressure gauge.          |
|  | 09916-14510<br>Valve spring compressor<br>Used to remove and remounting valve stem.         |
|  | 09916H35C00<br>Valve spring compressor attachment<br>Used with valve spring compressor.     |
|  | 09920-13120<br>Crankcase separator<br>Separate to crankcase.                                |
|  | 09920-53710<br>Clutch sleeve hub holder<br>Used to install or remove clutch sleeve hub nut. |

| Special tools   | Part Number · Part Name · Description                        |
|---|--|
|    | 09921-20200<br>Bearing remover(10mm)                         |
|   | Used to remove oil seal or bearing.                          |
|    | 09921-20210<br>Bearing remover(12mm)                         |
|   | Used to remove oil seal or bearing.                          |
|    | 09923-73210<br>Bearing remover(17mm)                         |
|   | Used to remove bearing with the rotor remove sliding shaft.  |
|   | 09923-74510<br>Bearing remover(20~35mm)                      |
|   | Used to remove bearing with the rotor remove sliding shaft.  |
|  | 09924-84521<br>Bearing installer                             |
|   | Used to drive small bearing in.                              |
|  | 09930-10121<br>Spark plug socket wrench set                  |
|   | Used to remove or remounting spark plug.                     |
|  | 09930-30102<br>Rotor remove sliding shaft                    |
|   | Used to with bearing remover or rotor remover.               |
|  | 09930-30164<br>Rotor remover                                 |
|   | Attached to the top of sliding shaft when removing rotor.    |
|  | 09930-40113<br>Rotor holder                                  |
|   | Widely used to lock rotary parts such as a flywheel magneto. |

| Special tools  | Part Number · Part Name · Description                        |
|--|--|
|    | 09930-44510<br>Rotor holder                                  |
|  | Widely used to lock rotary parts such as a flywheel magneto. |
|    | 09940-10122<br>Clamp wrench                                  |
|  | A hook wrench to adjust the steering head of motorcycle.     |
|    | 09940-34520<br>T-handle                                      |
|  | Remove and remounting front fork oil cylinder.               |
|   | 09940-34561<br>Front fork assembling tool attachment "D"     |
|  | Used with T-handle.  |
|  | 09940-50113<br>Front fork oil seal installer                 |
|  | Install front fork oil seal.                                 |
|  | 09941-34513<br>Steering race installer                       |
|  | Used to install steering outer race.                         |
|  | 09941-50111<br>Wheel bearing remover                         |
|  | Used to remove wheel bearing.                                |
|   | 09943-74111<br>Front fork oil level gauge                    |
|  | Used to drain the fork oil to the specified level.           |

## TIGHTENING TORQUE

### ENGINE

| ITEM                            | N · m    | kg · m     |
|---------------------------------|----------|------------|
| Magneto rotor nut               | 50 ~ 60  | 5.0 ~ 6.0  |
| Magneto cover bolt              | 8 ~ 12   | 0.8 ~ 1.2  |
| Muffler mounting bolt           | 20 ~ 30  | 2.0 ~ 3.0  |
| Exhaust pipe nut                | 18 ~ 28  | 1.8 ~ 2.8  |
| Starter clutch bolt             | 15 ~ 20  | 1.5 ~ 2.0  |
| Cylinder head bolt              | 7 ~ 11   | 0.7 ~ 1.1  |
| Cylinder head cover bolt        | 12 ~ 16  | 1.2 ~ 1.6  |
| Cylinder head stud bolt         | 21 ~ 25  | 2.1 ~ 2.5  |
| Cylinder head base nut          | 7 ~ 11   | 0.7 ~ 1.1  |
| Engine sprocket nut             | 80 ~ 100 | 8.0 ~ 10.0 |
| Engine oil drain plug           | 18 ~ 20  | 1.8 ~ 2.0  |
| Engine mounting bolt            | 40 ~ 60  | 4.0 ~ 6.0  |
| Cam chain sprocket bolt         | 10 ~ 13  | 1.0 ~ 1.3  |
| Cam chain tensioner bolt        | 6 ~ 8    | 0.6 ~ 0.8  |
| Cam chain tension adjuster bolt | 8 ~ 12   | 0.8 ~ 1.2  |
| Camshaft sprocket bolt          | 10 ~ 12  | 1.0 ~ 1.2  |
| Crankcase bolt                  | 8 ~ 12   | 0.8 ~ 1.2  |
| Clutch sleeve hub nut           | 30 ~ 50  | 3.0 ~ 5.0  |
| Primary drive gear nut          | 40 ~ 60  | 4.0 ~ 6.0  |
| Camshaft housing bolt           | 8 ~ 12   | 0.8 ~ 1.2  |
| Oil cooler union bolt (M10)     | 20 ~ 25  | 2.0 ~ 2.5  |
| Oil cooler union bolt (M12)     | 20 ~ 25  | 2.0 ~ 2.5  |
| Spark plug                      | 20 ~ 25  | 2.0 ~ 2.5  |
| Neutral cam stopper plug        | 20 ~ 25  | 2.0 ~ 2.5  |

**CHASSIS**

| ITEM                                      | N · m    | kg · m     |
|---|----------|------------|
| Rear brake cam lever bolt                 | 8 ~ 12   | 0.8 ~ 1.2  |
| Rear shock absorber fitting nut (Upper)   | 20 ~ 30  | 2.0 ~ 3.0  |
| Rear shock absorber fitting nut (Lower)   | 35 ~ 55  | 3.5 ~ 5.5  |
| Rear sprocket nut                         | 22 ~ 35  | 2.2 ~ 3.5  |
| Rear axle nut                             | 90 ~ 140 | 9.0 ~ 14.0 |
| Swing arm pivot nut                       | 45 ~ 70  | 4.5 ~ 7.0  |
| Steering stem nut                         | 40 ~ 50  | 4.0 ~ 5.0  |
| Steering stem head nut                    | 80 ~ 100 | 8.0 ~ 10.0 |
| Front brake disc bolt                     | 18 ~ 28  | 1.8 ~ 2.8  |
| Front brake master cylinder mounting bolt | 5 ~ 8    | 0.5 ~ 0.8  |
| Front brake caliper air bleeder valve     | 6 ~ 9    | 0.6 ~ 0.9  |
| Front brake caliper mounting bolt         | 18 ~ 28  | 1.8 ~ 2.8  |
| Front brake hose union bolt               | 20 ~ 25  | 2.0 ~ 2.5  |
| Front axle                                | 50 ~ 80  | 5.0 ~ 8.0  |
| Front axle pinch bolt                     | 15 ~ 25  | 1.5 ~ 2.5  |
| Front fork damper rod bolt                | 15 ~ 25  | 1.5 ~ 2.5  |
| Front fork upper clamp bolt               | 22 ~ 35  | 2.2 ~ 3.5  |
| Front fork upper bolt                     | 15 ~ 30  | 1.5 ~ 3.0  |
| Front fork lower clamp bolt               | 22 ~ 35  | 2.2 ~ 3.5  |
| Front footrest bolt                       | 36 ~ 52  | 3.6 ~ 5.2  |
| Handlebar clamp bolt                      | 18 ~ 28  | 1.8 ~ 2.8  |
| Handlebar holder lower nut                | 40 ~ 60  | 4.0 ~ 6.0  |

**SERVICE DATA****VALVE + GUIDE**

Unit : mm

| ITEM                                | STANDARD  |                                 | LIMIT |
|-------------------------------------|-----------|---------------------------------|-------|
| Valve diam.                         | IN.       | 22                              | —     |
|                                     | EX.       | 19.0                            | —     |
| Valve clearance (When cold)         | IN.       | 0.1~0.2                         | —     |
|                                     | EX.       | 0.2~0.3                         | —     |
| Valve guide to valve stem clearance | IN.       | 0.010~0.037                     | —     |
|                                     | EX.       | 0.030~0.057                     | —     |
| Valve stem deflection               | IN. & EX. | —                               | 0.35  |
| Valve guide I.D.                    | IN. & EX. | 4.500~4.512                     | —     |
| Valve stem O.D.                     | IN.       | 4.475~4.490                     | —     |
|                                     | EX.       | 4.455~4.470                     | —     |
| Valve stem runout                   | IN. & EX. | —                               | 0.05  |
| Valve head thickness                | IN. & EX. | —                               | 0.5   |
| Valve seat width                    | 0.9~1.1   |                                 | —     |
| Valve seat angle                    | IN. & EX. | 45°                             | —     |
| Valve head radial runout            | IN. & EX. | —                               | 0.03  |
| Valve spring free length            | IN.       | —                               | 37.8  |
|                                     | EX.       | —                               | 37.8  |
| Valve spring tension                | IN.       | 12.1~13.9kgf (at length 33.7mm) | —     |
|                                     | EX.       | 12.1~13.9kgf (at length 33.7mm) | —     |

**CAMSHAFT + CYLINDER HEAD**

Unit : mm

| ITEM                           | STANDARD  |                 | LIMIT  |
|--------------------------------|-----------|-----------------|--------|
| Cam height                     | IN.       | 34.470 ~ 34.510 | 34.170 |
|                                | EX.       | 34.420 ~ 34.460 | 34.120 |
| Camshaft journal holder I.D.   | IN. & EX. | 35.000 ~ 35.018 | —      |
| Cylinder head distortion       | —         |                 | 0.05   |
| Cylinder head cover distortion | —         |                 | 0.05   |
| Cam chain pin (Arrow "3")      | 16th pin  |                 | —      |

**CYLINDER + PISTON + PISTON RING**

Unit : mm

| ITEM                                     | STANDARD  |             | LIMIT                 |
|--|---|-------------|-----------------------|
| Compression pressure                     | 14~16 kg/cm <sup>2</sup> (at 600 rpm)                 |             | 12 kg/cm <sup>2</sup> |
| Piston to cylinder clearance             | 0.050~0.060   |             | 0.120                 |
| Cylinder bore                            | 57.000~57.015   |             | 57.080                |
| Piston diam.                             | 56.945~56.960<br>(Measure at 15mm from the skirt end) |             | 56.880                |
| Cylinder or cylinder head distortion     | —   |             | 0.05                  |
| Piston ring free end gap                 | 1st   | 7.2         | 5.7                   |
|  | 2nd   | 5.8         | 4.6                   |
| Piston ring end gap (Assembly condition) | 1st   | 0.20~0.32   | 0.5                   |
|  | 2nd   | 0.20~0.32   | 0.5                   |
| Piston ring to groove clearance          | 1st   | —           | 0.180                 |
|  | 2nd   | —           | 0.150                 |
| Piston ring to groove width              | 1st   | 1.01~1.03   | —                     |
|  | 2nd   | 1.01~1.03   | —                     |
|  | Oil   | 2.01~2.03   | —                     |
| Piston ring thickness                    | 1st   | 0.970~0.990 | —                     |
|  | 2nd   | 0.970~0.990 | —                     |
| Piston pin hall I.D.                     | 15.002 ~ 15.008                                       |             | 15.030                |
| Piston pin O.D.                          | 14.994 ~ 15.000                                       |             | 14.980                |

**CONROD + CRANKSHAFT**

Unit : mm

| ITEM                          | STANDARD      |  | LIMIT  |
|-------------------------------|---------------|--|--------|
| Conrod small end I.D.         | 15.006~15.014 |  | 15.040 |
| Conrod deflection             | —             |  | 3.0    |
| Conrod big end side clearance | 0.40~0.85     |  | 1.0    |
| Conrod big end width          | 15.95~16.00   |  | —      |
| Crank web to web width        | 72 ± 0.1      |  | —      |
| Crankshaft runout             | —             |  | 0.05   |

**OIL PUMP**

Unit : mm

| ITEM                     | STANDARD  | NOTE |
|--------------------------|---|------|
| Oil pressure             | 1.3 ± 0.2 kg/cm <sup>2</sup><br>(at 60 °C, 4,000 rpm) | —    |
| Oil pump reduction ratio | 58/19 × 14/20=2.137                                   | —    |

## 7-15 SERVICING INFORMATION

### CLUTCH

Unit : mm

| ITEM                      | STANDARD  | LIMIT |
|---------------------------|-----------|-------|
| Clutch cable play         | 4         | —     |
| Drive plate thickness     | 2.9~3.1   | 2.6   |
| Drive plate claw width    | 11.8~12.0 | 11.0  |
| Driven plate distortion   | —         | 0.1   |
| Clutch spring free length | 38.2      | 36.2  |

### TRANSMISSION + DRIVE CHAIN

Unit : mm

| ITEM                           | STANDARD        |              | LIMIT |
|--------------------------------|-----------------|--------------|-------|
| Primary reduction ratio        | 3.05 (58/19)    |              | —     |
| Secondary reduction ratio      | 3.29 (46/14)    |              | —     |
| Gear ratio                     | 1st             | 2.46 (32/13) | —     |
|                                | 2nd             | 1.56 (28/18) | —     |
|                                | 3rd             | 1.19 (25/21) | —     |
|                                | 4th             | 0.96 (22/23) | —     |
|                                | 5th             | 0.84 (21/25) | —     |
| Shift fork to groove clearance | 0.10~0.30       |              | 0.5   |
| Shift fork groove width        | NO.1 & NO.2     | 5.0~5.1      | —     |
|                                | NO.3            | 5.0~5.1      | —     |
| Shift fork thickness           | NO.1 & NO.2     | 4.8~4.9      | —     |
|                                | NO.3            | 4.8~4.9      | —     |
|                                | Type            | RK-520DS     | —     |
| Drive chain                    | Links           | 116 LINKS    | —     |
|                                | 20-pitch length | 317.5        | 319.4 |
| Drive chain slack              | 20~30           |              | —     |



**CARBURETOR**

Unit : mm

| ITEM                   | SPECIFICATION            |     |     |     |             |     |     |     |
|------------------------|--------------------------|-----|-----|-----|-------------|-----|-----|-----|
| Carburetor type        | MIKUNI BDS26TYPE(DOUBLE) |     |     |     |             |     |     |     |
| Bore size              | φ 26                     |     |     |     |             |     |     |     |
| I.D. NO.               | HJ 82                    |     |     |     |             |     |     |     |
| Idle r.p.m.            | 1,450~1,550 r.p.m.       |     |     |     |             |     |     |     |
| Float height           | 17                       |     |     |     |             |     |     |     |
| Throttle cable play    | 0.5~1.0                  |     |     |     |             |     |     |     |
|                        | <b>FRONT</b>             |     |     |     | <b>REAR</b> |     |     |     |
| Main jet (M.J.)        | 90                       |     |     |     | 87.5        |     |     |     |
| Main air jet (M.A.J.)  | 140                      |     |     |     | 140         |     |     |     |
| Jet needle (J.N.)      | 2ND                      |     |     |     | 2ND         |     |     |     |
| Needle jet (N.J.)      | O-6                      |     |     |     | 6           |     |     |     |
| Pilot jet (P.J.)       | 20                       |     |     |     | 20          |     |     |     |
| Throttle valve (TH.V.) | 130                      |     |     |     | 130         |     |     |     |
| By-pass (B.P.)         | #1                       | #2  | #3  | #4  | #1          | #2  | #3  | #4  |
|                        | 0.9                      | 0.9 | 0.8 | 0.8 | 0.9         | 0.9 | 0.8 | 0.8 |
| Valve seat (V.S.)      | 1.2                      |     |     |     | 1.2         |     |     |     |
| Starter jet (G.S.)     | 22.5                     |     |     |     | 22.5        |     |     |     |
| Pilot outlet (P.O.)    | 0.75                     |     |     |     | 0.75        |     |     |     |
| PV. Stroke (P.V.)      | STD                      |     |     |     | STD         |     |     |     |

## 7-17 SERVICING INFORMATION

### ELECTRICAL

Unit : mm

| ITEM                              | STANDARD                    |                      | NOTE |
|-----------------------------------|-----------------------------|----------------------|------|
| Ignition timing                   | 13°/2,000rpm ~ 30°/6,000rpm |                      |      |
| Spark plug                        | Type                        | CR8E                 |      |
|                                   | Gap                         | 0.7~0.8              |      |
|                                   | Hot type                    | CR7E                 |      |
|                                   | Standard type               | CR8E                 |      |
|                                   | Cold type                   | CR9E                 |      |
| Spark performance                 | Over 8mm                    |                      |      |
| Ignition coil resistance          | Primary                     | 0.19~0.34Ω           |      |
|                                   | Secondary                   | 5.4~6.6kΩ            |      |
| Magneto coil resistance           | Pick-up coil                | 90~110Ω              | G-L  |
|                                   | Charging coil               | 0.6~0.9Ω             | Y-Y  |
| Generator no-load voltage         | 72~99V/5,000rpm             |                      |      |
| Regulated voltage                 | 14~15V                      |                      |      |
| Battery standard charging voltage | 13.5~16.0V/5,000rpm         |                      |      |
| Battery                           | Type                        | YTX7A-BS             |      |
|                                   | Capacity                    | 6Ah                  |      |
|                                   | Standard electrolyte S.G.   | 1.320[at 20°C(60°F)] |      |
| Fuse size                         | 15A                         |                      |      |

### WATTAGE

Unit : W

| ITEM                                      | SPECIFICATION |     |
|---|---------------|-----|
| Head lamp                                 | HI            | 35W |
|   | LO            | 35W |
| Position lamp                             | 5W            |     |
| License lamp                              | 5W            |     |
| Brake/Tail lamp                           | 21/5W         |     |
| Turn signal lamp                          | 10W           |     |
| Speedometer lamp                          | 1.7W×3        |     |
| Neutral lamp                              | 1.7W          |     |
| Turn signal indicator lamp (Right & left) | 1.7W×2        |     |
| High beam indicator lamp                  | 1.7W          |     |

#### CAUTION

Do not use except the specified bulb (Wattage).

**SUSPENSION**

Unit : mm

| ITEM                                  | STANDARD       | LIMIT |
|---------------------------------------|----------------|-------|
| Front fork stroke                     | 120            | —     |
| Front fork spring free length         | 361            | 356   |
| Front fork oil type                   | TELLUS #22     | —     |
| Front fork oil level                  | 325            | —     |
| Front fork oil capacity (each leg)    | 250cc          | —     |
| Rear wheel travel                     | 92             | —     |
| Swingarm pivot shaft runout           | —              | 0.6   |
| Rear shock absorber pre-load position | 1 / 5 position | —     |
| Rear shock absorber spring length     | 199.8          | 195   |

**BRAKE+WHEEL**

Unit : mm

| ITEM                         | STANDARD                                     |          | LIMIT |
|------------------------------|--|----------|-------|
| Rear brake pedal free travel | 20~30  |          | —     |
| Rear brake pedal height      | 310 (when one person riding from the ground) |          | —     |
| Brake disc thickness         | Front  | 4.0      | 3.0   |
| Brake disc runout            | Front  | —        | 0.3   |
| Master cylinder bore         | 12.700~12.743                                |          | —     |
| Master cylinder piston diam  | 12.657~12.684                                |          | —     |
| Brake caliper cylinder bore  | 25.4   |          | —     |
| Brake caliper piston diam    | 25.4   |          | —     |
| Brake fluid type             | DOT3 or DOT4                                 |          | —     |
| Brake drum I.D.              | Rear   | —        | 160.7 |
| Wheel rim runout             | Axial  | —        | 2.0   |
|                              | Radial                                       | —        | 2.0   |
| Wheel axle runout            | Front  | —        | 0.25  |
|                              | Rear   | —        | 0.25  |
| Wheel rim size               | Front  | 2.5 × 16 | —     |
|                              | Rear   | 3.0 × 15 | —     |

## 7-19 SERVICING INFORMATION

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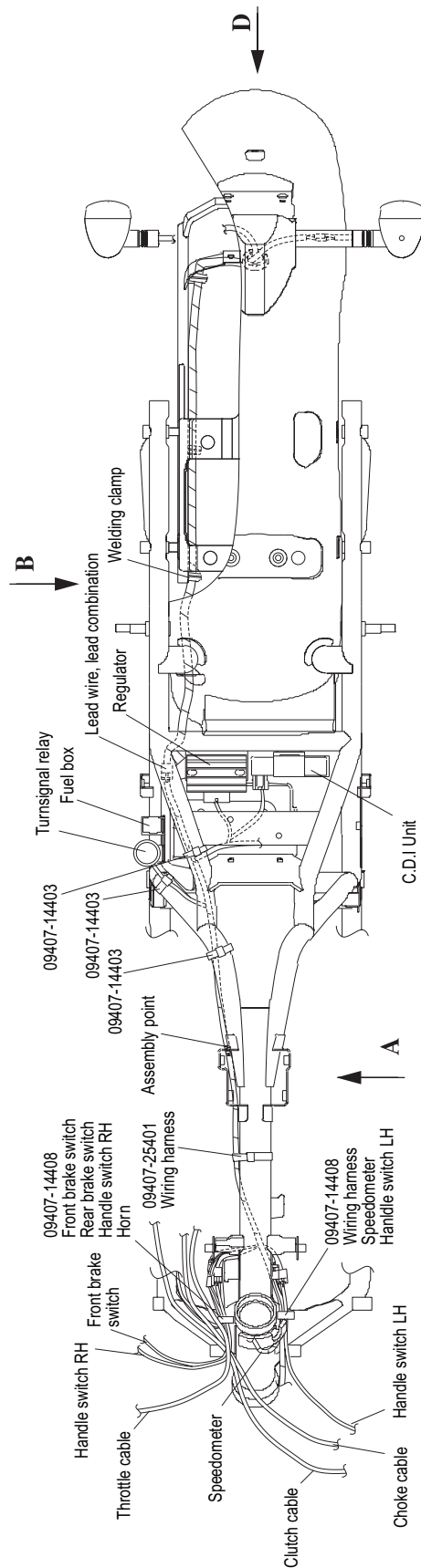
### TIRE

| ITEM                                       | STANDARD |      | LIMIT |
|--|----------|------|-------|
| Cold inflation tire pressure (Solo riding) | Front    | 1.75 | —     |
|  | Rear     | 2.00 | —     |
| Cold inflation tire pressure (Dual riding) | Front    | 1.75 | —     |
|  | Rear     | 2.25 | —     |
| Tire tread depth                           | Front    | —    | 5.5   |
|  | Rear     | —    | 8.0   |

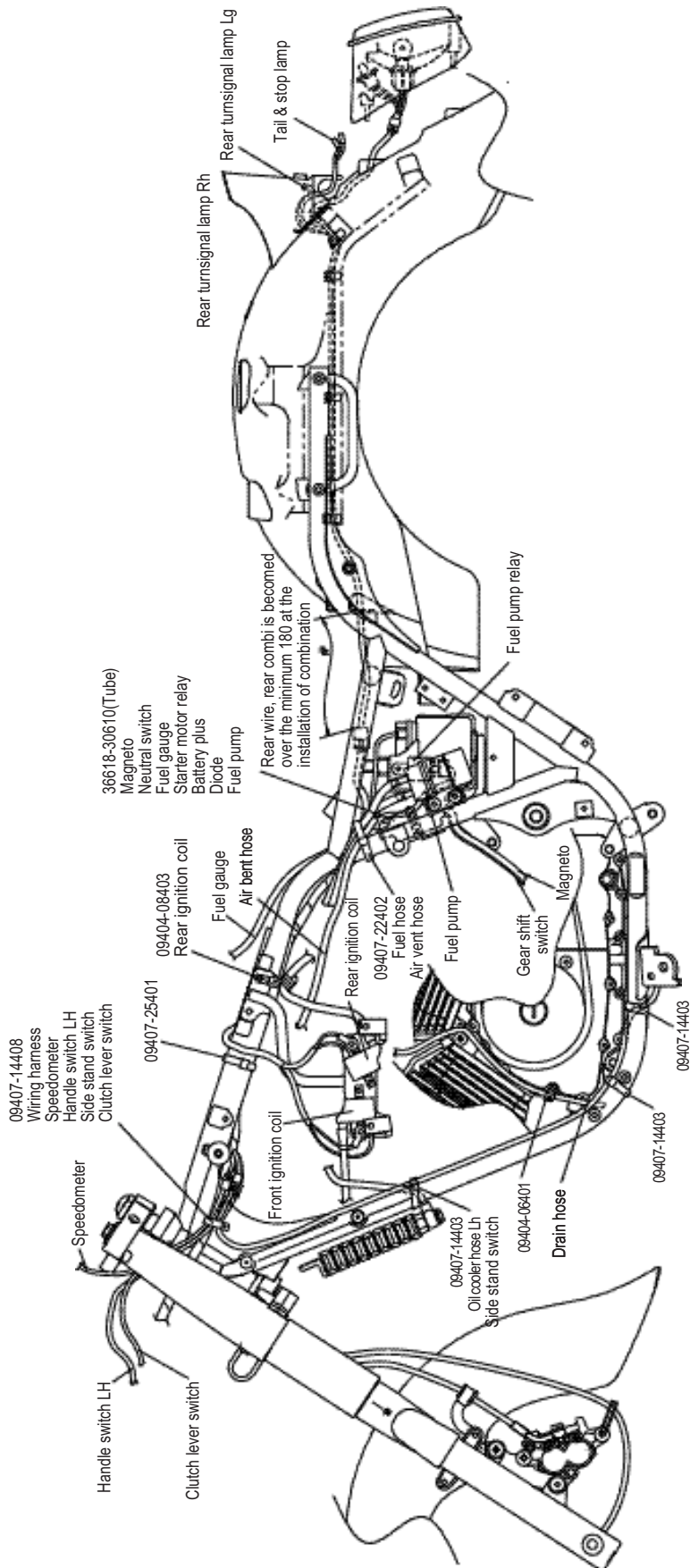
### FUEL + OIL

| ITEM                | SPECIFICATION   |          | NOTE |
|---------------------|---|----------|------|
| Fuel type           | Gasoline used should be graded 91 octane or higher.<br>An unleaded gasoline is recommended. |          |      |
| Fuel tank capacity  | Including reserve   | 14.0 ℓ   |      |
|                     | Reserve   | 2.0 ℓ    |      |
| Engine oil type     | SAE 10W40   |          |      |
| Engine oil capacity | Change  | 1,450 mℓ |      |
|                     | Filter change   | 1,500 mℓ |      |
|                     | Overhaul  | 1,800 mℓ |      |

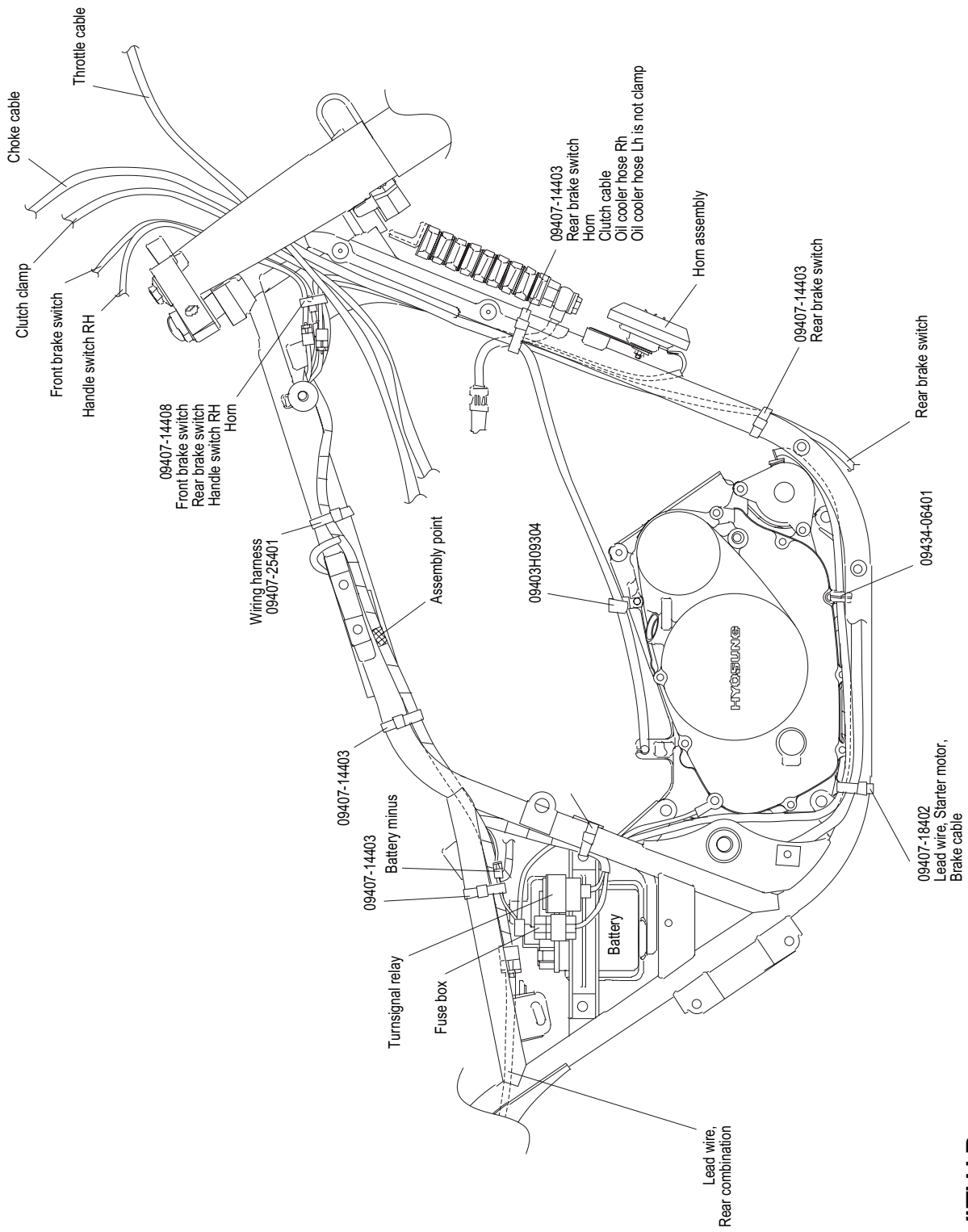
# WIRE AND CABLE ROUTING



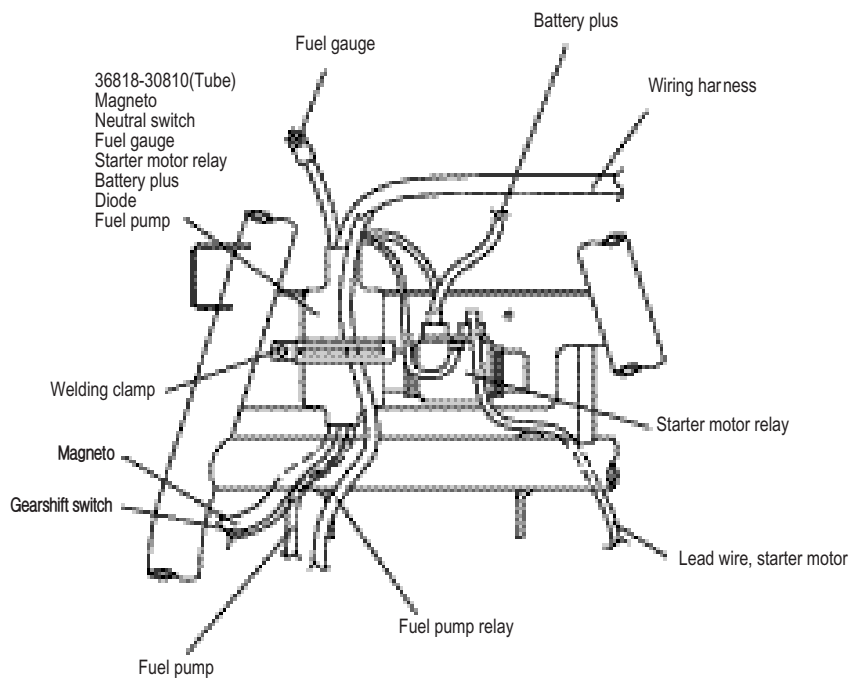
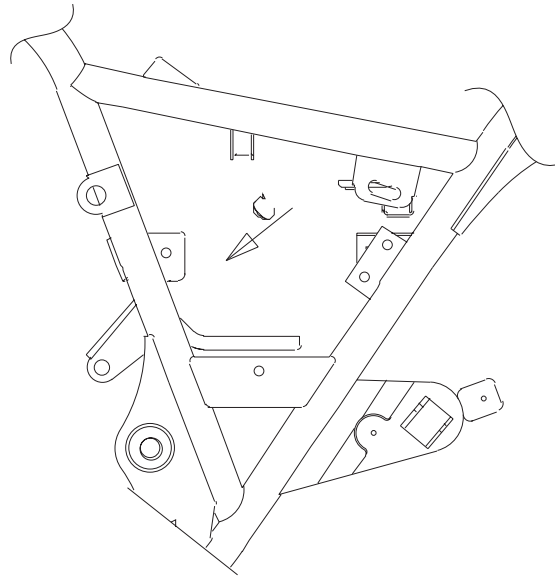
7-21 SERVICING INFORMATION



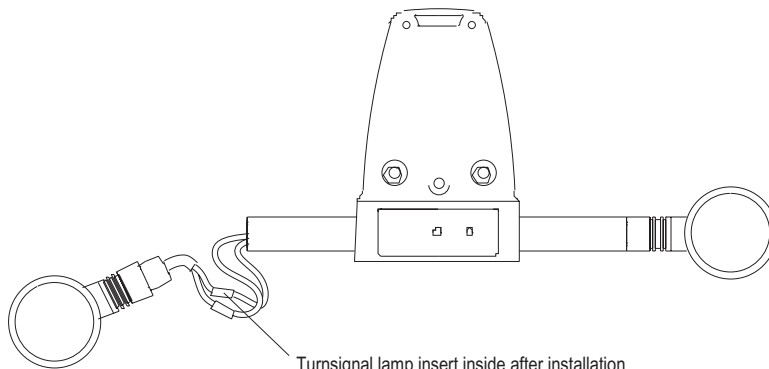
**VIEW A**



**VIEW B**



**VIEW C**

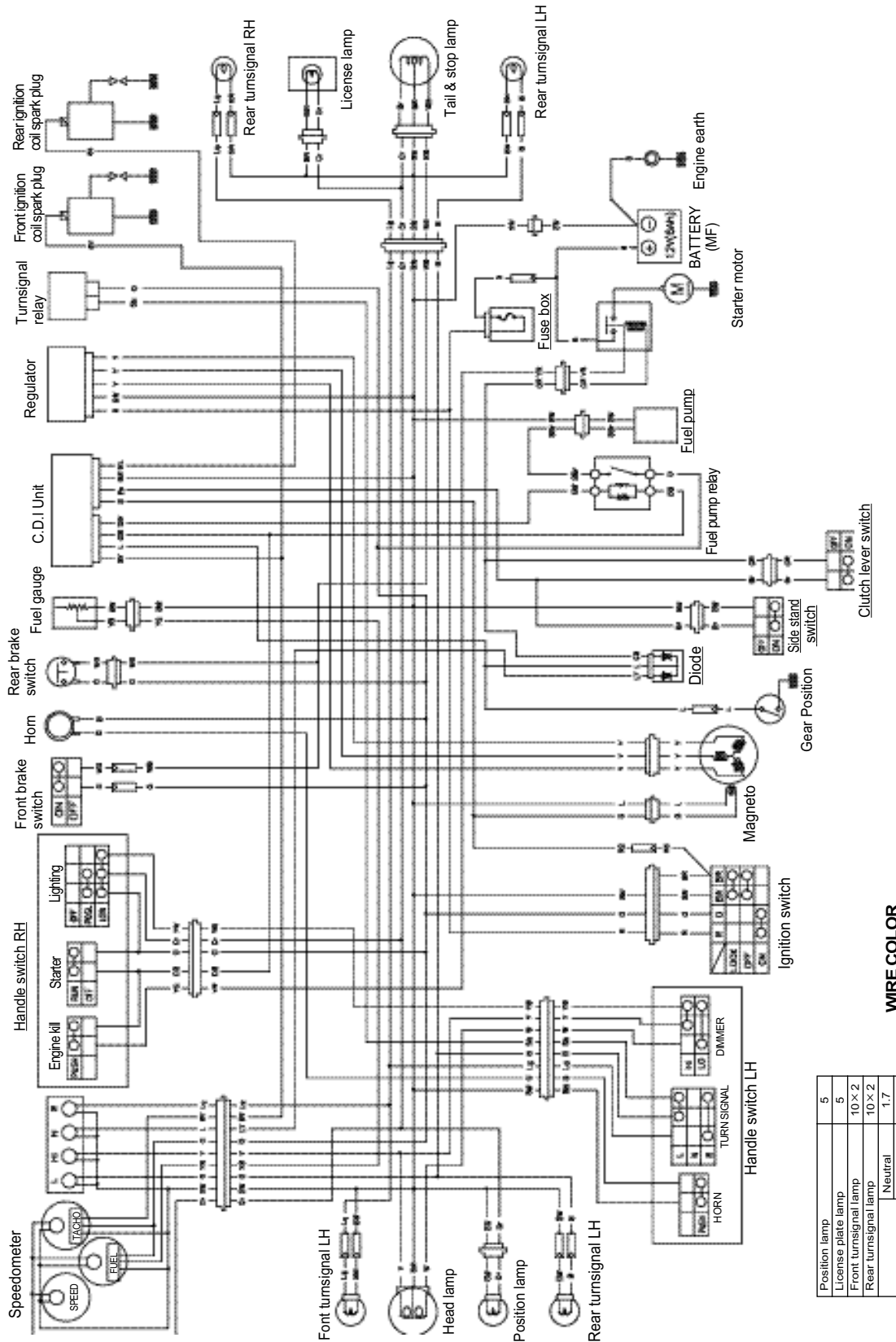


Turnsignal lamp insert inside after installation with the wiring be comed out.

**VIEW D**

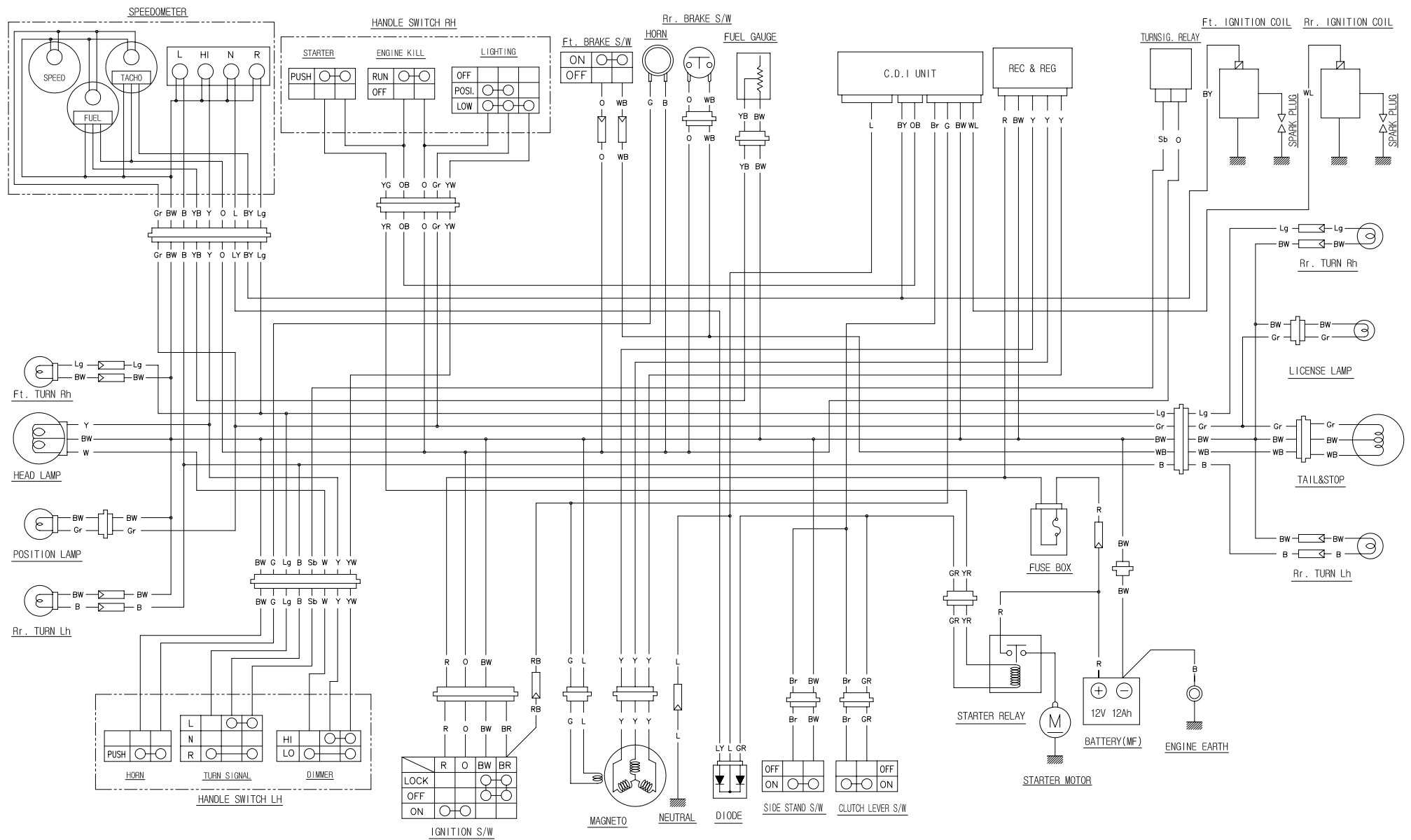


# WIRING DIAGRAM



- WIRE COLOR**
- B : Black
  - Br : Brown
  - G : Green
  - Gr : Gray
  - L : Blue
  - Y : Yellow
  - BG : Black with Green tracer
  - BW : Black with White tracer
  - BR : Black with Red tracer
  - WL : White with Blue tracer
  - OB : Orange with Black tracer
  - Lg : Light green
  - O : Orange
  - R : Red
  - Sb : Light blue
  - W : White
  - RB : Red with Black tracer
  - RW : Red with White tracer
  - WB : White with Black tracer
  - WR : White with Red tracer
  - BY : Black with Yellow tracer
  - GW : Green with White tracer

|                        |         |
|------------------------|---------|
| Position lamp          | 5       |
| License plate lamp     | 5       |
| Front turn signal lamp | 10 × 2  |
| Rear turn signal lamp  | 10 × 2  |
| Indicator lamp         | 1.7     |
| Neutral                | 1.7     |
| High beam              | 1.7 × 2 |
| turn signal            | 1.7 × 3 |
| Speedometer            | 5       |
| Tail & stop lamp       | 21      |
| Lamp                   | 35 / 35 |
| H/L/O                  | W       |
| DIST                   |         |



WIRING, HARNESS \_ 30001 H J8254

# TAPPET SHIM SELECTION CHART (IN.)

| MEASURING TAPPET CLEARANCE (mm) | SHIM No.                                     |      | 120  | 125  | 130  | 135  | 140  | 145  | 150  | 155  | 160  | 165  | 170  | 175  | 180  | 185  | 190  | 195  | 200  | 205  | 210  | 215  | 220  |      |
|---------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                                 | SHIM THICKNESS AT PRESENT (mm)               |      | 1.20 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |      |
| 0.00-0.04                       |  |      | 1.20 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |      |
| 0.05-0.09                       |  |      | 1.20 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |      |
| 0.10-0.20                       | Specified clearance - Adjustment unnecessary |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 0.21-0.25                       | 1.30   | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.26-0.30                       | 1.35   | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.31-0.35                       | 1.40   | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.36-0.40                       | 1.45   | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.41-0.45                       | 1.50   | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.46-0.50                       | 1.55   | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.51-0.55                       | 1.60   | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.56-0.60                       | 1.65   | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.61-0.65                       | 1.70   | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.66-0.70                       | 1.75   | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.71-0.75                       | 1.80   | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.76-0.80                       | 1.85   | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.81-0.85                       | 1.90   | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.86-0.90                       | 1.95   | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.91-0.95                       | 2.00   | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 0.96-1.00                       | 2.05   | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 1.01-1.05                       | 2.10   | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 1.06-1.10                       | 2.15   | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| 1.11-1.15                       | 2.20   | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |

## HOW TO USE THE CHART

1. Measure the tappet clearance. (When cold)
2. Measure the shim thickness at present.
3. Look for meeting space in that horizontal line for thickness and vertical line for clearance.

### (EXAMPLE)

When the tappet clearance is 0.23mm and the shim thickness at present is 1.70mm, the shim thickness should be used 1.80mm.

# TAPPET SHIM SELECTION CHART (EX.)

| SHIM No.<br><br>MEASURING<br>TAPPET<br>CLEARANCE (mm) | 120  | 125  | 130  | 135  | 140  | 145  | 150  | 155  | 160  | 165  | 170  | 175  | 180  | 185  | 190  | 195  | 200  | 205  | 210  | 215  | 220  |  |
|---|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|   | Specified clearance - Adjustment unnecessary |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |
| 0.05-0.09   | 1.20   | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |  |
| 0.10-0.14   | 1.20   | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |  |
| 0.15-0.19   | 1.20   | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 |  |
| 0.20-0.30   | Specified clearance - Adjustment unnecessary |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |
| 0.31-0.35   | 1.30   | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 |  |
| 0.36-0.40   | 1.35   | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.41-0.45   | 1.40   | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.46-0.50   | 1.45   | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.51-0.55   | 1.50   | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.56-0.60   | 1.55   | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.61-0.65   | 1.60   | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.66-0.70   | 1.65   | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.71-0.75   | 1.70   | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.76-0.80   | 1.75   | 1.80 | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.81-0.85   | 1.80   | 1.85 | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.86-0.90   | 1.85   | 1.90 | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.91-0.95   | 1.90   | 1.95 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 0.96-1.00   | 1.95   | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 1.01-1.05   | 2.00   | 2.05 | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 1.06-1.10   | 2.05   | 2.10 | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 1.11-1.15   | 2.10   | 2.15 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 1.16-1.20   | 2.15   | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |
| 1.21-1.25   | 2.20   | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  |

### HOW TO USE THE CHART

1. Measure the tappet clearance. (When cold)
2. Measure the shim thickness at present.
3. Look for meeting space in that horizontal line for thickness and vertical line for clearance.

#### (EXAMPLE)

When the tappet clearance is 0.33mm and the shim thickness at present is 1.70mm, the shim thickness should be used 1.80mm.



Prepared by

**HYOSUNG MOTORS & MACHINERY INC.**

Overseas Technical Department

2nd Ed. MAY. 2001.

Manual No. 99000-95310

Printed in Korea