# IGNITION SYSTEM

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</tr>
<tr>
<td>d. Reassembly</td>
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</tr>
</tbody>
</table>
7-1 GENERAL DESCRIPTION

DESCRIPTION

The ignition system consists of two ignition coils, two contact breakers, four spark plugs, an ignition switch and a battery.

The current from the battery flows through the primary winding of the ignition coil and circuit is completed by grounding through the contact breaker. There are two contact breakers which are located 180° apart.

One of the breakers furnishes the high voltage currents to spark plugs 1 and 4; the other breaker furnishes the current to plugs 2 and 3. The contact breakers ignite the spark plugs in alternate sequence to provide a firing sequence of 1, 2, 4 and 3. Since no distributor is used, the construction is simple and the system is easy to service. (Fig. 7-1)

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Ignition coil make</th>
<th>Toyo Denso</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark plug type</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>NGK D-8 ES</td>
</tr>
<tr>
<td>Optional</td>
<td>NGK D-7 ES, D-10E</td>
</tr>
<tr>
<td>Size</td>
<td>12 mm (thread diameter), 12.7 mm (reach)</td>
</tr>
<tr>
<td>Gap</td>
<td>0.024<del>0.028 in (0.6</del>0.7 mm)</td>
</tr>
<tr>
<td>Contact breaker make</td>
<td>Hitachi</td>
</tr>
<tr>
<td>Spring force</td>
<td>1.43<del>1.87 lb (650</del>850 g)</td>
</tr>
<tr>
<td>Point gap</td>
<td>0.012<del>0.016 in (0.3</del>0.4 mm)</td>
</tr>
<tr>
<td>Condenser capacity</td>
<td>0.24 µF ± 10%</td>
</tr>
<tr>
<td>Condenser insulator resistance</td>
<td>Over 10 MΩ (1,000 meger)</td>
</tr>
<tr>
<td>Spark advancer</td>
<td></td>
</tr>
<tr>
<td>Crankshaft speed at start of advance</td>
<td>1,000~1,150 rpm</td>
</tr>
<tr>
<td>Crankshaft speed at full advance</td>
<td>2,300~2,500 rpm</td>
</tr>
<tr>
<td>Advance angle</td>
<td>35°</td>
</tr>
</tbody>
</table>
DIAGNOSIS

<table>
<thead>
<tr>
<th>Item</th>
<th>Probable Causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine over heat</td>
<td>1. Ignition timing out of adjustment</td>
<td>Adjust ignition timing</td>
</tr>
<tr>
<td>Spark plug does not fire</td>
<td>1. Defective ignition coil</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>2. Defective spark plug</td>
<td>Replace</td>
</tr>
<tr>
<td>Spark at points excessive</td>
<td>1. Defective condenser</td>
<td>Replace</td>
</tr>
<tr>
<td>Weak spark</td>
<td>2. Broken or shorted ignition high tension cord</td>
<td>Replace</td>
</tr>
<tr>
<td>No spark</td>
<td>3. Dirty spark plug electrodes</td>
<td>Clean spark plug electrodes</td>
</tr>
</tbody>
</table>

IGNITION TIMING TEST

An accurate timing test can be made by using a strobo timing light.

Follow the procedure below for checking timing with the service tester. (Tool No. 07308-0010000)

1. Connect the power cord to the battery and ground the black ground cable. (Fig. 7–2)
2. Set the selector knob to TIMING.
3. Plug in the timing light cable and attach the high voltage cord to the No. 1 (or No. 4) spark plug head attachment.
4. Remove the point cover on the right side of the crankcase.
5. Start the engine and with the engine idling (850–950 rpm), point the strobo timing mark.

The ignition timing is correct, if the F mark (1.4 cylinder) on the spark advancer is aligned to the timing mark. (Fig. 7–3)
6. Next, raise the engine speed above 2,500 rpm; if the timing index mark is between the two timing marks located at 23.5–26.5° ahead of the "F" mark, the timing for both idling and full advance is satisfactory.

If there is malfunction with the ignition timing even though the RPM is constant, the fault is probably with the spark advancer spring or a defect in the breaker points, therefore, the unsatisfactory parts should be repaired or replaced.

If it is necessary to make adjustment, perform the adjustment in accordance with the procedure described in service adjustment on page 91–92.
7. The ignition timing for the No. 2 and 3 cylinders are also checked in the same manner described above.
8. The engine RPM is checked with a tachometer or a revolution counter located on the tester. Set the tachometer switch to the ON position, insert the tachometer cable, place the tachometer against the center of the spark advance shaft and then read off the green scale.

7-2 IGNITION COIL

a. Description

The ignition coil of a primary coil with 380 turns of enameled and secondary coil with 15,000 turns wire wound around the primary coil, with an iron core of laminated silicon steel sheets in the center. Each secondary coil has two high tension cables that lead to two spark plugs. (Fig. 7-6)

b. Disassembly

1. Open the seat and remove the fuel tank in accordance with section 6-3 b on page 74.
2. Disconnect the electrical leads (yellow, blue and black/white leads).
3. Unscrew the two ignition coil mounting bolts and then the ignition coil can be removed from the frame. (Fig. 7-7)

c. Inspection

1. Bench testing ignition coil

Check the ignition coil using the service tester by following the procedure below. (Fig. 7-8, 9)

Connect the power cord to the 12V battery and ground the black ground cord.

Connect the high tension cable (red) to the secondary coil terminal.

Position the selector knob to COIL TEST. Adjust the three point spark tester to the maximum distance spark is maintained and then note this distance. The coil is satisfactory if the distance is greater than 0.28 in (7 mm).
Note:

Spark condition as shown in Fig. 7-9A is normal. Fig. 7-9B shown the spark condition when the test leads are connected in reverse at the ignition coil.

Fig. 7-8 Ignition coil test

Fig. 7-9

2. Testing the coil without removing
   External battery is not required. Connect the tester ground lead (black) to the motorcycle frame. Remove the spark plug cap and install the spark plug head attachment on the spark plug. Connect high voltage tester cable to the attachment and then reinstall the spark plug cap.
   Turn the ignition switch to the ON position use the kick starter or starting motor to turn over the engine and determine the maximum sparking distance of the coil.
3. Check the high tension cord for damage and deterioration, if it is found to be improper condition, replace it with new one.

d. Reassembly
1. Mount the ignition coil assembly on the frame with the two bolts.
2. Connect electrical leads (yellow, blue and black/white leads) to wire harness leads.
3. Install the fuel tank carefully not to damage the electrical leads or cables.

7-3 SPARK PLUG

a. Description
The main parts of the spark plug are the electrodes, insulator and the plug body.
Standard spark plug used is NGK D-8ES.
However, the following types are also available for different operating condition (Fig.7-10)

| Hotter type | D-7 ES |
| Standard    | D-8 ES |
| Colder type | D-10 E |
b. Disassembly
1. Remove any foreign matter from around the spark plugs by blowing out with compressed air.
2. Detach the high tension cord cap and remove the spark plug with the special wrench provided in the tool kit.

C. Inspection
1. Inspect each spark plug for badly worn electrodes, broken or cracked procelain insulator. The spark plug conditions and corrective action procedure is shown below.

<table>
<thead>
<tr>
<th>Spark plug condition</th>
<th>Cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrode coated with carbon deposit</td>
<td>1. Too rich a fuel</td>
<td>Adjust carburetor</td>
</tr>
<tr>
<td></td>
<td>2. Excessive idling</td>
<td>Adjust idling</td>
</tr>
<tr>
<td></td>
<td>3. Poor quality gasoline</td>
<td>Use good quality gasoline</td>
</tr>
<tr>
<td></td>
<td>4. Clogged air cleaner</td>
<td>Service the air cleaner</td>
</tr>
<tr>
<td></td>
<td>5. Use of cold spark plug</td>
<td>Use proper heat range plug (hot type)</td>
</tr>
<tr>
<td>Electrode fouled with oil</td>
<td>1. Worn piston ring</td>
<td>Replace piston ring</td>
</tr>
<tr>
<td></td>
<td>2. Worn piston and cylinder</td>
<td>Replace piston or cylinder</td>
</tr>
<tr>
<td></td>
<td>3. Excessive clearance between valve guide and valve stem</td>
<td>Replace valve guide or valve</td>
</tr>
<tr>
<td>Electrode overheated or burnt</td>
<td>1. Use of hot spark plug</td>
<td>Use proper heat range plug</td>
</tr>
<tr>
<td></td>
<td>2. Engine over heating</td>
<td>Readjust ignition timing</td>
</tr>
<tr>
<td></td>
<td>3. Improper ignition timing</td>
<td>Retighten plug or replace cylinder head</td>
</tr>
<tr>
<td></td>
<td>4. Loose spark plug or damaged spark plug hole thread</td>
<td>Adjust carburetor</td>
</tr>
<tr>
<td></td>
<td>5. Too lean a fuel mixture</td>
<td></td>
</tr>
<tr>
<td>Damage</td>
<td>Spark plug over torqued</td>
<td>Replace with a new spark plug</td>
</tr>
</tbody>
</table>

2. Plug cleaning is best performed by spark plug cleaning set, however, lacking this set, a satisfactory job can be performed by using a wire brush or stiff pin to remove the deposits and washing in gasoline. *(Fig. 7-11)*

---

**Fig. 7-11**

1. Spark plug
2. Spark plug cleaner
3. After completing inspection of section 2 adjust spark plug gap to \(0.024-0.028\) in \((0.6-0.7\) mm\). The gap can be measured by a thickness gauge. The adjustment is made by bending the negative (ground) electrode (Fig. 7-12).

4. Inspect the spark plug hole threads and clean before installing plugs. Corrosion deposits can be removed with a \(12\) mm \(\times\) \(1.25\) mm pitch thread tap or by using a small wire brush.

Note:
1. Never use an improper heat range spark plug.
2. Do not attempt to dry or remove soot from the spark plug by burning.

d. Reassembly
1. Install the spark plug in the reverse order of disassembly.

Note:
1. The spark plugs in the No. 2 and No. 3 cylinders are difficult to reach and if care is not taken during the removal and installation of these spark plugs, it is possible for the plugs to be dropped and become lodged in the cylinder head cavities. (Fig. 7-13)
2. All spark plugs must be properly torqued. Loose plug will not properly dissipate heat and become very hot, causing possibly damage to the engine.

7-4 CONTACT BREAKER AND CONDENSER

a. Description
The contact breaker is mounted in the compartment which is at the right end of the crankshaft and consists of a base plate, two breaker arms, fixed and movable points, primary terminal, spring and lubricating felt.

The two condensers are also located on the contact breaker base.

The purpose of the condenser is to prevent unwanted sparking across the points. (Fig. 7-14)
b. Disassembly
   1. Remove the point cover.
   2. Disconnect the lead connectors (yellow and blue leads) at the center of the frame, right lower side. (Fig. 7-15)
   3. Unscrew the 6 mm hex nut and remove the contact breaker assembly. (Fig. 7-16)
   4. The condenser can be removed from the breaker base.

c. Inspection
   1. Checking the contact breaker point.
      If oil is left for a long time without removal, a hard film will be formed and eventually result in misfiring.
      Therefore, remove oil with trichloroethylene from the contact breaker point.
      a. Dress the pitted or dirty point with either a point file or emery paper, however, if the condition is relatively severe, remove the contact breaker arm and dress the points on both the arm and the stationary point with an oil stone, making sure that the points will have parallel contact when assembled. The point gap should be adjusted to \(0.012\sim0.016\) in \((0.3\sim0.4\) mm). (Fig. 7-17)
   b. Replace the breaker arm if the pivot hole worn excessively.
   c. Always maintain the contact breaker terminal and insulators as well as the wiring free from water, oil, and foreign matters.
   d. After the points have been dressed, clean the surfaces with a clean rag soaked in small amount of trichloroethylene, further, oil or other foreign matters should not be permitted on the breaker assembly.

3. Condenser capacity
   Measure the condenser capacity with the service tester. If the capacity is \(0.22\sim0.26\) \(\mu\)F, it is satisfactory. Refer to the service tester operating instruction leaflet for the measuring procedure.

d. Reassembly
   1. Assemble the each component parts on the contact breaker base plate.
   2. Install the contact breaker assembly with the three setting screws.
3. Install the advance shaft special washer, 6 mm washer and tighten 6 mm hex nut. (Fig. 7-18)
4. Connect the electrical leads.
5. When attempting the ignition timing adjustment, both the ignition timing and the breaker points gap should be adjusted.

(1) Contact breaker point gap (Fig. 7-19)

Before adjusting ignition timing the breaker points must be checked.

Open the spring loaded contact breaker point by a finger and check surface condition.

If the points are eroded, pitted or burnt, dress with a point file and follow by polishing with unwaxed paper to remove any file dust.

Next, turn the crankshaft in the clockwise direction hold at the position where the point gap is at maximum opening and check the gap by inserting a filler gauge. The standard gap is between 0.012 to 0.016 in (0.3 ~ 0.4 mm).

To adjust the point gap, loosen the contact breaker plate locking screw and move the contact breaker to the right or left until the proper gap opening is obtained and then tighten the locking screw. (Fig. 7-19)

(2) Ignition timing adjustment

After testing the ignition timing with the service tester, it is found to adjust the ignition timing, perform the following manner.

a. Start adjustment from the 1.4 breaker point indicated on the base plate.
b. Remove the contact breaker wire terminal unscrewing the retaining nut and connect one end of continuity light to the point terminal and hook the negative terminal to the crankcase.

Rotate the crankshaft in the clockwise direction slowly to align the “F” (1.4 cylinder) timing mark to the index mark. At this moment the breaker point should just to open while the continuity light flickers or goes off.

If point opening moment is incorrect, adjustment should be made in the following manner.
c. Loosen the three base plate setting screws (Fig. 7-20) and carefully rotate the base plate until the continuity light flickers. Tighten base plate setting screws. Rotating the base
plate clockwise will retard ignition timing, counterclockwise rotation will advance ignition timing.

d. Next connect continuity light to 2.3 cylinder breaker points. Rotate the crankshaft 180° in the clockwise direction and align the “F” (2.3 cylinder) timing mark to the timing index mark.

Adjustment may be done in the same manner as mentioned in section a and b by loosening two base plate locking screws ①.
e. Recheck the contact breaker points gaps and recheck the ignition timing with service tester on page 85~86.

7-5 SPARK ADVANCER

a. Description

Centrifugal advance type mechanism is used to advance the spark.

As the speed of the engine increases, the centrifugal force of the advance weight overrides the force of the spring and starts to move outward, moving the point cam in the direction of rotation, in other words, advances the point cam to produce an early ignition.

The advance assembly is mounted on the crankshaft inboard of the contact breaker point assembly. (Fig. 7-21)

b. Disassembly

1. Remove the contact breaker in accordance with section 7-4.b on page 90.
2. Remove the spark advance from the spark advance shaft. (Fig. 7-22)

c. Inspection

Check the spark advance spring for loss of tension and also the advance pin for excessive wear; replace any part found worn excessively or defective.

d. Reassembly

1. Install the spark advance to make sure that the pin is inserted into the pin hole at the end of the crankshaft. (Fig. 7-23)
2. Install the contact breaker assembly in the reverse procedure of disassembly.
# CHARGING SYSTEM

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## 8-1 GENERAL DESCRIPTION

### DESCRIPTION

The charging system for the CB 750 is made up of the excited field 3-phase alternator, rectifier, voltage regulator and the fuse. The alternator consists of the battery excited field coil, stator coil and the rotor; it does not, however, contain a slip-ring or brushes.

In order for the stator coil to produce a constant voltage, the current from the battery to produce the exciter field is regulated to very close limits by the dual contact regulator. The output from the alternator is rectified by the silicon rectifier before being sent to recharge the battery.

The regulator has two different types of function depending upon the charge condition of the battery.
The electrical current from the battery flows through the switch and into the regulator. When the battery voltage is lower than normal (less than 13.5V at the battery terminal), the current flowing through the armature away from the upper contact and the battery to the generator field coil. The strength of the magnetic field is depended upon the strength of the battery voltage. The current field coil is 1.6A at a battery terminal voltage of 12V. This produces an output voltage of corresponding strength which is used to charge the battery. (Fig. 8-1)
When the battery voltage exceeds approximately 14.5 V the armature coil pulls the armature away from the upper contacts and closes the lower contacts to insert a resistance (10 Ω resistor) in the generator field coil circuit; as the result of the resistance, the current to the field coil is reduced to 0.7 A and consequently a lower voltage is produced by the generator, limiting the amount of charge to the battery.

This function of inserting or removing the resistance into the generator field coil is performed by the voltage regulator in accordance with the charge condition of the battery regulate the charging of the battery. (Fig. 8-2)
## SPECIFICATIONS

### 1. Alternator
- **Type and make**: LD 113-01, Hitachi.
- **Battery voltage**: 12 V
- **Output**: 12 V 13 A
- **Polarity**: (−) ground
- **Weight**: 11.0 lbs (5 kg)
- **Stator coil resistance**: 0.2 Ω
- **Field coil resistance**: 7.2 Ω

### 2. Regulator
- **Type and make**: TLIZ–38, Hitachi.
- **Battery voltage**: 12 V
- **Polarity**: (−) ground
- **Weight**: 0.49 lb (0.22 kg)
- **Core gap**: 0.024–0.04 in (0.6–1.0 mm)
- **Point gap**: 0.012–0.016 in (0.3–0.4 mm)

### 3. Silicon rectifier
- **Type and make**: SB68–7, Hitachi.
- **Battery voltage**: 12 V
- **Output**: 12 V 15 A
- **Polarity**: (−) ground
- **Weight**: 0.99 lb (0.45 kg)
### DIAGNOSIS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No charging</td>
<td>1. Broken wire or short, loose connection.</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>2. Defective coil due to short, grounding, open circuit.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>3. Defective silicon diode.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>4. Broken or shorted lead wire at regulator.</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>5. Regulator voltage at no load is too low.</td>
<td>Readjust</td>
</tr>
<tr>
<td>Insufficient charging</td>
<td>1. Wiring</td>
<td>Repair, retighten</td>
</tr>
<tr>
<td></td>
<td>- Broken wire, intermittent shorting or loose connection.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Generator</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Shorting across layer in the field coil (resistance indicated in continuity test).</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Shorting across layer in stator coil.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Open circuit in one of the stator coil.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Defective silicon diode.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Regulator</td>
<td>Readjust</td>
</tr>
<tr>
<td></td>
<td>- Voltage below specified value at no load.</td>
<td>Polish</td>
</tr>
<tr>
<td></td>
<td>- Dirty or pitted points.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Coil or resistor internally shorted.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Battery</td>
<td>Add distilled water</td>
</tr>
<tr>
<td></td>
<td>- Low electrolyte level.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Defective battery plates.</td>
<td></td>
</tr>
<tr>
<td>Excessive charging</td>
<td>1. Wiring</td>
<td>Repair</td>
</tr>
<tr>
<td></td>
<td>- P terminal circuit and F terminal circuit shorted resulting in split wound generator.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>2. Battery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Internal short.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Regulator</td>
<td>Repair</td>
</tr>
<tr>
<td></td>
<td>- Excessive voltage at no load voltage.</td>
<td>Provide proper ground</td>
</tr>
<tr>
<td></td>
<td>- Defective grounding.</td>
<td>Repair, replace</td>
</tr>
<tr>
<td></td>
<td>- Broken coil lead wire.</td>
<td></td>
</tr>
<tr>
<td>Unstable charging voltage</td>
<td>1. Wiring</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>- Bare wire shorting intermittently under vibration or broken wire making partial contact.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Generator</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>- Layer short (intermittent shorting)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Generator</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>- Intermittent open circuit in the coil.</td>
<td>Readjust</td>
</tr>
<tr>
<td></td>
<td>- Improperly adjusted voltage.</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>- Defective key switch.</td>
<td>Clean</td>
</tr>
<tr>
<td></td>
<td>- Dirty points.</td>
<td></td>
</tr>
</tbody>
</table>
8. CHARGING SYSTEM

CHARGING TEST

1. Check the battery voltage in accordance with procedure described in the Battery Group, page 105. Make sure that the battery voltage is at 12 V, if not, charge the battery conducting the following test.

2. From the battery (+) terminal remove the red/white selenium rectifier lead and the red power lead, and connect both to the (+) terminal of the ammeter. Next, connect the battery (+) terminal to the ammeter (−) terminal by using a wire lead.

3. Start the engine and conduct the test for the following two modes:
   a. Set the main key switch to the night riding position turning on only the headlight high beam.
   b. Set main key switch to day riding position, however, do not turn on the turn signal or the stop lights.

4. Operate the engine at the different speed listed in the table below and check to see if the measured value corresponds to those shown.
   If the measured values are below the rated current, adjust the regulator in accordance with next section on page 100-101.
   **Note:** The charge current may fluctuate slightly depending upon the charge condition of the battery.

5. Also, check the battery terminal voltages for the respective engine RPM. The rated voltages are shown in the table below.

<table>
<thead>
<tr>
<th>Engine (rpm)</th>
<th>1,000</th>
<th>2,000</th>
<th>3,000</th>
<th>4,000</th>
<th>5,000</th>
<th>6,000</th>
<th>7,000</th>
<th>8,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charging current (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night riding</td>
<td>6.5</td>
<td>0</td>
<td>2.4</td>
<td>1.3</td>
<td>1.0</td>
<td>1.0</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Day riding</td>
<td>2–3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Battery terminal voltage (V)</td>
<td>12</td>
<td>12.4</td>
<td>13.2</td>
<td>14.5</td>
<td>14.5</td>
<td>14.5</td>
<td>14.5</td>
<td>14.5</td>
</tr>
</tbody>
</table>
8-2 ALTERNATOR

a. Description
The alternator consists of the field coil, stator coil and the rotor. Field coil and the stator coil are mounted on the dynamo cover while the rotor is mounted on the crankshaft (Fig. 8-4).

b. Disassembly
1. Remove the dynamo cover and pull out the generator rotor using the rotor puller (Tool No. 07933-3000000) (Fig. 8-5)
2. Remove the stator coil from the dynamo cover by unscrewing the four 6 mm bolts (Fig. 8-6).
3. Remove the field coil from the dynamo cover by unscrewing the three screws (Fig. 8-7).

c. Inspection
1. Field coil continuity test
The insulation and open circuit condition of the field coil winding is checked with a tester. If there is continuity between the lead wires and the core, the coil is grounded and if there is no continuity between the two lead wires, the coil has an open circuit; in either case, the coil is defective and must be replaced. The rated resistance value is 7.2 Ω. (Fig. 8-8)
2. Stator coil continuity test
The insulation and open circuit condition of the stator coil is checked with a tester. If there are no continuity between the three terminals, the coil has an open circuit, in either case, the coil is defective and must be replaced. The rated resistance value is 0.2 Ω. (Fig. 8–9)

d. Reassembly
Reassembly is performed in the reverse order of disassembly.

8–3 REGULATOR

a. Description
The regulator is a dual contact type regulator and if functions by opening or closing the resistance circuit to the alternator field coil; in this way, the output voltage is maintained at a constant level.

It is mounted in the center of the frame within the battery cover. (Fig. 8–10)

b. Disassembly
1. Detach the battery cover and remove the regulator by unscrewing the two setting bolts. (Fig. 8–11)
2. Remove the regulator cover by unscrewing the two setting screws.

c. Inspection
1. If an adjustment is necessary to the regulator after checking the voltage or charging current by the procedure outlined in the test section, perform the adjustment by the following manner.

If the charging current or battery voltage is too low, loosen the voltage adjusting screw lock nut and turn the adjusting screw clockwise. If the charging current or battery voltage is excessively high, turn the screw in the opposite direction. (Fig. 8–12)
Note: The voltmeter indicates an output of 14~15 V at 5,000 rpm at no load, the circuit is satisfactory.

2. After completing the adjustment, reinstall the regulator cover and perform a recheck of the voltage.

Note: There will be a 0.5 V rise in voltage when the low speed contacts changes to the high speed contacts in the regulator. (Fig. 8-13)

If the change in voltage is higher than 0.5 V or if there is a drop in voltage, core gap should be adjusted by referring to next paragraph.

3. Core gap adjustment

If the surface of the points are dirty or pitted, use a fine grade emery paper and clean up the points. Check the core gap with a thickness gauge to see if it is within the specified limits, 0.024~0.04 in. (0.6~1.0 mm). Core gap can be adjusted by loosening the adjusting screw. (Fig. 8-14)

4. Point gap adjustment

If the surface of the points and if they are dirty or pitted, use a fine grade emery paper and clean up the points. Check the gap with a thickness gauge. Standard gap is 0.12~0.016 in. (0.3~0.4 mm). If necessary to adjust, loosen the point gap lock screw, then tighten the screw after adjustment. (Fig. 8-15)

d. Reassembly

Reassembly is performed in the reverse order of disassembly.

8-4 SILICON RECTIFIER

a. Description

As the rotor rotates three phase alternation currents are induced in the stator coil. However, the currents are rectified to D.C currents by the six silicon diodes which are in one unit and attached to the center of the frame. The silicon rectifier requires cooling and complete condition in negative terminal by which the rectifier is attached to the frame. Therefore it is necessary to take special care for attachment. (Fig. 8-16)
b. Disassembly

Detach the battery cover and remove the silicon rectifier by unscrewing a setting nut. (Fig. 8–17)

c. Inspection

1. The condition of the silicon rectifier is tested by disconnecting it from the generator and testing the rectifier function in both the normal and reverse directions. A continuity in only one direction indicates a good condition. Continuity in both directions or no continuity in either direction indicates a defective rectifier and should be replaced. (Fig. 8–18)

Note: Do not use a megger for testing since it will expose the silicon diodes to excessively high voltage and cause damages.

2. Observe the following precautions.
   a. Battery polarity should be strictly observed, do not connect the battery in reverse. Reversing the battery connection will cause the battery to become shorted, resulting in a large current to flow through the electrical system and damaging the silicon rectifier as well as burning up the wiring harness.
   b. Care should be exercised to assure that the electrical terminals are not connected in reverse.
   c. Do not operate the generator at high speed with the “P” terminal of the rectifier disconnected. The high voltage produced may cause damage to the silicon rectifier.
   d. When charging the battery from an external source such as quick charging, the lead should be disconnected from the ‘P’ terminal of the rectifier.

d. Reassembly

Reassembly is performed in the reverse order of disassembly.
9-1 GENERAL DESCRIPTION

DESCRIPTION

A push button type starter switch is located on the right side of the handle bar. When pressed, it engages the starter magnetic switch in the starter circuit to close the starting circuit.

Approximately 120A current flows from the battery to operate the starting motor. (Fig. 9-1)


**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
<th>Serviceable limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon brush length</td>
<td>0.472<del>0.512in. 12</del>13mm</td>
<td>0.217in. 5.5mm</td>
</tr>
<tr>
<td>Mica undercut</td>
<td></td>
<td>0.012in. 0.3mm</td>
</tr>
<tr>
<td>Carbon brush spring</td>
<td>500~600gr</td>
<td></td>
</tr>
</tbody>
</table>

**DIAGNOSIS**

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting motor does not operate</td>
<td>1. Defective battery</td>
<td>Charge or replace</td>
</tr>
<tr>
<td></td>
<td>2. Poor contact of magnetic switch</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>3. Poor contact of starting motor carbon brush</td>
<td>Repair or replace</td>
</tr>
</tbody>
</table>
9-2 STARTING MOTOR

a. Description
The starting motor is mounted in the upper crankcase behind the cylinder and drive the crankshaft through the starting clutch gear.

The primary reduction is accomplished by the starting motor reduction gear and the secondary reduction is by the starting clutch gear. (Fig. 9-2)

b. Disassembly
1. Remove the left side cover and disconnect the starting motor cable from the magnetic switch. (Fig. 9-3)
2. Remove the starting motor cover from the upper crankcase and detach the starting motor. (Fig. 9-4)
3. Remove the starting motor side cover.
4. Unscrew the brush mounting screws and remove the brushes from the brush holders. (Fig. 9-5)

c. Inspection
1. Checking the carbon brush length
Measure the length of the starting motor brush using a vernier caliper to determine amount of wear. If it is less than 0.217 in. (5.5 mm), the brush should be replaced (Fig. 9-6)
2. Checking the amount of mica undercut.
   Measure the amount of mica undercut and if the difference in height is less than
   0.012 in. (0.3 mm), it should be repaired. It is recommended that this repair be
   performed by a specialist. (Fig. 9-7)
3. Armature insulation test
   Perform a continuity test between the commutator and the shaft mounting area.
   If a short is indicated, a defect is in the armature and, therefore, it should be
   replaced.
4. Measuring the starting current.
   The current draw of the starting motor can be measured with the Honda service tester
   by using external shunt (refer to the service tester operational manual for the testing
   procedure).
   The starting motor should conform to the standard value shown in the specification on
   page 104.

d. Reassembly
   Perform the reassembly in the reverse order of disassembly.

9-3 STARTING CLUTCH

a. Description
   The one way clutch is used for starter clutch which incorporates the A.C. generator rotor
   connected to the crankshaft. As the rotation of the starting motor is transmitted to the
   starting clutch gear, the rollers within the starting clutch will move the narrow section of
   the slot to lock the starting clutch (lock to A.C. generator rotor) and ensuring the starting
   clutch to rotate. (Fig. 9-8)
   Since the generator rotor is mounted on the crankshaft with a key, the crankshaft will
   rotate and causes the engine to start. After the engine starts and the crankshaft speed
   exceeds the speed of the starting clutch gear, the roller between the starting clutch gear and
   the clutch outer will move toward the wide section of the groove due to centrifugal force
   and the transmission of the rotating force will no longer be transmitted. As a result, the
   crankshaft rotation will no longer be transmitted to the starting motor.

b. Disassembly
   Perform the disassembly in accordance with 3-6 b on page 46.

c. Inspection
   1. Check to make sure that the clutch roller operates smoothly.
   2. Inspect the starting clutch for defect.

d. Reassembly
   Perform the reassembly in accordance with 3-6 d on page 53.
9-4. STARTER MAGNETIC SWITCH

a. Description

A large current is required to operate the starter and if the starter circuit was connected directly to the push button switch on the handle, the switch will burn out. A starter solenoid of a large capacity is installed between the battery and the starting motor. When the push button switch is pressed, the solenoid coil is energized, creating an electromagnet which draws the iron core. A heavy duty electrical contacts are mounted to this iron core which closes the circuit between the battery and the starting motor. (Fig. 9-9)
b. Disassembly
1. Remove the left side cover, disconnect the electric lead to the magnetic switch and then remove the magnetic switch. (Fig. 9–10)
2. Remove the cover.

c. Inspection
1. Press the starter switch listen for the click in the magnetic switch, it is an indication that the plunger within the magnetic switch is functioning.
2. If the magnetic switch has been used for a long period, the contacts will become pitted or burned, creating a high resistance which will prevent flow of current to properly operate the starting motor. When such condition develops, dress the contact points with a file or sand paper.

d. Reassembly
Reassembly is performed in the reverse order of the disassembly procedure.
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10-1. GENERAL DESCRIPTION

DESCRIPTION

The 12V-14AH battery is mounted under the seat. The service life of the battery depends upon the maintenance it receives.

The following instructions must be carefully observed.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Yuasa B64-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery voltage</td>
<td>12V</td>
</tr>
<tr>
<td>Capacity rating</td>
<td>14AH</td>
</tr>
<tr>
<td>Electrolyte specific gravity</td>
<td>1.26~1.28 at 20°C (68°F)</td>
</tr>
</tbody>
</table>

DIAGNOSIS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfation</td>
<td>1. Charging rate is too small or else excessively large.</td>
<td>1. When motorcycle is in storage, the battery should be recharged</td>
</tr>
<tr>
<td></td>
<td>2. The specific gravity or the mixture of the electrolyte is improper.</td>
<td>once a month even though the motorcycle is not used.</td>
</tr>
<tr>
<td></td>
<td>3. Battery left in a discharge condition for a long period.</td>
<td>2. Check the electrolyte periodically and always maintain the proper</td>
</tr>
<tr>
<td></td>
<td>4. Exposed to excessive vibration due to improper insulation.</td>
<td>level.</td>
</tr>
<tr>
<td></td>
<td>5. Motorcycle stored during cold season with battery connected.</td>
<td>3. In a lightly discharge condition, performing recharging and dis-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>charging several times by starting the engine may be sufficient.</td>
</tr>
<tr>
<td>Trouble</td>
<td>Probable cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Self discharge</strong>&lt;br&gt;Battery discharges in addition to that caused by the connected load.</td>
<td>1. Dirty contact areas and case.&lt;br&gt;2. Contaminated electrolyte or electrolyte excessively concentrated</td>
<td>1. Always maintain the exterior clean&lt;br&gt;2. Handle the replenishing electrolyte with care and use clean container.</td>
</tr>
<tr>
<td><strong>C. Large discharge rate</strong>&lt;br&gt;Specific gravity gradually lowers and around 1.100 (S.G.) the winker and the no longer function.</td>
<td>1. The fuse and the wiring is satisfactory, loads such as winker and horn does not function. In this condition the motorcycle will operate but with prolong use, both ± and ± plates will react with the sulfuric acid and form lead sulfide deposits, (sulfation) making it impossible to recharge.</td>
<td>1. When the specific gravity falls below 1.200 (20 C: 68° F), the battery should be recharged immediately.&lt;br&gt;2. When the battery frequently becomes discharged while operating at normal speed, check the generator for proper output.&lt;br&gt;3. If the battery discharges under normal charge output, it is an indication of overloading, remove some of the excess load</td>
</tr>
<tr>
<td><strong>High charging rate</strong>&lt;br&gt;The electrolyte level drops rapidly but the charge is always maintained at 100 % and the condition appears satisfactory. A condition which is overlooked. (Specific gravity over 1.260)</td>
<td>1. The deposit will heavily accumulate at the bottom and will cause internal shorting and damage the battery.</td>
<td>1. Check to assure proper charging rate.&lt;br&gt;2. When overcharge condition exist with the proper charging rate, place on appropriate resistor in the charging circuit.</td>
</tr>
<tr>
<td><strong>Specific gravity drops</strong>&lt;br&gt;Electrolyte evaporates</td>
<td>1. Shorted&lt;br&gt;2. Insufficient charging&lt;br&gt;3. Distilled water overfilled&lt;br&gt;4. Contaminated electrolyte</td>
<td>1. Perform specific gravity measurement&lt;br&gt;2. If the addition of distilled water causes a drop in specific gravity, add sulfuric acid and adjust to proper value.</td>
</tr>
</tbody>
</table>

### Fig. 10-1
- ① Battery<br>- ② ± terminal<br>- ③ ⊕ terminal

### Fig. 10-2
- ① Upper level mark<br>- ② Lower level mark

## 10-2. REPAIRING PROCEDURE

### a. Disassembly
1. Raise the seat and remove the battery band from the battery.<br>2. Disconnect the ground ± negative cable connection first and the positive ⊕ last. (Fig. 10-1)<br>3. Remove the battery from the battery compartment.

### b. Inspection
1. Checking the battery electrolyte level<br>Remove the left side cover at the frame center and observe the battery electrolyte level marking on the side of the battery to make sure that the electrolyte level is between the upper and lower marks. (Fig. 10-2)
To correct the electrolyte level, remove the battery cell caps from the cells needing level correction. For ease of cell level correction a small syringe or plastic funnel should be used. Carefully add the proper amount of distilled water to bring the electrolyte level of the cells between the lower and upper marks. For maximum battery performance and life, only distilled water should be added, however, in an emergency situation where electrolyte level is found to be low and distilled water is not available, drinking water of a low mineral content can be used. Reinstall the cell caps. (Fig. 10-3)

2. Check the specific gravity of the battery electrolyte

The specific gravity is measured with a hydrometer, the type shown in Fig. 10-4. When making a reading of the measured value, the electrolyte level in the hydrometer should be held at the eye level and the scale read at the fluid level. Temperature of the electrolyte can be measured by a rod thermometer. (Fig. 10-4)

The relation between the battery capacity and the specific gravity (residual capacity) is shown in Fig. 10-5. When the specific gravity is 1.189 at 20°C (68°F) (less than 50%) the residual capacity is small and if continued to be used in such a condition, it will eventually lead to trouble as well as shortening the battery life, therefore, the battery should, under such a condition, be recharged as soon as possible. (Fig. 10-5)

The electrolyte used in the battery must be comprised of pure sulfuric acid diluted to the designated specific gravity. The specific gravity will vary with the temperature, therefore, the specific gravity index is based on the electrolyte temperature of 20°C (68°F). The temperature correction formula should be used to derive at the proper specific gravity for the measure temperature of the electrolyte.

\[
S_{20} = S_t + 0.0007 \ (t - 20)
\]

Where:

- \( S_{20} \) = Specific gravity of the electrolyte corrected to 68°F (20°C)
- \( S_t \) = Specific gravity of the electrolyte measured temperature, °C
- \( t \) = Temperature of the measured electrolyte

---

**Fig. 10-3** 1 Battery cell caps

**Fig. 10-4** 1 Hydrometer
2 Float

**Fig. 10-5** 1 Specific gravity (20°C)
2 Residual capacity (%)

**Fig. 10-5-1** Relationship between atmospheric temperature and specific gravity
3. **Battery charging procedure**

There are two methods of charging of a battery, namely, the constant current method and the constant voltage method. In the constant current method, the battery is charged at a constant current throughout the charging period. This method is safe and is recommended for initial charging of the battery. In the constant voltage charging method, a constant voltage is applied during the charging period. In this method, the charging period can be shortened by applying a larger current, however, one drawback is that if too large a current is applied, the battery will overheat.

**Charger hook-up**

Connect the positive terminal \( \oplus \) and the negative battery terminal \( \ominus \) to the respective terminal of the charger. (Fig. 10-6)

When more than one battery is to be charged at once, they should be connected in series, as shown in Fig. 10-7.

The charger voltages must be the sum of the battery voltages. For example, to charge three 12V batteries, the charger must have an output voltage in excess of \((15 + 16 + 15 + 16 + 15) \) or 48 (or 45) volts.

A fully discharged battery will require charging rate that is 1.25 higher than the normal charge rate of the battery. As an example, a 14AH battery will require 17.5AH charging rate \((14AH \times 1.25 = 17.5AH)\). There is a definite relationship between the charging current and the charging time. This is shown in Fig. 10-8. The charging current should not be greater than three times the 10 hours current rate. (For a 14AH battery, \(1.4A \times 3 = 4.2A\)).

As the battery approaches the full charge condition, gas will be released from the electrolyte. At this time, check the battery electrolyte to see if the specific gravity is up to the standard value of 1.26~1.28, and the terminal voltage is up to the standard value of 15~16V. Perform the check again after 30 minutes and again in an hour, and if for the three checks the values are constants, the battery is fully charged and the charging can be terminated. (Fig. 10-8)
Note: If during the charging process the temperature of the electrolyte should raise above 45°C (113°F) or if the gas is being released from the electrolyte in abundance, the charging should be stopped temporarily or the charging current reduced to a lower rate.

- Quick charger

Quick charger should not be on battery which has been fully discharged. Further, quick charging method should not be frequently used. However, when it is inevitable and quick charging must be performed, the following items should be observed.

For quick charging a 14AH battery, use the charging current rate of 14A. A battery which is 50% discharged, approximately 30 minutes should be adequate to charge the battery. However, if during the charging process the electrolyte temperature should raise above 50°C (122°F), the charging should be temporarily stopped or the charging current rate reduced.

Note: Disconnect the silicon diode P terminal when quick charging the battery.

- Other precaution

If the electrolyte level falls during charging, refill with distilled water to the upper level mark. Inflammable hydrogen gas is discharged from the cells, therefore, do not charge batteries near any open fire.

After charging, add distilled or battery water to the cells to bring the electrolyte to the upper mark.

Tighten cell caps firmly and wash off with clean water any acid spilled.

The battery is now ready for installation. When installing a battery in the motorcycle, be sure not to pinch the battery vent tube. Explosion may result if the exhaust tube is blocked.

4. Check the terminal voltage

The battery terminal voltage can be checked with a service tester. The standard battery voltage is 12V, however, immediately after charging, the voltage will be at 15~16V.

Set the selector knob to the D.C. VOLTAGE position on the tester and clamp the (+) tester lead to the (+) terminal of the battery and then connect the other tester lead to the (−) terminal of the battery and read the voltage off the blue scale. When performing battery charging, refer to the battery charging section. (Fig. 10-9)

c. Reassembly

Battery installation is performed in the reverse order of removal. Pay particular attention the battery rubber mount pads and the vent tube routing. Connect and protect the positive (+) terminal with the rubber insulator first. Connect the negative (−) terminal second.

Note: Do not over tighten these terminal connection as damage to the battery terminals may result. Install battery retainer, lower the seat and install the left side cover.
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CB750 Ignition Points Assembly
CB750 Piston
CB750 Piston Ring Set
CB750 Side Cover Left
CB750 Side Cover Right
CB750 Shock Absorber Set
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