

CHARGING SYSTEM

GROUP

8

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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 re-charge 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 1.6 A at a battery terminal voltage of 12 V. This produces an output voltage of corresponding strength which is used to charge the battery. (Fig. 8-1)

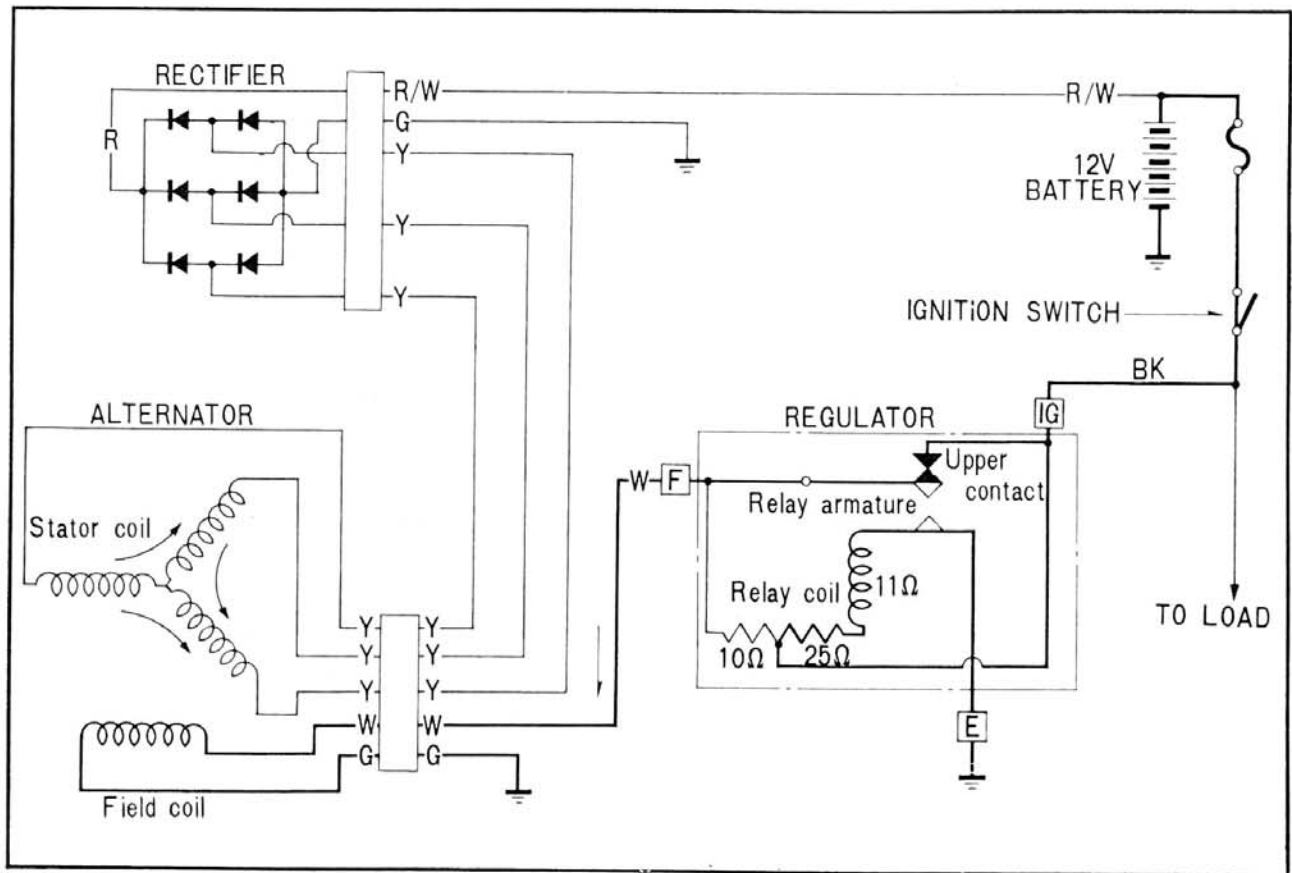


Fig. 8-1

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 (10Ω 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)

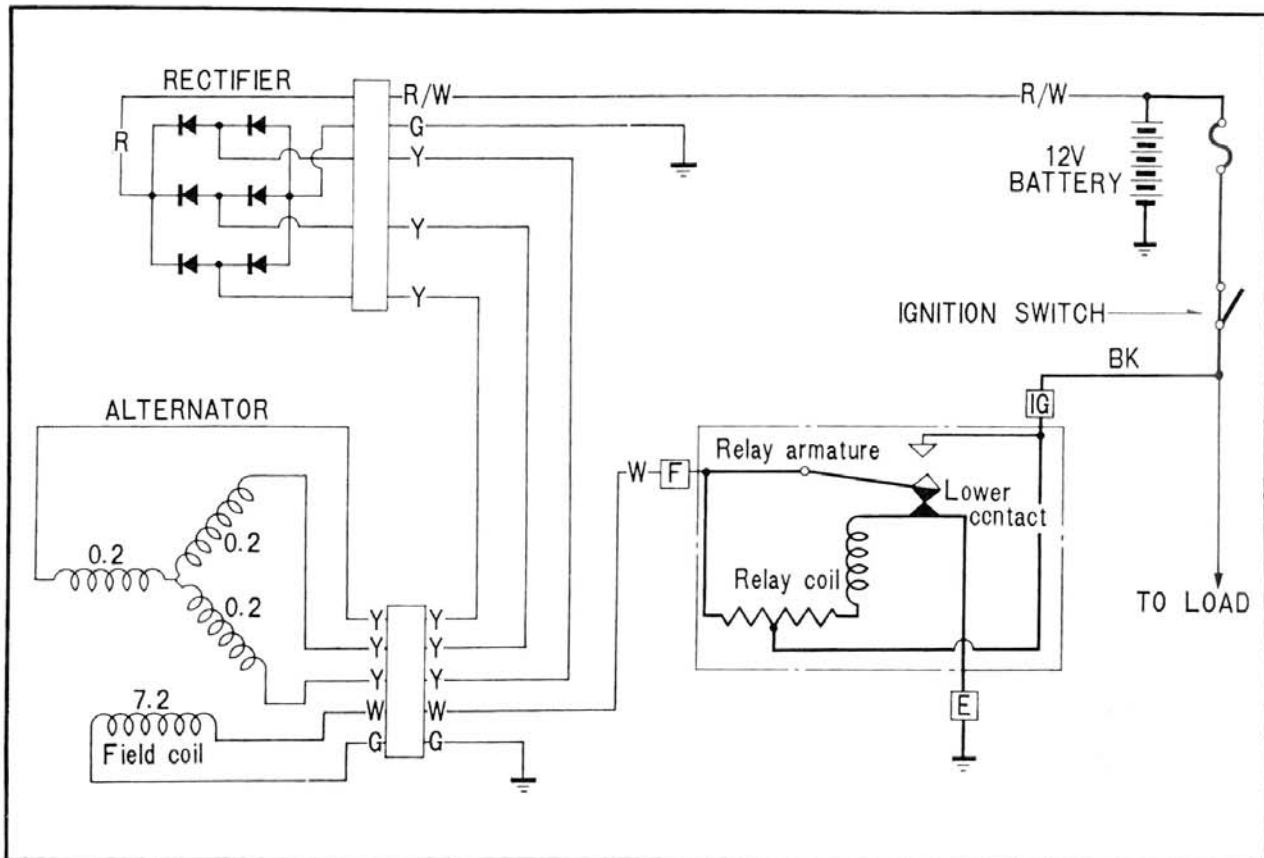


Fig. 8-2

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	SB6B-7, Hitachi.
Battery voltage	12 V
Output	12 V 15 A
Polarity	(-) ground
Weight	0.99 lb (0.45 kg)

DIAGNOSIS

Trouble	Probable Causes	Remedy
No charging	<ol style="list-style-type: none"> 1. Broken wire or short, loose connection. 2. Defective coil due to short, grounding, open circuit. 3. Defective silicon diode. 4. Broken or shorted lead wire at regulator. 5. Regulator voltage at no load is too low. 	Repair or replace Replace Replace Repair or replace Readjust
Insufficient charging	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • Broken wire, intermittent shorting or loose connection. 2. Generator <ul style="list-style-type: none"> • Shorting across layer in the field coil (resistance indicated in continuity test). • Shorting across layer in stator coil. • Open circuit in one of the stator coil. • Defective silicon diode. 3. Regulator <ul style="list-style-type: none"> • Voltage below specified value at no load. • Dirty or pitted points. • Coil or resistor internally shorted. 4. Battery <ul style="list-style-type: none"> • Low electrolyte level. • Defective battery plates. 	Repair, retighten Replace Replace Replace Replace Readjust Polish Replace Add distilled water Replace
Excessive charging	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • P terminal circuit and F terminal circuit shorted resulting in split wound generator. 2. Battery <ul style="list-style-type: none"> • Internal short. 3. Regulator <ul style="list-style-type: none"> • Excessive voltage at no load voltage. • Defective grounding. • Broken coil lead wire. 	Repair Replace Repair Provide proper ground Repair, replace
Unstable charging voltage	<ol style="list-style-type: none"> 1. Wiring <ul style="list-style-type: none"> • Bare wire shorting intermittently under vibration or broken wire making partial contact. 2. Generator <ul style="list-style-type: none"> • Layer short (intermittent shorting) 3. Generator <ul style="list-style-type: none"> • Intermittent open circuit in the coil. • Improperly adjusted voltage. • Defective key switch. • Dirty points. 	Repair or replace Repair or replace Repair or replace Readjust Replace Clean

CHARGING TEST

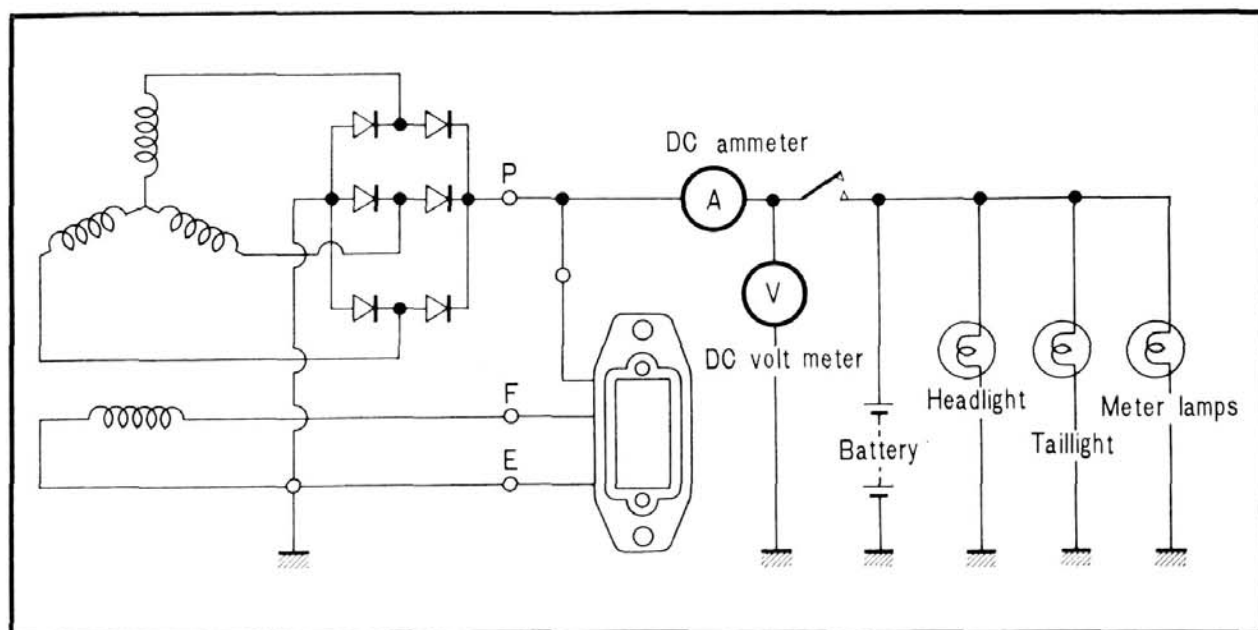


Fig. 8-3

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.

Engine (rpm)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Charging current (A)								
Night riding	6.5	0	2.4	1.3	1.0	1.0	0.8	0.6
Day riding	2—3	1	1	1	1	1	1	1
Battery terminal voltage (V)	12	12.4	13.2	14.5	14.5	14.5	14.5	14.5

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 6mm 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 7.2Ω . (Fig. 8-8)

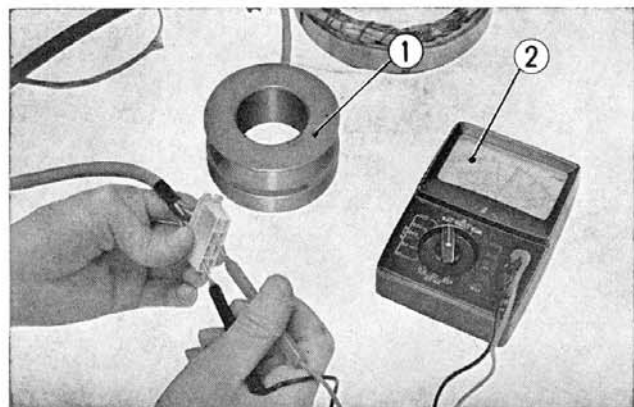


Fig. 8-8 ① Field coil
② Tester

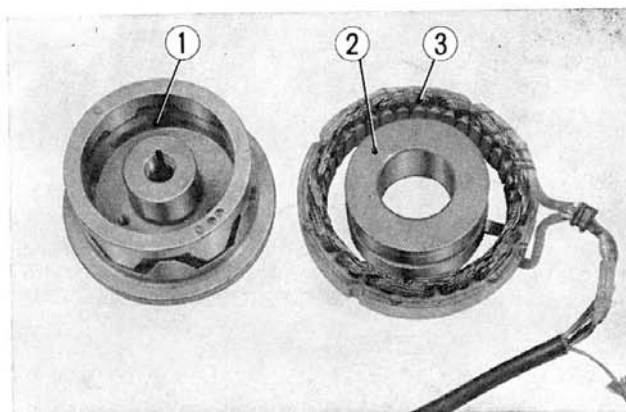


Fig. 8-4 ① Generator rotor
② Field coil ③ Stator coil

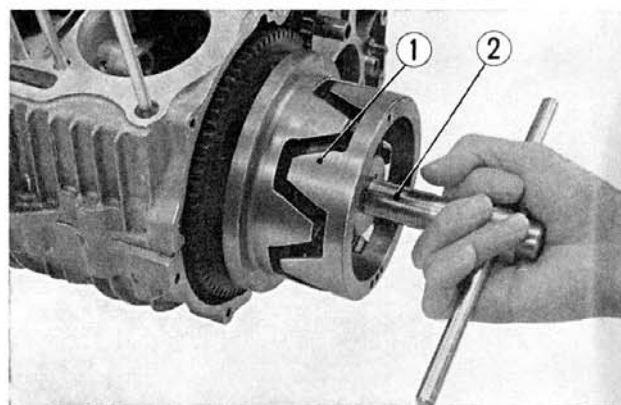


Fig. 8-5 ① A.C generator rotor
② Rotor puller

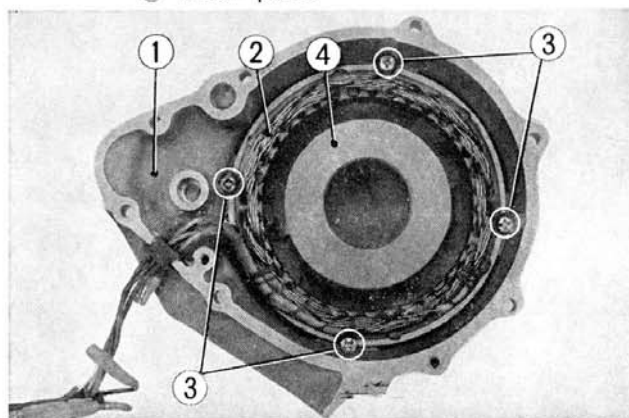


Fig. 8-6 ① Dynamo cover ③ 6mm cross screws
② Stator coil ④ Field coil

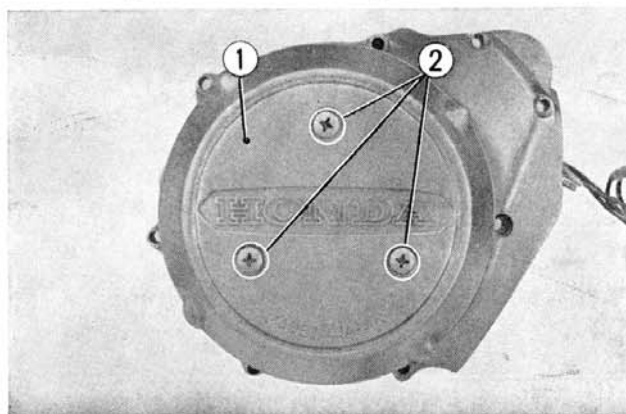


Fig. 8-7 ① Dynamo cover
② 6mm cross screws

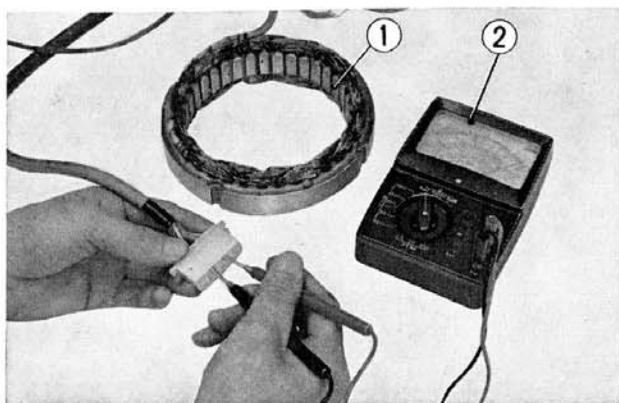


Fig. 8-9 ① Stator coil
② Tester

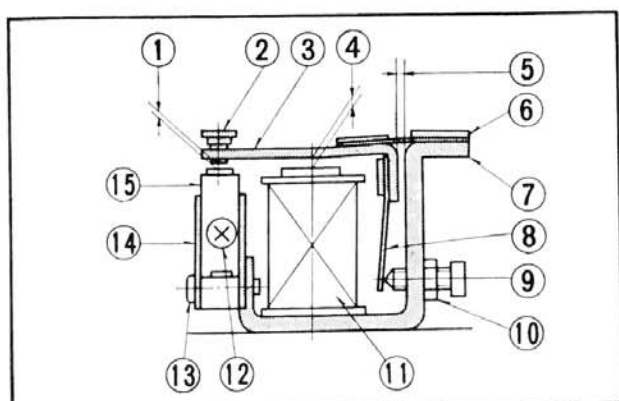


Fig. 8-10 ① Point gap
② Lower contact
③ Armature
④ Core gap
⑤ Yoke gap
⑥ Spring
⑦ Yoke
⑧ Adjusting spring
⑨ Voltage adjusting screw
⑩ Lock nut
⑪ Coil
⑫ Point gap adjusting screw
⑬ Core gap adjusting screw
⑭ Contact set
⑮ Upper contact

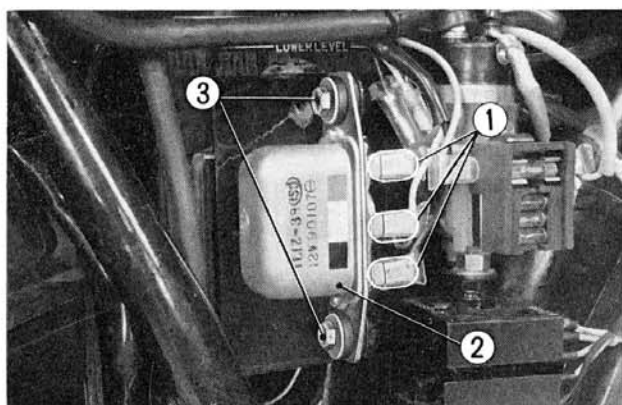


Fig. 8-11 ① Connectors
② Regulator
③ Regulator setting bolts

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 0.2Ω . (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 it 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)

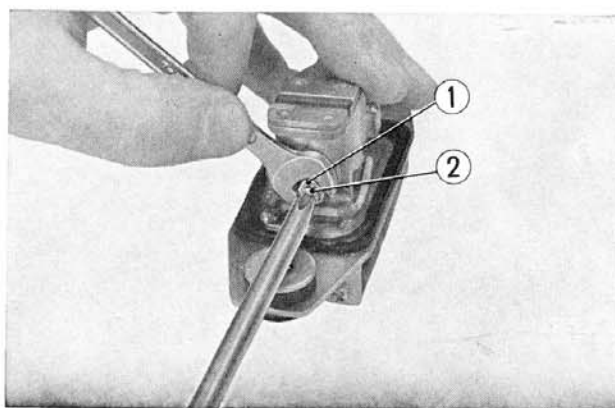


Fig. 8-12 ① Adjusting screw lock nut
② Adjusting screw

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 0.5V 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 0.5V 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)

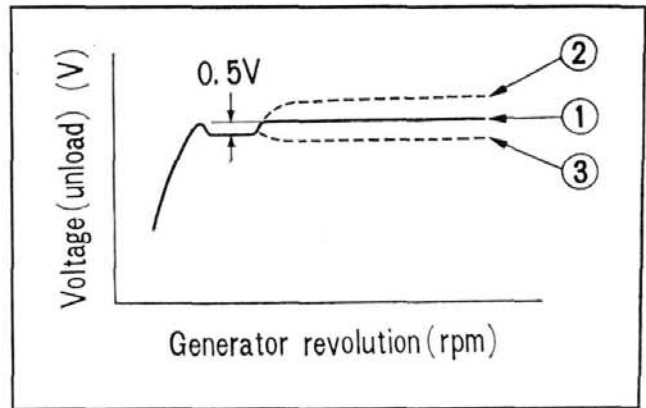


Fig. 8-13 ① Standard ② Wide core gap ③ Narrow core gap

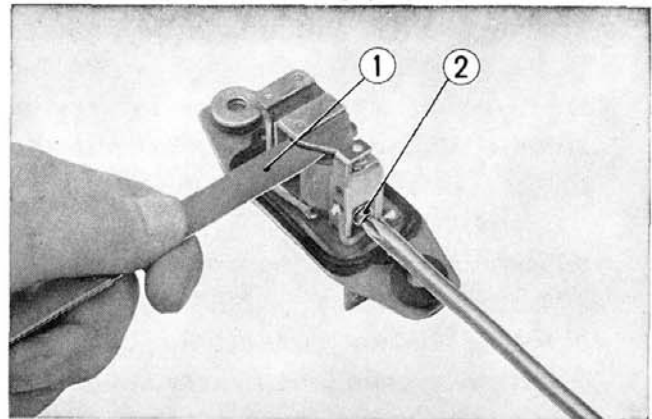


Fig. 8-14 ① Thickness gauge ② Core gap adjusting screw

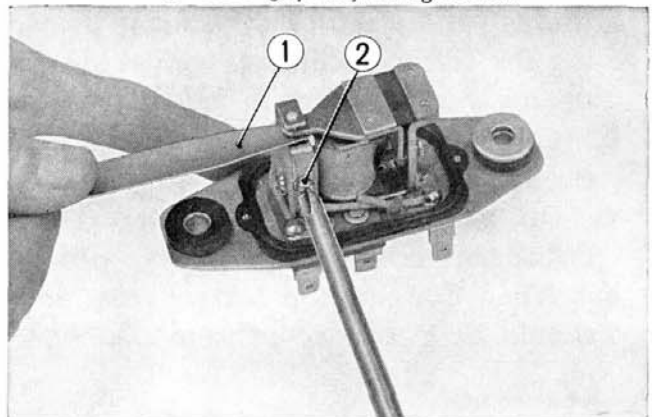


Fig. 8-15 ① Thickness gauge ② Point gap lock screw

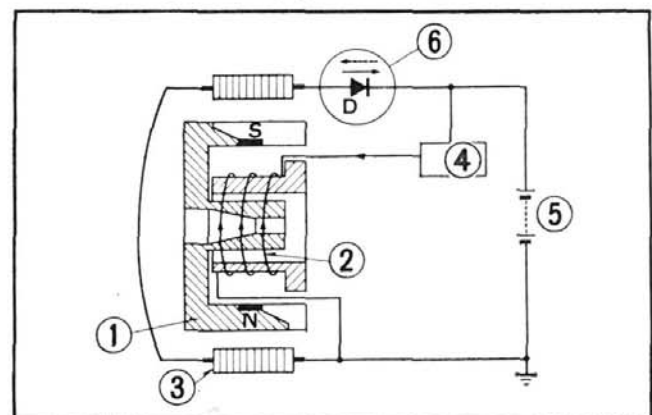


Fig. 8-16 ① Generator rotor ② Field coil ③ Stator coil ④ Regulator ⑤ Battery ⑥ Silicon rectifier

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.

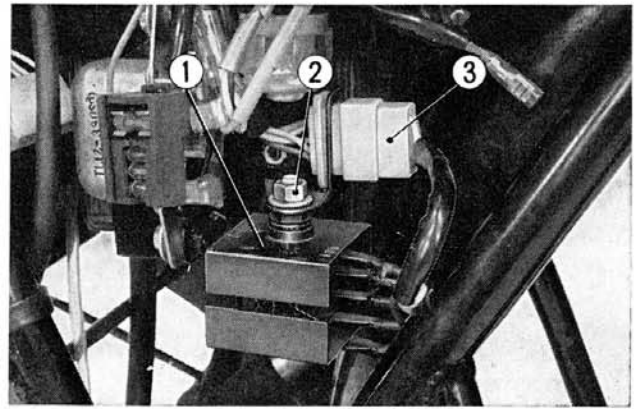


Fig. 8-17 ① Silicon rectifier ② Rectifier setting nut ③ Connector

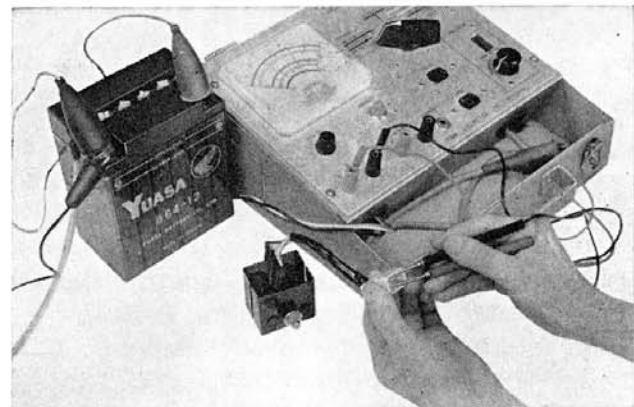


Fig. 8-18

STARTING SYSTEM

GROUP

9

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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)

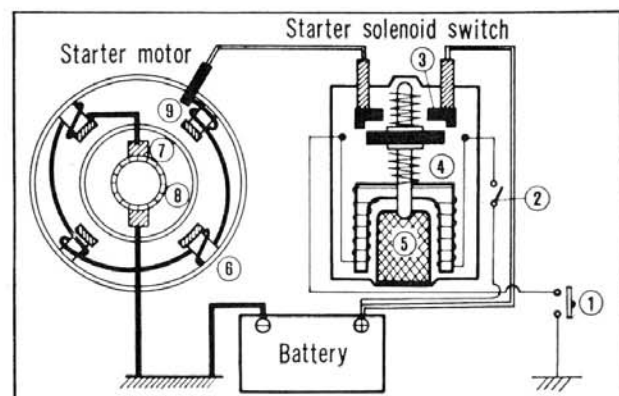


Fig. 9-1

- | | |
|-------------------------|--------------|
| ① Starter button switch | ⑥ Pole |
| ② Ignition switch | ⑦ Brush |
| ③ Contact unit | ⑧ Armature |
| ④ Excitation coil | ⑨ Field coil |
| ⑤ Plunger | |

SPECIFICATIONS

Starting motor			
Rated voltage	12V		
Rated output	0.6kW		
Rated operation	30seconds		
Direction of rotation	Counterclockwise (viewing into shaft)		
Weight	5.3lbs (2.4kg)		
	Without load	With load	Stalling load
Voltage	11V	8.5V	5V
Amperage	Max. 35 A	120 A	Max. 280 A
Torque	—	Min. 0.12kg-m	Min. 0.32kg-m
Revolution	11,000~22,000rpm	Min. 3,200rpm	—
Primary reduction ratio	4.7 : 1		
Secondary reduction ratio	4.69 : 1		
Total reduction ratio	22.04 : 1		
Starter magnetic switch			
Rated voltage	12V		
Operating voltage	7.5V		

Item	Standard value	Serviceable limit
Carbon brush length	0.472~0.512in. 12~13mm	0.217in. 5.5mm
Mica undercut		0.012in. 0.3mm
Carbon brush spring	500~600gr	—

DIAGNOSIS

Trouble	Probable Causes	Remedy
Starting motor does not operate	1. Defective battery 2. Poor contact of magnetic switch 3. Poor contact of starting motor carbon brush	Charge or replace Repair or replace Repair or replace

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)

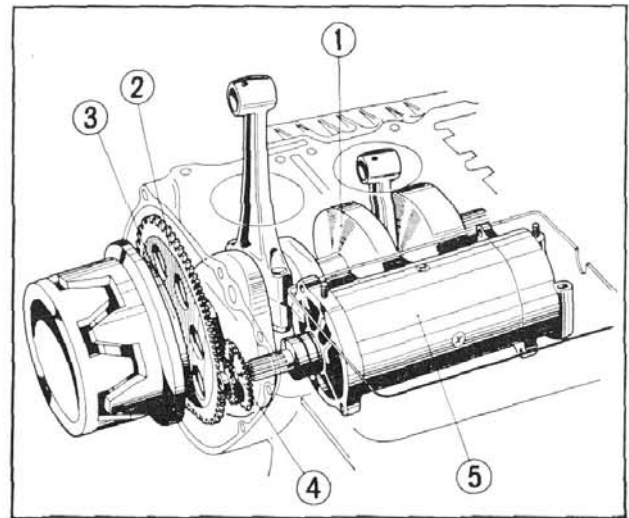


Fig. 9-2 ① Crankshaft
② Starting clutch gear
③ Starting clutch
④ Starting motor reduction gear
⑤ Starting motor

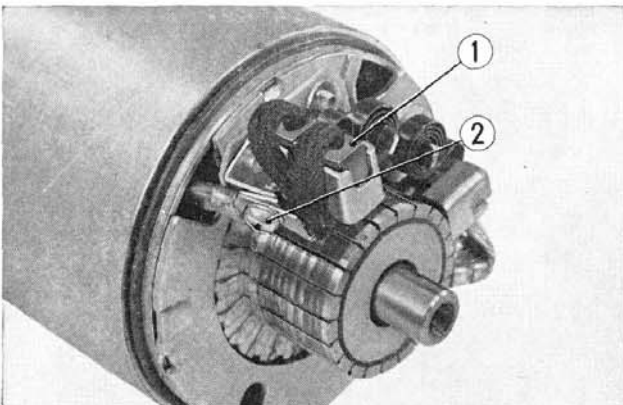


Fig. 9-5 ① Brush ② Brush mounting screw

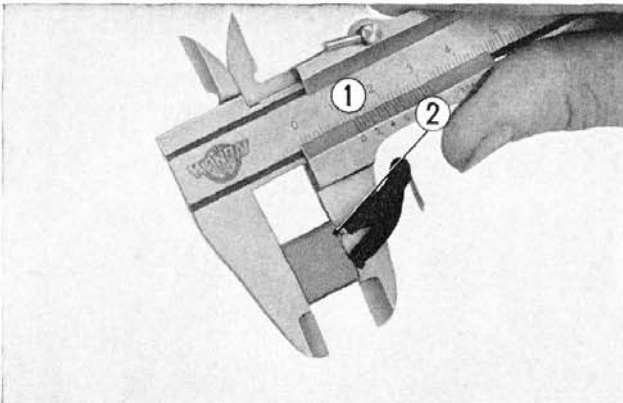


Fig. 9-6 ① Vernier caliper ② Carbon brush

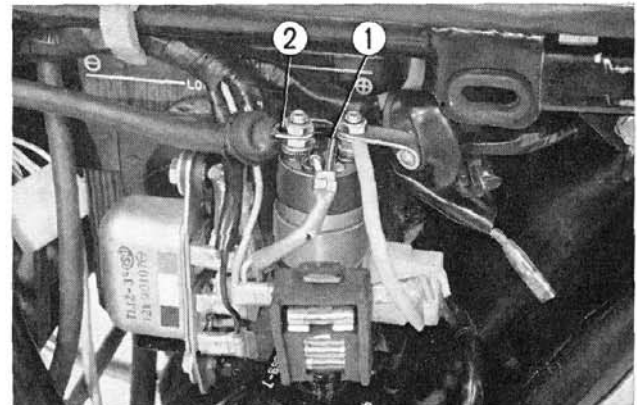


Fig. 9-3 ① Magnetic switch
② Starting motor cable

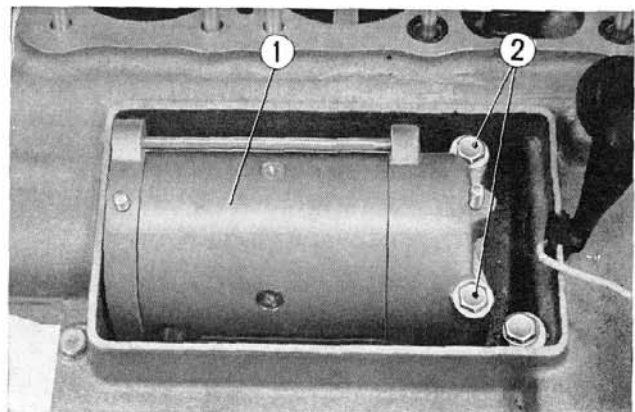


Fig. 9-4 ① Starting motor
② Motor setting bolts

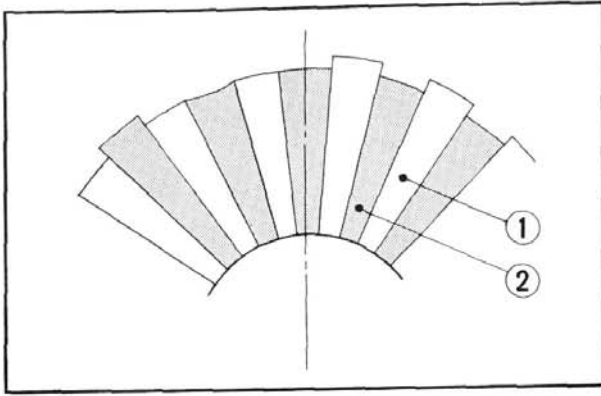


Fig. 9-7 ① Commutator
② Mica

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.

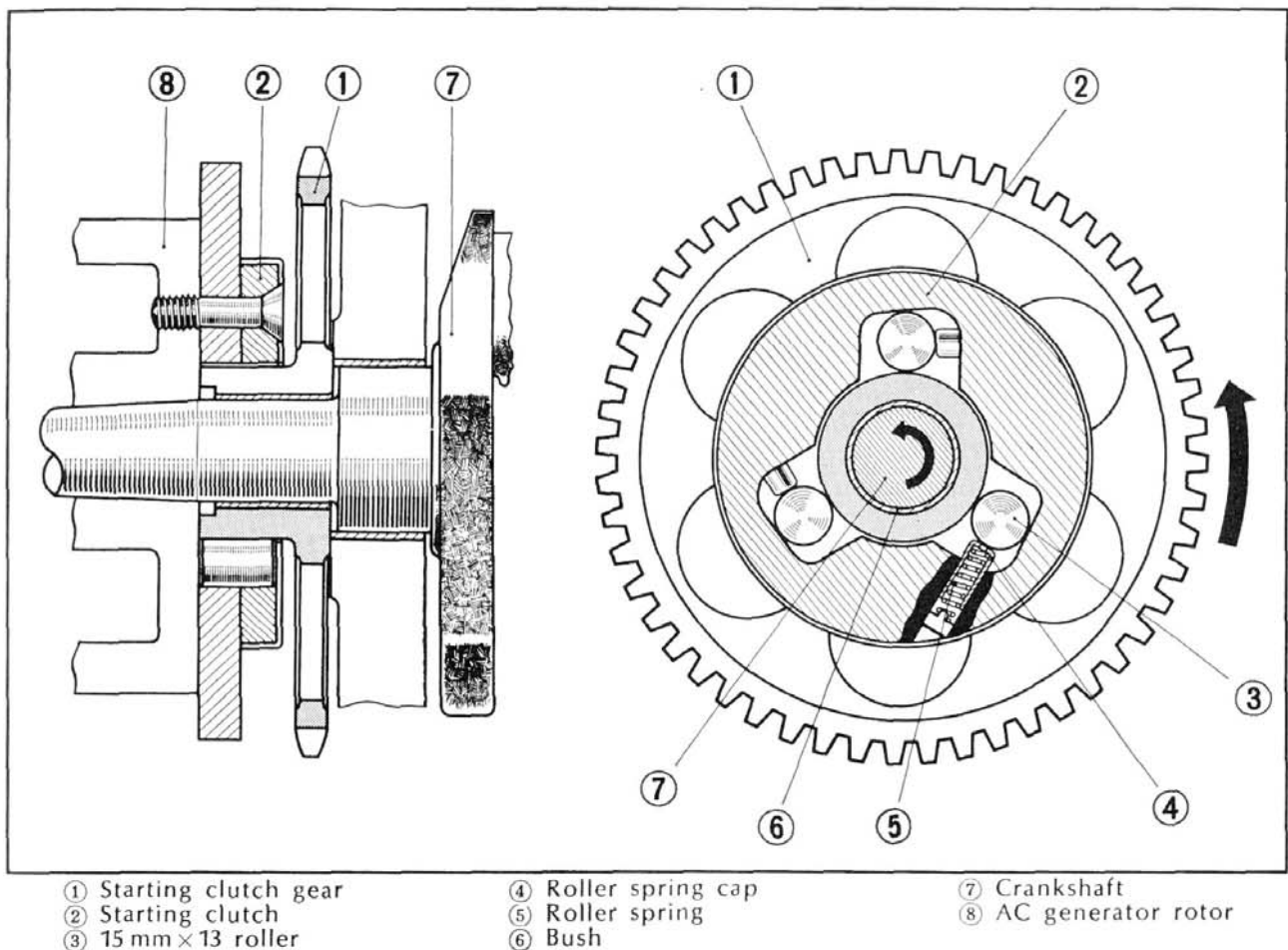


Fig. 9-8

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)

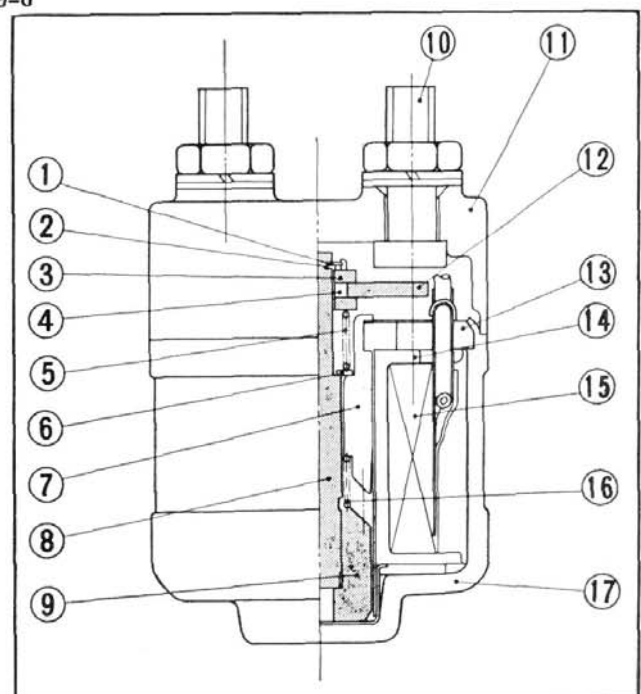


Fig. 9-9

- ① Stopper
- ② Stopper holder
- ③ Insulation washer
- ④ Insulation collar A
- ⑤ Contact spring
- ⑥ Flat washer
- ⑦ Plunger holder
- ⑧ Plunger shaft
- ⑨ Plunger
- ⑩ Contact bolt
- ⑪ Case
- ⑫ Contact plate
- ⑬ Yoke
- ⑭ Coil bobbin
- ⑮ Coil complete
- ⑯ Return spring
- ⑰ Body

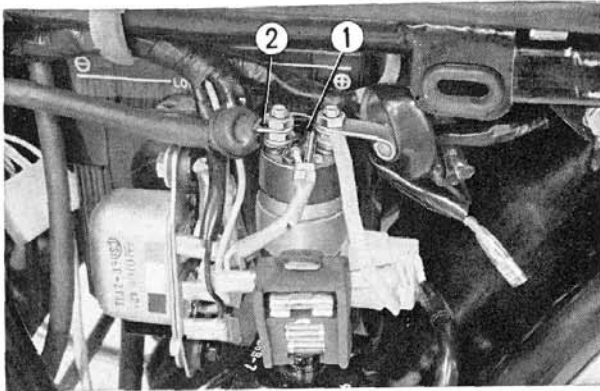


Fig. 9-10 ① Magnetic switch
② Starting motor cable

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.

BATTERY

GROUP

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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

Type	Yuasa B64-12 (Vacuum sealed dry charged battery)
Battery voltage	12V
Capacity rating	14AH
Electrolyte specific gravity	1.26~1.28 at 20°C (68°F)

DIAGNOSIS

Trouble	Probable Cause	Remedy
Sulfation The electrode plates are covered with white layer or in spots.	<ol style="list-style-type: none">1. Charging rate is too small or else excessively large.2. The specific gravity or the mixture of the electrolyte is improper.3. Battery left in a discharge condition for a long period. (Left with the switch turned on).4. Exposed to excessive vibration due to improper insulation.5. Motorcycle stored during cold season with battery connected.	<ol style="list-style-type: none">1. When motorcycle is in storage, the battery should be recharged once a month even though the motorcycle is not used.2. Check the electrolyte periodically and always maintain the proper level.3. In a lightly discharge condition, performing recharging and discharging several times by starting the engine may be sufficient.

Trouble	Probable cause	Remedy
Self discharge Battery discharges in addition to that caused by the connected load.	1. Dirty contact areas and case. 2. Contaminated electrolyte or electrolyte excessively concentrated	1. Always maintain the exterior clean 2. Handle the replenishing electrolyte with care and use clean container.
C. Large discharge rate Specific gravity gradually lowers and around 1.100 (S.G.) the winker and the no longer function.	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 \oplus and \ominus plates will react with the sulfuric acid and form lead sulfide deposits, (sulfation) making it impossible to recharge.	1. When the specific gravity falls below 1.200 (20°C : 68°F), the battery should be recharged immediately. 2. When the battery frequently becomes discharged while operating at normal speed, check the generator for proper output. 3. If the battery discharges under normal charge output, it is an indication of overloading, remove some of the excess load
High charging rate 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)	1. The deposit will heavily accumulate at the bottom and will cause internal shorting and damage the battery.	1. Check to assure proper charging rate. 2. When overcharge condition exist with the proper charging rate, place on appropriate resistor in the charging circuit.
Specific gravity drops Electrolyte evaporates	1. Shorted 2. Insufficient charging 3. Distilled water overfilled 4. Contaminated electrolyte	1. Perform specific gravity measurement. 2. If the addition of distilled water causes a drop in specific gravity, add sulfuric acid and adjust to proper value.

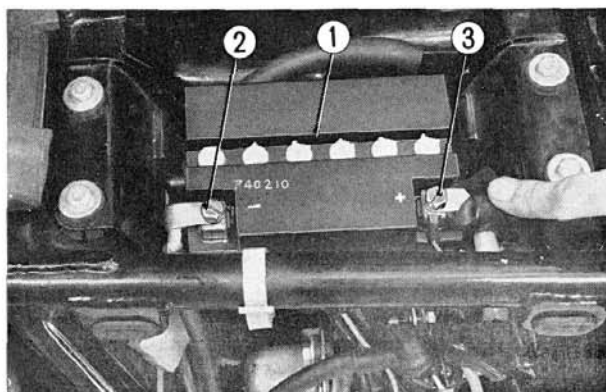


Fig. 10-1 ① Battery ③ \oplus terminal
② \ominus terminal

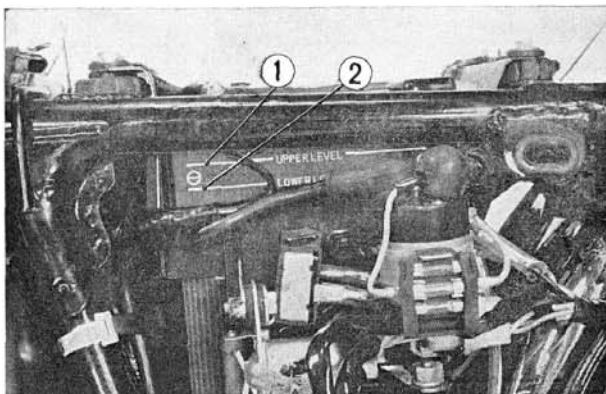


Fig. 10-2 ① Upper level mark
② Lower level mark

10-2. REPAIRING PROCEDURE

a. Disassembly

1. Raise the seat and remove the battery band from the battery.
2. Disconnect the ground \ominus negative cable connection first and the positive \oplus last. (Fig. 10-1)
3. Remove the battery from the battery compartment.

b. Inspection

1. Checking the battery electrolyte level
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, t°C

t = Temperature of the measured electrolyte

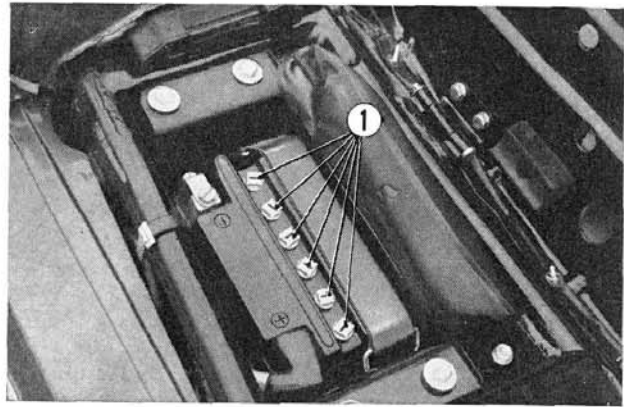


Fig. 10-3 ① Battery cell caps

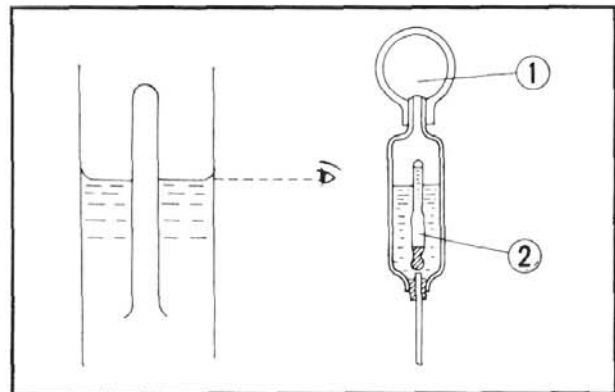


Fig. 10-4 ① Hydrometer
② Float

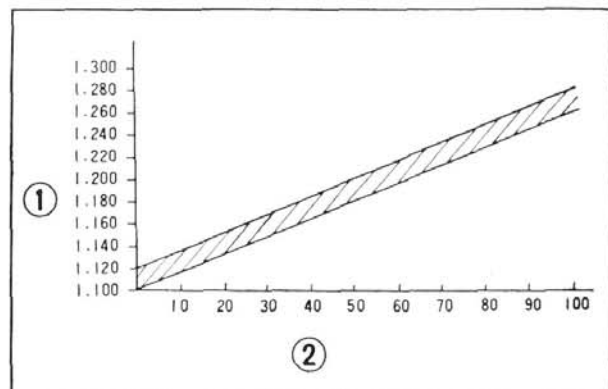


Fig. 10-5 ① Specific gravity (20°C)
② Residual capacity (%)

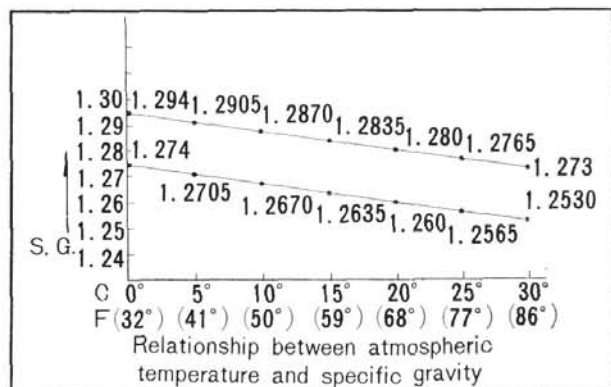


Fig. 10-5-1

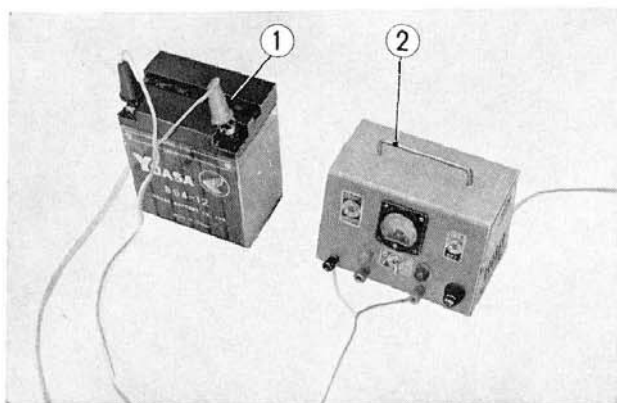


Fig. 10-6 ① Battery ② Battery charger

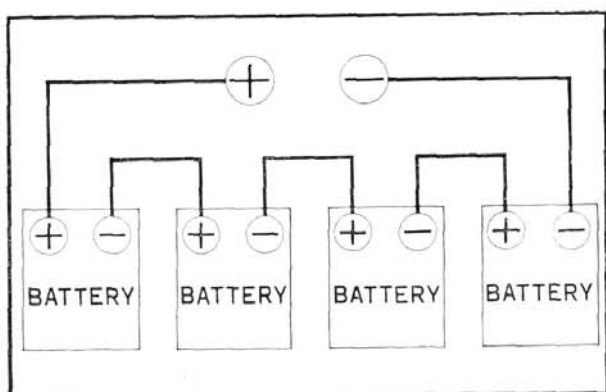


Fig. 10-7

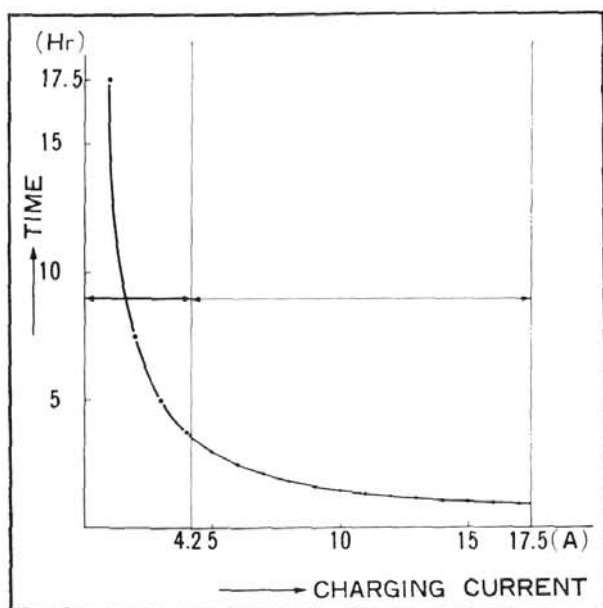


Fig. 10-8

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 36 (12+12+12) 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 ($14\text{AH} \times 1.25 = 17.5\text{AH}$). 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, $1.4\text{A} \times 3 = 4.2\text{A}$).

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)

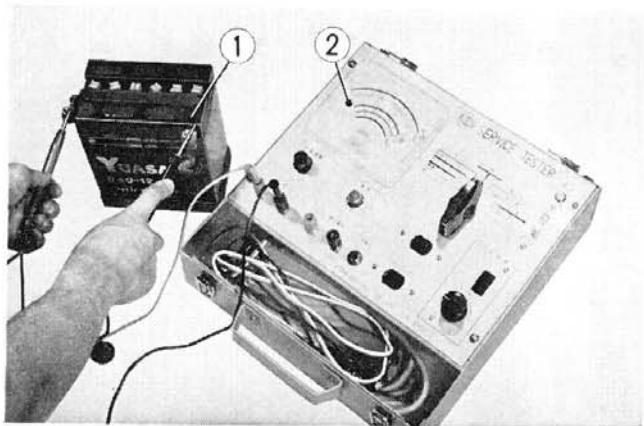


Fig. 10-9 ① Battery ② Tester

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.

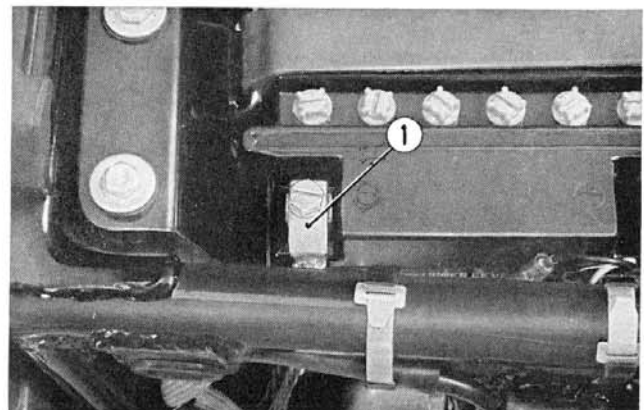


Fig. 10-10 ① Negative (-) terminal

