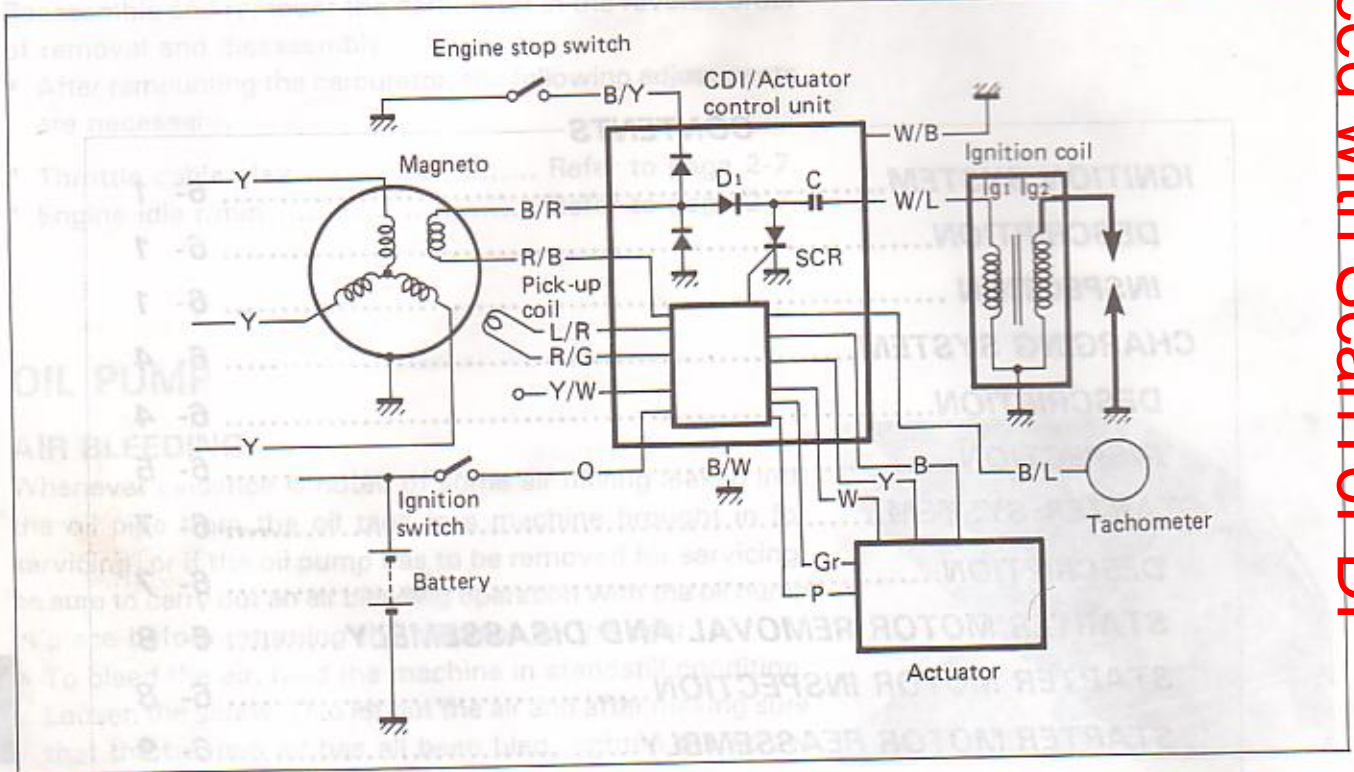


ELECTRICAL SYSTEM

CONTENTS

| | |
|--|------|
| IGNITION SYSTEM | 6- 1 |
| DESCRIPTION | 6- 1 |
| INSPECTION | 6- 1 |
| CHARGING SYSTEM | 6- 4 |
| DESCRIPTION | 6- 4 |
| INSPECTION | 6- 5 |
| STARTER SYSTEM | 6- 7 |
| DESCRIPTION | 6- 7 |
| STARTER MOTOR REMOVAL AND DISASSEMBLY | 6- 8 |
| STARTER MOTOR INSPECTION | 6- 8 |
| STARTER MOTOR REASSEMBLY | 6- 9 |
| STARTER RELAY INSPECTION | 6-10 |
| EXHAUST VALVE ACTUATOR | 6-11 |
| WATER TEMPERATURE METER | 6-12 |
| INSPECTION | 6-12 |
| OIL LEVEL GAUGE | 6-12 |
| LAMPS | 6-13 |
| COMBINATION METER | 6-14 |
| REMOVAL | 6-14 |
| INSPECTION | 6-14 |
| SWITCHES | 6-14 |
| BATTERY | 6-15 |

IGNITION SYSTEM



DESCRIPTION

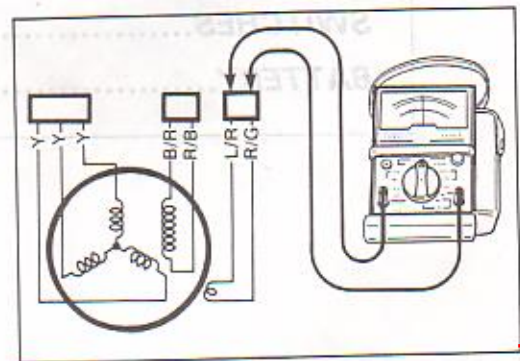
This motorcycle is equipped with a new type ignition system. This new system further reduces timing fluctuations. It has an "ignition timing control circuit" which accurately controls ignition timing depending on the engine r/min.

When the magneto rotor rotates, an electric current is generated in the power source coils, and this current charges the capacitor "C" via diode "D₁". On the other hand, when the protrusion on the rotor passes the pick-up coil, the currents are generated, they flow to the ignition timing control circuit, and they are converted into one ignition signal. This signal is sent to "SCR", the "SCR" becomes ON, the circuit "C" → "SCR" → "Ig₁" is formed, and as the electric energy stored in the capacitor "C" is discharged instantly, a high voltage is induced in the ignition secondary coil "Ig₂", and a spark.

INSPECTION
MAGNETO COIL

- Remove the seat and fuel tank. (Refer to page 3-2.)
- Measure the resistance between the lead wires in the following table with a pocket tester.

09900-25002 : Pocket tester



Magneto coil resistance

| | |
|-------------------|--|
| Pick-up coil | R/G — L/R 180 — 280 Ω (x 100 Ω range) |
| Power source coil | B/R — R/B 50 — 100 Ω (x 10 Ω range) |
| Charging coil | Y — Y 0.1 — 1.0 Ω (x 1 Ω range) |

WIRE COLOR

R/G : Red with Green tracer
 L/R : Blue with Red tracer
 B/R : Black with Red tracer
 R/B : Red with Black tracer
 Y : Yellow

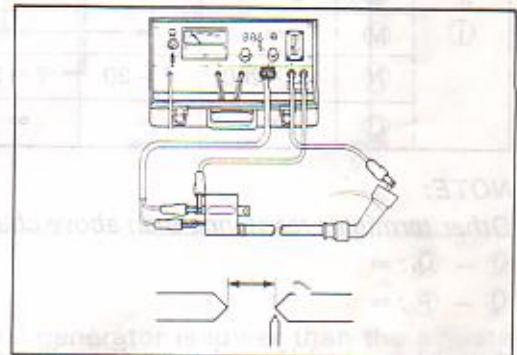
IGNITION COIL

- Remove the seat and fuel tank. (Refer to page 7-3.)
- Remove the ignition coil.

**Checking with electro tester**

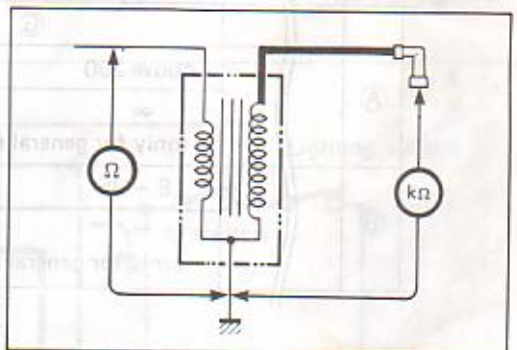
Test the ignition coil for sparking performance.

Test connection is as indicated. Make sure that the three-needle sparking distance is at least 8 mm.



Spark performance (STD) : 8 mm (0.3 in)

09900-28106 : Electro tester

**Checking with pocket tester****Ignition coil resistance**

Primary (Terminal-Ground) : 0.1 — 1.0 Ω

Secondary (Plug cap-Ground) : 13 — 20 k Ω

09900-25002 : Pocket tester

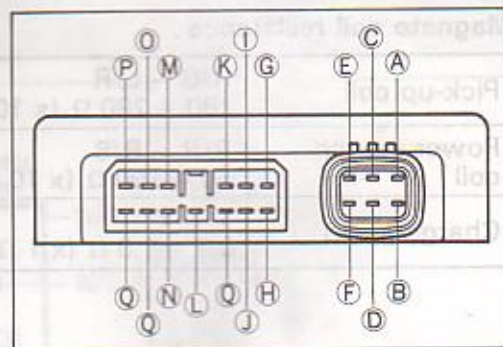
CDI/ACTUATOR CONTROL UNIT

- Remove the seat and frame covers. (Refer to page 7-3.)
- Remove the CDI/Actuator control unit and disconnect the couplers.



Measure the resistance between the terminals in the following table with the pocket tester.

09900-25002 : Pocket tester



For Ignition circuit

Unit: k Ω

| | | ⊕ Probe of tester to: | | | | | | | | |
|-----------------------|---|-----------------------|----------|----------|-----------|----------|----------|-----------|-----------|-----------|
| ⊖ Probe of tester to: | | Ⓐ | Ⓑ | Ⓒ | Ⓓ | Ⓚ | Ⓛ | Ⓜ | Ⓝ | Ⓞ |
| | Ⓐ | | Above 80 | * | Above 100 | ∞ | Above 80 | Above 150 | Above 150 | Above 200 |
| | Ⓑ | 5 - 20 | | * | 2 - 11 | ∞ | 0 | 1 - 6 | 1 - 6 | 4 - 16 |
| | Ⓒ | ∞ | ∞ | | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| | Ⓓ | 17 - 70 | 4 - 18 | 4 - 20 | | ∞ | 4 - 18 | 10 - 40 | 11 - 45 | 30 - 150 |
| | Ⓚ | 30 - 150 | 6 - 26 | 7 - 30 | 3 - 13 | | 6 - 26 | 20 - 90 | 20 - 90 | Above 70 |
| | Ⓛ | 5 - 20 | 0 | 8 - 35 | 2 - 11 | ∞ | | 1 - 6 | 1 - 6 | 4 - 16 |
| | Ⓜ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | | ∞ | ∞ |
| | Ⓝ | 40 - 200 | 7 - 30 | 7 - 30 | 3 - 13 | ∞ | 7 - 30 | 24 - 100 | | Above 70 |
| | Ⓞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | |

NOTE:

Other terminals resistance than above chart is as shown below.

Q - Q: ∞

Q - P: ∞

Asterisk marked (*) resistance is as shown below.

| Ⓐ | | Ⓒ |
|---|--|--|
| | | Above 200 ∞ (only for general market model) |
| Ⓑ | | Ⓒ |
| | | 8 - 35 ∞ (only for general market model) |

For Exhaust valve actuator circuit

Unit: k Ω

| | | ⊕ Probe of tester to: | | | | | |
|-----------------------|---|-----------------------|---------|----------|---------|----------|----------|
| ⊖ Probe of tester to: | | Ⓒ | Ⓓ | Ⓔ | Ⓕ | Ⓖ | Ⓙ |
| | Ⓒ | | 4 - 20 | 14 - 60 | 4 - 16 | 10 - 40 | 10 - 40 |
| | Ⓓ | 3 - 13 | | 4 - 20 | 0.7 - 3 | 2 - 10 | 2 - 10 |
| | Ⓔ | 14 - 60 | 4 - 20 | | 5 - 22 | 12 - 50 | 12 - 50 |
| | Ⓕ | 4 - 16 | 0.7 - 3 | 3 - 15 | | 1.4 - 6 | 1.4 - 6 |
| | Ⓖ | 40 - 200 | 13 - 60 | Above 50 | 13 - 50 | | 45 - 200 |
| | Ⓙ | 40 - 200 | 13 - 60 | Above 50 | 13 - 50 | 45 - 200 | |

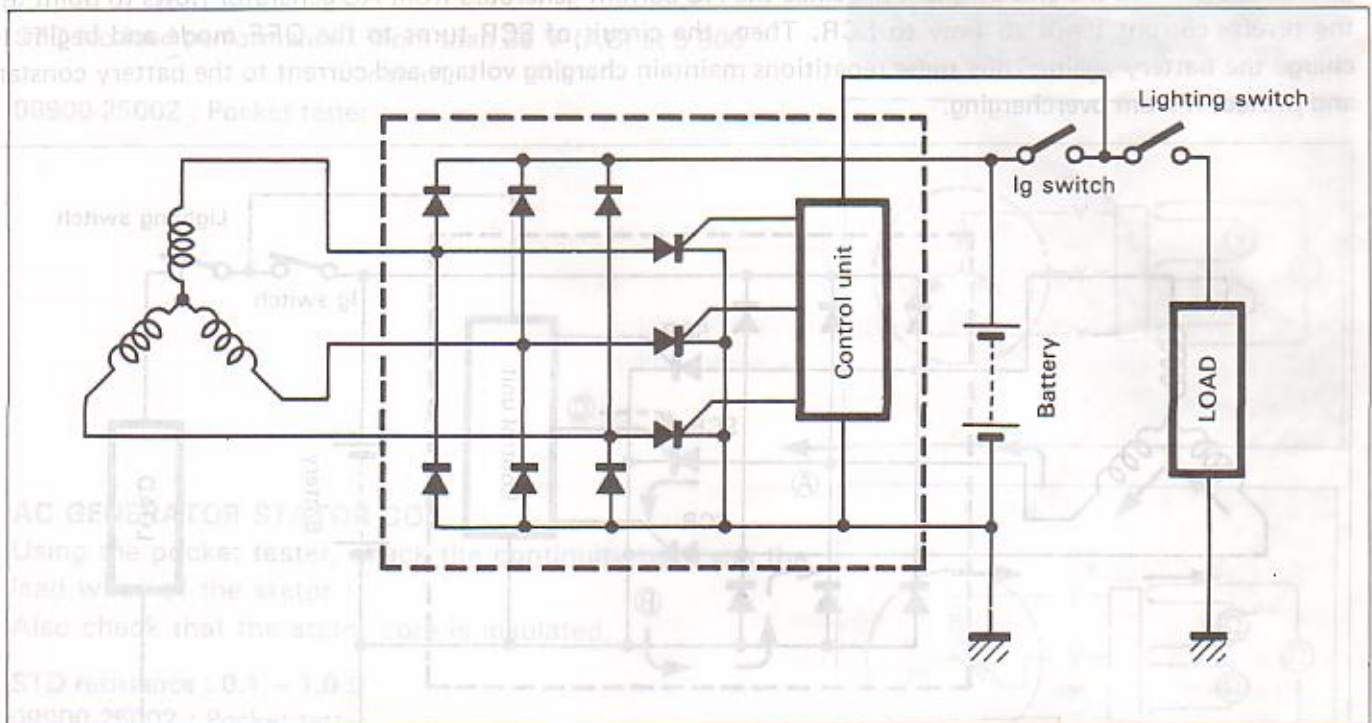
CAUTION:

As capacitors, zener diodes, etc. are used inside this unit, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.

CHARGING SYSTEM DESCRIPTION

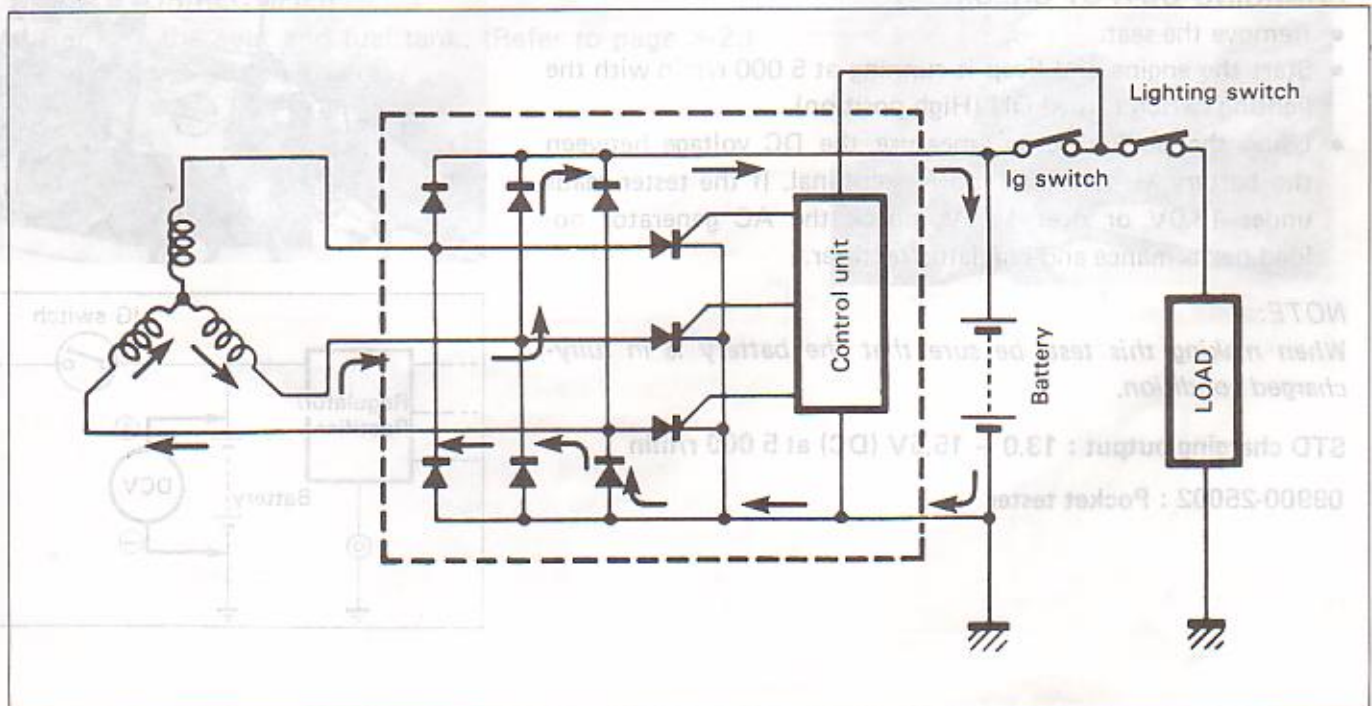
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.



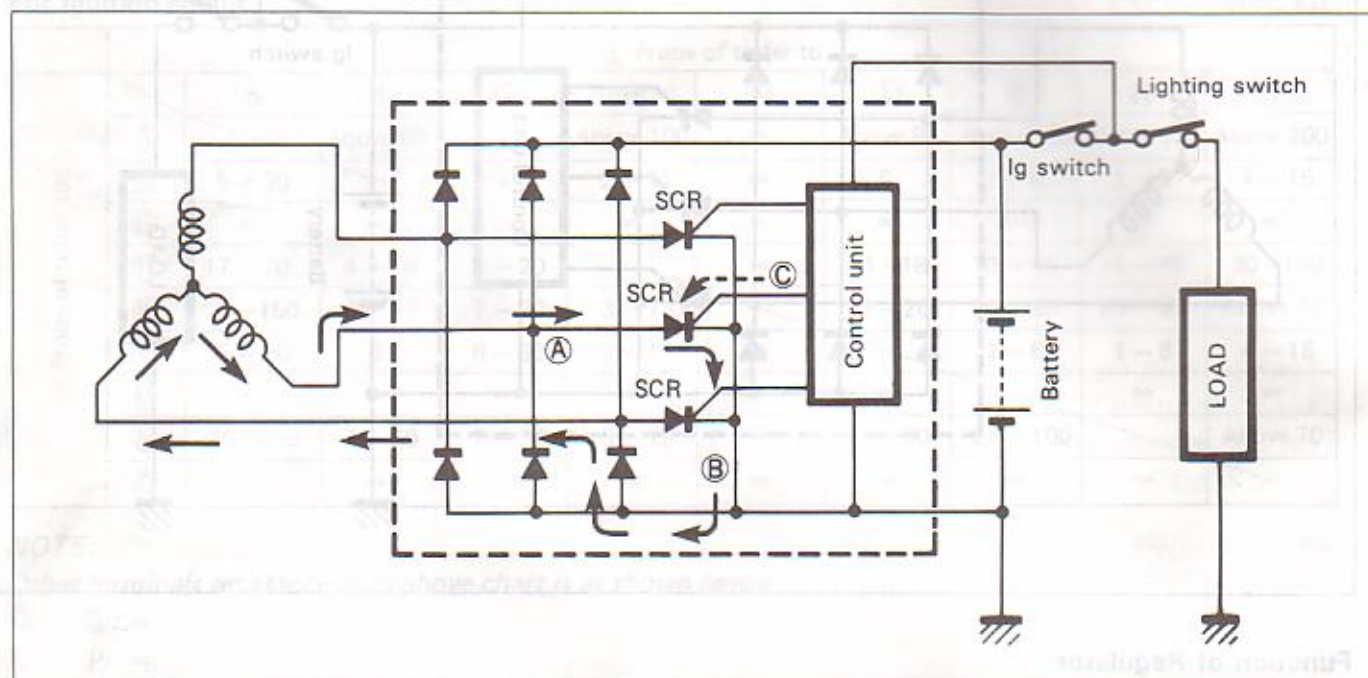
Function of Regulator

While the engine r/min is low and the generated voltage of AC generator is lower than the adjusted voltage of regulator, the regulator does not function, incidentally the generated current charges the battery directly.



When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the control unit and it is turned "ON", a signal © will be sent to the SCR (Thyristor) gate probe and the SCR will be turned "ON".

Then, the SCR becomes conductive in the direction from point (A) to point (B). At this time, the current generated from the AC generator gets through the SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows to point (B) the reverse current tends to flow to SCR. Then, the circuit of SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage and current to the battery constant and protect it from overcharging.



INSPECTION

CHARGING OUTPUT CHECK

- Remove the seat.
- Start the engine and keep it running at 5 000 r/min with the lighting switch turned ON (High position).
- Using the pocket tester, measure the DC voltage between the battery ⊕ terminal and ⊖ terminal. If the tester reads under 13.0V or over 15.5V, check the AC generator no-load performance and regulator/rectifier.

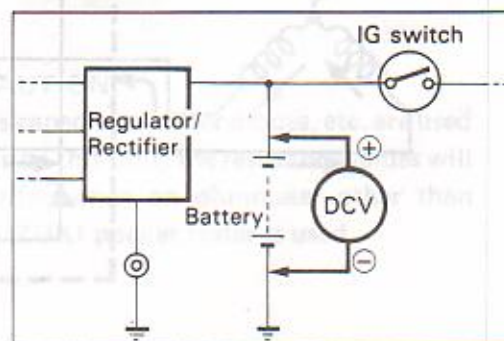


NOTE:

When making this test, be sure that the battery is in fully-charged condition.

STD charging output : 13.0 – 15.5V (DC) at 5 000 r/min

09900-25002 : Pocket tester



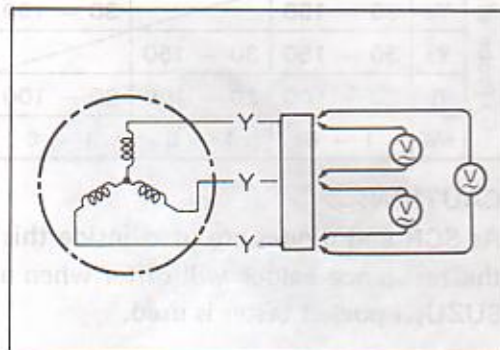
AC GENERATOR NO-LOAD PERFORMANCE

- Remove the seat and fuel tank. (Refer to page 3-2.)
- Disconnect the AC generator lead wire coupler.
- Start the engine and keep it running at 5 000 r/min.
- Measure the AC voltage between the three yellow lead wires with the pocket tester.

If the tester reads under 33 V, the AC generator is faulty.

STD No-load performance : More than 33 V (AC) at 5 000 r/min

09900-25002 : Pocket tester

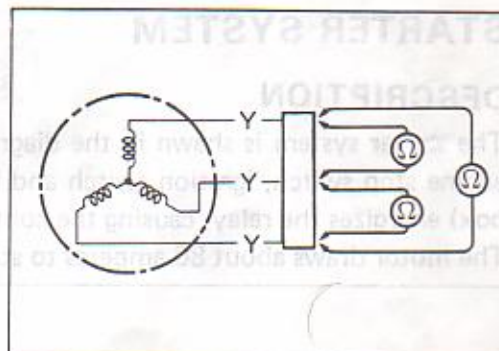
**AC GENERATOR STATOR COIL**

Using the pocket tester, check the continuity between the lead wires of the stator.

Also check that the stator core is insulated.

STD resistance : 0.1 – 1.0 Ω

09900-25002 : Pocket tester

**NOTE:**

When making this test, it is not necessary to remove the AC generator.

REGULATOR/RECTIFIER

- Remove the seat and fuel tank. (Refer to page 3-2.)
- Disconnect the lead wires.

**STARTER MOTOR INSPECTION****CARBON BRUSH**

When the brushes are worn, the motor will be unable to produce sufficient torque and the engine will be difficult to start. To prevent this, periodically inspect the length of the brushes, replacing them when they are worn or chipped.



Using the pocket tester ($\times 1 \text{ k}\Omega$ range); measure the resistance between the lead wires in the following table. If the reading is incorrect, replace the regulator/rectifier.

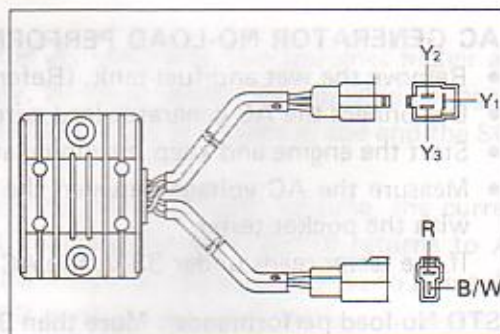
09900-25002 : Pocket tester

Unit : Approx. $\text{k}\Omega$

| ① Probe of tester to: | ⊕ Probe of tester to: | | | | |
|-----------------------|-----------------------|----------------|----------------|--------|----------|
| | Y ₁ | Y ₂ | Y ₃ | R | B/W |
| Y ₁ | | 30 - 150 | 30 - 150 | 1 - 6 | 20 - 100 |
| Y ₂ | 30 - 150 | | 30 - 150 | 1 - 6 | 20 - 100 |
| Y ₃ | 30 - 150 | 30 - 150 | | 1 - 6 | 20 - 100 |
| R | 20 - 100 | 20 - 100 | 20 - 100 | | 10 - 60 |
| B/W | 1 - 6 | 1 - 6 | 1 - 6 | 2 - 10 | |

CAUTION:

As SCR and diodes are used inside this regulator/rectifier unit, the resistance values will differ when an ohmmeter other than SUZUKI pocket tester is used.



WIRE COLOR

Y : Yellow

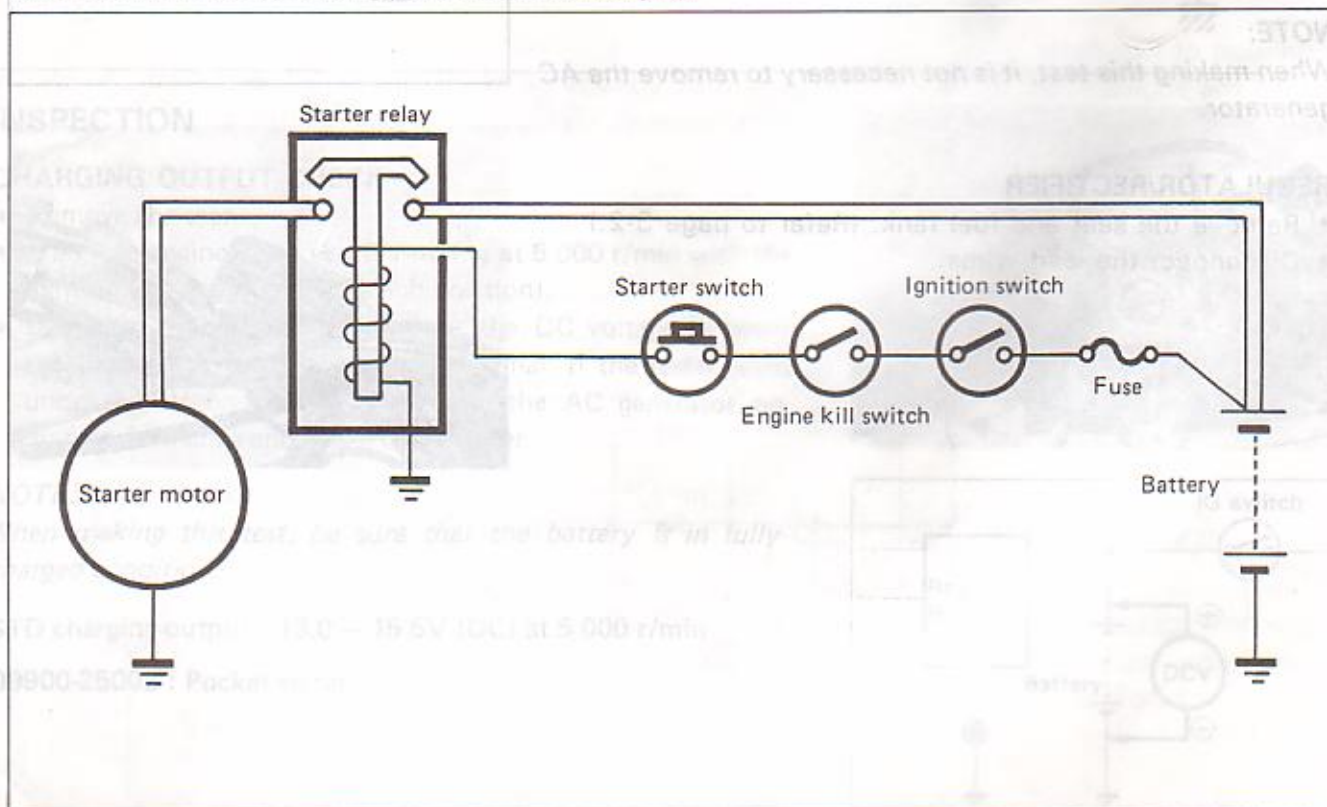
R : Red

B/W : Black with White tracer

STARTER SYSTEM

DESCRIPTION

The starter system is shown in the diagram below: namely, the starter motor, starter relay, starter button, engine stop switch, ignition switch and battery. Depressing the starter button (on the left handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.



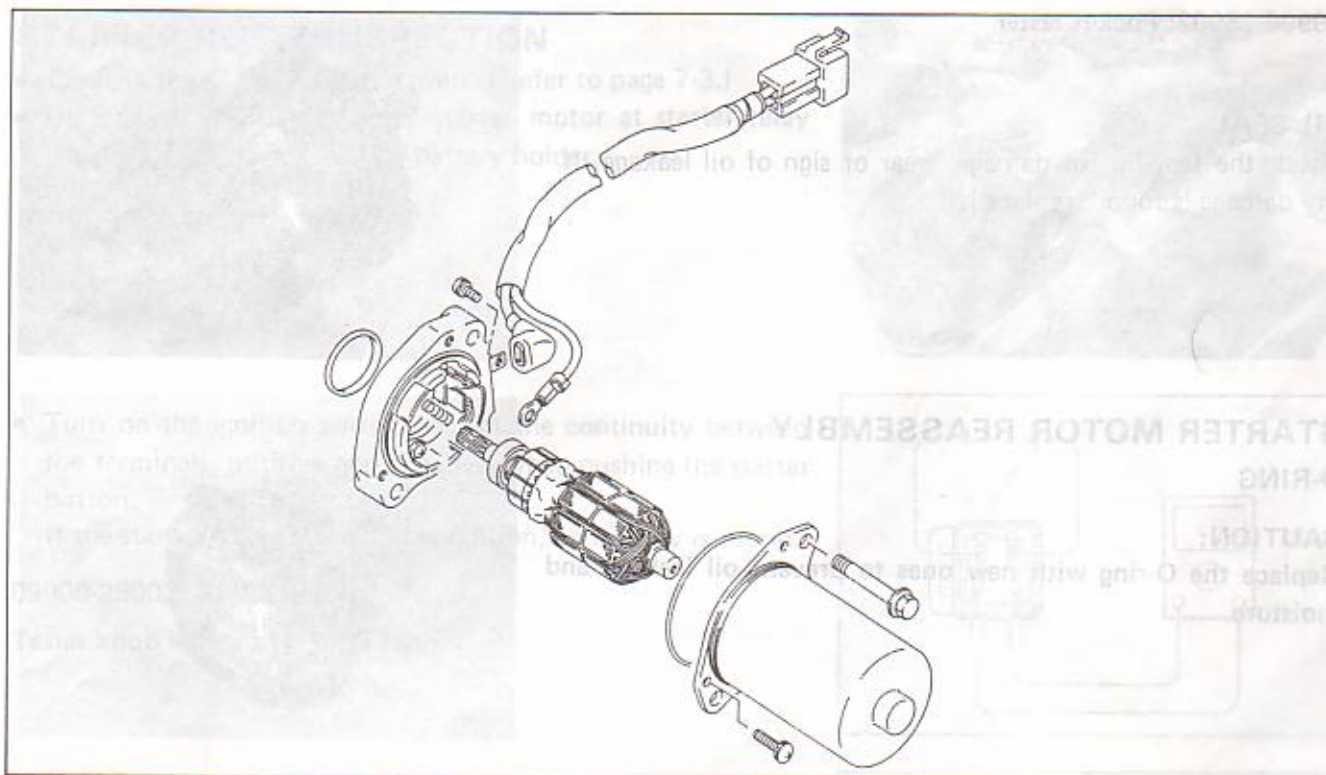
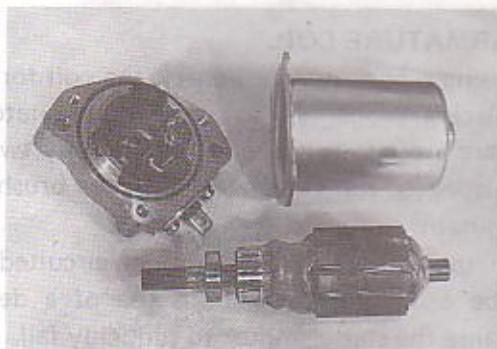
STARTER MOTOR REMOVAL AND DISASSEMBLY

- Remove the lower fairing. (Refer to page 7-1.)
- Disconnect the starter motor lead wires, then remove the starter motor by removing the mounting bolts.

(A) Engine ground wire



- Disassemble the starter motor as shown in the following illustration.

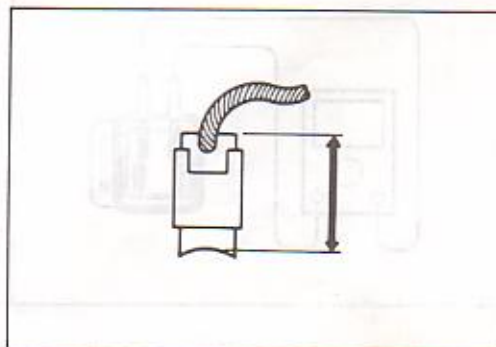


STARTER MOTOR INSPECTION

CARBON BRUSH

When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, inspect the length of the brushes, replacing them when they are too short or chipping.

Service Limit: 3.5 mm (0.14 in)

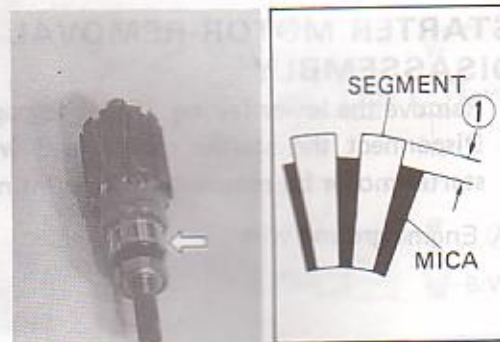


COMMUTATOR

If the commutator surface is dirty, starting performance decreases. Polish the commutator with # 400 or similar fine emery paper when it is dirty.

After polishing it, wipe the commutator with a clean dry cloth. Measure the commutator under-cut ①.

Service Limit: 0.2 mm (0.008 in)

**ARMATURE COIL**

Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.

If the coil is found to be open-circuited or grounded, replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.



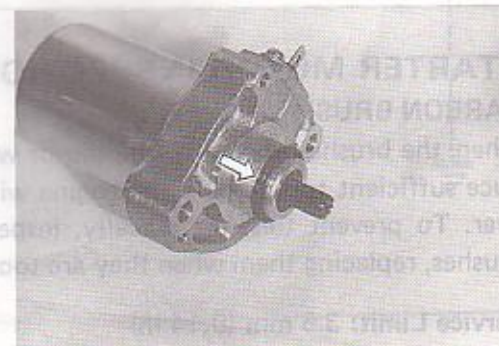
09900-25002: Pocket tester

OIL SEAL

Check the seal lip for damage, wear or sign of oil leakage. If any damage is found, replace it.

**STARTER MOTOR REASSEMBLY****O-RING****CAUTION:**

Replace the O-ring with new ones to prevent oil leakage and moisture.



ARMATURE

- Apply a small quantity of moly paste to the armature end.

99000-25140: SUZUKI Moly Paste



- Apply grease to the lip of oil seal.

99500-25010: SUZUKI SUPER GREASE "A"

**STARTER RELAY INSPECTION**

- Remove the seat and frame covers. (Refer to page 7-3.)
- Disconnect the lead wire of starter motor at starter relay which is located ahead of the battery holder.

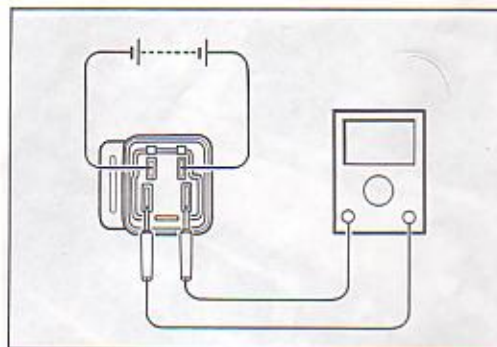


- Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when pushing the starter button.

If the starter relay is in sound condition, continuity is found.

09900-25002: Pocket tester

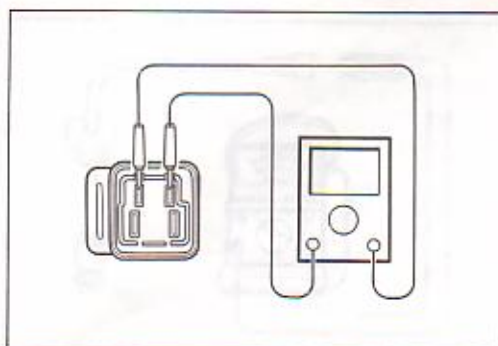
Tester knob indication: $\times 1\Omega$ range



- Disconnect the lead wire coupler from the starter relay.
- Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if the resistance is as follows.

09900-25002: Pocket tester

Tester knob indication: $\times 10\Omega$ range



| Starter relay resistance | Standard |
|--------------------------|------------------|
| | 40 – 80 Ω |

EXHAUST VALVE ACTUATOR

- Remove the seat and fuel tank. (Refer to page 3-2.)

Using the pocket tester, measure the resistance between the lead wires in the following table.

If the reading is incorrect, replace the actuator.

Actuator coil resistance

W – B : 3.2 – 7.2 k Ω (x k Ω range)

Y – B : 0 – 7.2 k Ω (x k Ω range)

P – Gr : 4.5 – 30 Ω (x 10 Ω range)

WIRE COLOR

B : Black

Gr: Gray

P : Pink

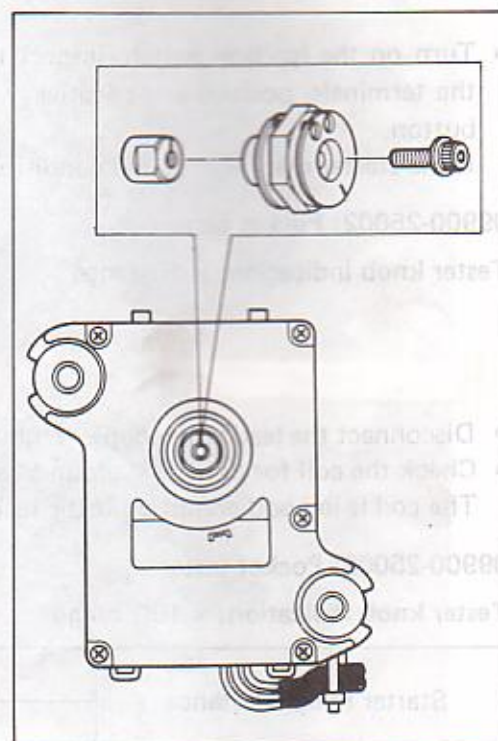
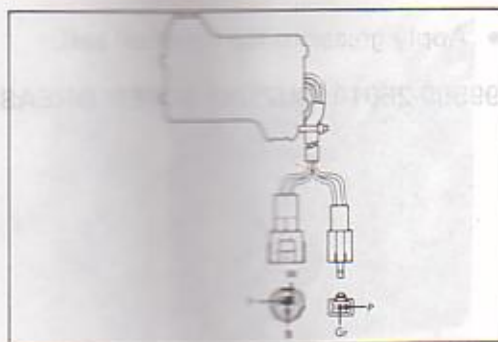
W : White

Y : Yellow

- When removing or tightening the actuator pulley bolt, hold the pulley with a plier to prevent the gear damage inside of the actuator.

Pully bolt tightening torque

4 – 6 N·m (0.4 – 0.6 kg·m, 3.0 – 4.5 lb·ft)



WATER TEMPERATURE METER

INSPECTION

As the coil spring is installed on the needle shaft of the water temperature meter, the needle is forced back to the original position when ignition switch is turned OFF.

To test the water temperature meter two different checks may be used. The first, and simplest test will tell if the meter is operating but will not indicate the meters accuracy throughout the range.

To perform this test, disconnect the B/G lead wire of the water temperature meter from the water thermo-gauge. Connect a jumper wire between B/G wires coming from the main wiring harness and engine ground. With the ignition switch turned on, the water temperature meter should indicate "H". The second test will check the accuracy of the meter in the "H" and "C" positions.

Connect a 318-ohm resistor between the B/G lead wire of the water thermo-gauge and the ground lead wire. The water thermo-gauge is normal if its pointer indicates the "C" position when the specified voltage is applied to the circuit and if its pointer indicates the "H" position when the resistor is changed to 25 ohms. If either one or both indications are abnormal, replace the water temperature meter with a new one.

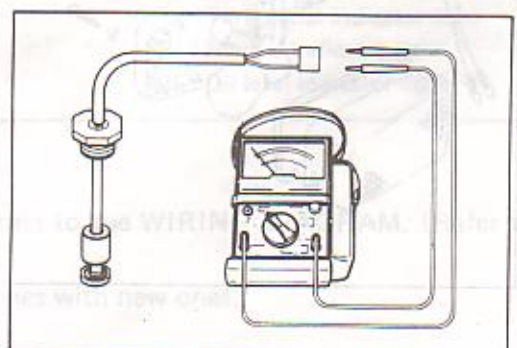
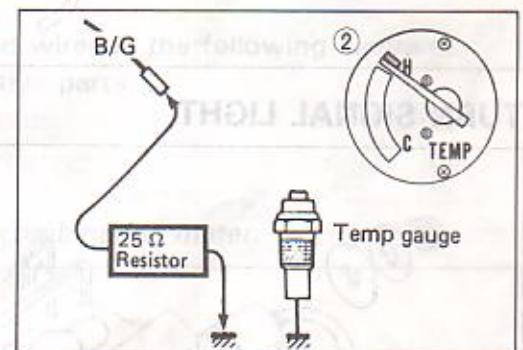
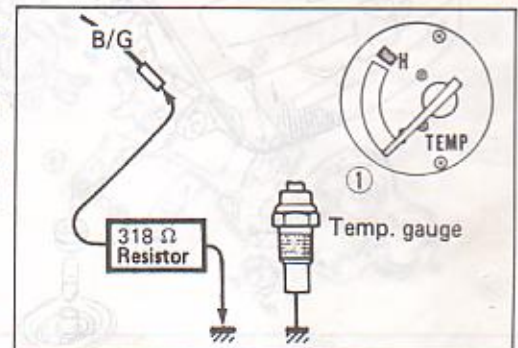
WATER TEMPERATURE METER

| POSITION | TEMP | RESISTANCE |
|----------|-------------------|------------|
| ① | 41.5°C (106.7°F) | 318 Ω |
| ② | 117.5°C (243.5°F) | 25 Ω |

OIL LEVEL GAUGE

- Remove the frame cover. (Refer to page 7-3.)
- Disconnect the oil level gauge lead wire coupler.

Check the oil level switch for continuity between LW and BW lead wires. If the tester does not show the value of 0 – 1 ohm when the switch ring is in bottom, file the contact surface or replace the unit.



SWITCHES

Inspect each switch for continuity with the pocket tester refer to the WIRING DIAGRAM. If any abnormality is found, replace the respective switch with a new one.

9900-25002: Pocket Tester

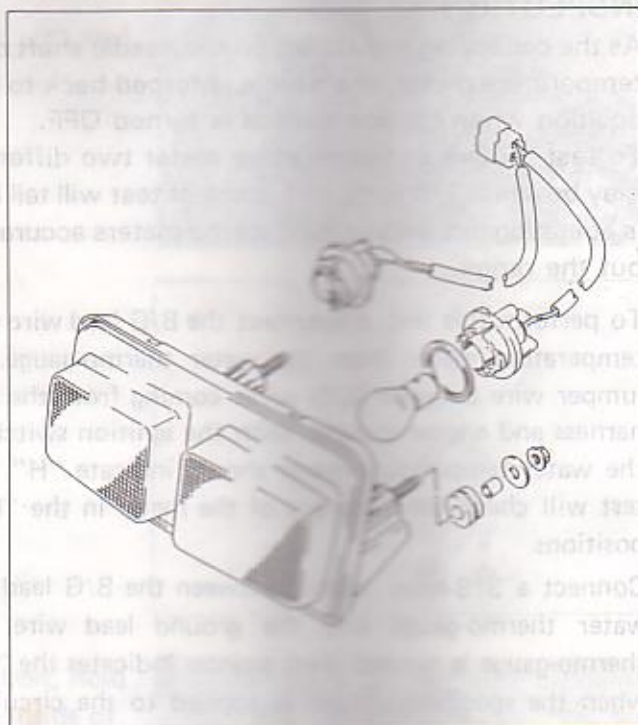
Tester Knob Indicator

Tester Knob Indicator

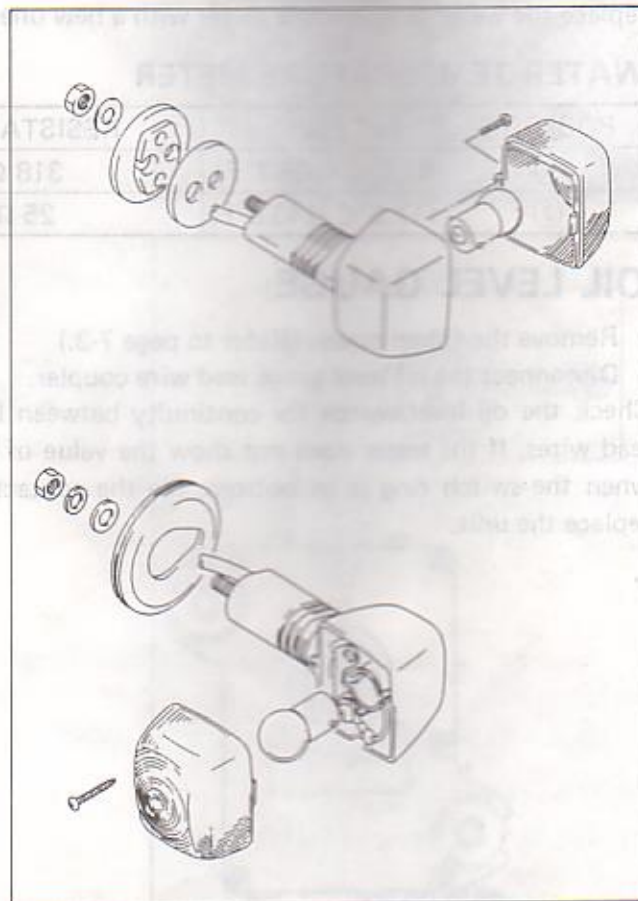
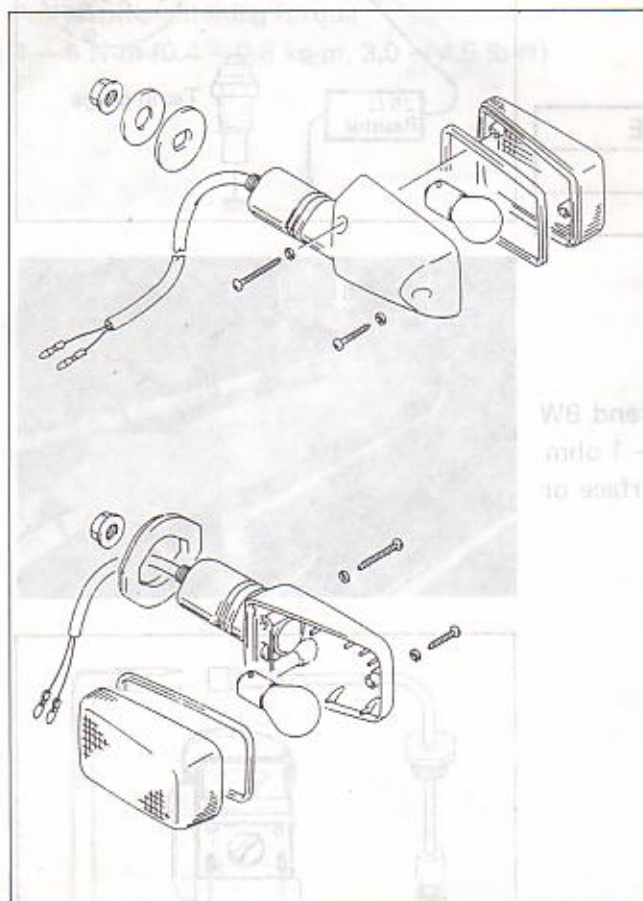
LAMPS HEADLIGHT



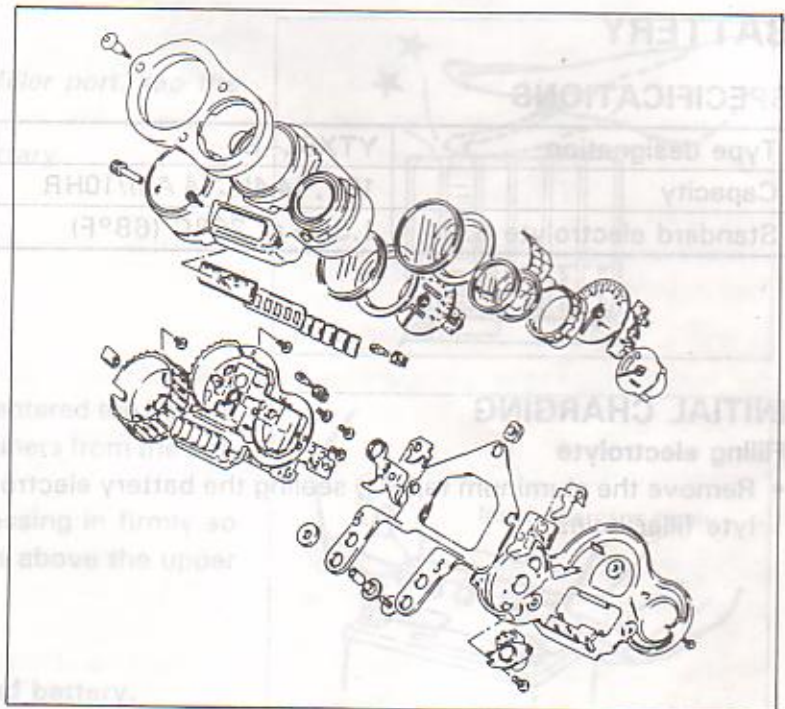
TAIL/BRAKE LIGHT



TURN SIGNAL LIGHT



COMBINATION METER REMOVAL (Refer to page 7-27.)



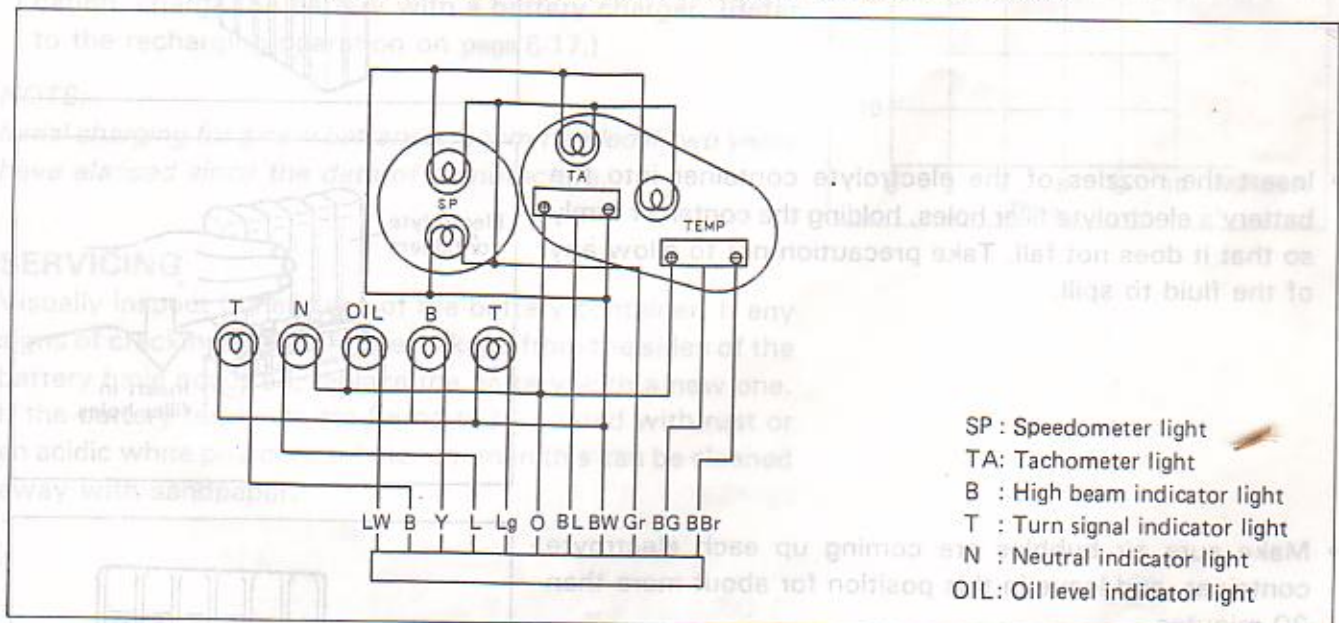
INSPECTION

Using the pocket tester, check the continuity between lead wires in the following diagram. If the continuity measured is incorrect, replace the respective parts.

09900-25002 : Pocket tester

NOTE:

When making this test, it is not necessary to remove the combination meter.



SWITCHES

Inspect each switch for continuity with the pocket tester referring to the WIRING DIAGRAM. (Refer to page 8-7.)

If any abnormality is found, replace the respective switch assemblies with new ones.

09900-25002: Pocket tester

Tester knob indication: x 1Ω range

BATTERY

SPECIFICATIONS

| | |
|---------------------------|-------------------------|
| Type designation | YTX5L-BS |
| Capacity | 12V, 14.4kC (4 Ah)/10HR |
| Standard electrolyte S.G. | 1.320 at 20°C (68°F) |

INITIAL CHARGING

Filling electrolyte

- Remove the aluminum tape ① sealing the battery electrolyte filler holes.

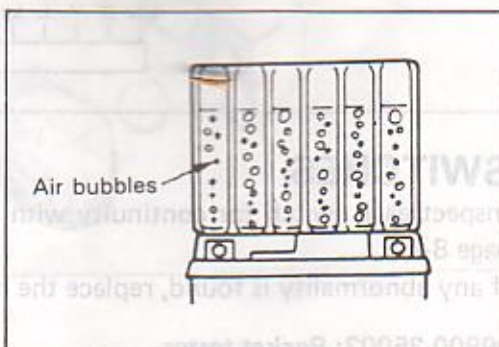
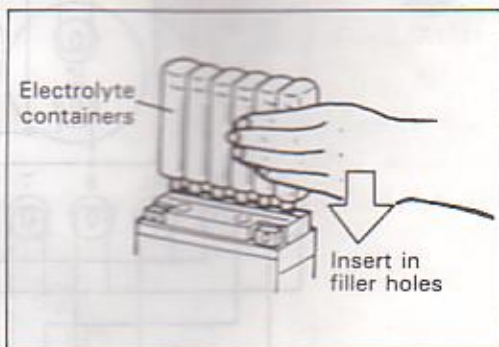
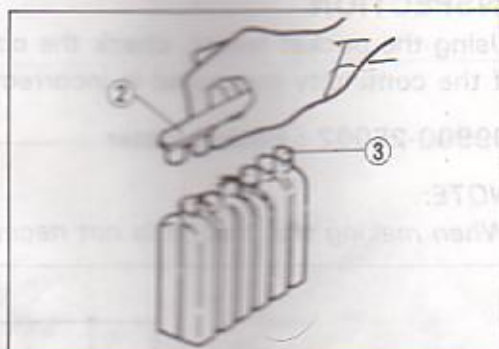
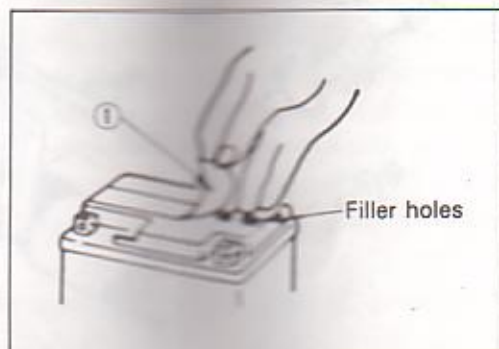
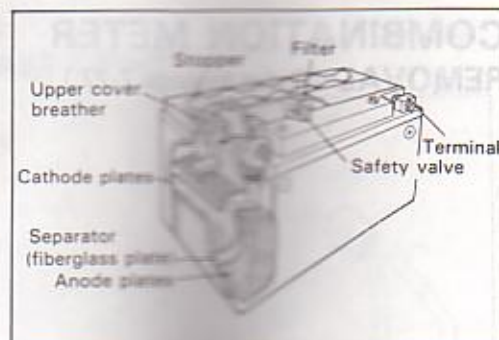
- Remove the caps ②.

NOTE:

- After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.
- Do not remove or pierce the sealed areas ③ of the electrolyte container.

- Insert the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall. Take precaution not to allow any of the fluid to spill.

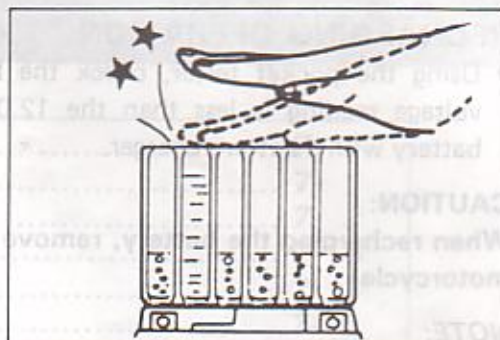
- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.



NOTE:

If no air bubbles are coming up from a filler port, tap the bottom of the two or three times.

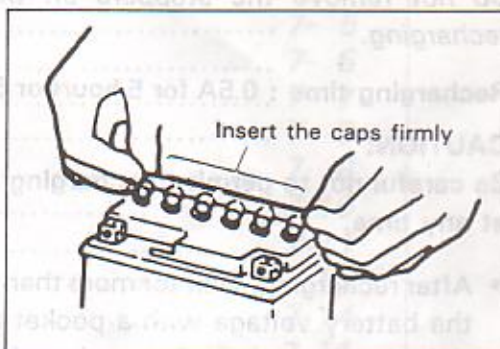
Never remove the container from the battery.



- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for around 20 minutes.
- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.

CAUTION:

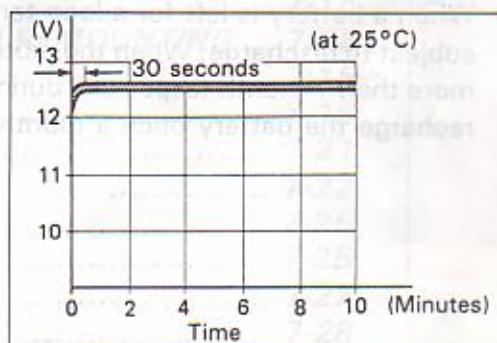
- * Never use anything except the specified battery.
- * Once install the caps to the battery; do not remove the caps.



- Using SUZUKI pocket tester, measure the battery voltage. The tester should indicate more than 12.5V (DC) as shown in the Fig. If the battery voltage is lower than the specification, charge the battery with a battery charger. (Refer to the recharging operation on page 6-17.)

NOTE:

Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

**SERVICING**

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

RECHARGING OPERATION

- Using the pocket tester, check the battery voltage. If the voltage reading is less than the 12.0V (DC), recharge the battery with a battery charger.

CAUTION:

When recharging the battery, remove the battery from the motorcycle.

NOTE:

Do not remove the stoppers on the battery top while recharging.

Recharging time : 0.5A for 5 hours or 5A for half an hour

CAUTION:

Be careful not to permit the charging current to exceed 5A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a pocket tester.
- If the battery voltage is less than the 12.5V, recharge the battery again.
- If battery voltage is still less than 12.5V after recharging, replace the battery with a new one.
- When a battery is left for a long term without using, it is subject to discharge. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

