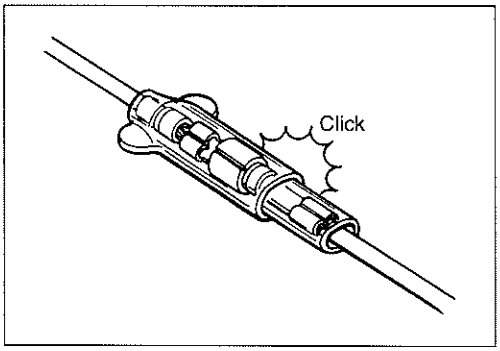
ELECTRICAL SYSTEM

CONTENTS

CAUTIONS IN SERVICING

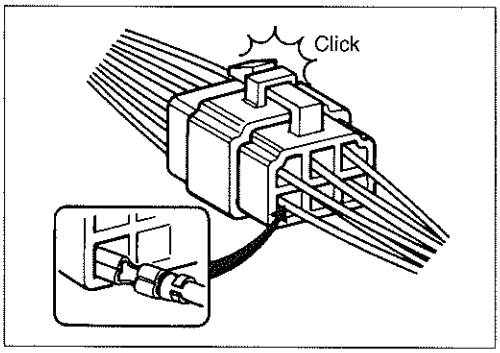
CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.



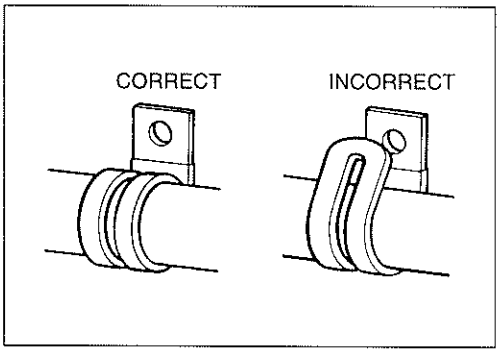
COUPLER

- With a lock type coupler, be sure to release the lock before disconnecting it and push it in fully till the lock works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler itself and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Inspect each terminal for corrosion and contamination.



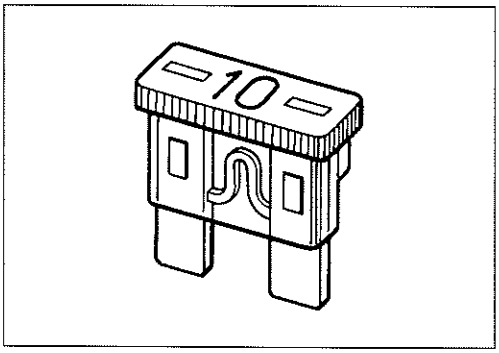
CLAMP

- Clamp the wire harness at such positions as indicated in "WIRE HARNESS ROUTING". (☞8-14 to 8-16)
- Bend the clamp properly so that the wire harness is clamped securely.
- In clamping the wire harness, use care not to allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.



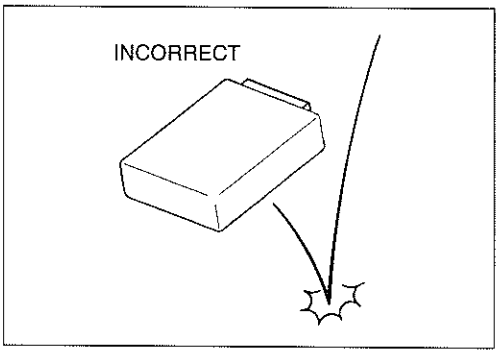
FUSE

- When a fuse blows, always investigate the cause, correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.



SEMI-CONDUCTOR EQUIPPED PART

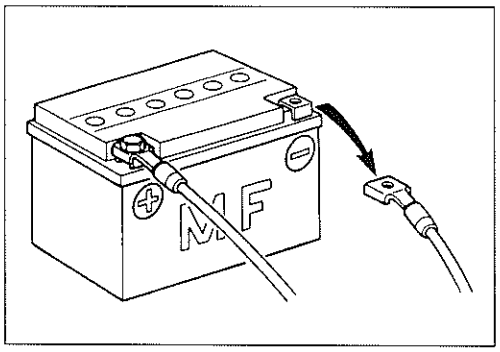
- Be careful not to drop the part with a semi-conductor built in such as a ECM.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



BATTERY

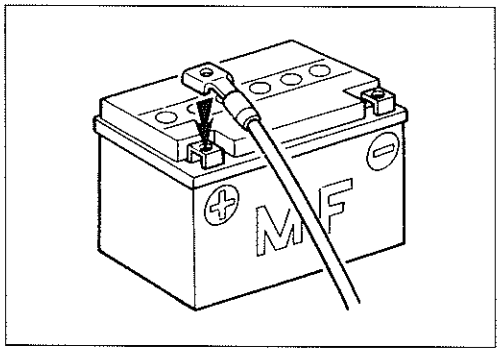
- The MF battery used in this motorcycle does not require maintenance (e.g., electrolyte level inspection, distilled water replenishment).
- During normal charging, no hydrogen gas is produced. However, if the battery is overcharged, hydrogen gas may be produced. Therefore, be sure there are no fire or spark sources (e.g., short circuit) nearby when charging the battery.
- Be sure to recharge the battery in a well-ventilated and open area.
- Note that the charging system for the MF battery is different from that of a conventional battery. Do not replace the MF battery with a conventional battery.

CONNECTING THE BATTERY



- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the ⊖ battery lead wire, first.
- When connecting the battery lead wires, be sure to connect the ⊕ battery lead wire, first.
- If the terminal is corroded, remove the battery, pour warm water over it and clean it with a wire brush.
- After connecting the battery, apply a light coat of grease to the battery terminals.
- Install the cover over the ⊕ battery terminal.

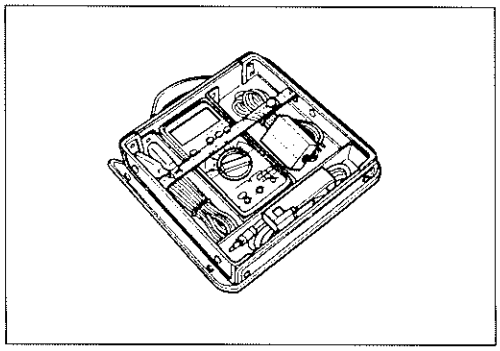
WIRING PROCEDURE



- Properly route the wire harness according to the "WIRE ROUTING" section. (☞8-14 to 8-16)

USING THE MULTI CIRCUIT TESTER

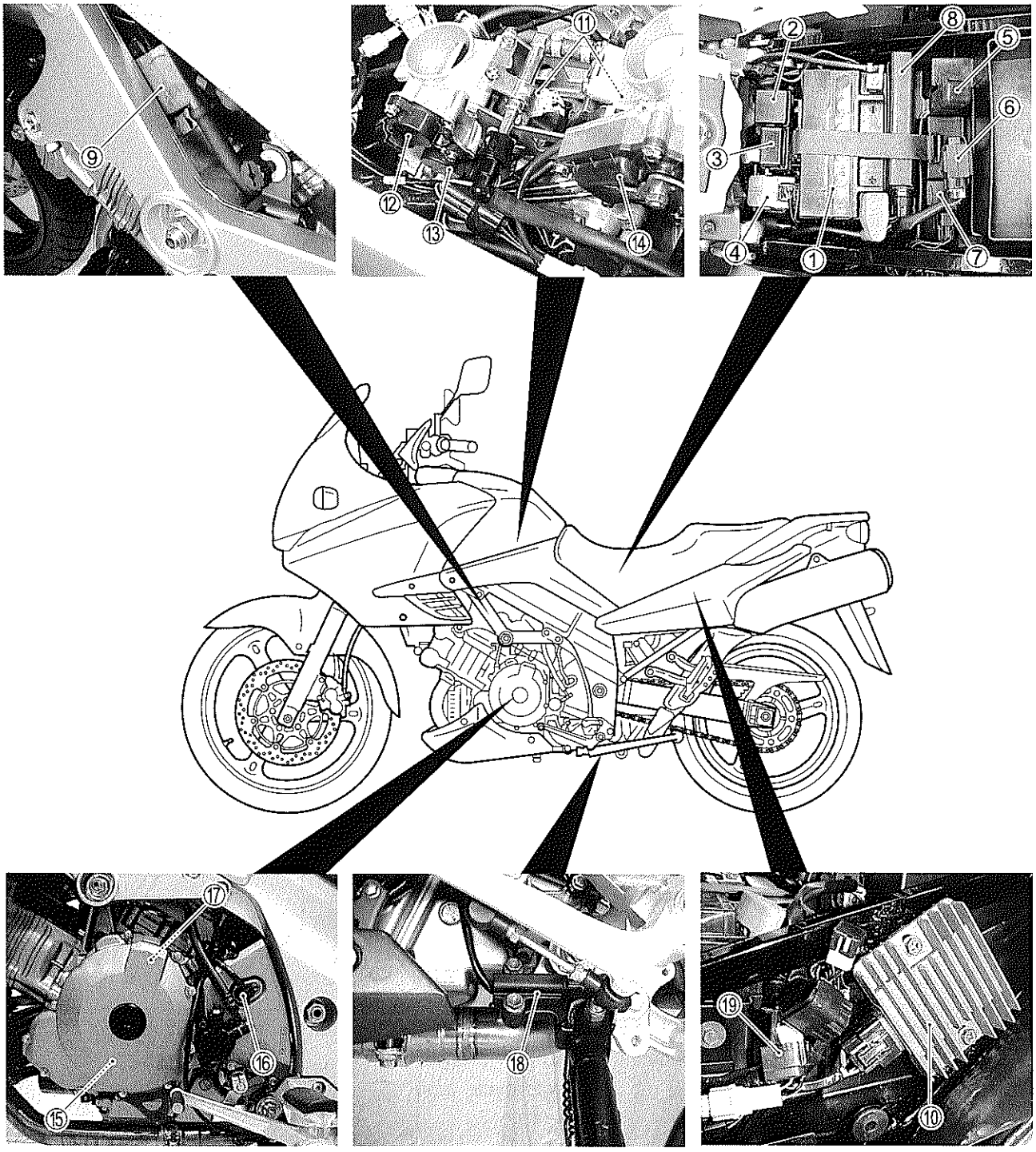
- Properly use the multi circuit tester ⊕ and ⊖ probes. Improper use can cause damage to the motorcycle and tester.
- If the voltage and current values are not known, begin measuring in the highest range.
- When measuring the resistance, make sure that no voltage is applied. If voltage is applied, the tester will be damaged.
- After using the tester, be sure to turn the switch to the OFF position.



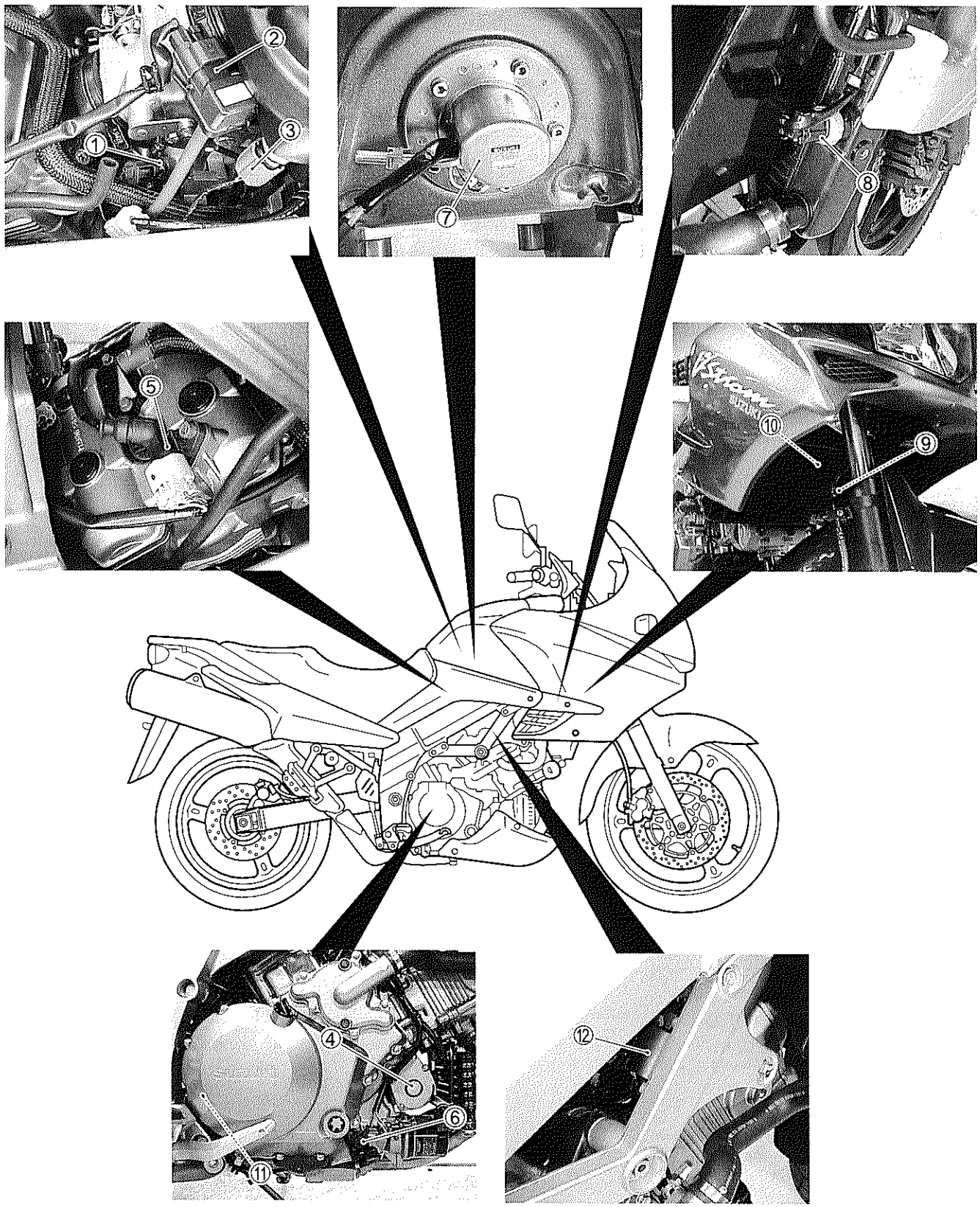
CAUTION

Before using the multi circuit tester, read its instruction manual.

LOCATION OF ELECTRICAL COMPONENTS

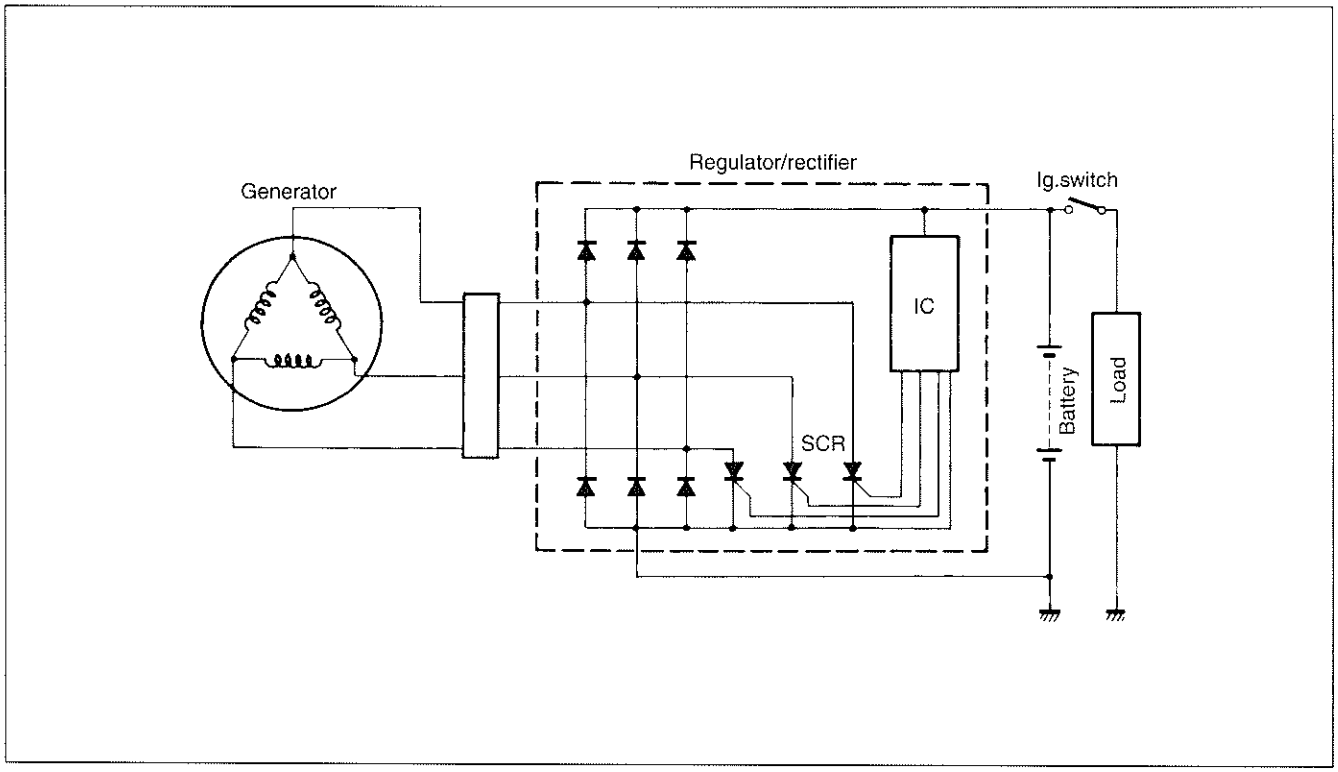


① Battery
② Fuse box
③ Side-stand/turn signal relay
④ Starter relay
⑤ Fuel pump relay
⑥ Tip over sensor (☞4-42)
⑦ AP sensor (☞4-40)
⑧ ECM (Engine Control Module)
⑨ Ignition coil (No.2)
⑩ Regulator/rectifier
⑪ Fuel injector (☞4-47 and 4-70)
⑫ STP sensor (☞4-44)
⑬ TP sensor (☞4-36)
⑭ Secondary throttle valve actuator (☞4-43)
⑮ Generator
⑯ Speedometer sensor
⑰ CKP sensor
⑱ Side stand switch
⑲ Mode selection switch coupler



① ECT sensor (☞4-38)
② IAP sensor (☞4-34)
③ IAT sensor (☞4-39)
④ Starter motor
⑤ CMP sensor (☞4-32)
⑥ Oil pressure switch
⑦ Fuel pump (☞4-55)
⑧ Cooling fan motor switch (☞5-9)
⑨ Cooling fan (☞5-8)
⑩ Horn
⑪ Gear position switch
⑫ Ignition coil (No.1)

CHARGING SYSTEM



TROUBLESHOOTING

Battery runs down quickly.

Check accessories which use excessive amounts of electricity.
- Accessories are installed → • Remove accessories.

No accessories

Check the battery for current leaks. (☞7-7)
- Current leaks → • Short circuit of wire harness
  • Faulty electrical equipment

No current leaks

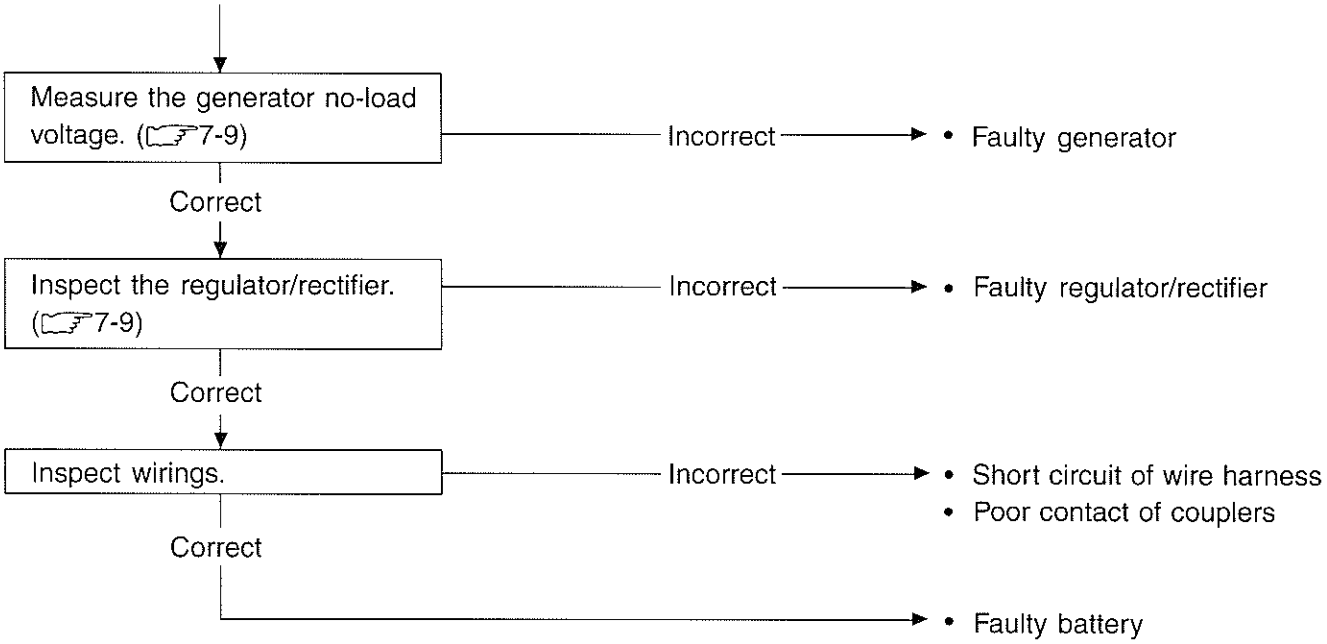
Measure the charging voltage between the battery terminals. (☞7-8)
- Correct → • Faulty battery
  • Abnormal driving condition

Incorrect

Measure the continuity of the generator coil. (☞7-8)
- No continuity → • Faulty generator coil or disconnected lead wires

Continuity

Continued on next page



Others

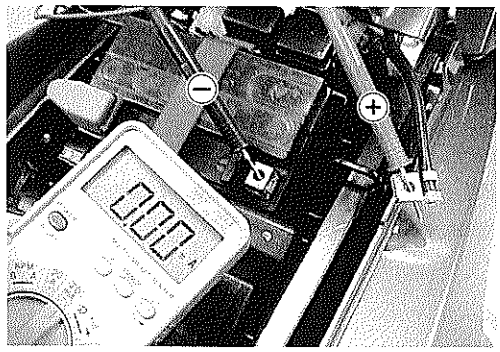
Battery overcharge	• Faulty regulator/rectifier • Faulty battery • Poor contact of generator lead wire coupler

INSPECTION

BATTERY CURRENT LEAKAGE

- Remove the seat. (☞6-4)
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.

Measure the current between ⊖ battery terminal and the ⊖ battery lead wire using the multi circuit tester. If the reading exceeds the specified value, leakage is evident.



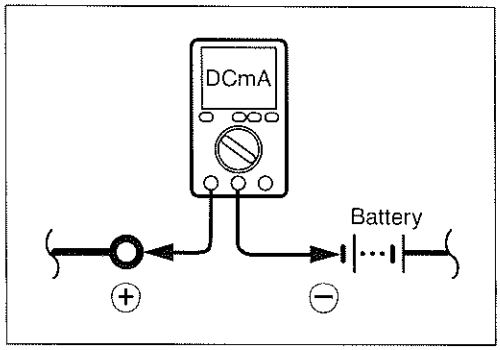
TOOL 09900-25008: Multi circuit tester set

DATA Battery current (leak): Under 3 mA

Tester knob indication: Current (⎓, 20 mA)

CAUTION

*** Because the current leak might be large, turn the tester to high range first to avoid tester damage.**
*** Do not turn the ignition switch to the "ON" position when measuring current.**

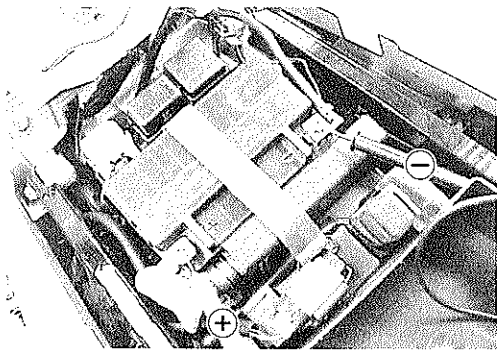


When checking to find the excessive current leakage, remove the couplers and connectors, one by one, checking each part.

REGULATED VOLTAGE

- Remove the seat. (☞6-4).
- Start the engine and keep it running at 5 000 r/min. with lighting switch turned ON (only E02, E19) and dimmer switch turned HI position.

Measure the DC voltage between the ⊕ and ⊖ battery terminals using the multi circuit tester. If the voltage is not within the specified value, inspect the generator and regulator/rectifier. (☞7-8 and 7-9)

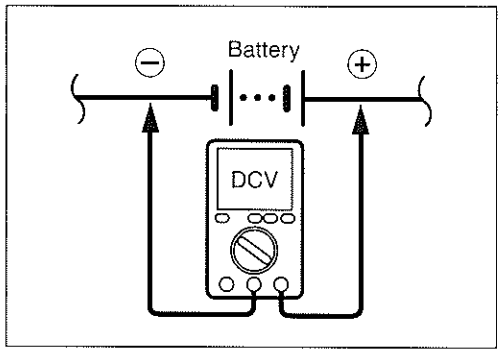


NOTE:
When making this test, be sure that the battery is in fully-charged condition.

09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

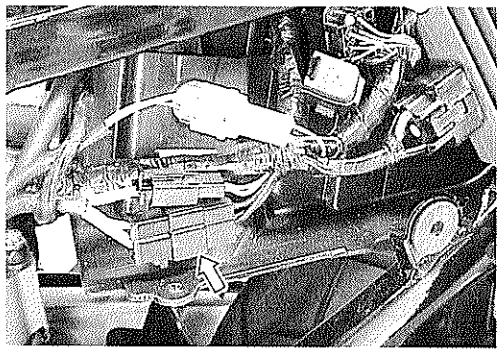
Charging output (Regulated voltage):
14.0 – 15.5 V at 5 000 r/min.



GENERATOR COIL RESISTANCE

- Remove the left frame cover. (☞6-5)
- Disconnect the generator coupler.

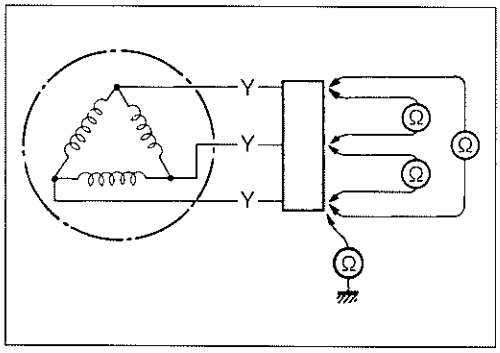
Measure the resistance between the three lead wires.
If the resistance is not specified value, replace the stator with a new one. Also, check that the generator core is insulated.



09900-25008: Multi circuit tester set

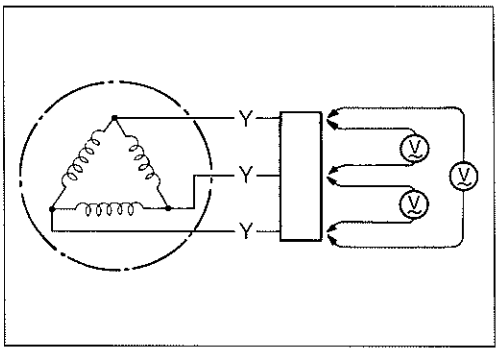
Tester knob indication: Resistance (Ω)

Generator coil resistance: 0.2 – 0.5 Ω (Yellow – Yellow)
∞ Ω (Yellow – Ground)



NOTE:
When making above test, it is not necessary to remove the generator.

GENERATOR NO-LOAD PERFORMANCE



- Remove the left frame cover. (☞6-5)
- Disconnect the generator coupler.
- Start the engine and keep it running at 5 000 r/min.

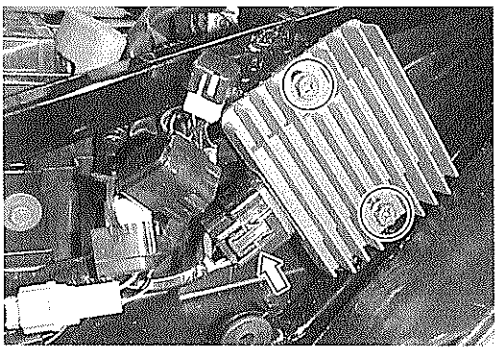
Using the multi circuit tester, measure the voltage between three lead wires.
If the tester reads under the specified value, replace the generator with a new one.

09900-25008: Multi circuit tester set

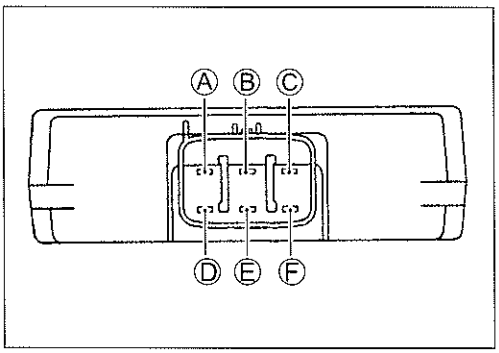
Tester knob indication: Voltage (~)

Generator no-load performance:
More than 75 V at 5 000 r/min (When engine is cold)

REGULATOR/RECTIFIER



- Remove the left frame cover. (☞6-5)
- Remove the regulator/rectifier and diconnect the coupler.



Measure the voltage between the terminals using the multi circuit tester as indicated in the table below. If the voltage is not within the specified value, replace the regulator/rectifier with a new one.

09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

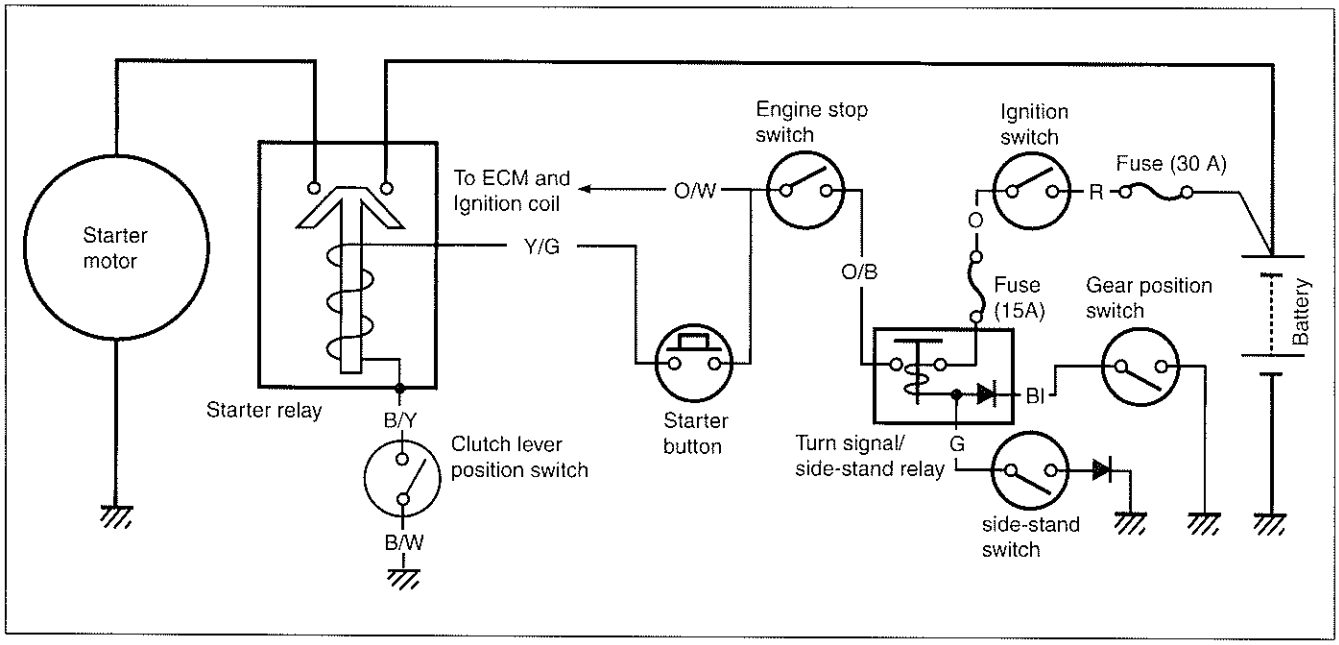
Unit: V

⊖ Probe of tester to:	⊕ Probe of tester to: Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ
Ⓐ		*	0.4–0.7	0.3–0.6	0.3–0.6	0.3–0.6
Ⓑ	*		*	*	*	*
Ⓒ	*	*		*	*	*
Ⓓ	*	*	0.3–0.6		*	*
Ⓔ	*	*	0.3–0.6	*		*
Ⓕ	*	*	0.3–0.6	*	*	

* More tham 1.4 V (tester's battery voltage)

NOTE:
If the tester reads under 1.4 V when the tester probes are not connected, replace the battery of multi circuit tester.

STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM



TROUBLE SHOOTING

Starter motor will not run.

The transmission is in neutral. Grasp the clutch lever, turn on the ignition switch with the engine stop switch in the "RUN" position and listen for a click from the starter relay when the starter button is pushed.

- Clicks → Check if the starter motor runs when its terminal is connected to the battery ⊕ terminal (Do not use thin "wire" because a large amount of current flows)
  - Runs →
    - Faulty starter relay
    - Loose or disconnected starter motor lead wire
    - Faulty ignition switch
    - Faulty engine stop switch
    - Faulty clutch lever position switch
    - Faulty gear position switch
    - Faulty turn signal/side-stand relay
    - Faulty starter button
    - Poor contact of connector
    - Open circuit in wire harness
  - Does not run →
    - Faulty starter motor
- No click →

Measure the starter relay voltage at the starter relay connectors (between Y/G ⊕ and B/Y ⊖) when the starter button is pushed.

- No voltage → (same causes as "Runs" above)
- Voltage →

Continued on next page

Check the starter relay. (☞7-13) — Incorrect → • Faulty starter relay

Correct → • Poor contact of the starter relay

The starter motor runs when the transmission is in neutral with the side-stand up or down, but does not run when the transmission is in any position other than neutral with the side-stand down.

Check the side-stand switch. (☞7-14) — Incorrect → • Faulty side-stand switch

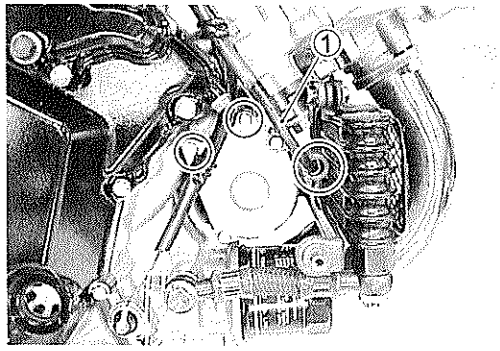
Correct → • Open circuit in wire harness
• Poor contact of connector

Others

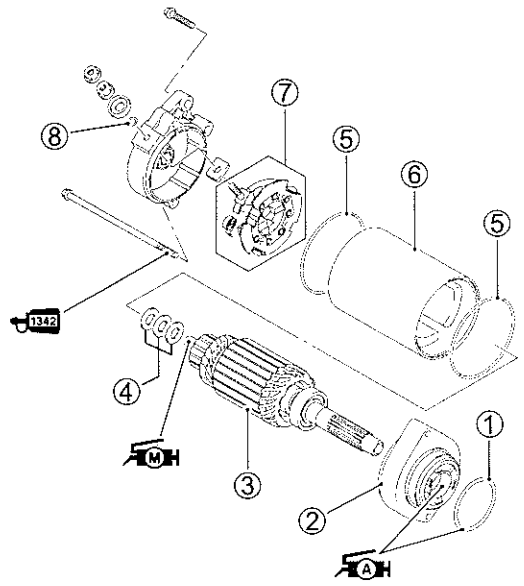
Engine does not turn though the starter motor runs.	• Faulty starter torque limiter (☞3-64)

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Remove the engine under cover.
- Remove the starter motor and disconnect the starter motor lead wire ①.



- Disassemble the starter motor as shown in the illustration.



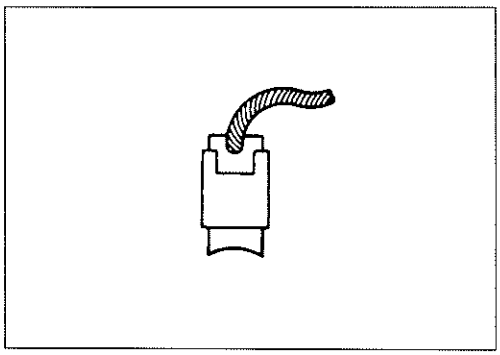
① O-ring
② Housing
③ Armature
④ Washer
⑤ O-ring
⑥ Starter motor case
⑦ Starter brush holder assembly
⑧ O-ring

STARTER MOTOR INSPECTION

CARBON BRUSH

Inspect the brushes for abnormal wear, cracks, or smoothness in the brush holder.

If any damages are found, replace the brush assembly with a new one.



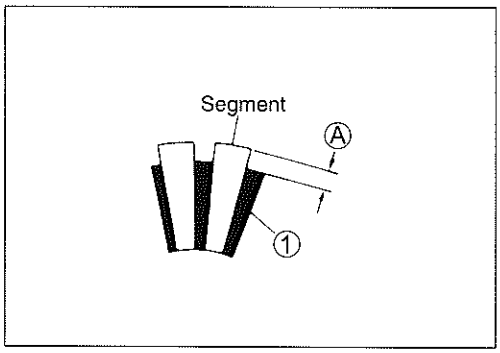
COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ.

If abnormal wear is found, replace the armature with a new one.

If the commutator surface is discolored, polish it with #400 sand paper and wipe it using a clean dry cloth.

If there is no undercut, scrape out the insulator ① with a saw blade.



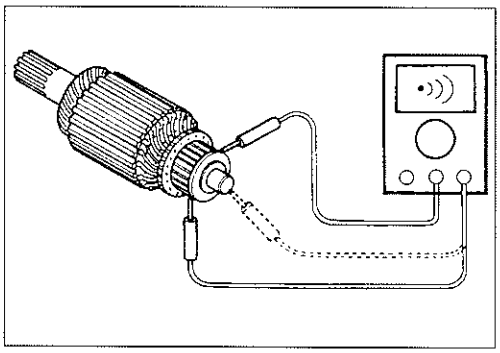
ARMATURE COIL INSPECTION

Check for continuity between each segment and between each segment and the armature shaft using the multi circuit tester.

If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.

09900-25008: Multi circuit tester set

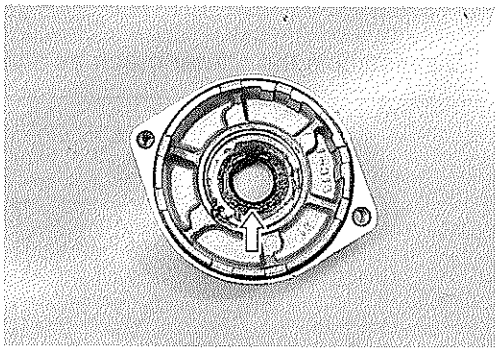
Tester knob indication: Continuity test (•)))



OIL SEAL INSPECTION

Check the oil seal lip for damage or leakage.

If any damage is found, replace the housing end.

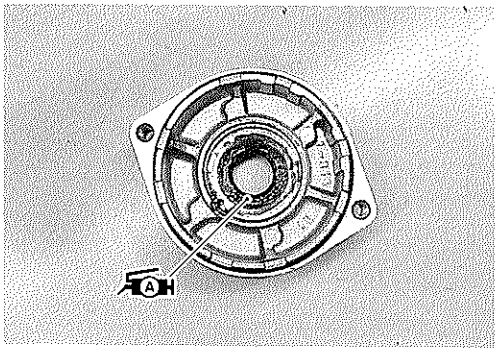


STARTER MOTOR REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

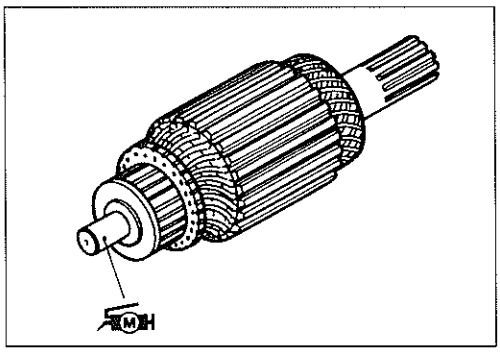
- Apply SUSUKI SUPER GREASE "A" to the lip of the oil seal.

99000-25030: SUZUKI SUPER GREASE "A" (USA)
99000-25010: SUZUKI SUPER GREASE "A" (Others)



- Apply a small quantity of SUZUKI MOLY PASTE to the armature shaft.

99000-25140: SUZUKI MOLY PASTE

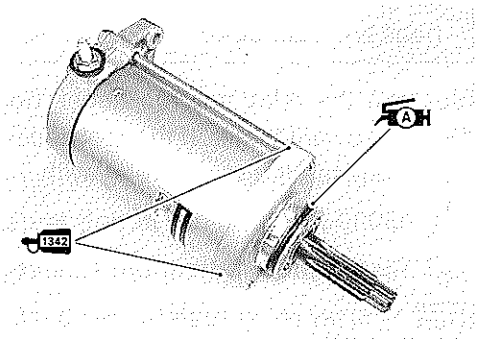


- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

99000-32050: THREAD LOCK "1342"

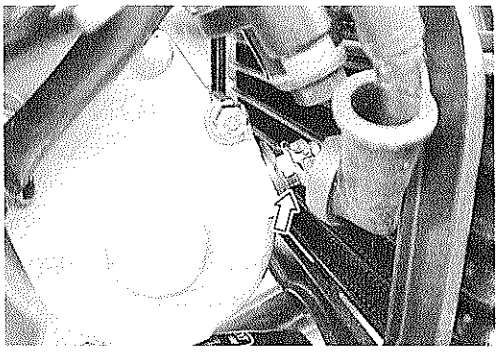
- Apply SUZUKI SUPER GREASE "A" to the O-ring.

99000-25030: SUZUKI SUPER GREASE "A" (USA)
99000-25010: SUZUKI SUPER GREASE "A" (Others)



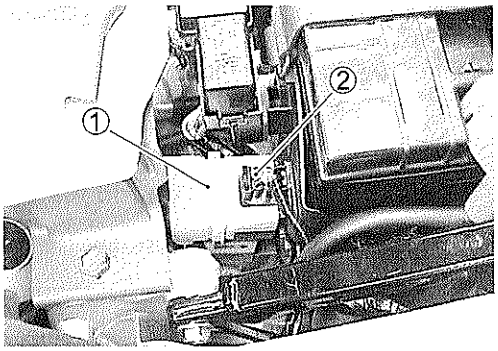
- Tighten the starter motor lead wire nut to the specified torque.

Starter motor lend wire nut: 5 N·m (0.5 Kgf-m, 3.7 lb-ft)

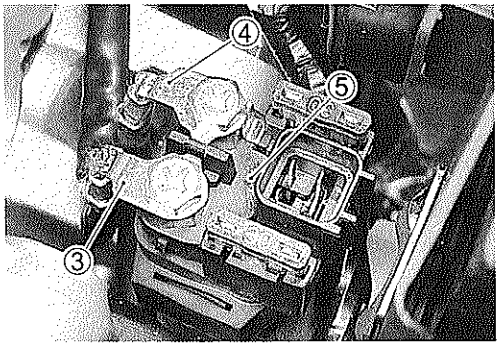


STARTER RELAY INSPECTION

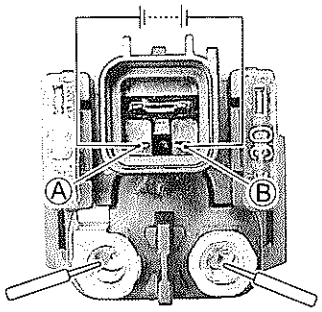
- Remove the seat. (☞6-4)
- Disconnect the battery ⊖ lead wire from the battery.
- Remove the starter relay cover ①.
- Disconnect the starter relay coupler ②.



- Disconnect the starter motor lead wire ③, battery lead wire ④.
- Remove the starter relay ⑤.



Apply 12 V to Ⓐ and Ⓑ terminals and check for continuity between the positive and negative terminals using the multi circuit tester. If the starter relay clicks and continuity is found, the relay is ok.



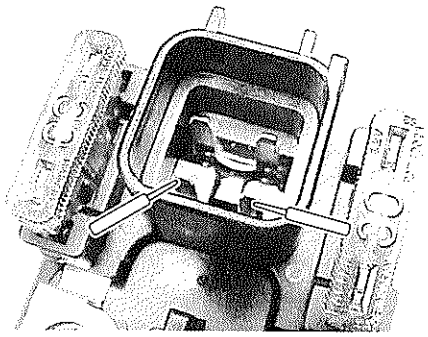
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Continuity test (•))))

CAUTION

Do not apply a battery voltage to the starter relay for more than five seconds, since the relay coil may overheat and damaged.

Measure the relay coil resistance between the terminals using the multi circuit tester. If the resistance is not within the specified value, replace the starter relay with a new one.



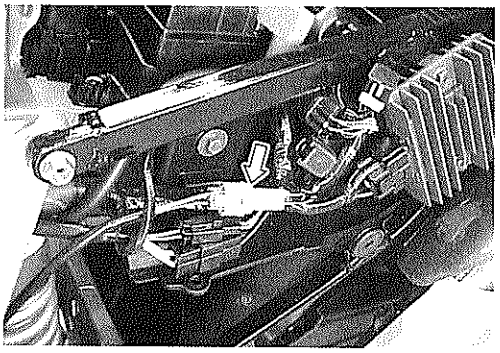
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Starter relay resistance: 3 – 6 Ω

SIDE-STAND/IGNITION INTERLOCK SYSTEM PARTS INSPECTION

Check the interlock system for proper operation. If the interlock system does not operate properly, check each component for damage or abnormalities. If any abnormality is found, replace the component with a new one.

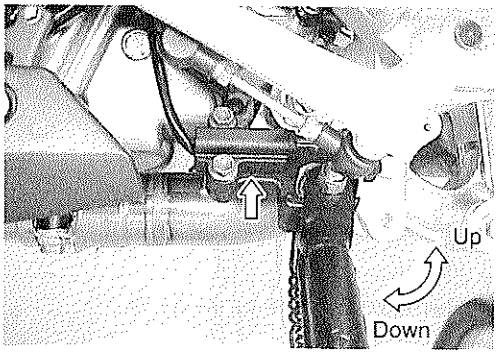


SIDE-STAND SWITCH

- Remove the seat. (☞6-4)
- Remove the left frame cover. (☞6-5)
- Disconnect the side-stand switch coupler and measure the voltage between Green and Black/White lead wires.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

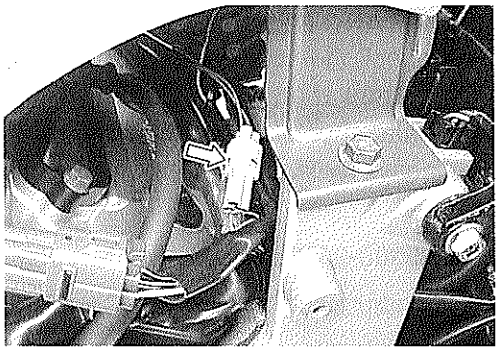


	Green (⊕ Probe)	Black/White (⊖ Probe)
ON (Side-stand up)	0.4 – 0.6 V	
OFF (Side-stand down)	More than 1.4 V (Tester's battery voltage)	

NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace its battery.

GEAR POSITION SWITCH

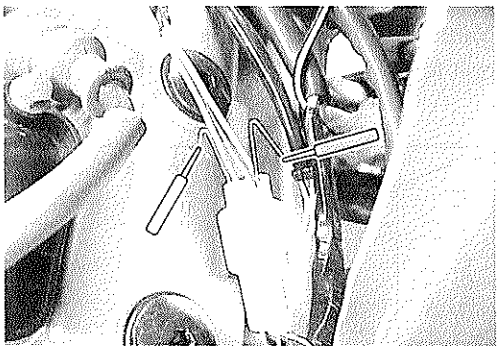


- Remove the seat. (☞6-4)
- Remove the fuel tank front cover.
- Remove the fuel tank side covers.
- Lift and support the fuel tank with the fuel tank prop stay. (☞4-51)
- Disconnect the gear position swtich coupler and check the continuity between Blue and Black with the transmission in "NEUTRAL".

	Blue	Black
ON (Neutral)	○———	———○
OFF (Expect neutral)		

CAUTION

When disconnecting and connecting the gear position switch coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.



- Connect the gear position switch coupler to the wiring harness.
- Turn the ignition switch to "ON" position and side-stand to upright position.

Measure the voltage between Pink and Black lead wires using the multi circuit tester when shifting the gearshift lever from low to top.

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

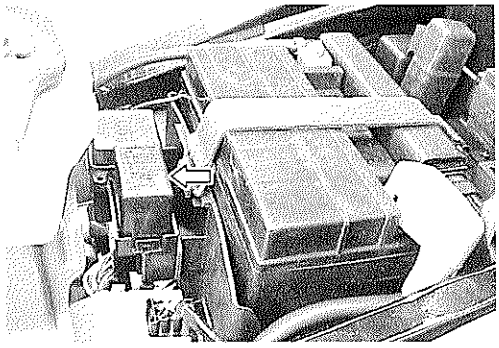
DATA Gear position switch voltage: More than 0.6V

(* Low to top gear position / * Except neutral position) (Pink – Black)

NOTE:

* *When connecting the multi circuit tester, use a fine copper wire (O.D is below 0.5 mm) to the back side of the lead wire coupler and connect the probes of tester to them.*
* *Use a fine copper wire, the outer diameter being below 0.5 mm, to prevent the rubber of the water proof coupler from damage.*

TURN SIGNAL/SIDE-STAND RELAY



The turn signal/side-stand relay is composed of the turn signal relay, and the side-stand relay and diode.

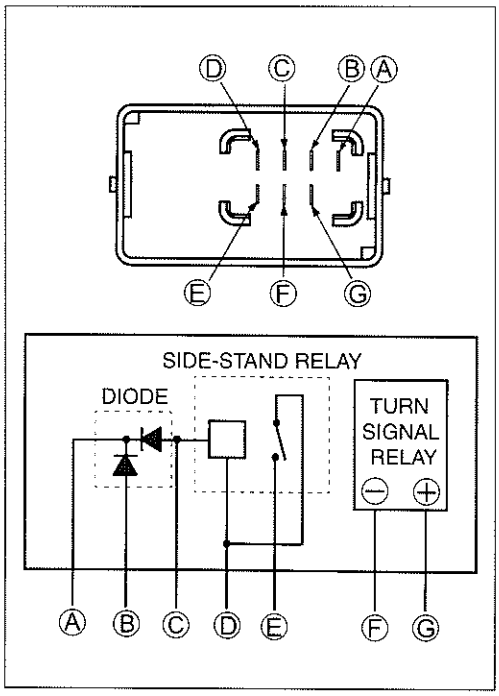
- Remove the seat. (☞6-4)
- Remove the turn signal/side-stand relay.

SIDE-STAND RELAY INSPECTION

First check the insulation between Ⓓ and Ⓔ terminals with the tester. Then apply 12 V to terminals Ⓓ and Ⓒ (⊕ to Ⓓ and ⊖ to Ⓒ) and check the continuity between Ⓓ and Ⓔ. If there is no continuity, replace the turn signal/side-stand relay with a new one.

09900-25008: Multi circuit tester set

Tester knob indication: Continuity test (•))))

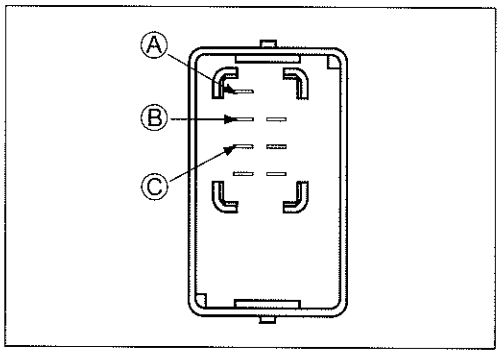


DIODE INSPECTION

Measure the voltage between the terminals using the multi circuit tester. Refer to the following table.

Unit: V

⊖ Probe of tester to: ⓘ	⊕ Probe of tester to: Ⓒ, Ⓑ	⊕ Probe of tester to: Ⓐ
Ⓒ, Ⓑ		More than 1.4 V (Tester's battery voltage)
Ⓐ	0.4 – 0.6	

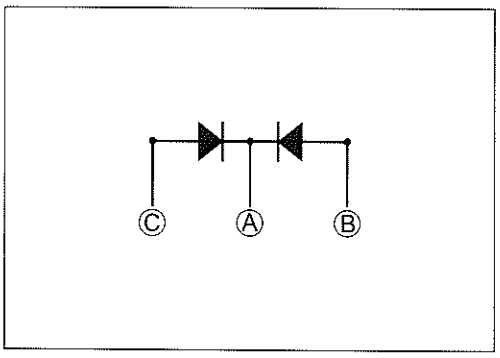


09900-25008: Multi circuit tester set

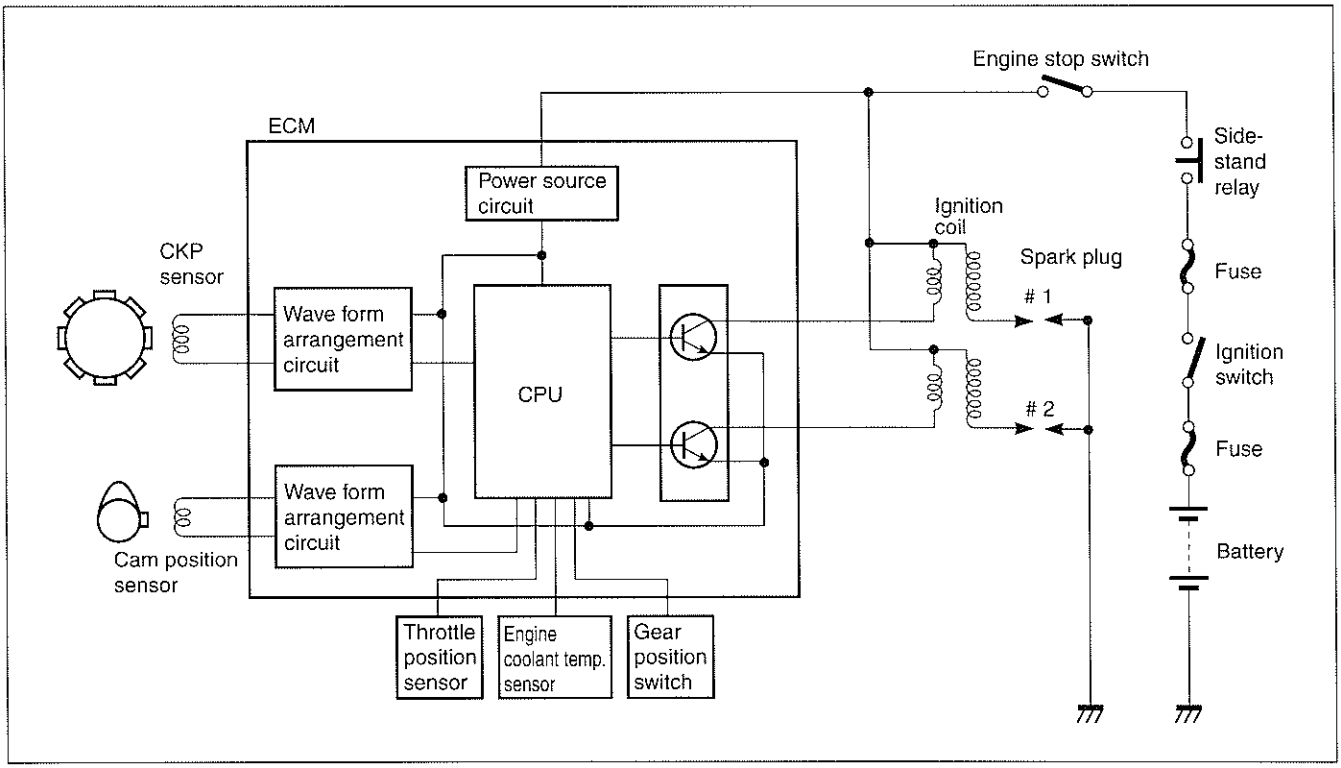
Tester knob indication: Diode test (→|)

NOTE:

If the multi circuit tester reads under 1.4 V when the tester probes are not connected, replace its battery.



IGNITION SYSTEM



NOTE:

The fuel cut-off circuit is incorporated in this ECM in order to prevent over-running of engine. When engine speed reaches 9 500 r/min, this circuit cuts off fuel at the fuel injector. But under no load, the clutch lever is pulled or the gear position is neutral, this circuit cuts off fuel when engine speed reaches 9 000 r/min.

CAUTION

Under no load, the engine can run over 9 000 r/min, even if the fuel cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 9 000 r/min at any-time.

TROUBLESHOOTING

No spark or poor spark

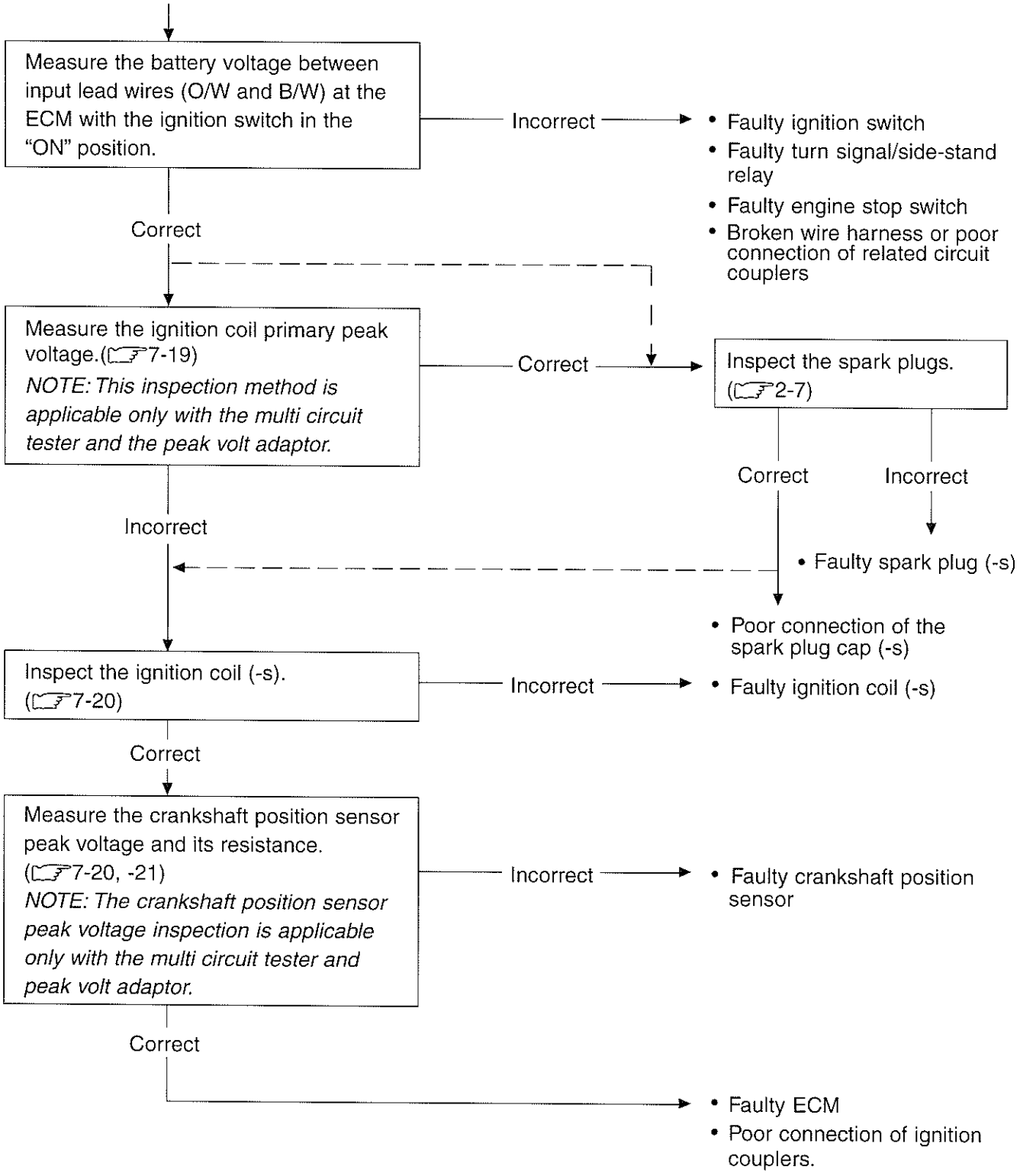
* Check that the transmission is in neutral and the engine stop switch is in the "RUN" position. Pull the clutch lever. Check that the fuse is not blown and the battery is fully-charged before diagnosing.

Check the ignition system couplers for poor connections.

Loose → • Poor connection of couplers

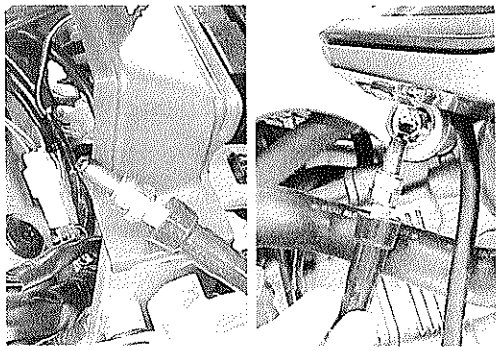
Correct

Continued on next page


Measure the battery voltage between input lead wires (O/W and B/W) at the ECM with the ignition switch in the "ON" position.
Incorrect
• Faulty ignition switch
• Faulty turn signal/side-stand relay
• Faulty engine stop switch
• Broken wire harness or poor connection of related circuit couplers
Correct
Measure the ignition coil primary peak voltage.(☞7-19)
NOTE: This inspection method is applicable only with the multi circuit tester and the peak volt adaptor.
Correct
Inspect the spark plugs. (☞2-7)
Correct
Incorrect
Incorrect
• Faulty spark plug (-s)
• Poor connection of the spark plug cap (-s)
Inspect the ignition coil (-s). (☞7-20)
Incorrect
• Faulty ignition coil (-s)
Correct
Measure the crankshaft position sensor peak voltage and its resistance. (☞7-20, -21)
NOTE: The crankshaft position sensor peak voltage inspection is applicable only with the multi circuit tester and peak volt adaptor.
Incorrect
• Faulty crankshaft position sensor
Correct
• Faulty ECM
• Poor connection of ignition couplers.

INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE



- Lift and support the fuel tank. (☞4-51)
- Disconnect the two spark plug caps.
- Connect new two spark plugs to each spark plug cap and ground them.

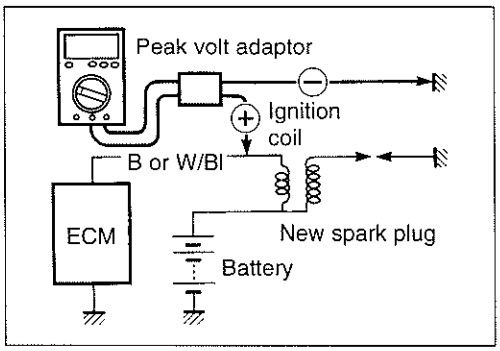
NOTE:

Make sure that all couplers and spark plugs are connected properly and the battery used is in fully-charged condition.

CAUTION

Avoid grounding the spark plugs and suppling the electrical shock to the cylinder head cover (magnesium parts) in order to prevent the magnesium material from damage.

Measure the No.1 and No.2 ignition coils primary peak voltage in the following procedure.



- Connect the multi circuit tester with peak voltage adaptor as follows.

No.1 ignition coil: ⊕ Probe: Black terminal
⊖ Probe: Ground

No.2 ignition coil: ⊕ Probe: White/Blue terminal
⊖ Probe: Ground

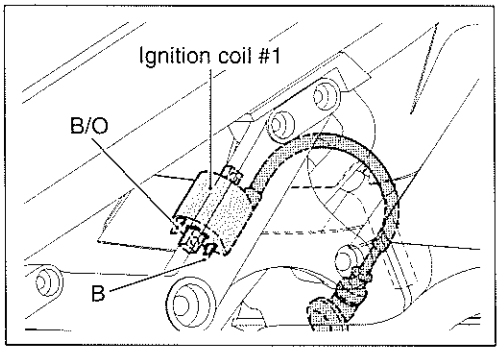
NOTE:

Do not disconnect the ignition coil primary wire coupler.

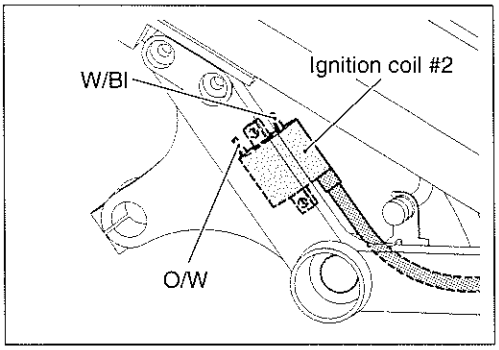
TOOL 09900-25008: Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.



- Shift the transmission into the neutral and then turn the ignition switch to the "ON" position.
- Pull the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.



Tester knob indication: Voltage (⎓)

DATA Ignition coil primary peak voltage: More than 150 V

⚠ WARNING

While testing, do not touch the tester probes and spark plugs to prevent receiving an electric shock.

- If the peak voltage is lower than the specified values, inspect the ignition coil. (☞7-20)

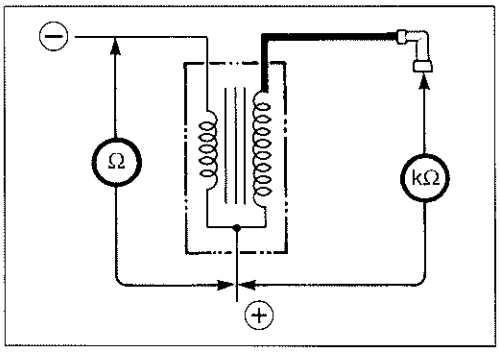
IGNITION COIL RESISTANCE

- Remove the fuel tank. (☞4-52)
- Disconnect the spark plug caps and coupler.

Measure the ignition coil resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

TOOL 09900-25008: Multi circuit tester set

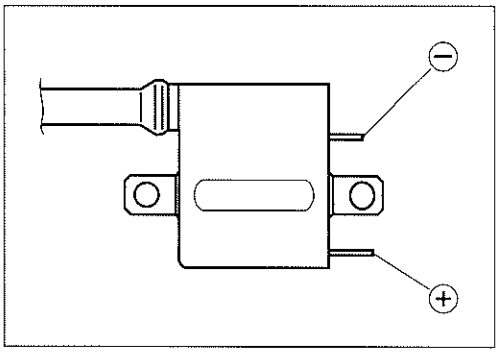
Tester knob indication: Resistance (Ω)



DATA Ignition coil resistance

Primary : 2 – 5 Ω (⊕ terminal – ⊖ terminal)

Secondary : 24 – 37 kΩ (Plug cap – ⊕ terminal)



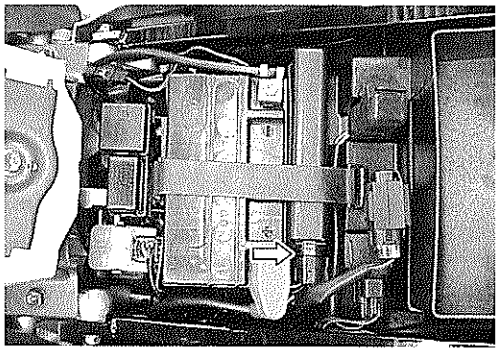
CKP SENSOR PEAK VOLTAGE

- Remove the seat. (☞6-4)
- Disconnect the ECM coupler.

NOTE:

Make sure that all of the couplers are connected properly and the battery used is in fully-charged condition.

Measure the CKP sensor peak voltage in the following procedures.

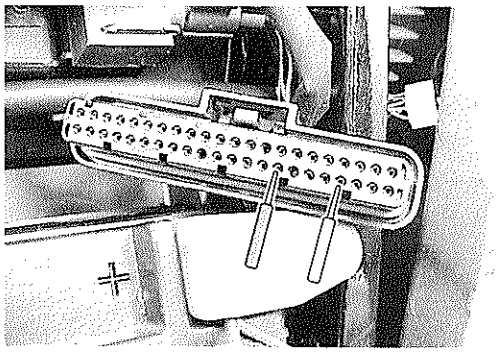


- Connect the multi circuit tester with peak volt adaptor as follows.
  - ⊕ Probe: Yellow/Blue lead wire
  - ⊖ Probe: White lead wire

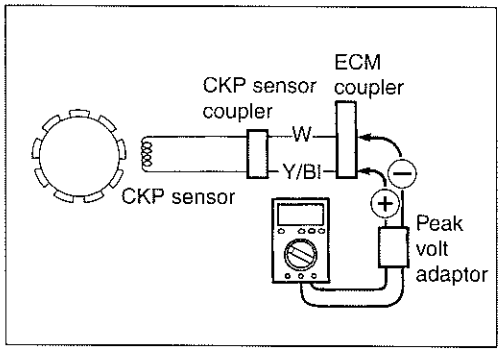
TOOL 09900-25008: Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.



- Shift the transmission into the neutral, and then turn the ignition switch to the "ON" position.
- Pull the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the CKP sensor peak voltage.
- Repeat the above procedure a few times and measure the highest peak voltage.

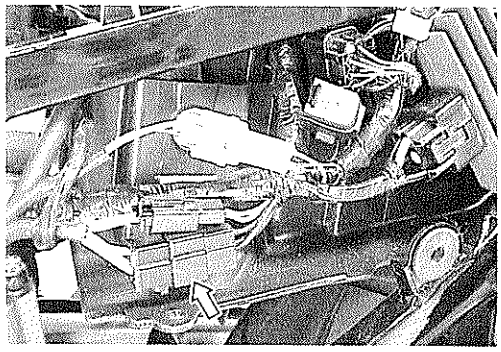


Tester knob indication: Voltage (⎓)

DATA CKP sensor peak voltage: More than 3.7 V

If the peak voltage is lower than the specified values, check the peak voltage at the CKP sensor lead wire coupler.

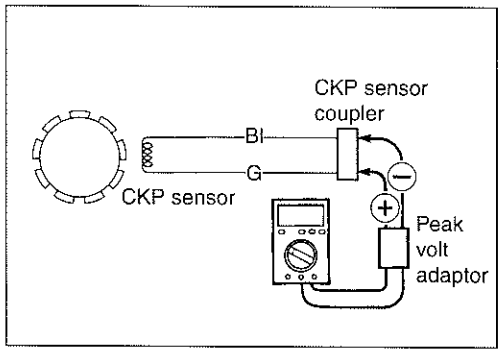
- Remove the left frame cover. (☞6-5)
- Disconnect the CKP sensor lead wire coupler and connect the multi circuit tester with the peak volt adaptor.
  ⊕ Probe: Green lead wire
  ⊖ Probe: Blue lead wire
- Measure the CKP sensor peak voltage at the CKP sensor lead wire coupler in the same manner as on the ECM coupler.



Tester knob indication: Voltage (⎓)

DATA CKP sensor peak voltage: More than 3.7 V

If the peak voltage on the CKP sensor lead wire coupler is ok but on the ECM coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the CKP sensor must be replaced and re-checked.



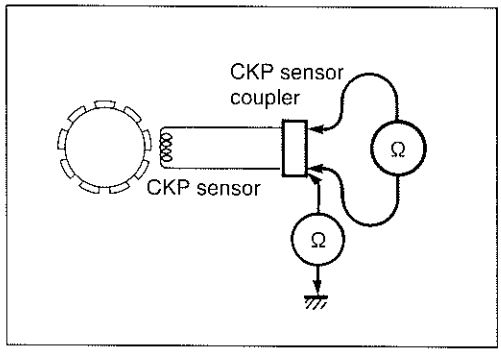
CKP SENSOR RESISTANCE

Measure the resistance between the lead wires and ground. If the resistance is not specified value, the CKP sensor must be replaced.

TOOL 09900-25008: Multi circuit tester set

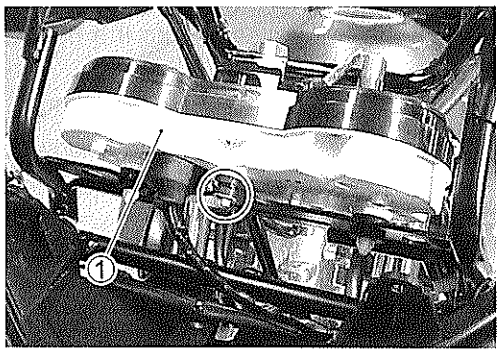
Tester knob indication: Resistance (Ω)

DATA CKP sensor resistance: 130 – 240 Ω (Green – Blue)
∞ Ω (Green – Ground)



COMBINATION METER

REMOVAL AND DISASSEMBLY



- Remove the combination meter panel. (☞6-6).
- Remove the combination meter ①.

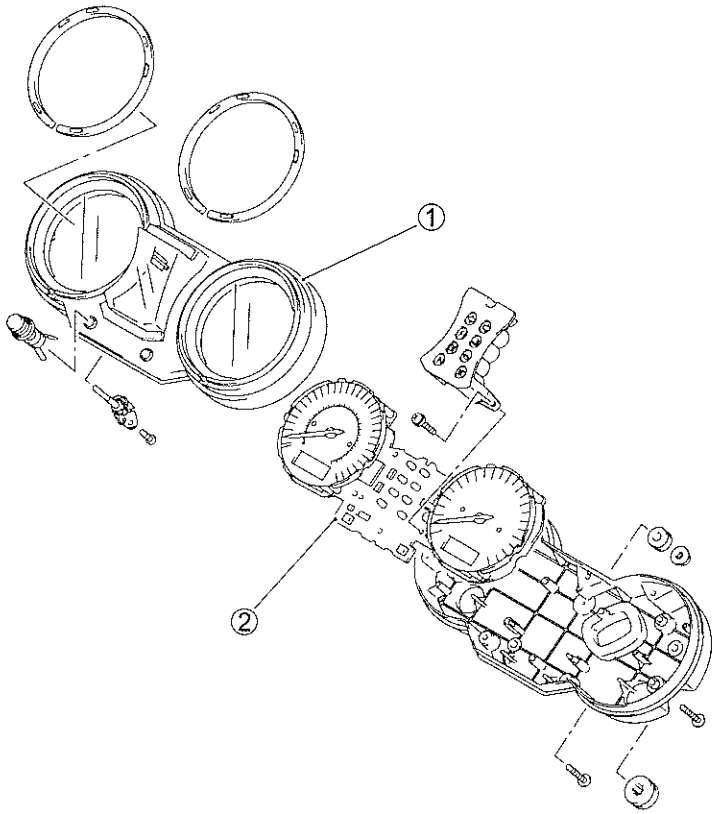
CAUTION

When disconnecting and connecting the combination meter coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.

- Disassemble the combination meter as follows.

CAUTION

Do not attempt to disassemble the combination meter unit.



① Combination meter cover
② Combination meter unit

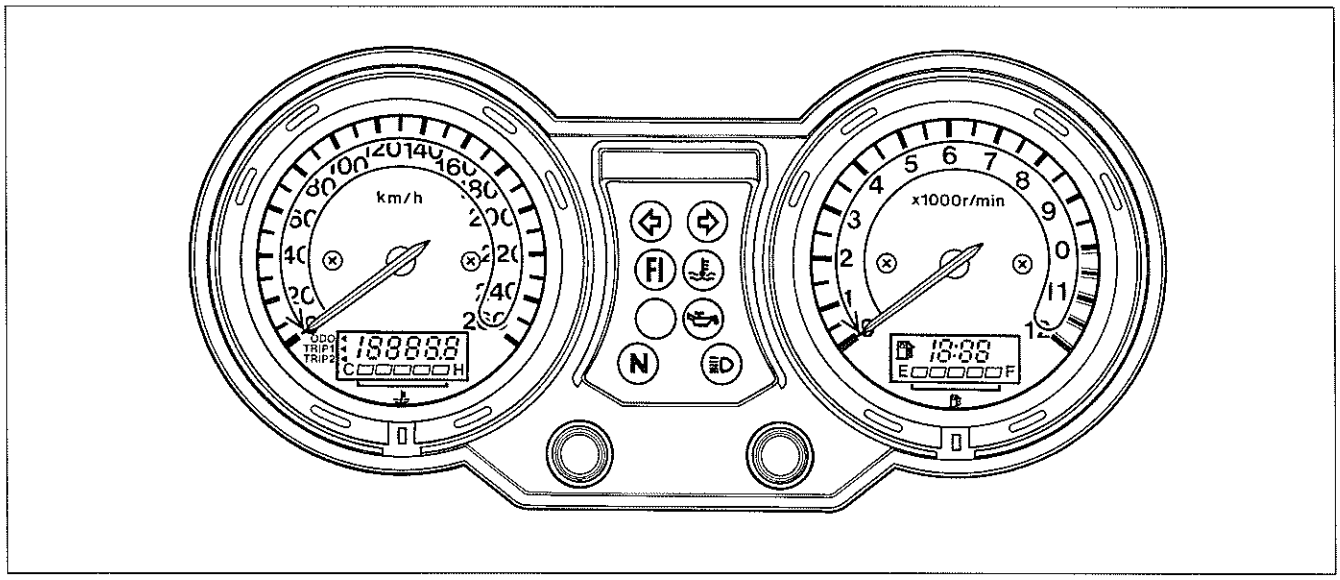
INSPECTION

LED (LIGHT EMITTING DIODE)

Check that the LED lights immediately after turning the ignition switch on.
If the LED fails in operation, replace the combination meter unit with a new one after checking its wire harness/coupler.

STEPPING MOTOR

Check that the pointer calibrates itself immediately after turning the ignition switch on and stops at starting point.
If abnormal condition is found, replace the combination meter unit with a new one after checking its wire harness/coupler.

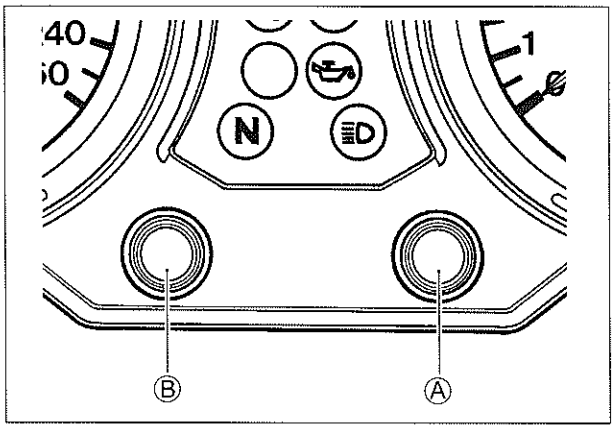


NOTE:

The pointer may not return to the proper position even turning the ignition switch on under low temperature condition. In that case, you can reset the pointer to the proper position by following the instruction below:

1) With the set switch Ⓐ pressed, turn the ignition switch on.
2) Keep pushing the set switch Ⓐ for 3 to 5 seconds.
3) Press the set switch Ⓐ twice (within 1 second). → Reset
** Complete the operation within 10 seconds after the ignition switch has been turned on.*

Time	Ignition switch	Set switch Ⓐ
	OFF	PUSH
0	ON	
• •		
3 sec • 5 sec		Release
• • • •		Push Push → Reset
10 sec		

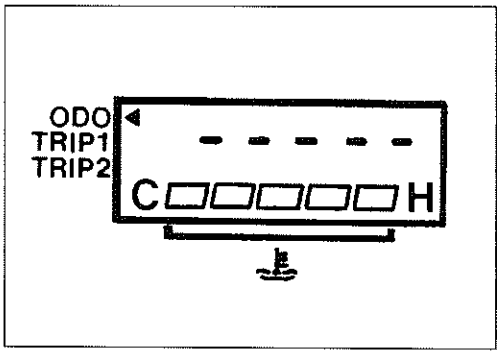


Ⓐ SET SWITCH Ⓑ MODE SWITCH

Pointer will return to the starting point right after the completion of the operation. In the case of the pointer not returning to the proper position after doing above, replace the combination meter unit.

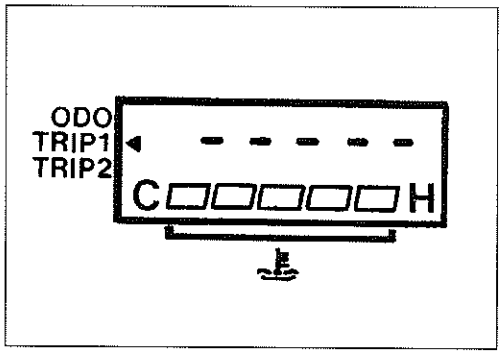
ODOMETER

The odometer indicates "-----" when the odometer is faulty. Replace the combination meter unit with a new one.



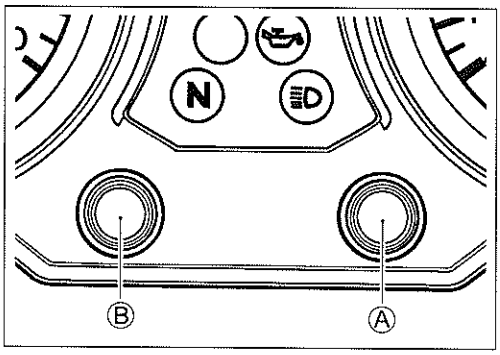
TRIP METER

The trip meter indicates "-----" when the trip meter is faulty. In case the odometer works normaly, perform the trip meter reset. If the trip meter isn't restored after above reset, replace the combination meter unit with a new one.

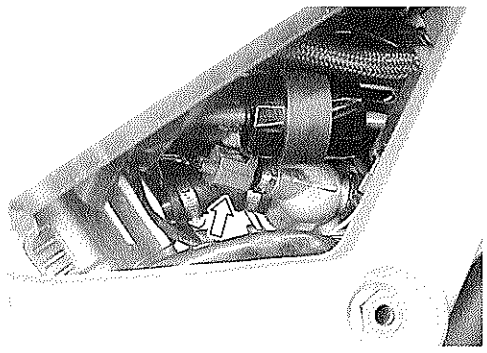


TRIP METER RESET PROCEDURE

1. Turn the ignition "ON".
2. Select the trip meter by pushing the mode switch Ⓐ.
3. Push the set switch Ⓑ for 2 seconds.



ENGINE COOLANT TEMPERATURE METER AND INDICATOR

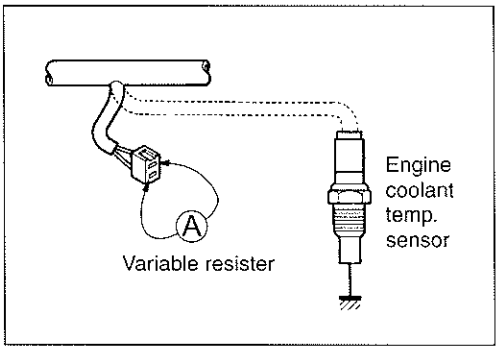


- Disconnect the engine coolant temperature sensor coupler.

CAUTION

When connecting and disconnecting the engine coolant temp. sensor lead wire coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.

- Connect the variable resistor Ⓐ between the terminals.
- Turn the ignition switch "ON".
- Check the display of engine coolant temperature meter as shown below. If any abnormality is found, replace the combination meter with a new one.

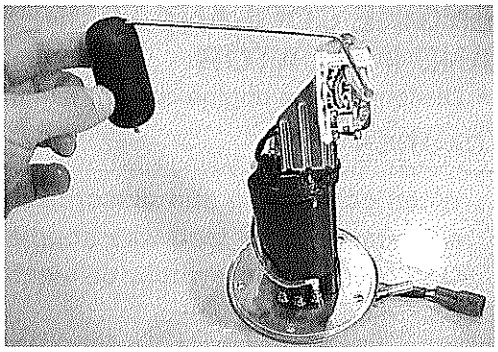


Water temperateure	Under 39 °C	40 – 59 °C	60 – 99 °C	100 – 111 °C
Resistance	More than 1.148 kΩ	1.148 – 0.587 kΩ	0.587 – 0.188 kΩ	0.188 – 0.140 kΩ
Engine coolant temperature meter	C □□□□□ H	C ■□□□□ H	C ■■□□□ H	C ■■■□□ H

Water temperateure	112 – 119 °C	Over 120 °C	Over 122 °C
Resistance	0.140 – 0.116 kΩ	Less than 0.116 kΩ	Less than 0.111 kΩ
Engine coolant temperature meter	C ■■■■□ H	C ■■■■■ H	ON C ■■■■■ H

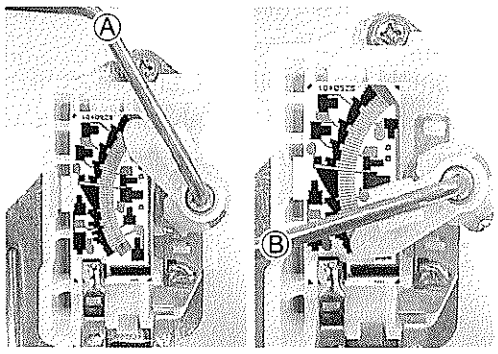
FUEL LEVEL GAUGE INSPECTION

- Remove the fuel tank. (☞4-52)
- Remove the fuel pump. (☞4-55)



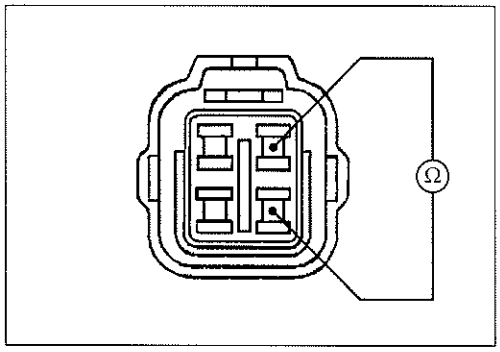
Measure the resistance at each fuel level gauge float position. If the resistance is incorrect, replace the fuel level gauge with a new one.

Float position	Resistance
Ⓐ "F" (Full)	Approx. 4 Ω
Ⓑ "E" (Empty)	Approx. 182 Ω



TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

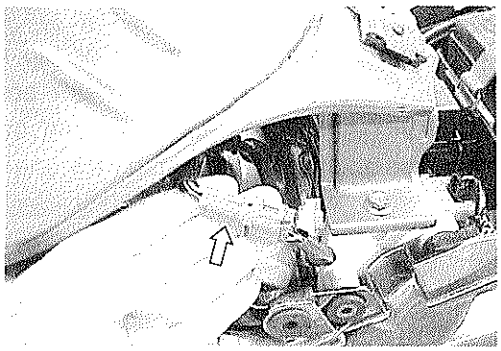


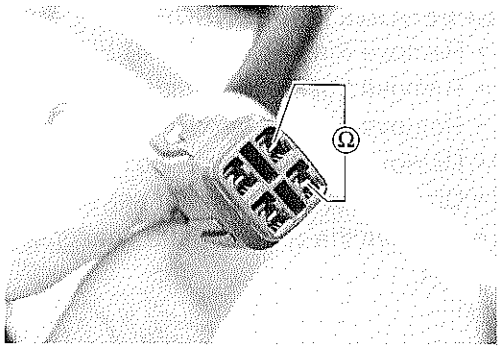
- Remount the fuel pump. (☞4-58)

FUEL LEVEL METER

- Lift and support the fuel tank with the fuel tank prop stay. (☞4-51)
- Connect each resistor between the Yellow/Black and Black/White lead wires at the wire harness.
- Turn the ignition switch "ON" position and wait for approx. 13 seconds.

Check the display of fuel meter as shown below, If any abnormality is found, replace the combination meter with a new one.





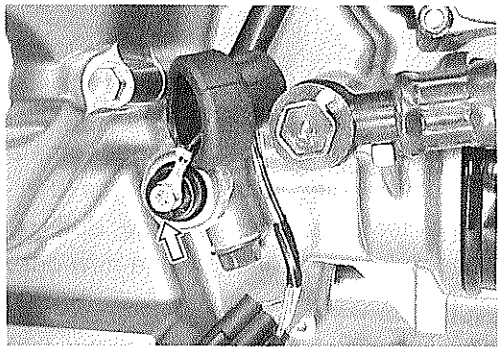
Resistance	More than 167 Ω	115 – 167 Ω	73 – 115 Ω	45 – 73 Ω	22 – 45 Ω	Less than 21 Ω
Fuel level meter	Flicker E F Flicker	Flicker E F	E F	E F	E F	E F

OIL PRESSURE INDICATOR

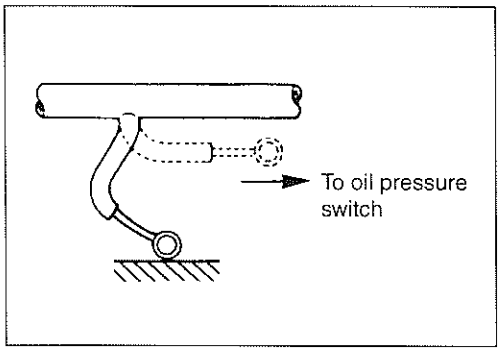
NOTE:

Before inspecting the oil pressure switch, check the engine oil level. (☞2-14)

- Remove the engine under cover.
- Disconnect the oil pressure switch lead wire from the oil pressure switch.
- Turn the ignition switch "ON" position.

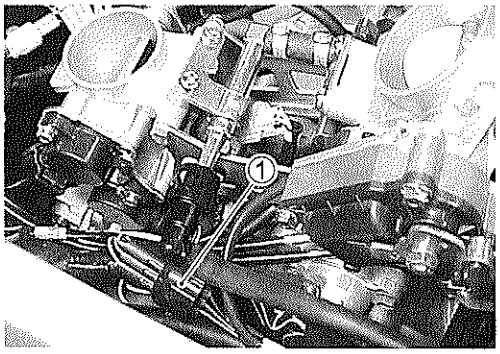


Check if the oil pressure indicator will light, when grounding the lead wire.



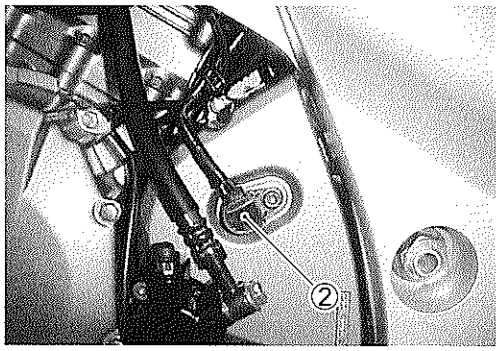
SPEEDOMETER

If the speedometer, odometer or trip meter does not function properly, inspect the speedometer sensor and connection of coupler ①. If the speedometer sensor and connection are all right, replace the meter with a new one.



SPEEDOMETER SENSOR

- Remove the seat. (☞6-4)
- Remove the fuel tank side covers. (☞6-5)
- Remove the fuel tank. (☞4-52)
- Remove the air cleaner box.
- Disconnect speedometer sensor coupler.
- Remove the speedometer sensor ② by removing its mounting bolt.

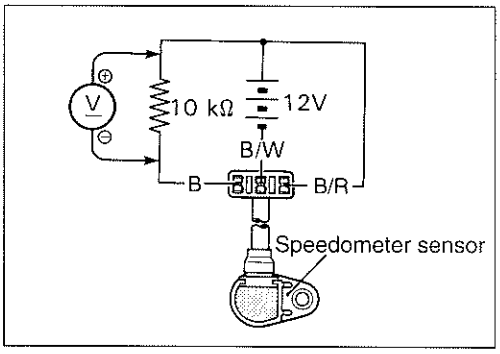


- Connect 12 V battery, 10 kΩ resistor and the multi circuit tester as shown in the right illustration.

B/R: Black with Red tracer
B/W: Black with White tracer
B: Black

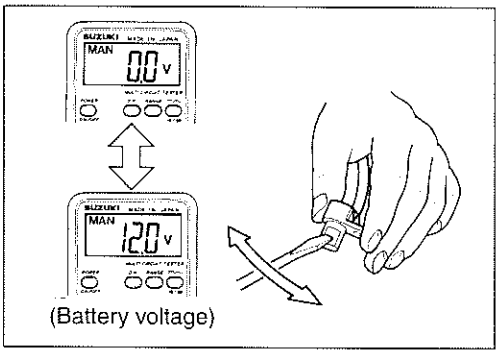
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)



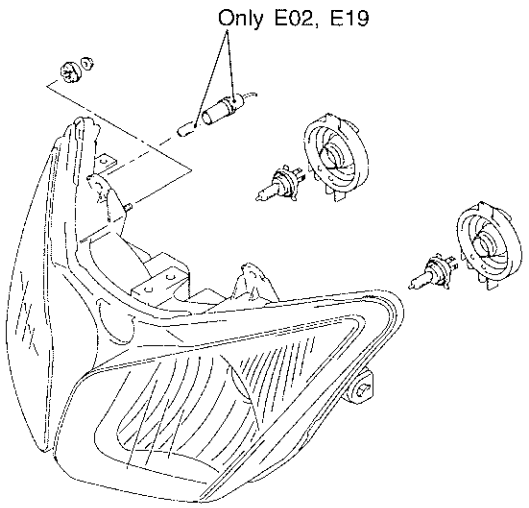
- Under above condition, if a suitable screwdriver touching the pick-up surface of the speedometer sensor is moved, the tester reading voltage changes (0 V → 12 V or 12 V → 0 V). If the tester reading voltage does not change, replace the speedometer sensor with a new one.

NOTE:
The highest voltage reading in this test will be the same as that of battery voltage (12 V).

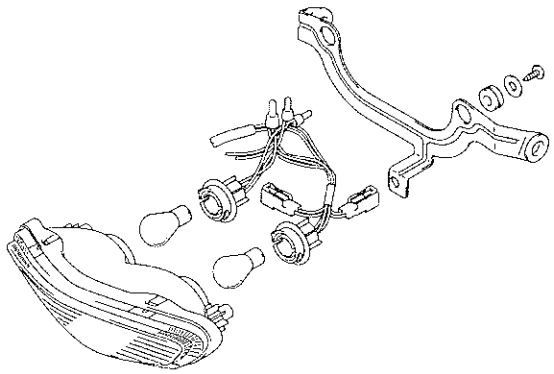


LAMPS
HEADLIGHT, BRAKE LIGHT/TAILLIGHT AND TURN SIGNAL LIGHT

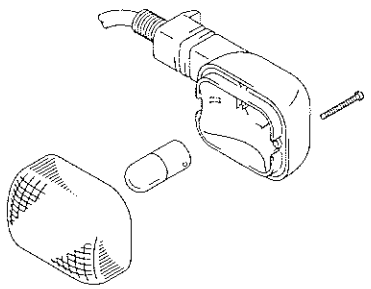
HEADLIGHT
12 V 60/50 W
12 V 60/50 W + 5 W (ONLY E02, E19)



BRAKE LIGHT/TAIL LIGHT
12 V 21/5 W



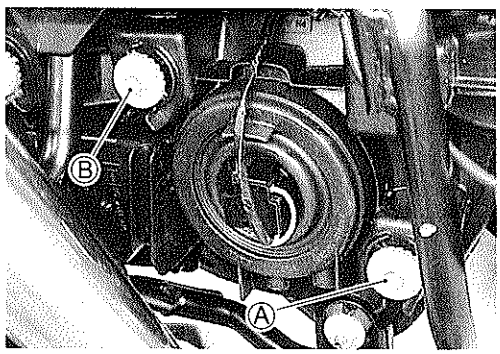
TURN SIGNAL LIGHT
12 V 10 W



HEADLIGHT BEAM ADJUSTMENT

- Adjust the headlight beam, both vertical and horizontal.
  Ⓐ: Vertical adjuster
  Ⓑ: Horizontal adjuster

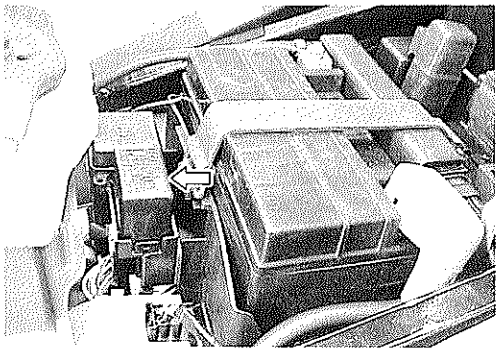
NOTE:
To adjust the headlight beam, adjust the beam horizontally first, then adjust the vertically.



RELAYS

TURN SIGNAL/SIDE-STAND RELAY

The turn signal/side-stand relay is composed of the turn signal relay, side-stand relay and diode.



INSPECTION

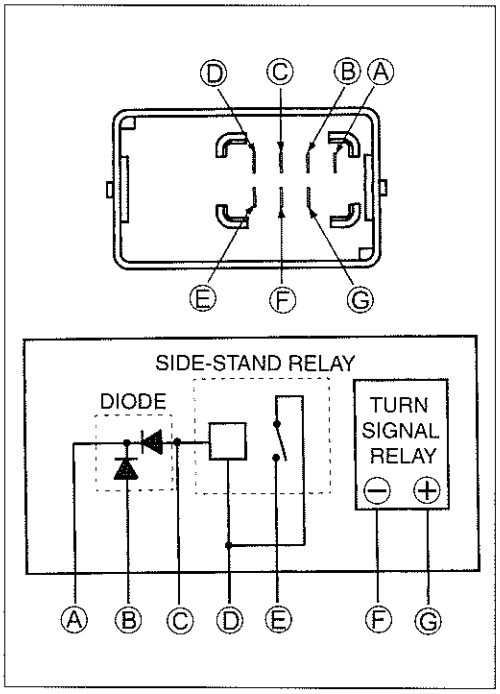
Before removing the turn signal/side-stand relay, check the operation of the turn signal light.

If the turn signal light does not illuminate, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection are OK, the turn signal relay may be faulty; therefore, replace the turn signal/side-stand relay with a new one.

NOTE:

* *Make sure that the battery is fully charged.*
* *Refer to the page 7-16 for the side-stand relay and diode inspection.*



STARTER RELAY

☞7-13

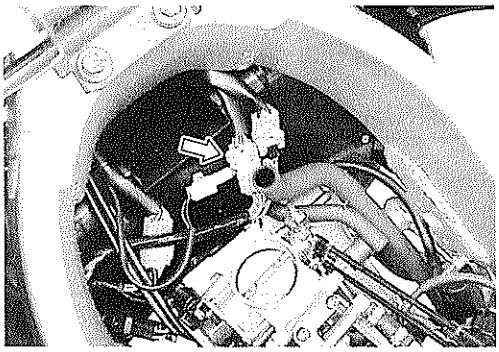
FUEL PUMP RELAY

☞4-55

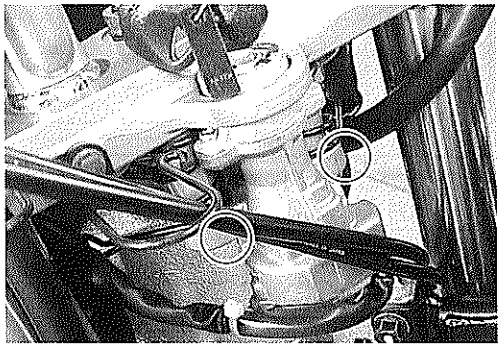
SWITCHES

IGNITION SWITCH REMOVAL

- Remove the fuel tank. (☞4-52)
- Remove the air cleaner box. (☞4-60)
- Disconnect the ignition switch coupler.



- Remove the ignition switch mounting bolts using the special tools.



TOOL 09930-11920: Torx bit JT40H
09930-11940: Bit holder

CAUTION

When reusing the ignition switch bolt, clean thread and apply the THREAD LOCK SUPER "1322" or THREAD LOCK "1342".

1342 99000-32050: THREAD LOCK "1342" (USA)

1322 99000-32110: THREAD LOCK SUPER "1322" (Others)

Inspect each switch for continuity with a tester. If any abnormality is found, replace the respective switch assemblies with new ones.

IGNITION SWITCH (For E24)

Color / Position	R	O	O/Y	B/W
ON	○——	○	○——	○
OFF				
LOCK				

(For Others)

Color / Position	R	O	O/Y	B/W	Gr	Br
ON	○——	○	○——	○	○——	○
OFF						
LOCK						
P	○					○

LIGHTING SWITCH (Except for E03, E24, E28, E33)

Color / Position	O/Bl	Gr	O/R	Y/W
OFF (•)				
S (≋)	○——	○		
ON (☼)	○——	○	○——	○

DIMMER SWITCH

Color / Position	W	Y	Y/W
HI (≡D)		○——	○
LO (≡D)	○		○

TURN SIGNAL SWITCH

Color / Position	Lg	Lbl	B
L		○——	○
PUSH			
R	○——	○	

PASSING LIGHT SWITCH (Except for E03, E28, E33)

Color / Position	O/R	Y
•		
PUSH	○——	○

ENGINE STOP SWICH

Color / Position	O/B	O/W
OFF (⊘)		
RUN (Ω)	○——	○

STARTER BUTTON

Color / Position	O/W	Y/G
•		
PUSH	○——	○

HORN BUTTON

Color / Position	B/Bl	B/W
•		
PUSH	○——	○

HAZARD (Except for E03, E24, E28, E33)

Color / Position	Lg	Lbl	B
ON	○——	○——	○
OFF			

FRONT BRAKE SWITCH

Color / Position	B/R	B/Bl
OFF		
ON	○——	○

REAR BRAKE SWITCH

Color / Position	O/G	W/B
OFF		
ON	○——	○

CLUTCH LEVER POSITION SWITCH

Color / Position	B/Y	B/Y
OFF		
ON	○——	○

OIL PRESSURE SWITCH (For E03, E24, E28, E33)

Color / Position	G/Y	Ground
ON (engine is stopped)	○——	○
OFF (engine is running)		

(For Others)

Color / Position	B	Ground
ON (engine is stopped)	○——	○
OFF (engine is running)		

NOTE:
Before inspecting the oil pressure switch, check the engine oil level.(☞2-14)

WIRE COLOR

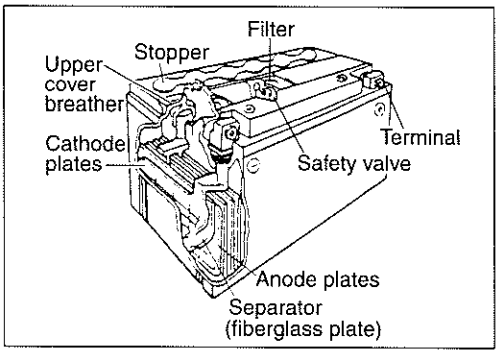
B : Black
Br : Brown
Gr : Gray
Lbl : Light blue
Lg : Light green
O : Orange
R : Red
Y : Yellow
W : White
Bl : Blue
G : Green

B/Bl : Black with Blue tracer
B/W : Black with White tracer
B/Y : Black with Yellow tracer
B/R : Black with Red tracer
G/Y : Green with Yellow tracer
O/B : Orange with Black tracer
O/Bl : Orange with Blue tracer
O/G : Orange with Green tracer
O/R : Orange with Red tracer
O/W : Orange with White tracer
O/Y : Orange with Yellow tracer
W/B : White with Black tracer
Y/G : Yellow with Green tracer
Y/W : Yellow with White tracer

BATTERY

SPECIFICATIONS

Type designation	FTX14-BS
Capacity	12 V, 43.2 kC (12 Ah)/10 HR



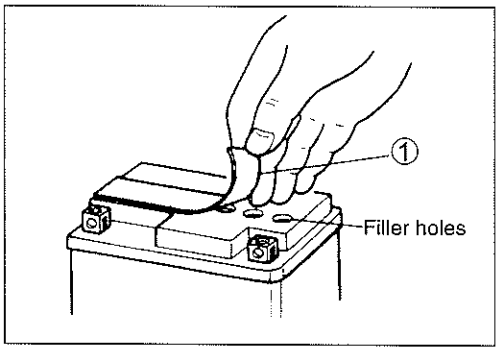
INITIAL CHARGING

Filling electrolyte

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

NOTE:

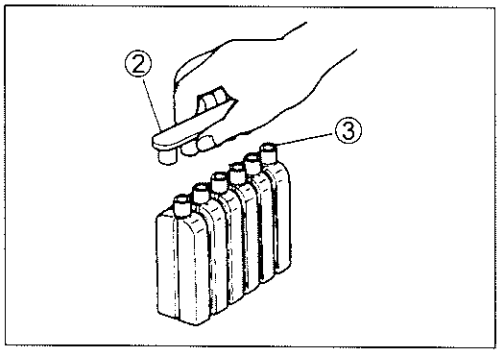
When filling electrolyte, the battery must be removed from the vehicle and must be put on the level ground.



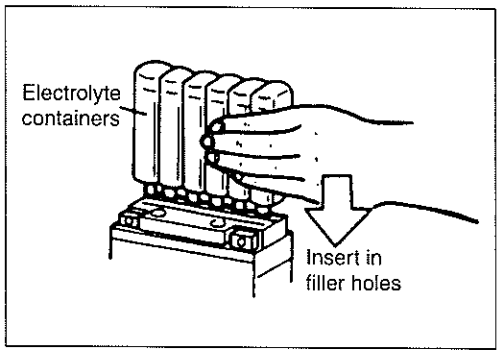
- Remove the caps ②.

NOTE:

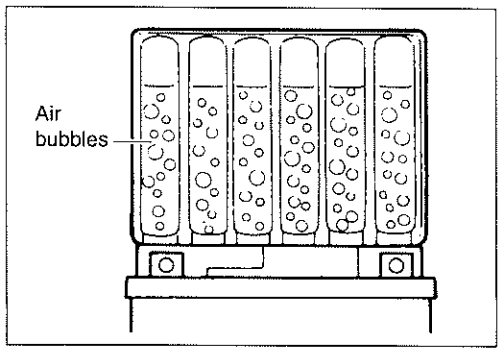
* *After filling the electrolyte completely, use the removed cap ② as the sealed caps of battery-filler holes.*
* *Do not remove or pierce the sealed areas ③ of the electrolyte container.*



- 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.

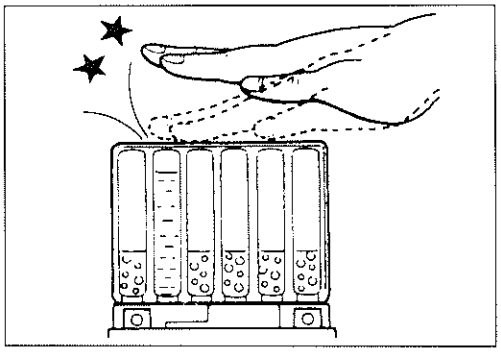


- Make sure air bubbles are coming up each electrolyte container, and leave in this position for about more than 20 minutes.



NOTE:
If no air bubbles are coming up from a filler port, tap the bottom of the electrolyte container two or three times.
Never remove the container from the battery.

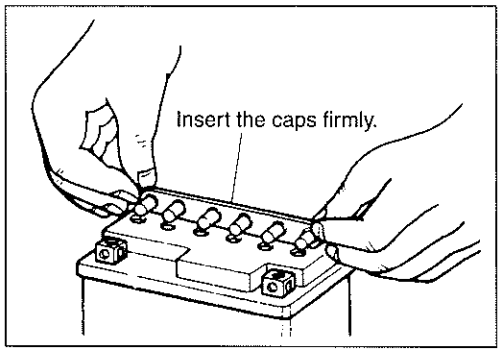
- After confirming that the electrolyte has entered the battery completely, remove the electrolyte containers from the battery. Wait for about 20 minutes.

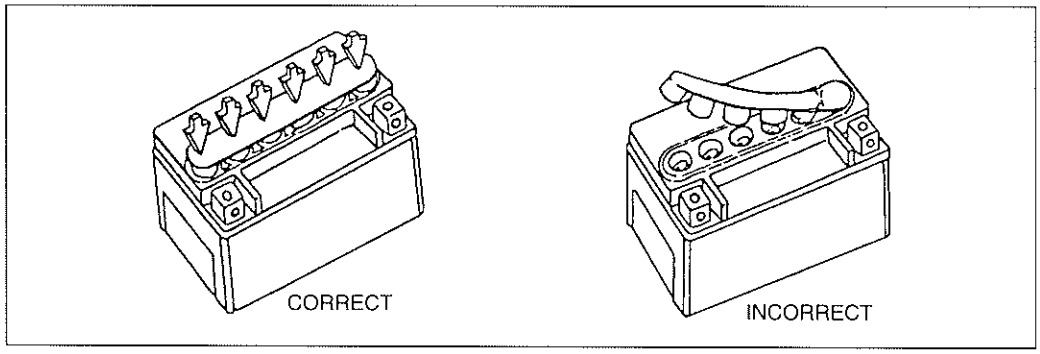


- Insert the caps into the filler holes, pressing in firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.

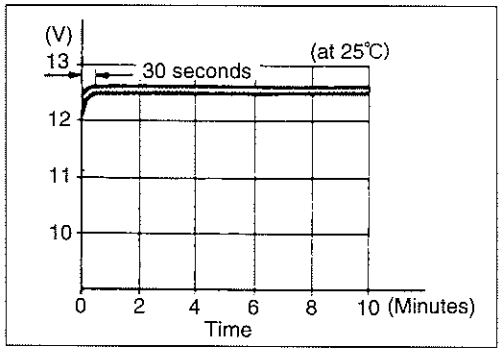
CAUTION

*** Never use anything except the specified battery.**
*** Once install the caps to the battery; do not remove the caps.**
*** Do not tap the caps with a hammer when installing them.**





- Using multi circuit tester, measure the battery voltage. The tester should indicate more than 12.5 – 12.6 V (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)



CAUTION

Do not remove the caps on the battery top while charging.

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

SERVICING

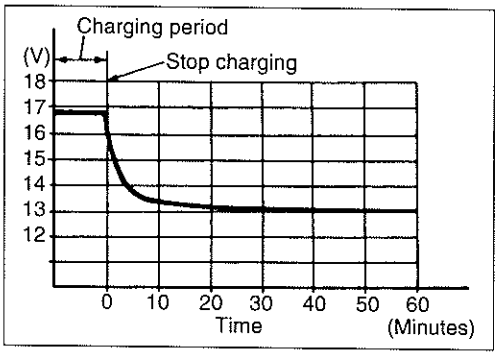
Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned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

RECHARGING OPERATION

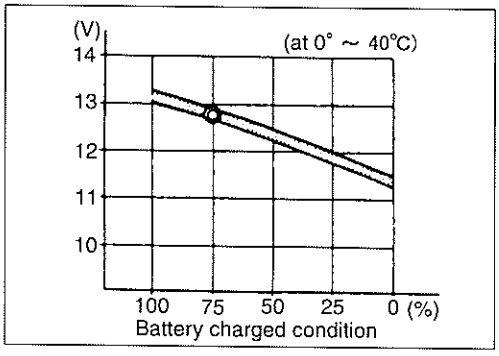
- Using the multi circuit tester, check the battery voltage. If the voltage reading is less than the 12.0 V (DC), recharge the battery with a battery charger.

CAUTION

*** When recharging the battery, remove the battery from the motorcycle.**
*** Do not remove the caps on the battery top while recharging.**



Recharging time: 1.4 A for 5 to 10 hours or 6 A for one hour



CAUTION

Be careful not to permit the charging current to exceed 6 A at any time.

- After recharging, wait for more than 30 minutes and check the battery voltage with a multi circuit tester.
- If the battery voltage is less than the 12.5 V, recharge the battery again.
- If battery voltage is still less than 12.5 V, after recharging, replace the battery with a new one.
- When the motorcycle is not used for a long period, check the battery every 1 month to prevent the battery discharge.