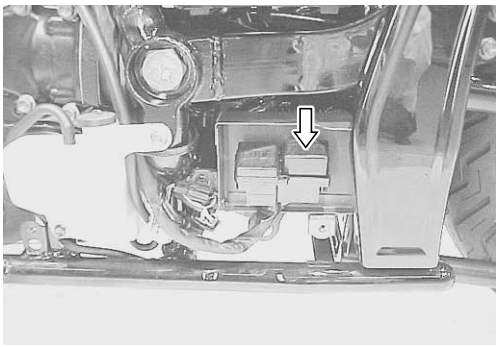
TURN SIGNAL/SIDE-STAND RELAY

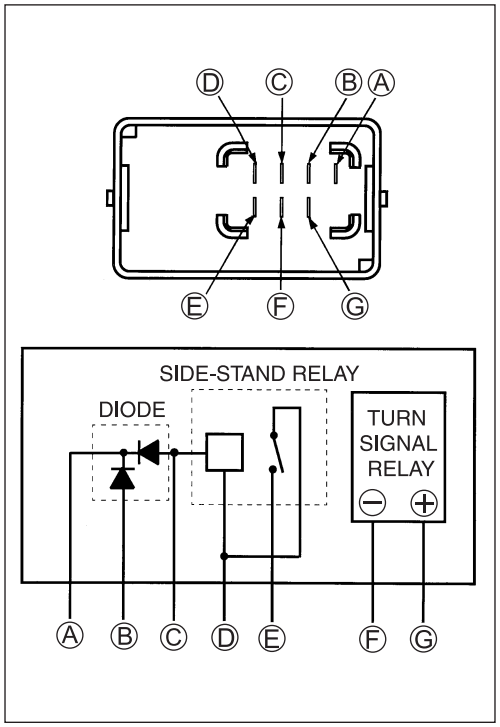
The turn signal/side-stand relay is composed of the turn signal relay, and the side-stand relay and diode.

- Remove the secondary gear case cover.
- Remove the turn signal/side-stand relay.



SIDE-STAND RELAY INSPECTION

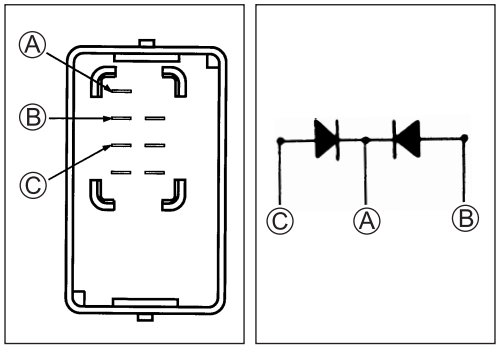
First check the insulation between Ⓓ and Ⓔ terminals with the tester. Then apply 12V to terminals Ⓓ and Ⓒ (⊕ to Ⓓ and ⊖ to Ⓒ) and check the continuity between Ⓓ and Ⓔ. If there is no continuity, replace the turn signal/side-stand relay with a new one.



DIODE INSPECTION

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

⊖ 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 V	



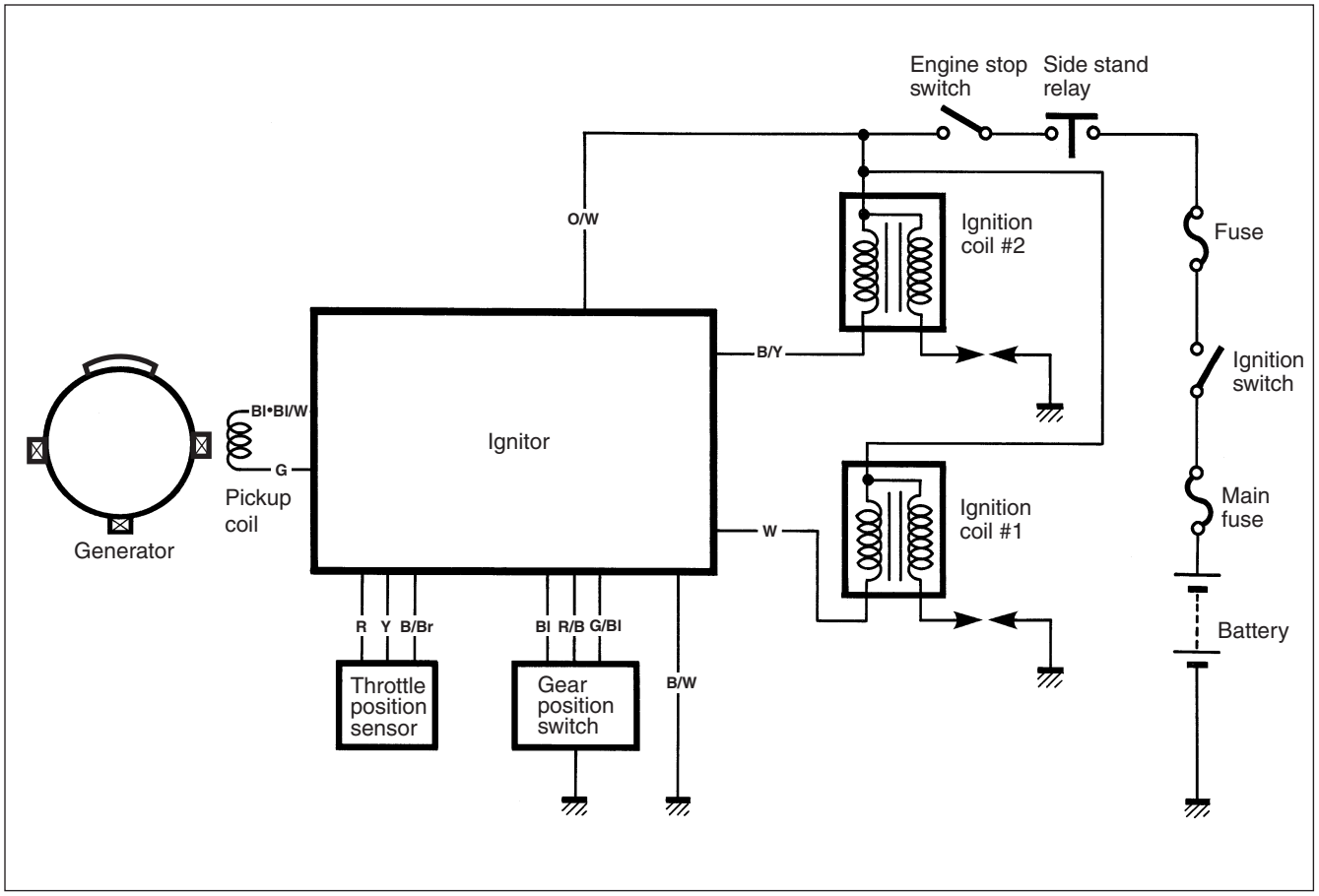
09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀⊢)

NOTE:

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

IGNITION SYSTEM



NOTE:
The ignition cut-off circuit is incorporated in this ignitor to prevent over-running of engine. If engine rpm reaches 8 000 r/min., this circuit cuts off the ignition primary current for all spark plugs.

⚠ CAUTION

Under no load, the engine can run over 8 000 r/min, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 8 000 r/min at anytime.

TROUBLESHOOTING

No spark or poor spark

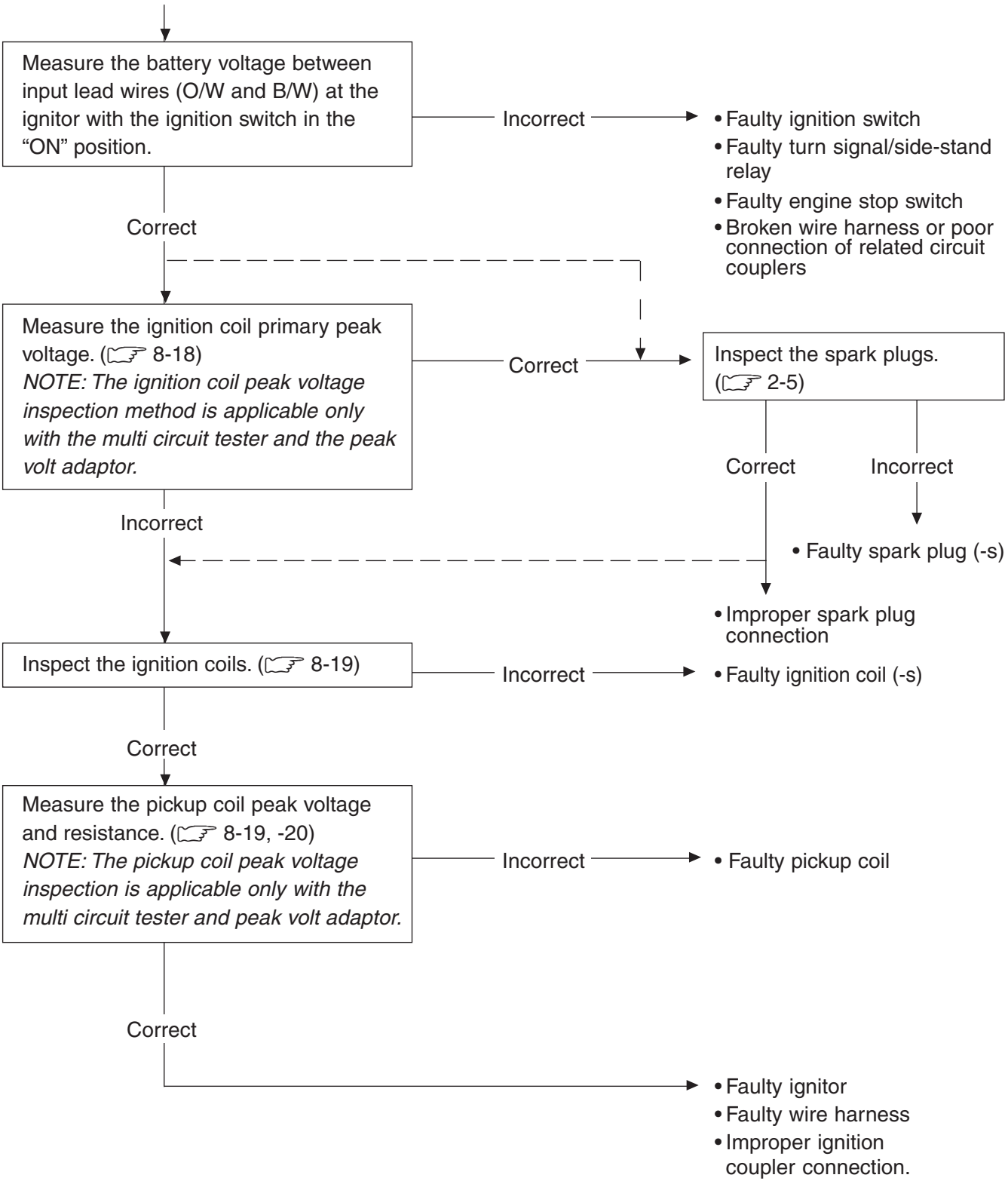
* Make sure the transmission is in neutral and the engine stop switch is in the "RUN" position. Grasp the clutch lever. Make sure the fuse is not blown and the battery is fully-charged before diagnosing.

Check the ignition system couplers for poor connections.

Loose → • Improper coupler connection

Correct

Continued on next page


Measure the battery voltage between input lead wires (O/W and B/W) at the ignitor 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. (☞ 8-18)
NOTE: The ignition coil peak voltage inspection method is applicable only with the multi circuit tester and the peak volt adaptor.
Correct
Inspect the spark plugs. (☞ 2-5)
Correct
Incorrect
• Faulty spark plug (-s)
Incorrect
• Improper spark plug connection
Inspect the ignition coils. (☞ 8-19)
Incorrect
• Faulty ignition coil (-s)
Correct
Measure the pickup coil peak voltage and resistance. (☞ 8-19, -20)
NOTE: The pickup coil peak voltage inspection is applicable only with the multi circuit tester and peak volt adaptor.
Incorrect
• Faulty pickup coil
Correct
• Faulty ignitor
• Faulty wire harness
• Improper ignition coupler connection.

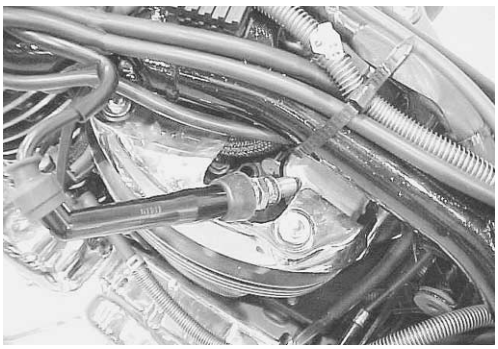
INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the fuel tank. (☞5-3)
- Disconnect the two spark plug caps.
- Connect the new spark plugs to the each spark plug cap and ground them on the cylinder head.

NOTE:
Make sure that the each spark plug cap and spark plug are connected properly.

Measure the ignition coil primary peak voltage using the multi circuit tester in the following procedure.



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

No.1 ignition coil ⊕ Probe: White lead wire connector
⊖ Probe: Ground
No.2 ignition coil ⊕ Probe: Black/Yellow lead wire connector
⊖ Probe: Ground

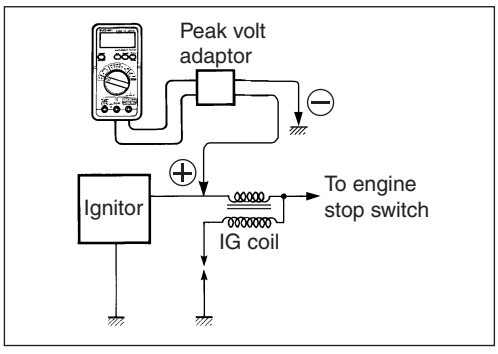
NOTE:
Do not disconnect the ignition coil primary lead wires.

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 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 200 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. (☞8-19)

IGNITION COIL RESISTANCE

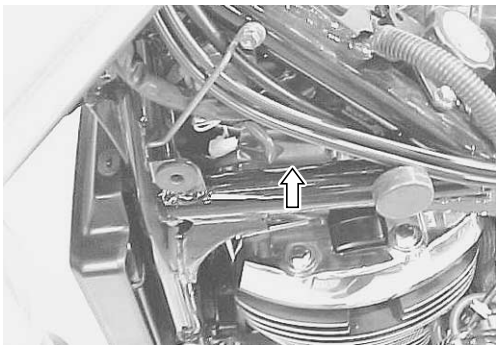
- Remove the fuel tank. (☞5-3)
- Disconnect the ignition coil lead wires and plug caps.

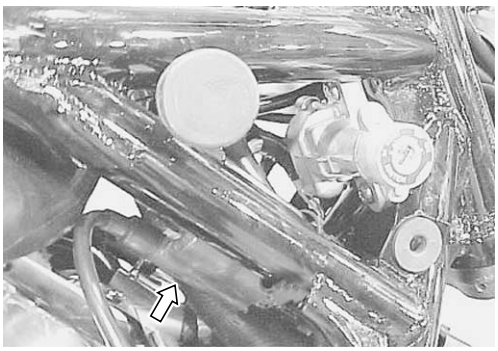
Measure the ignition coil resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

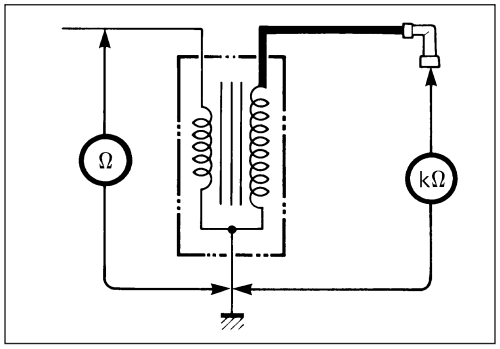
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Ignition coil resistance
Primary : 2 – 6 Ω (Terminal – Terminal)
Secondary : 15 – 30 kΩ (Plug cap – Terminal)







PICKUP COIL PEAK VOLTAGE

- Remove the two seats. (☞7-2)
- Disconnect the wire harness coupler ① at the ignitor.

NOTE:
Make sure that all of the couplers are connected properly.

Measure the pickup coil peak voltage in the following procedure.

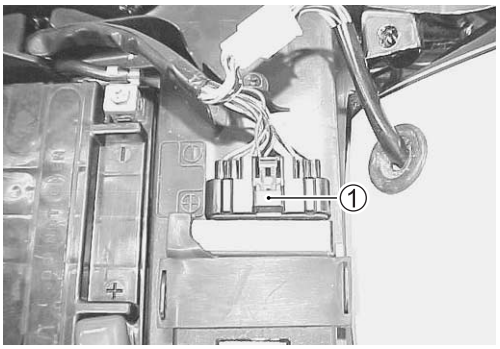
- Connect the multi circuit tester with the peak volt adaptor as follows.

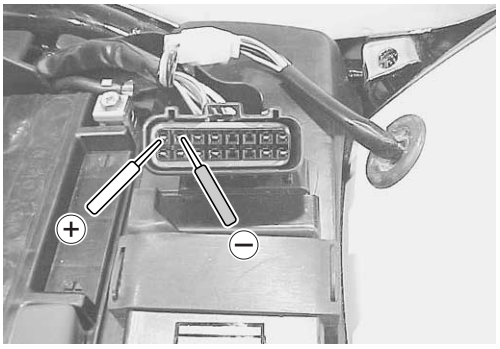
⊕ Probe: Blue/White lead wire
⊖ Probe: Green lead wire

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.



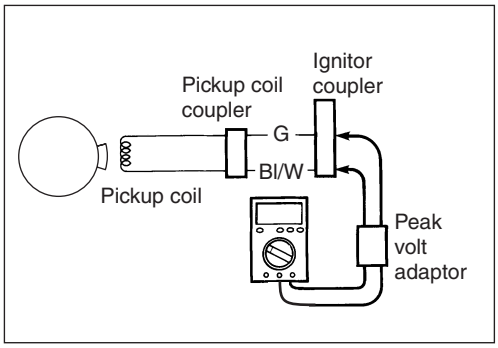


- Shift the transmission into the neutral, and then turn the ignition switch to the "ON" position.
- Pull the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the pickup coil peak voltage.
- Repeat the above procedure a few times and measure the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

Tester knob indication: Voltage (⎓)

DATA Pickup coil peak voltage: More than 1.5 V

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



- Remove the secondary gear case cover.
- Disconnect the pickup coil lead wire coupler and connect the multi circuit tester with the peak volt adaptor.

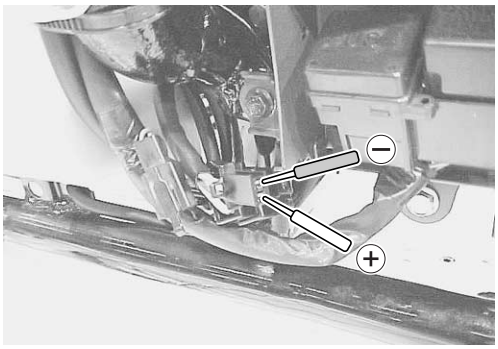
⊕ Probe: Blue lead wire
⊖ Probe: Green lead wire

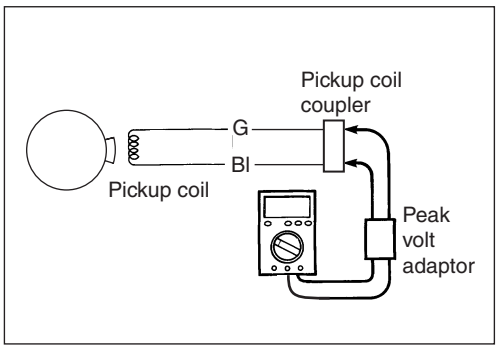
Measure the pickup coil peak voltage at the pickup coil lead wire coupler, in the same manner as on the ignitor coupler.

Tester knob indication: Voltage (⎓)

DATA Pickup coil peak voltage: More than 1.5 V

If the peak voltage on the pickup coil lead wire coupler is ok but on the ignitor coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the generator must be replaced and re-checked.





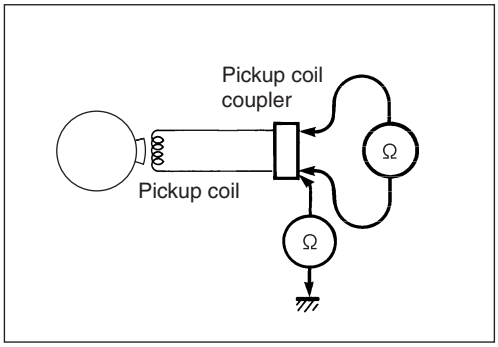
PICKUP COIL RESISTANCE

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

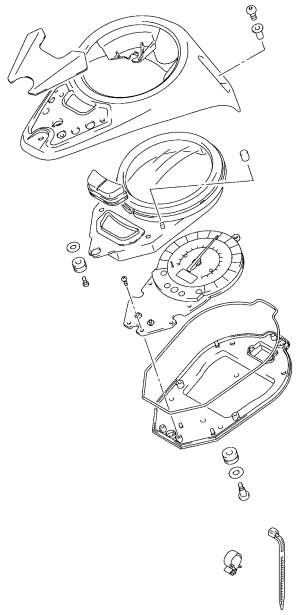
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

DATA Pickup coil resistance : 160 – 300 Ω (Green – Blue)
: ∞ Ω (Green – Ground)



SPEEDOMETER



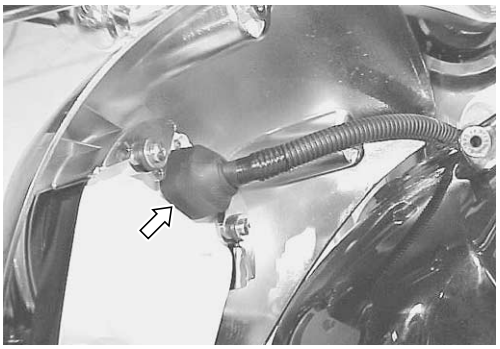
REMOVAL

- Remove the screws.

- Disconnect the cover and coupler.

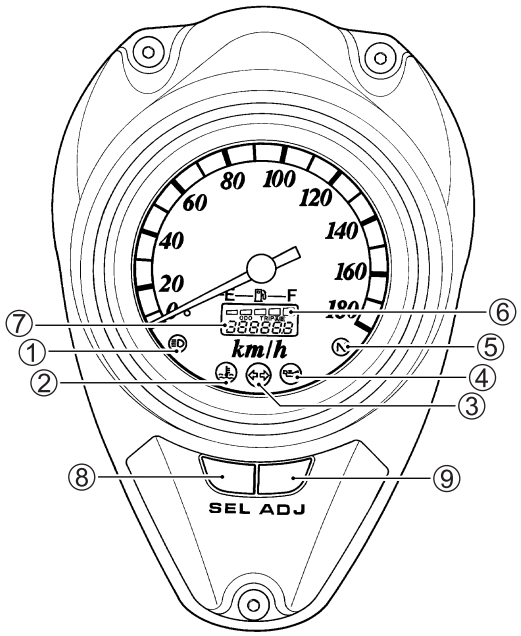
⚠ CAUTION

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



- Remove the speedometer.

PARTS NAMES



① High beam indicator light
② Engine coolant temperature indicator light
③ Turn signal indicator light
④ Oil pressure indicator light
⑤ Neutral indicator light
⑥ Fuel level meter
⑦ Speedometer/tripmeter/clock
⑧ SELECT button
⑨ ADJUST button

OPERATING PROCEDURE

INITIAL DISPLAY

When the ignition switch is set to ON, all LCD light up for three seconds.

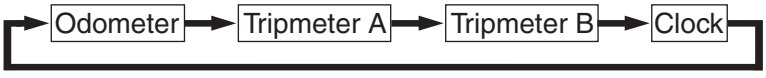
NOTE:

If the power supply is cut (e, g, when the battery is replaced):

* *The odometer, tripmeter and clock are displayed after the initial display appears.*
* *Since the clock resets to "1:00", it will need to be readjusted.*

CHANGE THE DISPLAY MODE

With each press of the SELECT button, the display changes between odometer, tripmeter A, tripmeter B and clock as shown.



⚠ WARNING

To avoid riding with only one hand, do not operate the buttons while riding.

ODOMETER

- Displays the total distance travelled.

TRIPMETER

- Displays the distance travelled since the tripmeter was last reset.

NOTE:

The tripmeters A and B can be used independently.

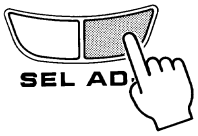
- Hold down the ADJUST button for two seconds to reset the tripmeter.

CLOCK

- Displays the time (hours and minutes) on a 12-hour clock.
- Setting the time.

Hold down the ADJUST button for two seconds while pressing the SELECT button and then flashing the hour display. ⇨ The setting that is flashing can be changed.

hour → min. → No Flashing ⇨ Select the correct time.



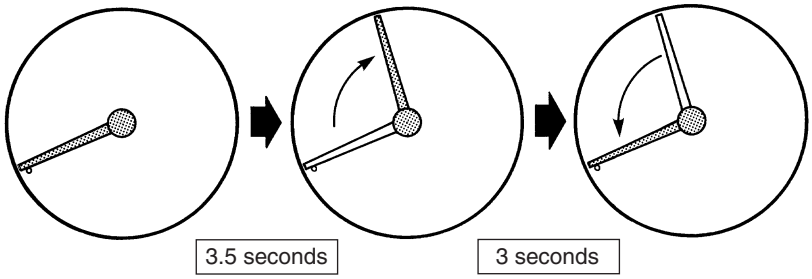
FUEL LEVEL INDICATOR

- Displays the amount of fuel remaining in the fuel tank.

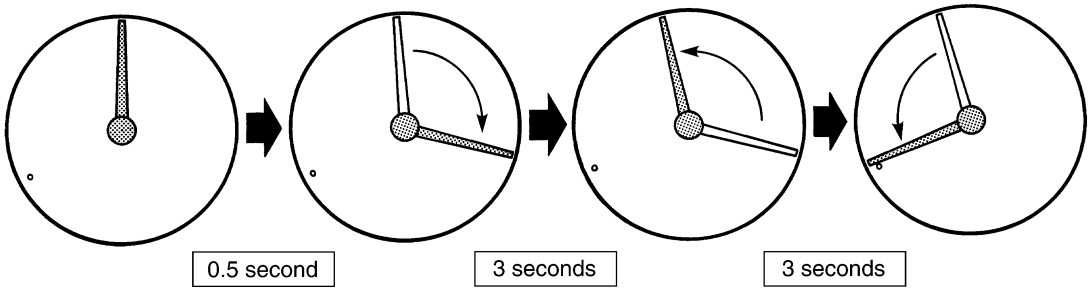
SPEEDOMETER

- The speedometer pointer operates onetime as shown below to reset speedometer pointer, when connecting the battery or speedometer coupler.

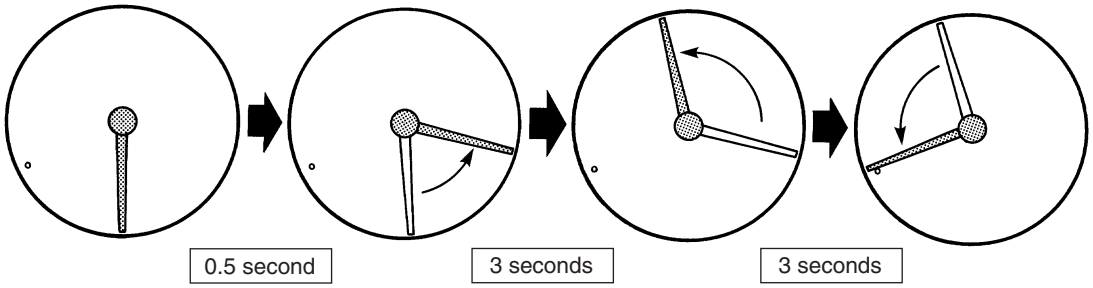
1. When the speedometer pointer is normal position.



2. When the speedometer pointer is top position.



3. When the speedometer pointer is bottom position.



NOTE:

The speedometer pointer can indicates case 2 or case 3 if the battery terminal or speedometer lead wire coupler is disconnected while riding.

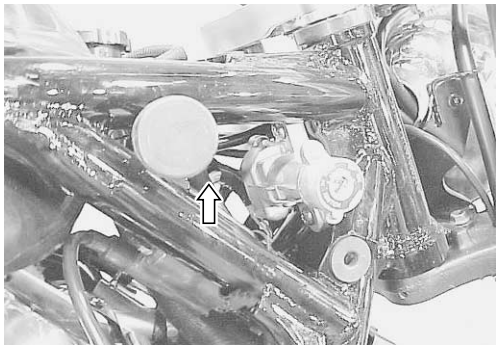
INSPECTION

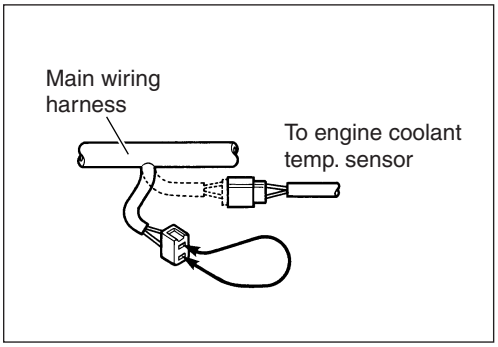
ENGINE COOLANT TEMPERATURE INDICATOR LIGHT

Engine coolant temperature sensor inspection: ☞6-8

- Remove the fuel tank. (☞5-3)
- Disconnect the engine coolant temperature sensor coupler.
- Connect the jumper wire to the wire harness coupler.

Check that the LED light immediately after turning the ignition switch on. If the LED fail in operation, replace the speedometer unit with a new one.





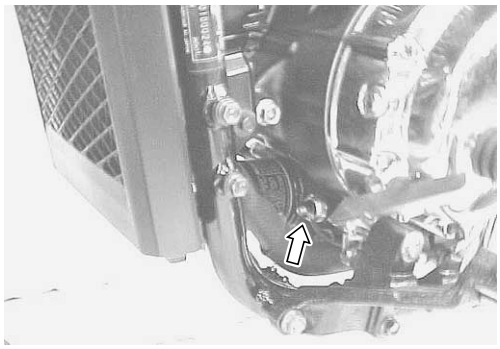
OIL PRESSURE INDICATOR LIGHT

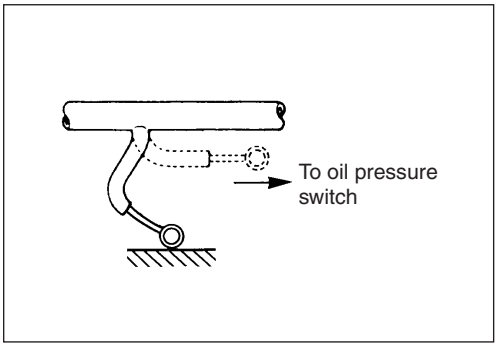
NOTE:

Before inspecting the oil pressure switch, check if the engine oil level is enough. (☞2-8)

- 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.

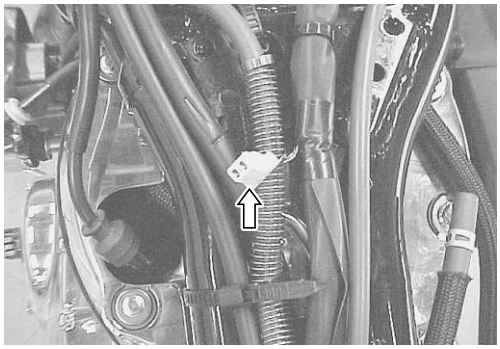


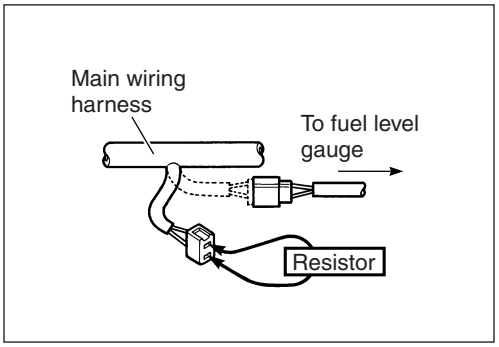


FUEL LEVEL METER

- Remove the fuel tank. (☞5-3)
- Connect the speedometer.
- Connect each resistor between the Yellow/Black and Black/White lead wire 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 speedometer with a new one.

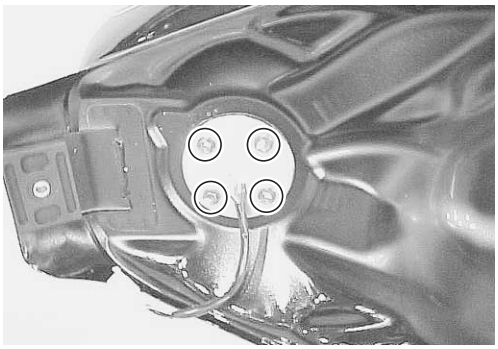




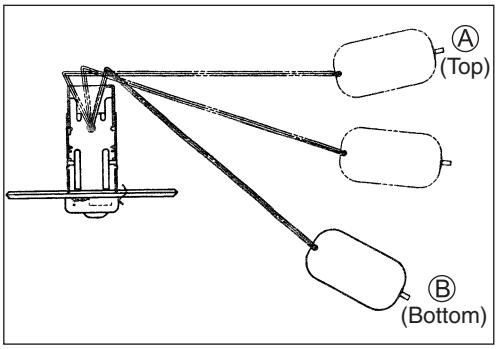
Resistance	Less than 17 Ω	22 – 28 Ω	33 – 49 Ω	54 – 69 Ω	74 – 83 Ω	More than 94 Ω
Fuel level meter	■■■■■	■■■■□	■■■□□	■■□□□	■□□□□	Flicker □□□□

FUEL LEVEL GAUGE INSPECTION

- Remove the fuel tank. (☞5-3)
- Remove the fuel level gauge.



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

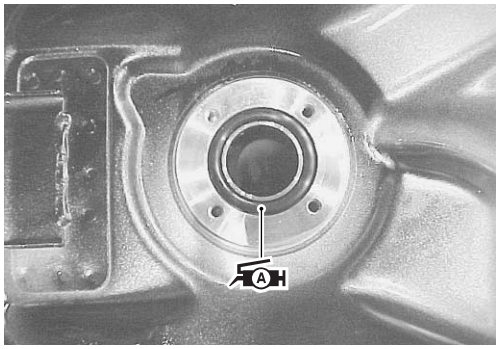


Float position	Resistance
Ⓐ "F" (Full)	4 – 10 Ω
Ⓑ "E" (Empty)	90 – 100 Ω

Remount the fuel level gauge in the reverse order of removal. Pay attention to the following points.

- Install the O-ring and apply grease to it.

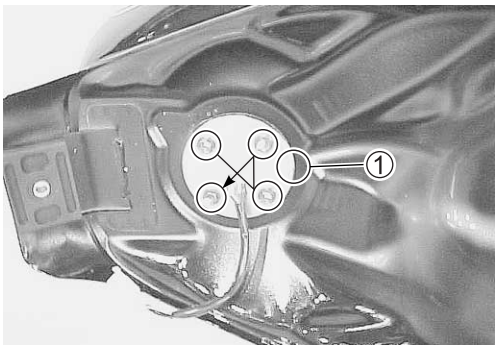
For U.S.A.
99000-25030: SUZUKI SUPER GREASE "A"
For the other countries
99000-25010: SUZUKI SUPER GREASE "A"



⚠ CAUTION

Use a new O-ring to prevent fuel leakage.

- Face the "△" mark ① on the fuel level gauge forward.
- Lightly tighten the bolts in a crisscross pattern, and then tighten them to the specified torque in the above manner.

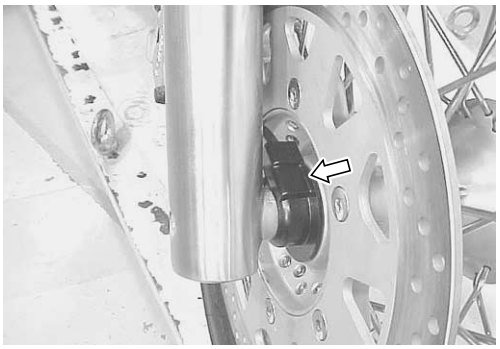


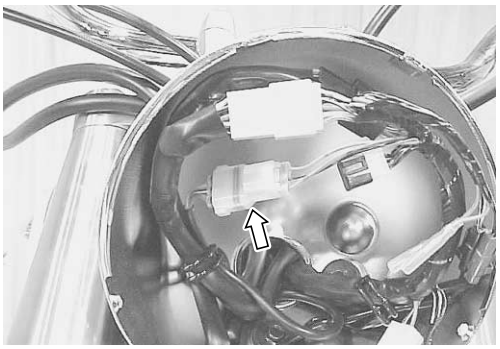
Fuel level gauge bolt: 10 N·m (1.0 kgf·m, 7.0 lb-ft)

SPEED SENSOR INSPECTION

If the speedometer, odometer or tripmeter does not function properly. Inspect the speed sensor and connection of couplers. If the speed sensor and connection is all right, replace the unit with a new one.

- Remove the front wheel. (☞7-4)
- Remove the head light.
- Disconnect the speed sensor lead wire coupler.
- Remove the speed sensor.
- Connect 12V battery (between O/R and B/W), 10 kΩ resistor (between O/R and P) and the multi circuit tester (⊕ probe of tester to O/R and ⊖ to P) as shown right illustration.





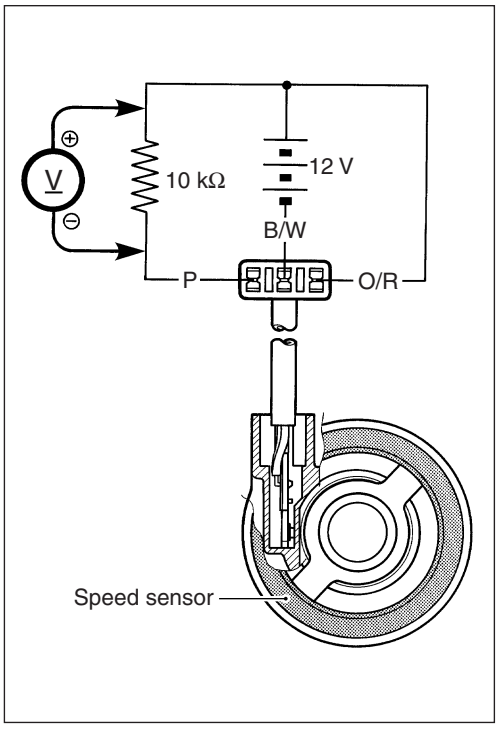
O/R : Orange with Red tracer
B/W: Black with White tracer
P : Pink

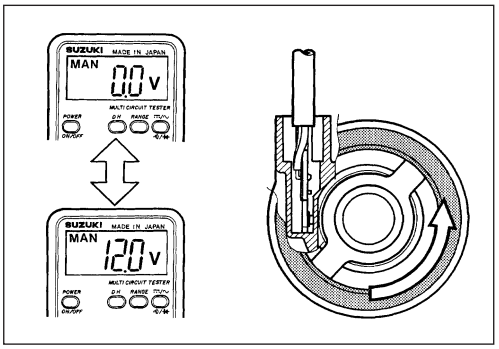
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (⎓)

Under above condition, by rotating the drive lugs of speed sensor slowly, the tester reading voltage relatively changes (0V → 12V or 12V → 0V). If the tester reading voltage does not change, replace the speed sensor with a new one.

NOTE:
The highest tester reading voltage (12V) while testing is same as battery voltage.



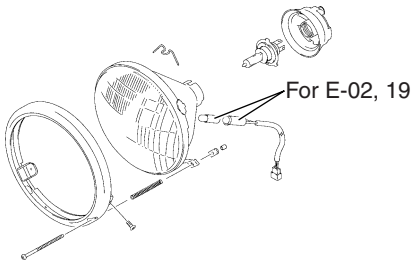


LAMPS

HEADLIGHT, BRAKE LIGHT/TAILLIGHT AND TURN SIGNAL LIGHT

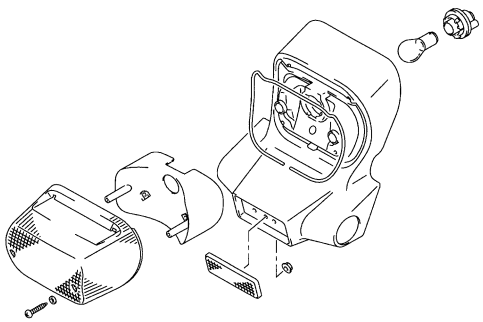
HEADLIGHT

12 V 60/55 W ..... For E-03, 24, 28, 33
12 V 60/55 W + 4 W ..... For E-02,19



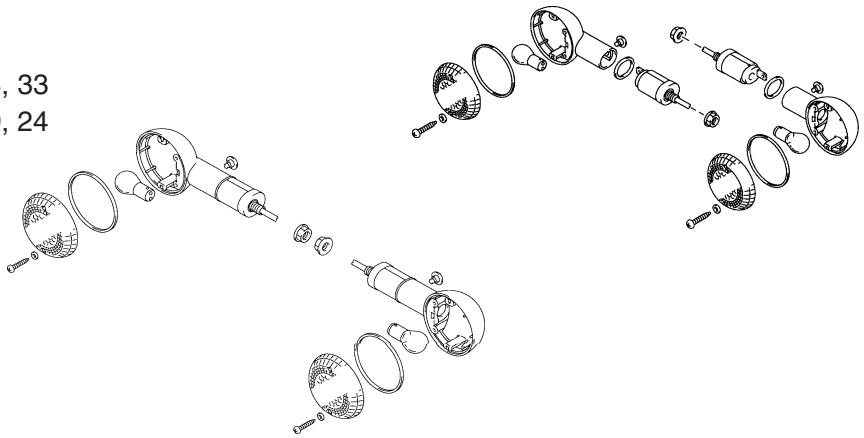
BRAKE LIGHT/TAILLIGHT

12 V 21/5 W



TURN SIGNAL LIGHT

Front
12 V 21/5 W ..... For E-03, 28, 33
12 V 21 W..... For E-02, 19, 24
Rear
12 V 21 W



⚠ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

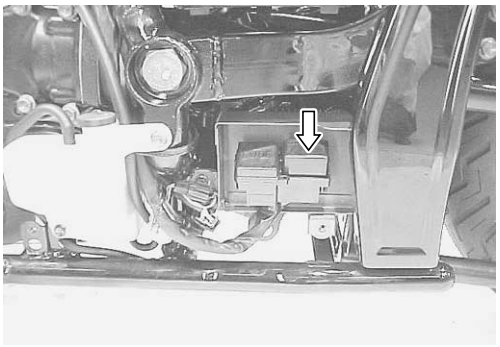
HEADLIGHT BEAM ADJUSTMENT

- Adjust the headlight beam, both vertical and horizontal.

RELAYS

TURN SIGNAL/SIDE-STAND RELAY

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

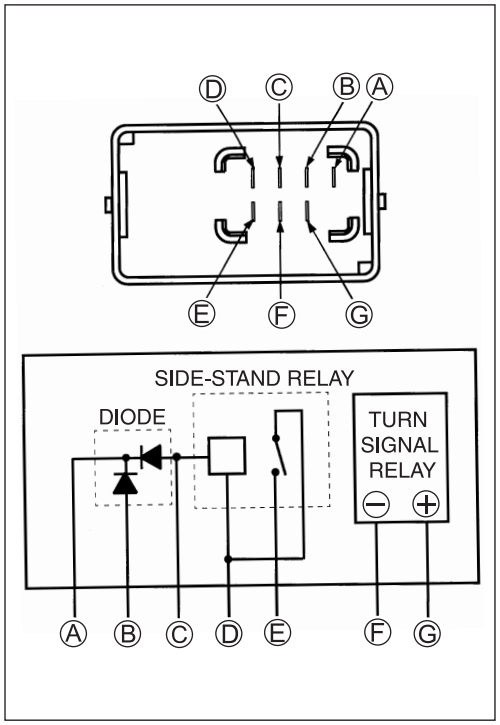


INSPECTION

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 8-15 for the side-stand relay and diode inspection.*



STARTER RELAY

☞8-13

SWITCHES

IGNITION SWITCH REMOVAL

- Remove the fuel tank. (☞5-3)
- Remove the frame head covers. (☞6-4)
- Disconnect the coupler.
- Remove the ignition switch mounting bolts using the special tool.

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 "1303"

1303 99000-32030: THREAD LOCK SUPER "1303"

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

IGNITION SWITCH

(For E-24)

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 E-03, 24, 28 and 33)

Color / Position	O/Bl	Gr	O/R	Y/W
OFF (•)				
S (≥00≤)	○——	——○		
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 E-03, 28 and 33)

Color / Position	O/R	Y
•		
PUSH	○——	——○

ENGINE STOP SWITCH

Color / Position	O/B	O/W
OFF (⊗)		
RUN (⊙)	○——	——○

STARTER BUTTON

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

HORN BUTTON

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

FRONT BRAKE SWITCH

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

REAR BRAKE SWITCH

Color / Position	Terminal	Terminal
OFF		
ON	○——	——○

CLUTCH LEVER POSITION SWITCH

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

OIL PRESSURE SWITCH

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

NOTE:

Before inspecting the oil pressure switch, check if the engine oil level is enough. (☞2-8)

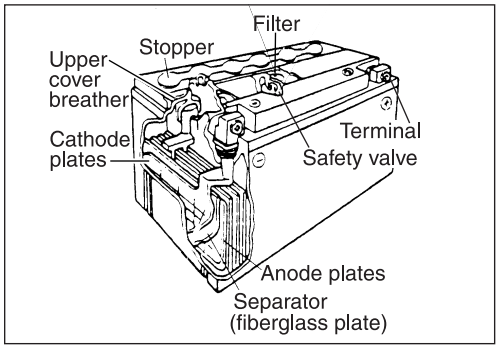
WIRE COLOR

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

BATTERY

SPECIFICATIONS

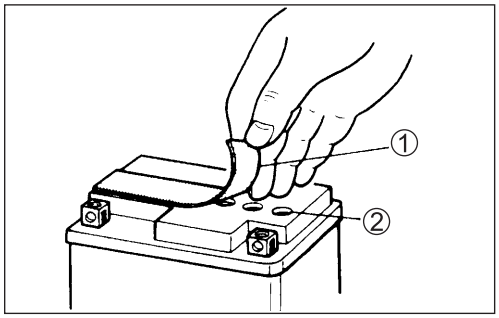
Type designation	FTX12-BS
Capacity	12V, 36 kC (10 Ah)/10HR



INITIAL CHARGING

FILLING ELECTROLYTE

- Remove the aluminum tape ① which seals the battery filler holes ②.

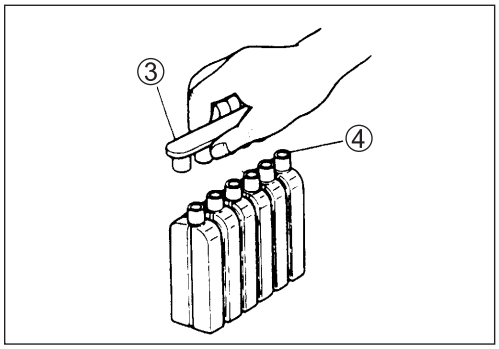


- Remove the caps ③ from the electrolyte container.

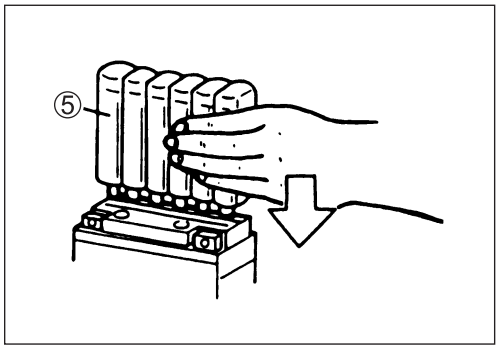
NOTE:

* *Do not remove or pierce the sealed areas ④ of the electrolyte container.*

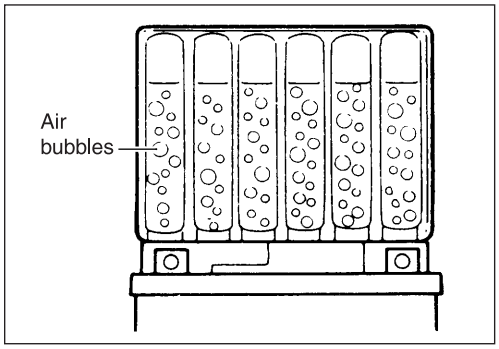
* *After completely filling the battery with electrolyte, use the caps ③ from the electrolyte container to seal the battery filler holes.*



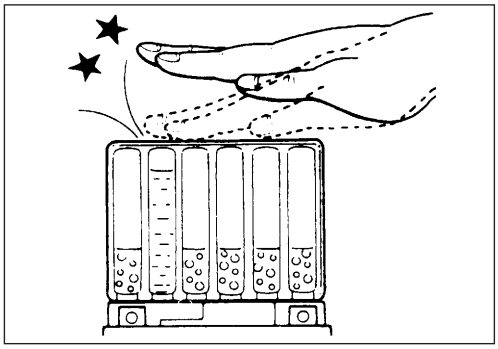
- Insert the nozzles of the electrolyte container ⑤ into the electrolyte filler holes of the battery. Hold the electrolyte container firmly so that it does not fall. Do not allow any of the electrolyte to spill.



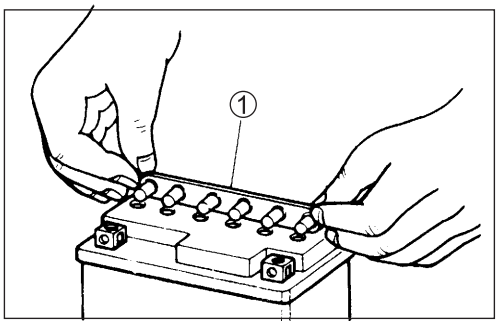
- Make sure the air bubbles rise to the top of each electrolyte container and leave the electrolyte container in this position for more than 20 minutes.



NOTE:
If air bubbles do not rise from any one of the filler ports, tap the bottom of the electrolyte container two or three times.
Never remove the electrolyte container from the battery while there is still electrolyte in the container.

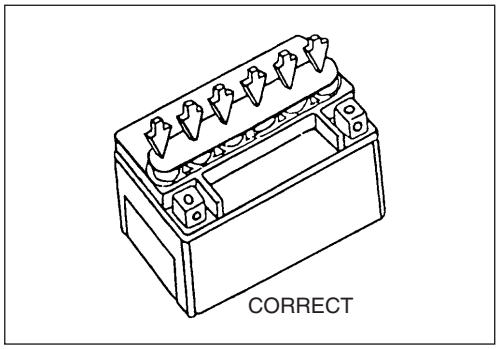


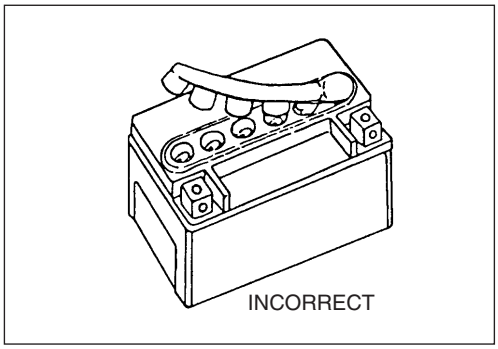
- After the electrolyte container is completely empty, remove it from the battery and wait about 20 minutes.
- Insert the caps ① firmly into the filler holes, so that the top of the caps do not protrude above the upper surface of the top cover of the battery.



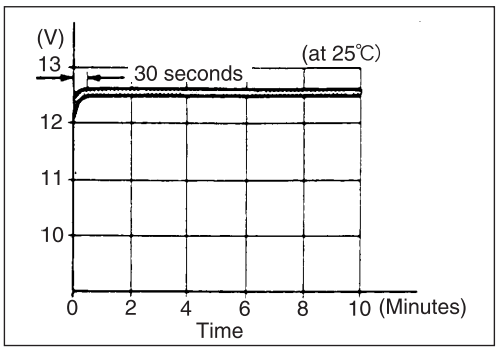
⚠ CAUTION

*** Never use anything except the specified battery.**
*** Do not remove the caps once they are installed in the battery.**
*** Do not tap the caps with a hammer when installing them.**





- Measure the battery voltage using multi circuit tester. The tester should indicate more than 12.5 – 12.6V (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, clean the battery terminals with sandpaper.

RECHARGING OPERATION

- Measure the battery voltage using the multi circuit tester. 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.**
*** Do not remove the caps on the battery top while recharging.**

Recharging time: 1.2A for 5 to 10 hours or 5A for one hour

⚠ CAUTION

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

- After recharging, wait at least 30 minutes and then measure the battery voltage using the multi circuit tester. If the battery voltage is less than 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 unused for a long time, its voltage needs to be regularly measured. When the motorcycle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.