

15-15 ELECTRICAL SYSTEM

- Check the stator coil resistance as follows:
  - Stop the engine
  - Connect the hand tester as shown in table.
  - Note the readings (total 3 measurements).

Stator Coil Resistance

Meter Range	Connections		Reading
	Meter (+) to	Meter to (–) to	
x 1 Ω	One yellow lead	Another yellow lead	0.3 – 1.0 Ω

- ★If there is more resistance than shown in the table, or no meter reading (infinity) for any two leads, the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.
- Using the highest resistance range of the hand tester measure the resistance between each of the yellow leads and chassis ground.
- ★Any meter reading less than infinity (∞) indicates a short, necessitating stator replacement.
- ★If the stator coils have normal resistance, but the voltage check showed the magneto to be defective; then the rotor magnetism have probably weakened, and the rotor must be replaced.

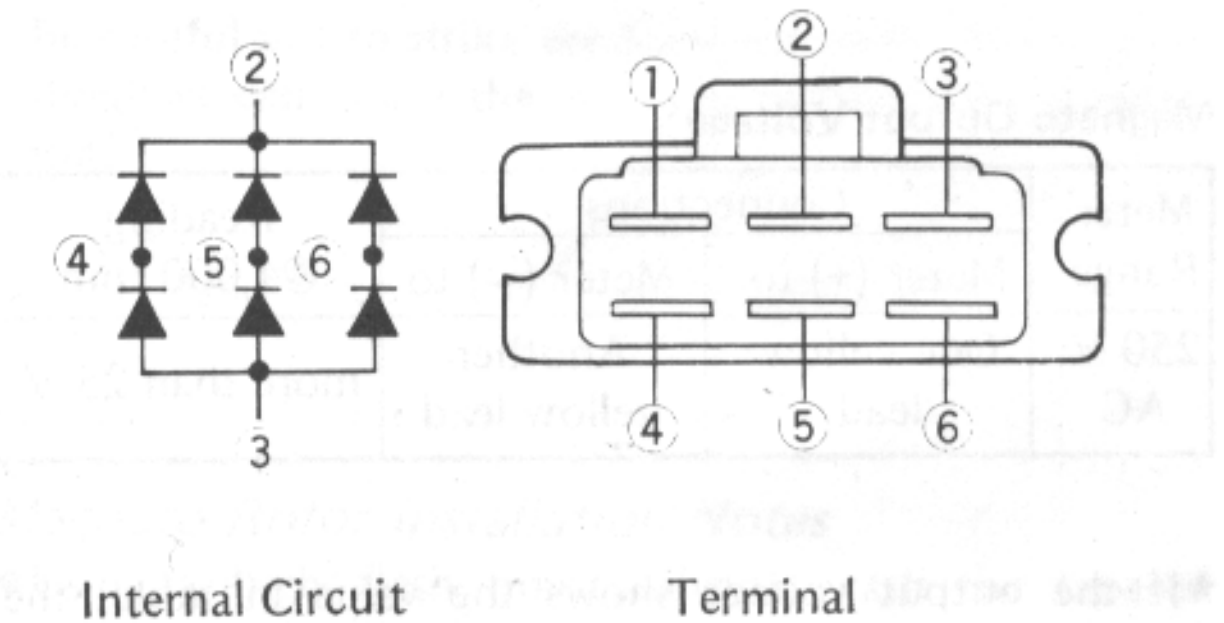
Rectifier Inspection

- Remove the regulator/rectifier.
- Set the hand tester to the x 100 Ω range, and check the resistance in both directions between the terminals.
- ★The resistance should be low in one direction and more than ten times as much in the other direction. If any diode shows low high in both directions, the diodes is defective and the diode assembly must be replaced.

NOTE

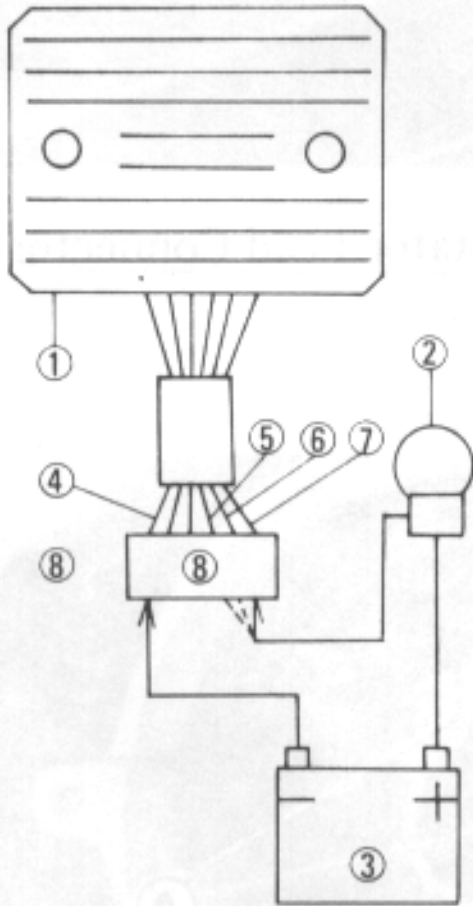
- The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from zero to the first 1/2 of the scale.

Regulator/Rectifier Internal Circuit



Regulator Inspection

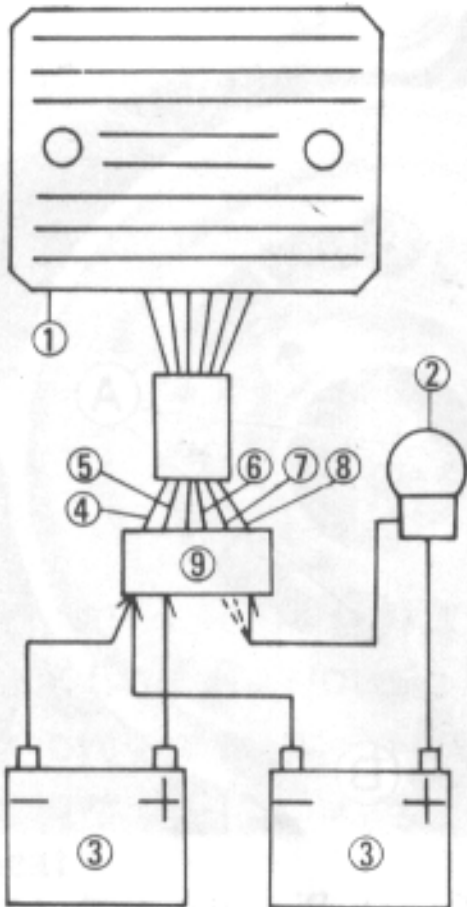
- To test the regulator out of circuit, use three 12 V batteries and a test light made form a 12 V 3 – 6 W bulb in a socket with leads.
- Remove the regulator/rectifier from the frame.
- Using auxiliary leads, connect one of the yellow leads to the battery (+) terminal, and connect the test light between the black lead and the battery (–) terminal.
- At this time the bulb should not be lit.



- 1. Regulator/Rectifier
- 2. Test Light
- 3. 12 V Battery
- 4. BK/Y
- 5. Y1
- 6. Y2
- 7. Y3
- 8. 6-pin Connector

CAUTION

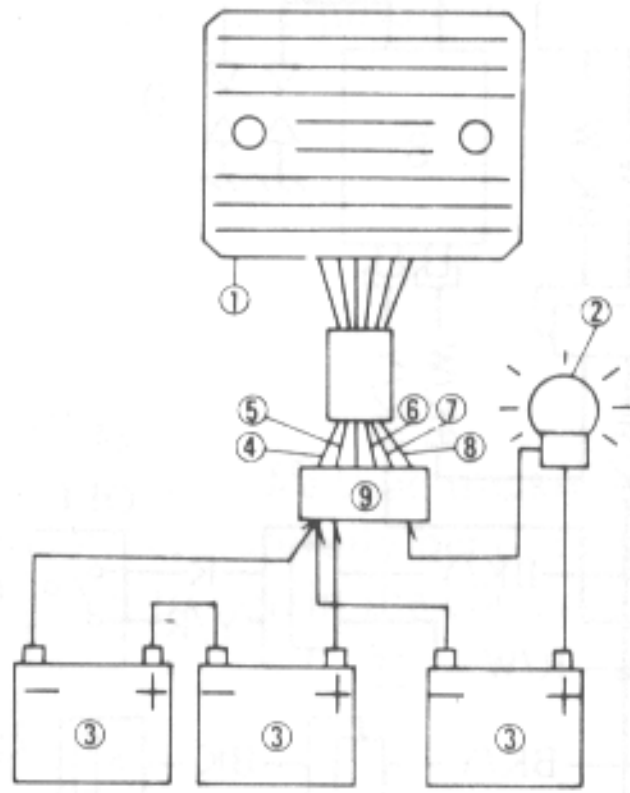
- The test light works as an indicator and also as a current limiter to protect the regulator/rectifier from excessive current. Do not use an ammeter instead of a test light.
- Connect the brown lead to the other battery (+) terminal and connect the black lead to the battery (–) terminal momentarily. At this time the bulb should not be lit.



- 1. Regulator/Rectifier
- 2. Test Light
- 3. 12 V Battery
- 4. BK/Y
- 5. BR
- 6. Y1
- 7. Y2
- 8. Y3
- 9. 6-pin Connector



- To apply 24 V to the regulator/rectifier, connect two 12 V batteries in series, and connect the brown lead to the battery (+) terminal and the black lead to the battery (–) terminal momentarily. The bulb should now light and stay on until the bulb circuit is opened.



1. Regulator/Rectifier
2. Test Light
3. 12 V Battery
4. BK/Y
5. BR
6. Y1
7. Y2
8. Y3
9. 6-pin Connector

### CAUTION

- Do not apply more than 24 volts. If more than 24 volts is applied, the regulator/rectifier may be damaged. Do not apply 24 V more than a few second, the regulator/rectifier may be damaged.

- Repeat the above three steps for other two yellow leads (in connector 3 which leads to the regulator/rectifier).
- ★ Replace the regulator/rectifier if the bulb does not light as described above.

### NOTE

- The above test is not foolproof. If the above checks show the regulator/rectifier is not damaged, but there is still trouble in the charging system, first carefully inspect the alternator, battery, wiring, and all connections. Replace the regulator/rectifier if all these other components turn out good.

### Regulator/Rectifier Output Voltage

Meter Range	Connectings		Reading
	Meter (+) to	Meter (–) to	
25 V DC	Battery (+) Terminal	Battery (–) Terminal	Battery voltage to 14 V

- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. The readings should show nearly battery voltage when the engine speeds is low, and, as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.
- Turn off the ignition switch to stop the engine, and disconnect the multimeter.
- ★ If the regulator/rectifier output voltage is kept between the values given in table, the charging system is considered to be working normally.
- ★ If the output voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.
- ★ If the battery voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the alternator output is insufficient for the loads. Check the alternator and regulator/rectifier to determine which part is defective.

### Ignition System

#### Safety Instructions:

### WARNING

- The ignition system produces extremely high voltage. Do not touch the spark plugs, high tension coils, or spark plug leads while the engine is running, or you could receive a severe electrical shock.

### CAUTION

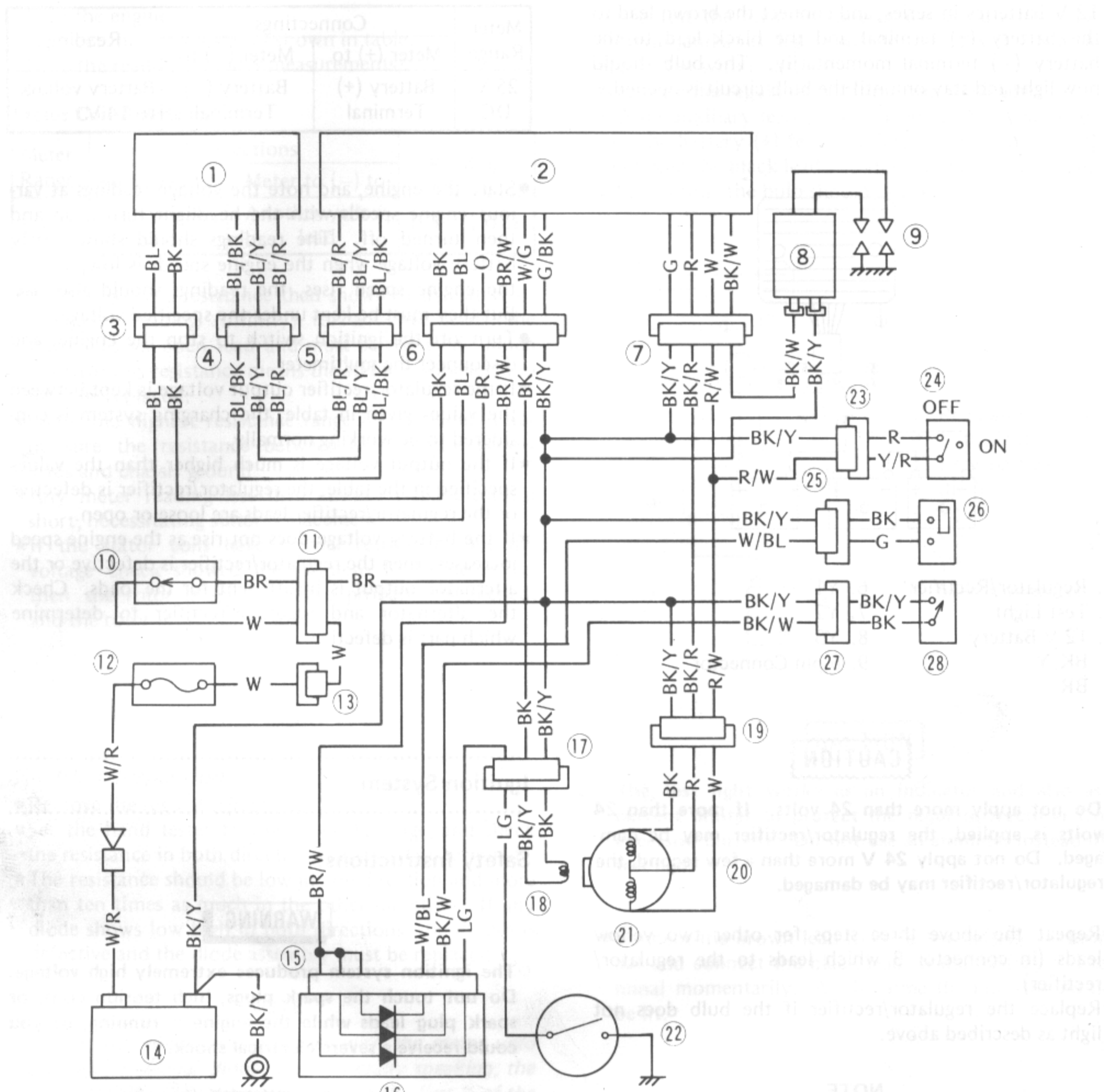
- Do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent CDI until damage.
- Operating the motorcycle without the battery will damage the CDI unit.
- Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes and CDI unit.
- The use of a sulfated old battery which will not accept a full charge by supplement charging will damage the CDI unit.
- The operation of the motorcycle with the 20A main fuse blown out will damage the CDI unit.
- Keep the CDI unit away from electrical noise during its operating such as that generated by spark plugs.

### Regulator/Rectifier Output Voltage Inspection

- Check the battery condition (see Battery section).
- Warm up the engine to obtain actual alternator operating conditions.
- Remove the seat.
- Check that the ignition switch is turned off, and connect the hand tester as shown in table.

# 15-17 ELECTRICAL SYSTEM

## Ignition System Wiring Diagram



- |                                  |                     |                               |
|----------------------------------|---------------------|-------------------------------|
| 1. Exhaust Valve Operating Motor | 11. 6-pin Connector | 21. Magneto Rotor             |
| 2. CDI Unit                      | 12. 20A Fuse        | 22. Neutral Switch            |
| 3. 2-pin Connector               | 13. 6-pin Connector | 23. 9-pin Connector           |
| 4. 3-pin Connector               | 14. Battery         | 24. Engine Stop Switch        |
| 5. 3-pin Connector               | 15. 6-pin Connector | 25. 2-pin Connector           |
| 6. 6-pin Connector               | 16. Diode           | 26. Side Stand Switch         |
| 7. 4-pin Connector               | 17. 3-pin Connector | 27. 2-pin Connector           |
| 8. Ignition Coil                 | 18. Pickup Coil     | 28. Starter Inter Lock Switch |
| 9. Spark Plugs                   | 19. 6-pin Connector |                               |
| 10. Ignition Switch              | 20. Exciter Coil    |                               |



### Spark Plug Cleaning and Inspection

- Remove the spark plugs.
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flash point solvent and a wire brush or other suitable tool.
- ★ If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug or its equivalent.

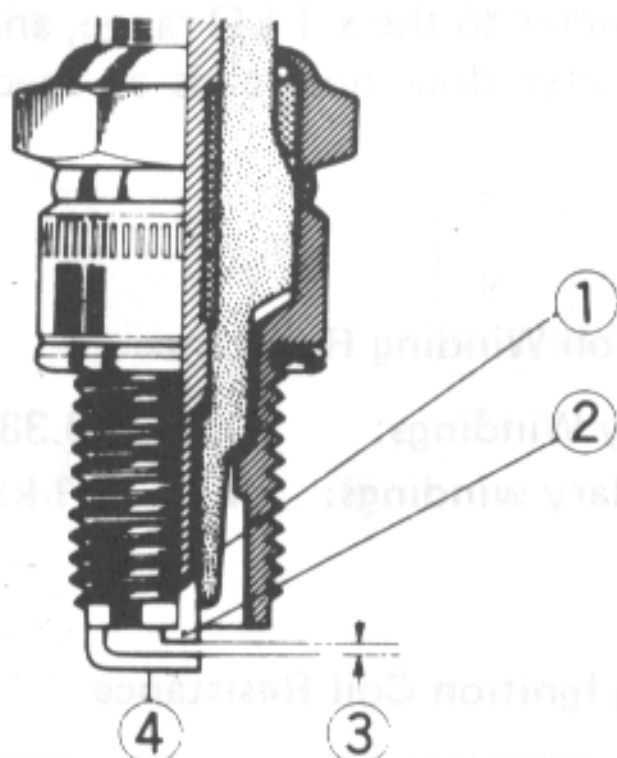
### Spark Plug Gap

- Measure the gap with a wire-type thickness gauge.
- ★ If the gap is incorrect, carefully bend the side electrode with a suitable tool to obtain the correct gap.

### Spark Plug Gap

0.7 – 0.8 mm

### Spark Plug Gap



1. Insulator
2. Center Electrode
3. Plug Gap
4. Side Electrode

### Pickup Coil Removal

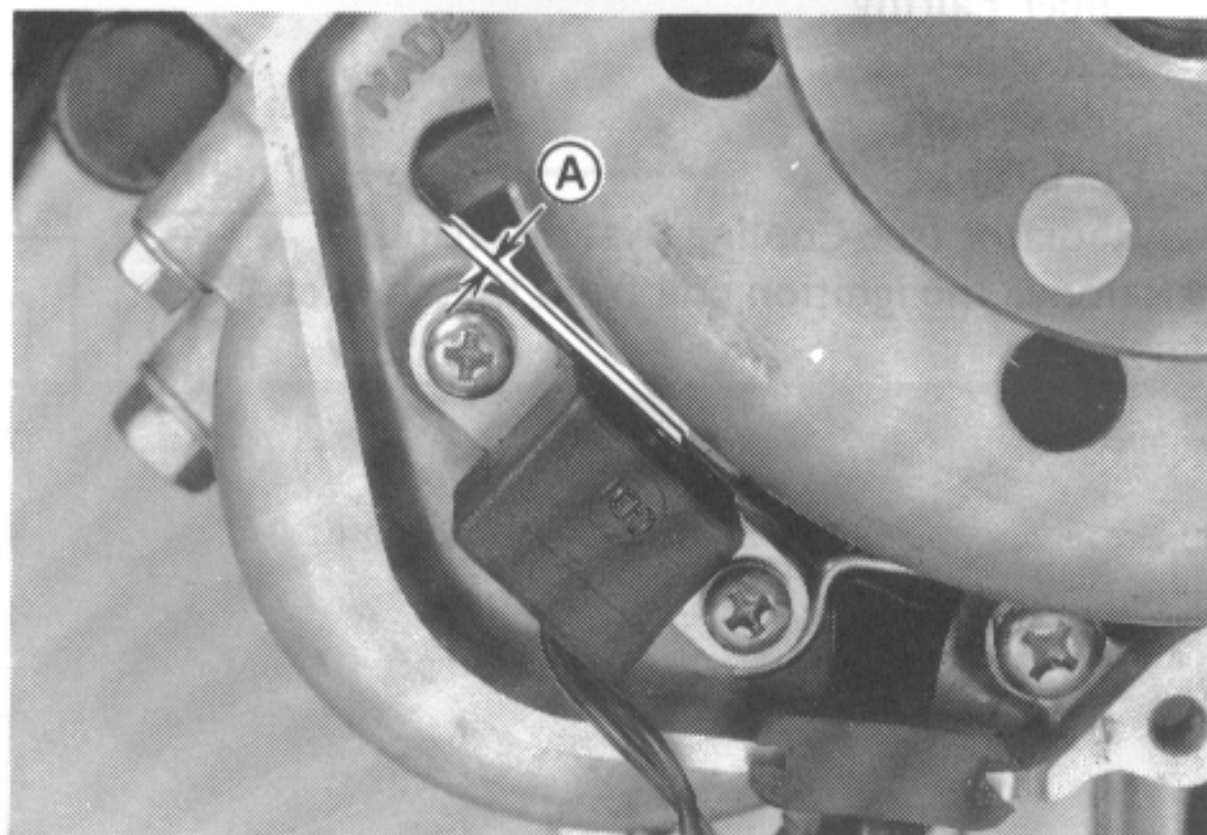
- Remove the magneto cover.
- Remove the pickup coil lead clamp screw and pickup coil mounting screw, then remove the pickup coil.

### Pickup Coil Installation Note

- Check the gap between the pickup coil core and the magneto rotor at installation.
- ★ Replace the pickup coil if necessary.

### Pickup Coil Air Gap

0.4 – 1.1 mm



A. Air Gap

### Pickup Coil Inspection

- Set the hand tester x 100  $\Omega$  range and connect it to pickup coil leads.
- ★ If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.

### Pickup Coil Resistance

100 – 150  $\Omega$

- Using the highest resistance range of the ohmmeter, measure the resistance between the pickup coil leads and chassis ground.
- ★ Any meter reading less than infinity ( $\infty$ ) indicates a short, necessitating replacement of the pickup coil assembly.

### Exciter Coil Resistance Measurement

- Set the hand tester to the x 10  $\Omega$  range, and connect it to the leads from the exciter coil to check the resistance.
- ★ If the reading is not the specified value, replace the stator.

### Exciter Coil Resistance

W – Meter – R: 2 – 7  $\Omega$   
BK – Meter – R: 100 – 200  $\Omega$

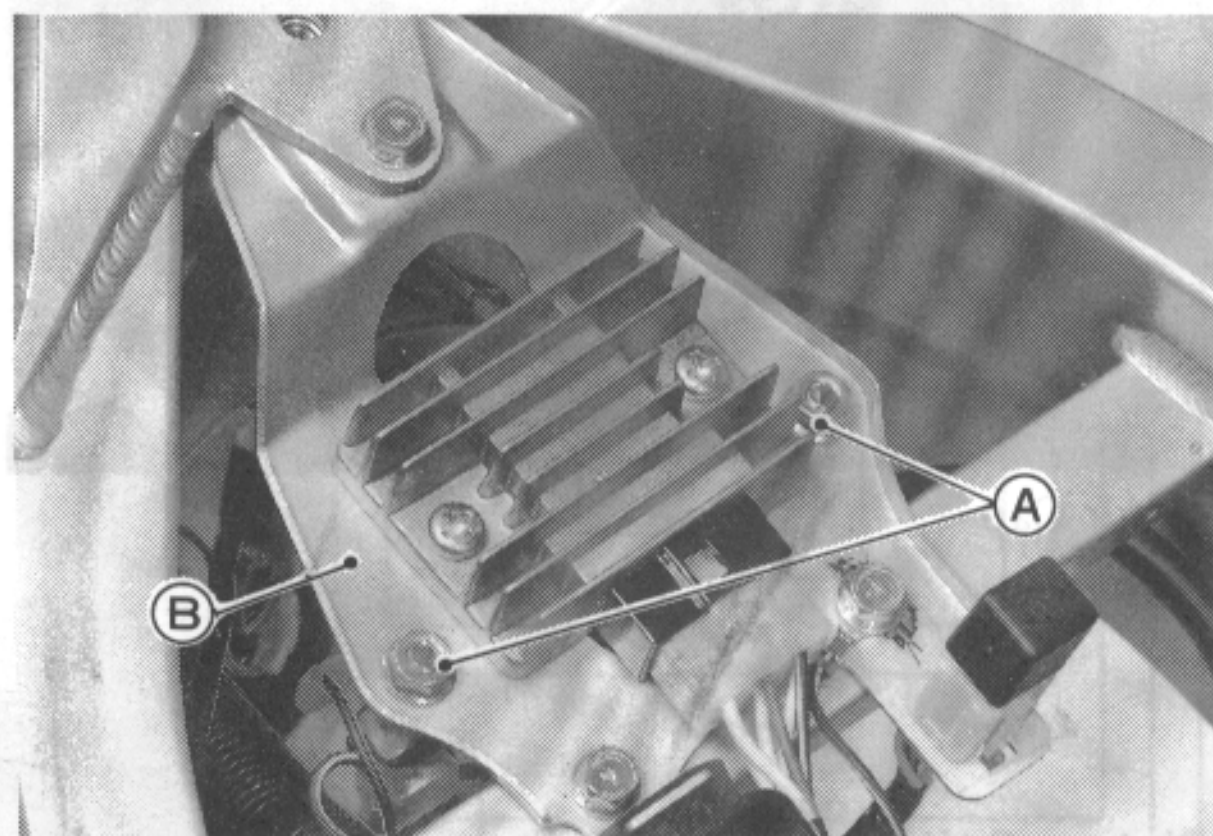
- Using the highest resistance range of the hand tester, check the resistance between the exciter coil leads and chassis ground.
- ★ Any meter reading less than infinity indicates a short, necessitating replacement of the stator.



## 15-19 ELECTRICAL SYSTEM

### Ignition Coil Removal

- Remove the following.
  - Lower Fairing
  - Upper Fairing
  - Seat
  - Side Covers
  - Fuel Tank
  - Radiator (see Cooling System chapter)
- Remove the ignition coil from the bracket.



A. Mounting Bolts

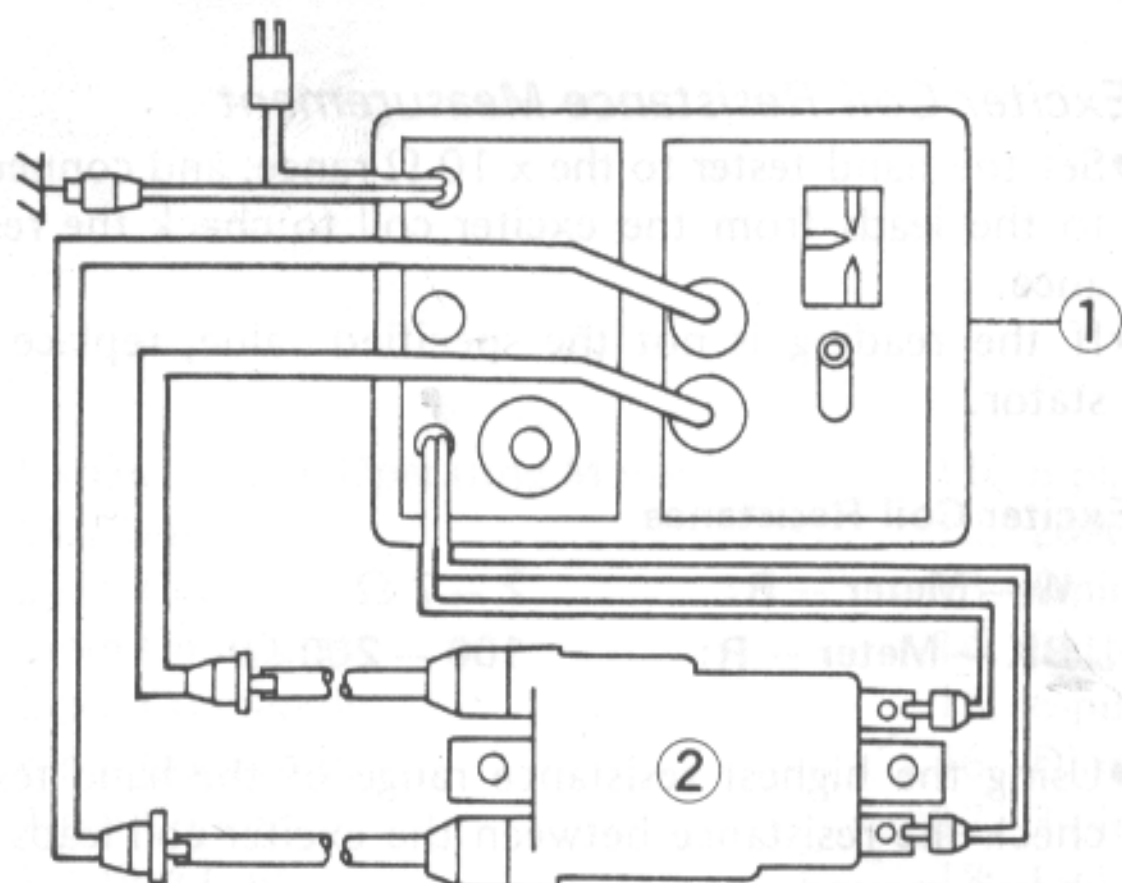
B. Brackets

### Ignition Coil Inspection

- Measure the arcing distance with the ignition coil tester (special tool) to check the condition of the ignition coil.
- Remove the ignition coil.
- Connect the ignition coil to the tester, and measure the arcing distance.

#### WARNING

- To avoid extremely high voltage shocks, do not touch the coil or leads.



1. Ignition Coil Tester (57001-1242)
2. Ignition Coil

- ★ If the distance reading is less than the specified value, the ignition coil is defective, and must be replaced.

### Ignition Coil Arcing Distance

6 mm or more

### Ignition Coil Resistance Measurement

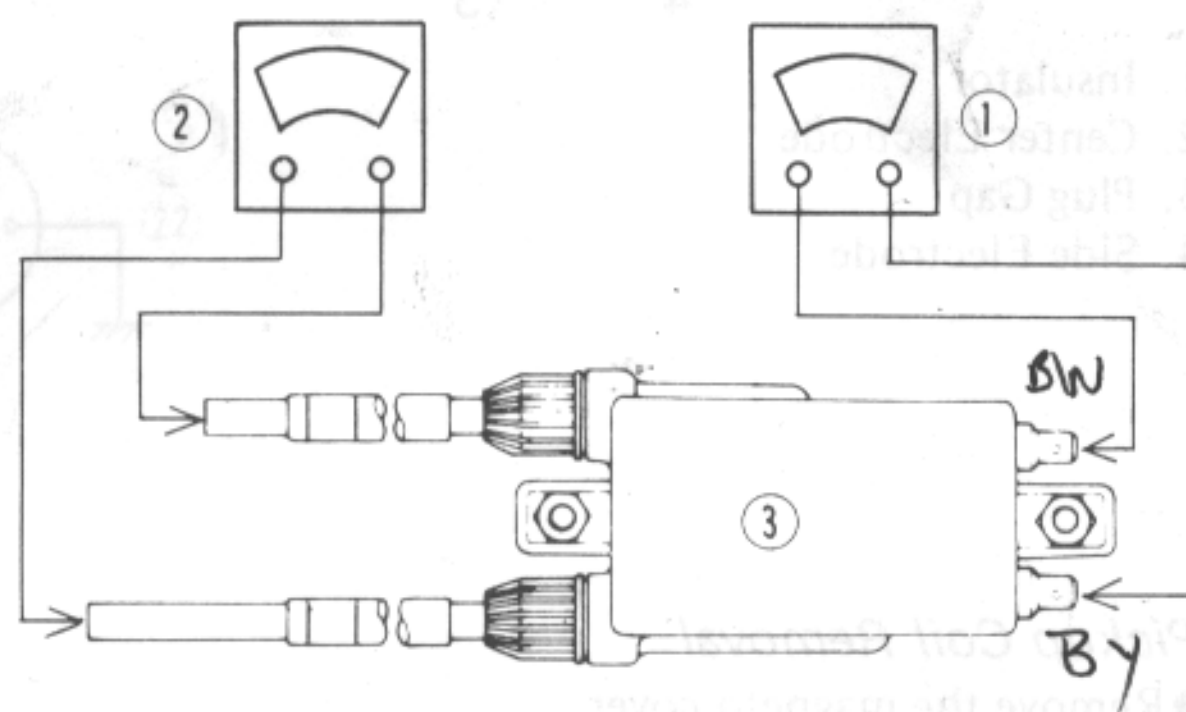
If the ignition coil tester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

- Disconnect the primary leads from the coil terminals.
- Measure the primary winding resistance.
  - Connect an ohmmeter between the coil terminals.
  - Set the tester to the  $\times 1 \Omega$  range, and read the meter.
- Measure the secondary winding resistance.
  - Pull the spark plug cap off each lead.
  - Connect the hand tester between the spark plug leads.
  - Set the meter to the  $\times 1 \text{ k}\Omega$  range, and read the meter.
- ★ If the meter does not read as specified, replace the coil.

### Ignition Coil Winding Resistance

Primary Windings:	0.28 – 0.38 $\Omega$
Secondary windings:	4.7 – 7.1 $\text{k}\Omega$

### Measuring Ignition Coil Resistance



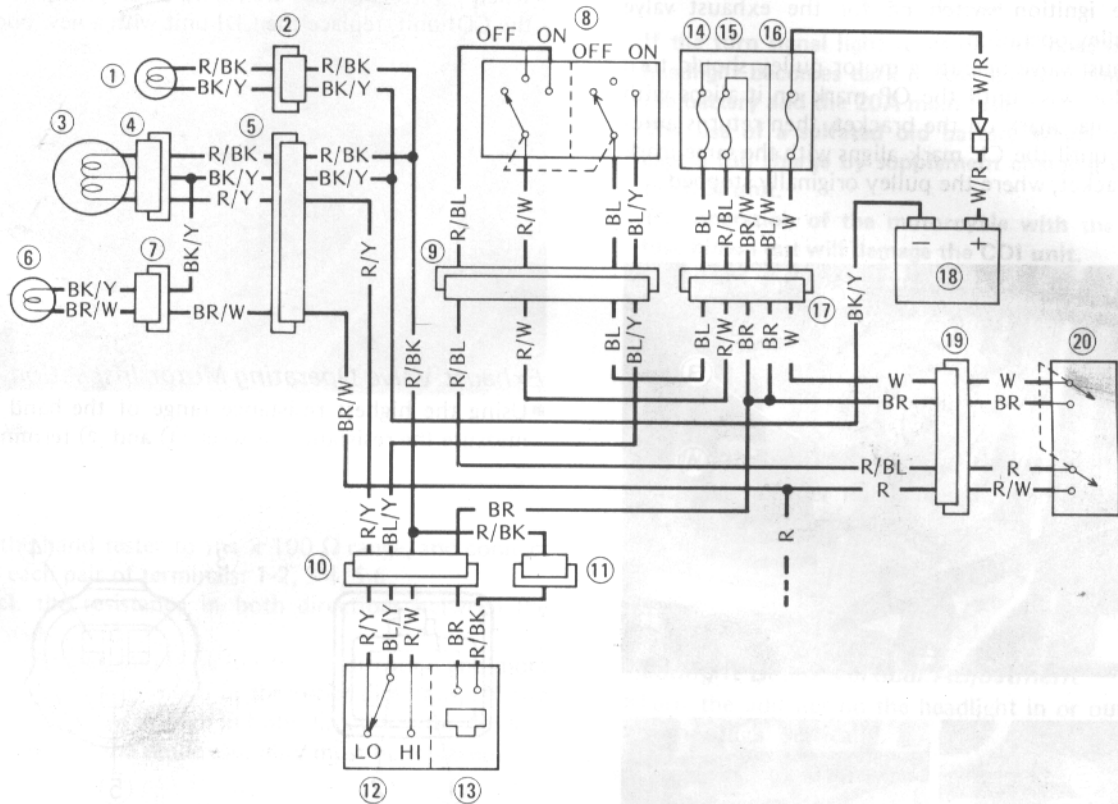
1. Measure primary winding resistance
2. Measure secondary winding resistance
3. Ignition Coil

- ★ If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked, test replace the coil with one known to be good.

- Check the spark plug leads for visible damage.

- ★ If any spark plug lead is damaged, replace the coil.

## Headlight Circuit Wiring Diagram



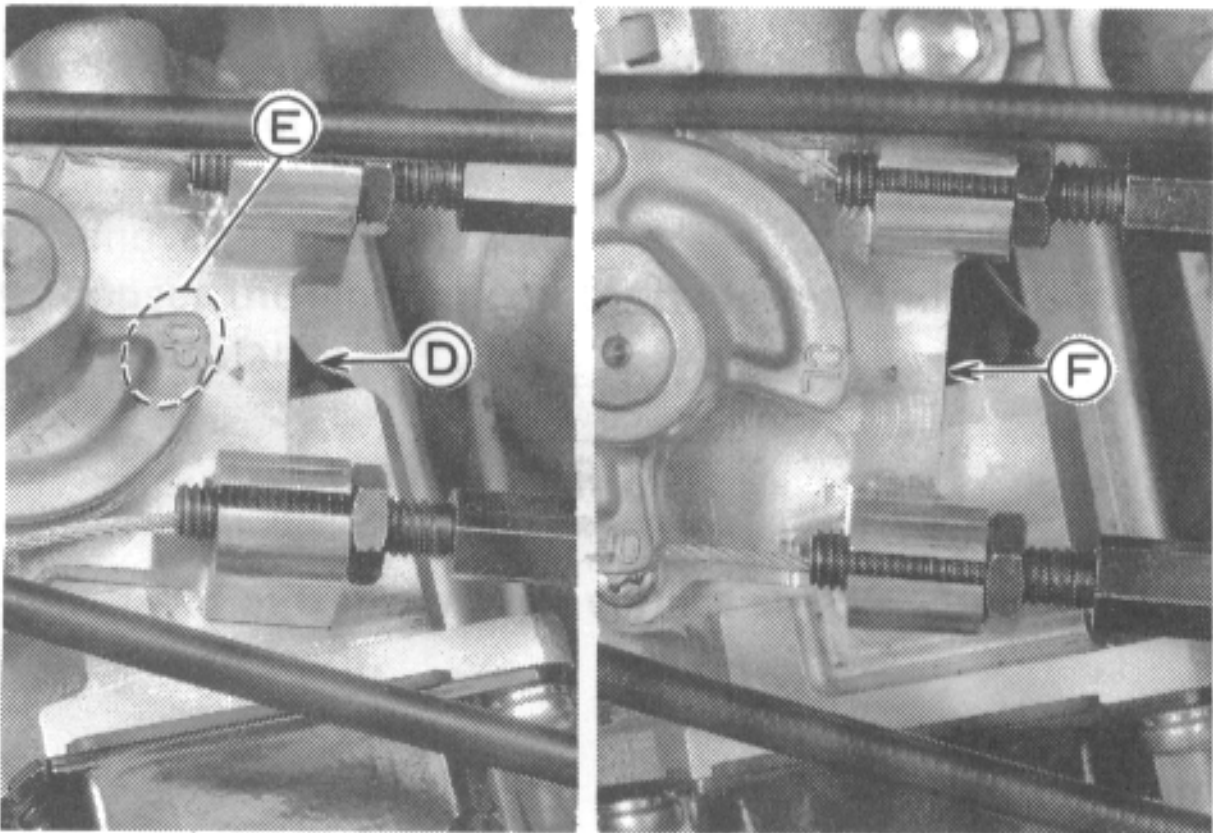
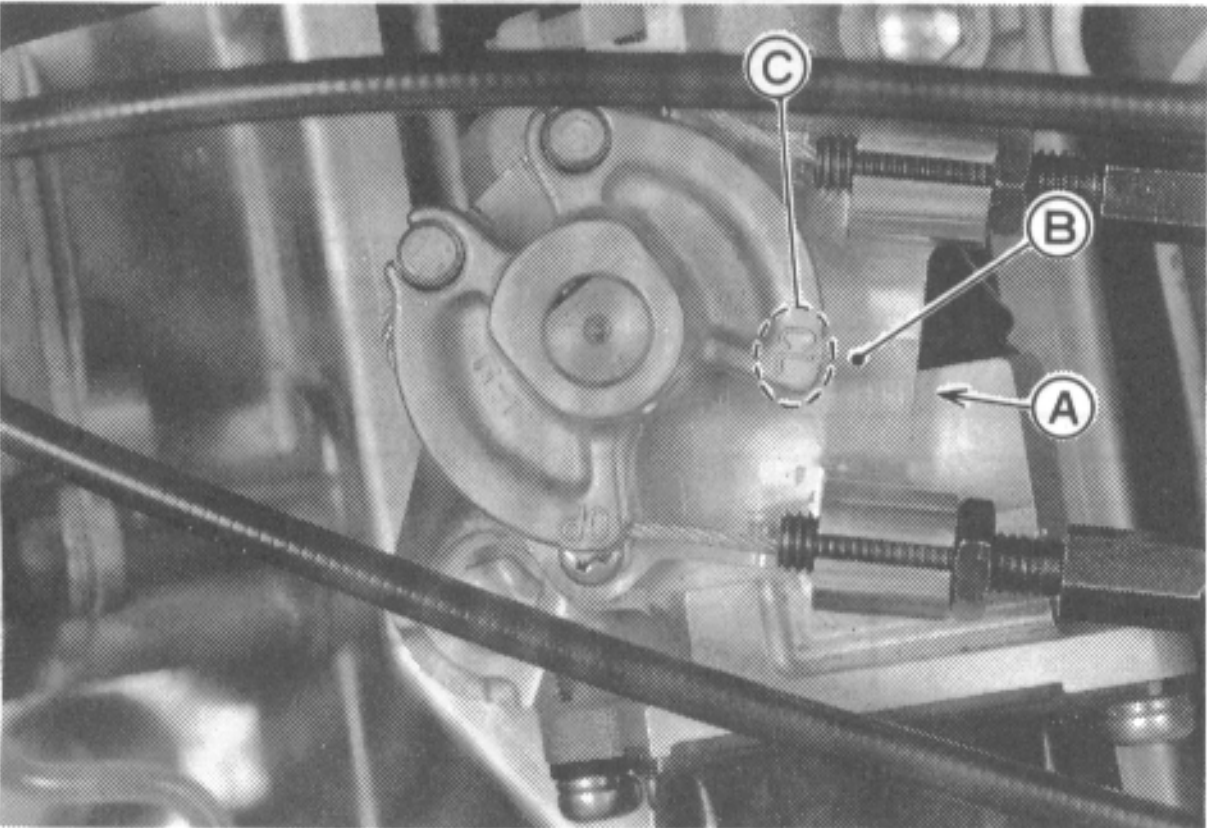
## NOTE

1. High Beam Indicator Light
2. 9-pin Connector
3. Headlight
4. 3-pin Connector
5. 6-pin Connector
6. City Light
7. 2-pin Connector
8. Headlight Switch
9. 9-pin Connector
10. 9-pin Connector
11. 3-pin Connector
12. Dimmer Switch
13. Passing Button
14. 10A Fuse
15. 10A Fuse
16. 20A Fuse
17. 6-pin Connector
18. Battery
19. 6-pin Connector
20. Ignition Switch



CDI Unit/Exhaust Valve Operation Inspection

- Remove the following parts.
  - Seat
  - Side Covers
  - Fuel Tank
- Turn the ignition switch on for the exhaust valve motor pulley operation.
- The exhaust valve operating motor pulley should turn counterclockwise until the OP mark on it aligns with the triangular mark on the bracket, then returns automatically until the CL mark aligns with the same mark on the bracket, where the pulley originally stopped.



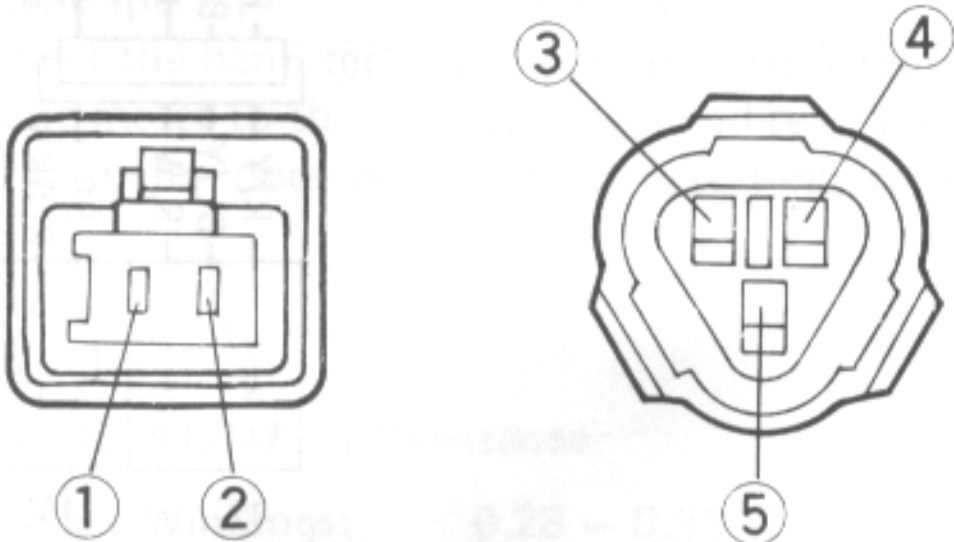
- A. Normal Pulley Position with Ignition OFF
- B. Mark on Bracket
- C. CL Mark
- D. Pulley Position when Ignition turned ON.
- E. OP Mark
- F. Pulley returns to the original position.

- ★ If the pulley movement looks slow, catchy, or the pulley doesn't move at all, follow the next procedure.
- Remove the exhaust valve operating cables from the pulley and turn the ignition on.
- ★ If the marks on the pulley do not align with the mark on the bracket, or the pulley moves roughly or doesn't move at all, inspect the operating motor (see Exhaust Valve Operating Motor Inspection).

- ★ When the pulley functions properly, check the operating cable for damage or correct adjustment, and inspect wire connections, exhaust valve operating unit and exhaust valve installation (see the Engine Top chapter).
- ★ When no irregularities are found on all parts except for the CDI unit, replace the CDI unit with a new one.

Exhaust Valve Operating Motor Inspection

- Using the highest resistance range of the hand tester, measure the resistance between ① and ② terminals.



- If the meter reading is infinity ( $\infty$ ), replace the operating motor).
- Apply DC 8-16 V current between ① and ② terminals. The pulley turns clockwise or counterclockwise.
- ★ If the pulley moves roughly or doesn't move at all, replace the operating motor.
- Measure the resistance between ③ - ④, ③ - ⑤, and ④ - ⑤ terminal.

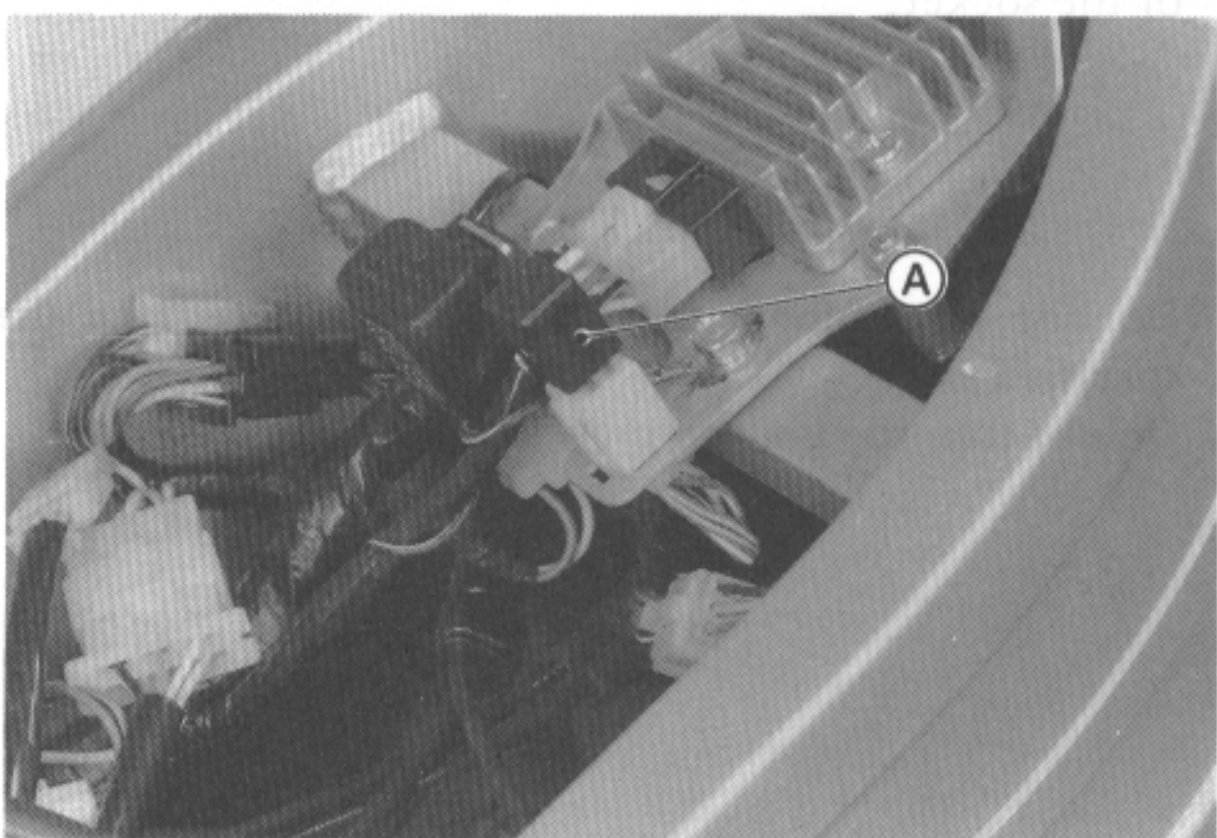
Meter Range	Connection	Standard (k $\Omega$ )
x 1 k $\Omega$	③ - ④	0 - 6
	③ - ⑤	0 - 6
	④ - ⑤	4 - 6

- ★ If the reading exceeds the standard, replace the operating motor.
- Visually inspect the operating motor for any kind of damages. Lightly shake the motor badly to check an abnormal noise.
- ★ Replace the operating motor if necessary.



### Diode Inspection

- Remove the diode assembly.



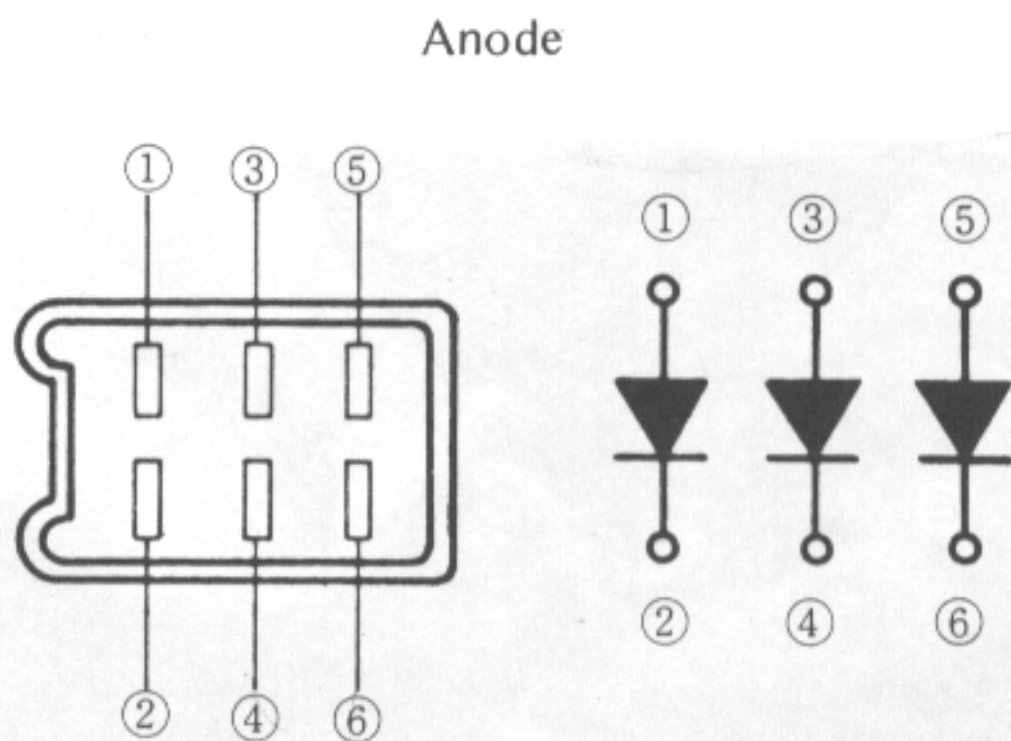
A. Diode

- Set the hand tester to the  $\times 100 \Omega$  range, and connect it to each pair of terminals: 1-2, 3-4, 5-6.
- Check the resistance in both directions between the terminals.
- ★ The resistance should be low in one direction and more than ten times as much in the other direction. If any diode shows low or high in both directions, the diode is defective and the diode assembly must be replaced.

### NOTE

- The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from zero to the first 1/2 of the scale.

### Diode Polarity



Cathode

### Lighting System

#### CAUTION

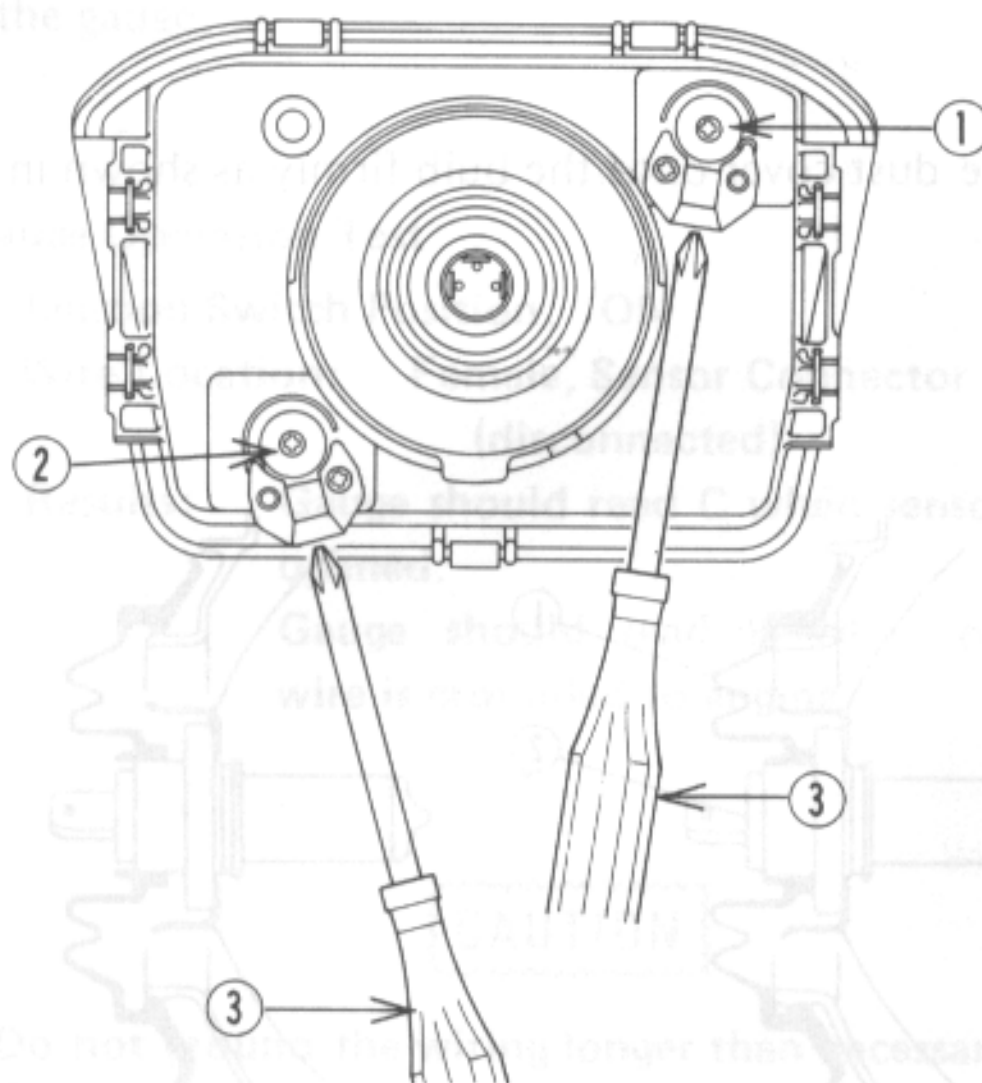
- If the turn signal light turns on but, does not flash, or headlight becomes dark at low speed operation, check the battery and the 20A main fuse.
- The use of a sulfated old battery which will not accept a full charge by supplement charging will damage the CDI unit.
- The operation of the motorcycle with the 20A main fuse blown out will damage the CDI unit.
- Operating the motorcycle without the battery will damage the CDI unit.

### Headlight Beam Horizontal Adjustment

- Turn the adjuster on the headlight in or out until the beam points straight ahead.

### Headlight Beam Vertical Adjustment

- Turn the adjuster on the headlight in or out to adjust the headlight vertically.

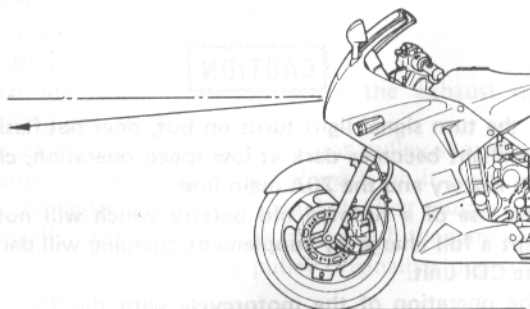


1. Horizontal Adjuster
2. Vertical Adjuster
3. Phillips Screwdriver

### NOTE

- On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.



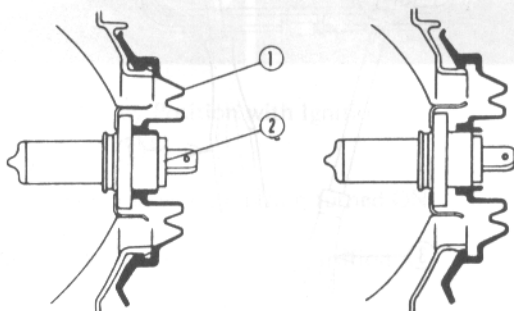


## Headlight Bulb Replacement Notes

### CAUTION

When handling the quartz-halogen bulbs, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.

Fit the dust cover onto the bulb firmly as shown in the figure.



Good

Bad

1. Dust Cover

2. Bulb

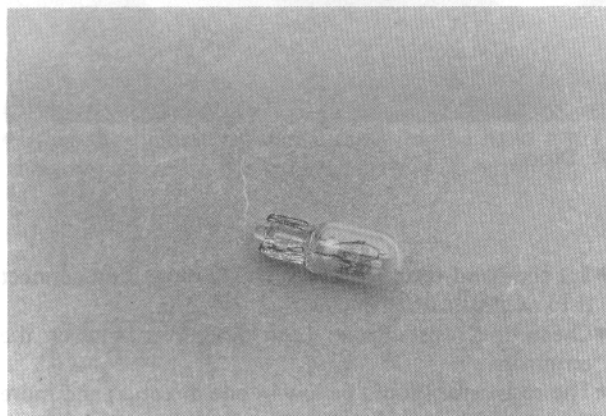
After installation, adjust the headlight aim.

## Wedge-Base Type Bulb Replacement Note

- Note the following.
- To remove the wedge-base type bulb pull the bulb out of the socket.

### CAUTION

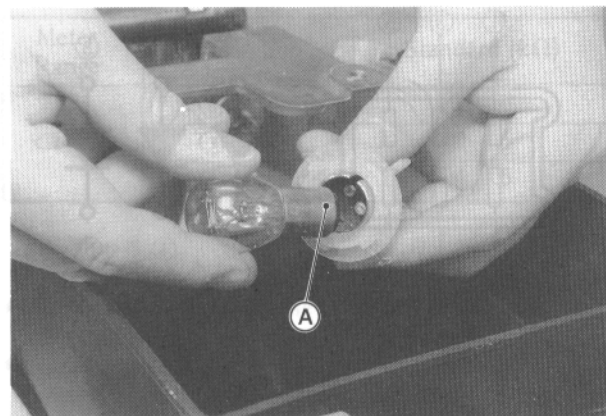
- Do not use bulb rated for greater wattage than the specified value.
- Do not turn the bulb to prevent damage to the bulb.



## Tail/Brake Light Bulb

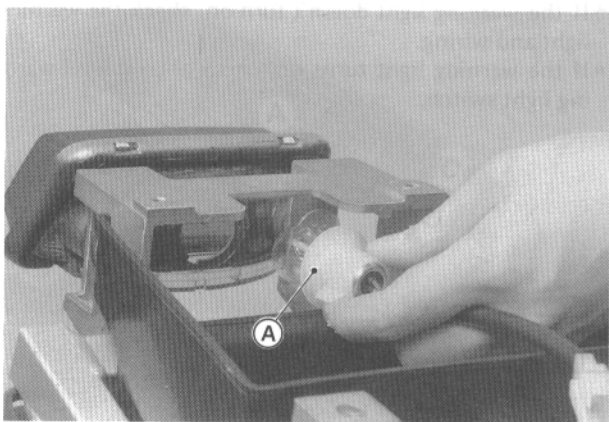
### (License Plate Light) Replacement Notes

- Insert the new bulb by aligning the pins with the grooves in the walls of the socket so that the pin closest to the bulb base is to the upper right.



A. Pin Closest to Base.

- Insert the socket by aligning the tangs with the catches in the housing so that the triangular mark points down, and turn it clockwise.



A. Triangular Mark

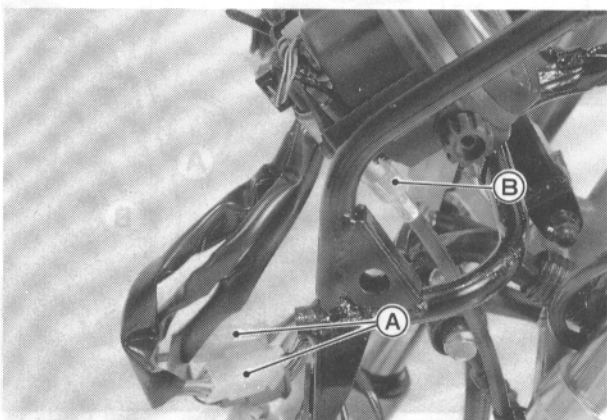
## Meter, Gauge

### CAUTION

- If the turn signal light turns on but does not flash, or headlight becomes dark at low speed operation, check the battery and the 20A main fuse.
- The use of a sulfated old battery which will not accept a full charge by supplement charging will damage the CDI unit.
- The operation of the motorcycle with the 20A main fuse blown out will damage the CDI unit.

### Removal

- Remove the following.
  - Lower Fairing
  - Upper Fairing



A. Connector

B. Speedometer Cable Upper End



A. Mounting Bolts

B. Meter Assembly

### CAUTION

- Place the meter or gauge so that the face is up. If a meter or gauge is left upside down or sideways for any length of time, it will malfunction.

### Coolant Temperature Gauge Operation Inspection

- Prepare an auxiliary wire, and check the operation of the gauge.

### Gauge Operation Test

Ignition Switch Position: ON

Wire Location: Female, Sensor Connector (disconnected)

Results: Gauge should read C when sensor wire is opened.

Gauge should read H when connector wire is grounded to engine.

### CAUTION

- Do not ground the wiring longer than necessary. After the needle swings to the H position, stop the test. Otherwise the gauge could be damaged.

★ If these readings are not correct, the trouble is with the gauge and/or wiring.

- Check the coolant temperature gauge circuit wiring (see Wiring Inspection).
- If all wiring and components other than the coolant temperature gauge unit check out good, the gauge is defective.

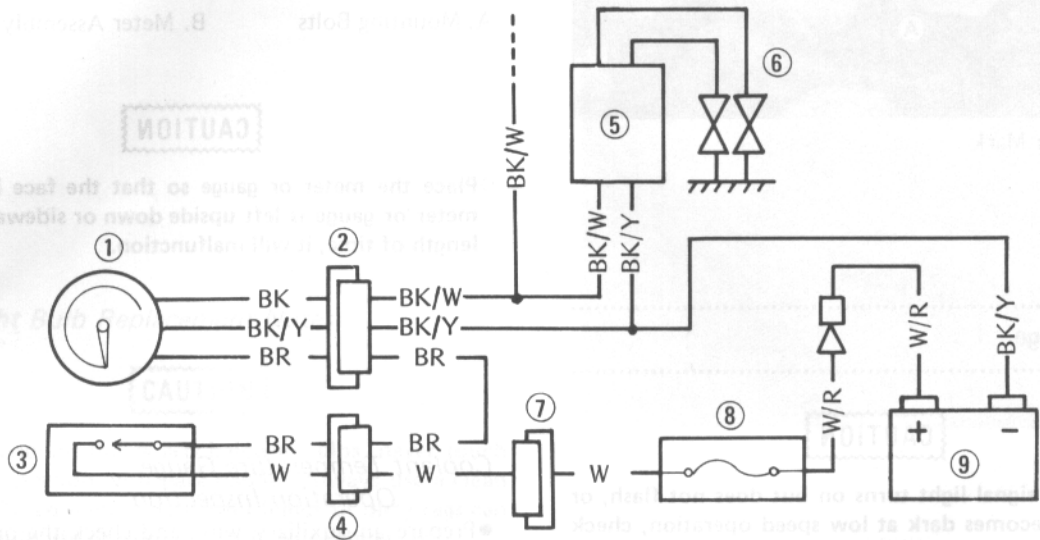


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Tachometer Inspection

- Check the tachometer circuit wiring.
- ★ If all wiring, battery, and 20A fuse check out good, the tachometer unit must be replaced.
- ★ If the battery or 20A main fuse check out bad, inspect the CDI unit also.

Tachometer Circuit Wiring Diagram



1. Tachometer
2. 4-pin Connector
3. Ignition Switch
4. 6-pin Connector
5. Ignition Coil
6. Spark Plugs
7. 6-pin Connector
8. 20A Fuse
9. Battery

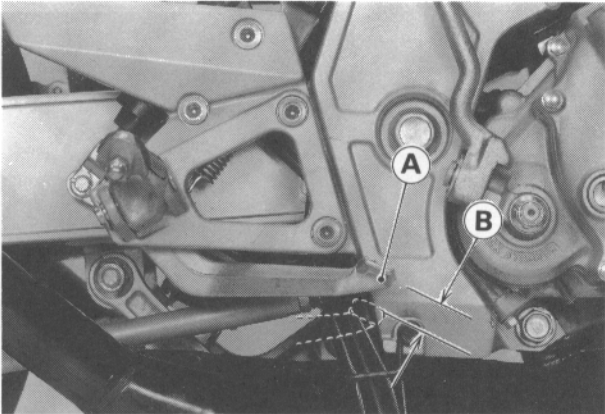
Oil Level Warning Light Inspection

- Disconnect the oil level warning light lead connector.
- Ground the blue/red lead from the light using an auxiliary wire.
- ★ If the warning light doesn't turn on, check the warning light and wiring.
- ★ If the warning light turns on, check the oil level warning light switch.

Switches and Sensors

Rear Brake Light Switch Adjustment

- Check the operation of the rear brake light switch by depressing the brake pedal. The brake light should go on after about 10 mm of pedal travel.

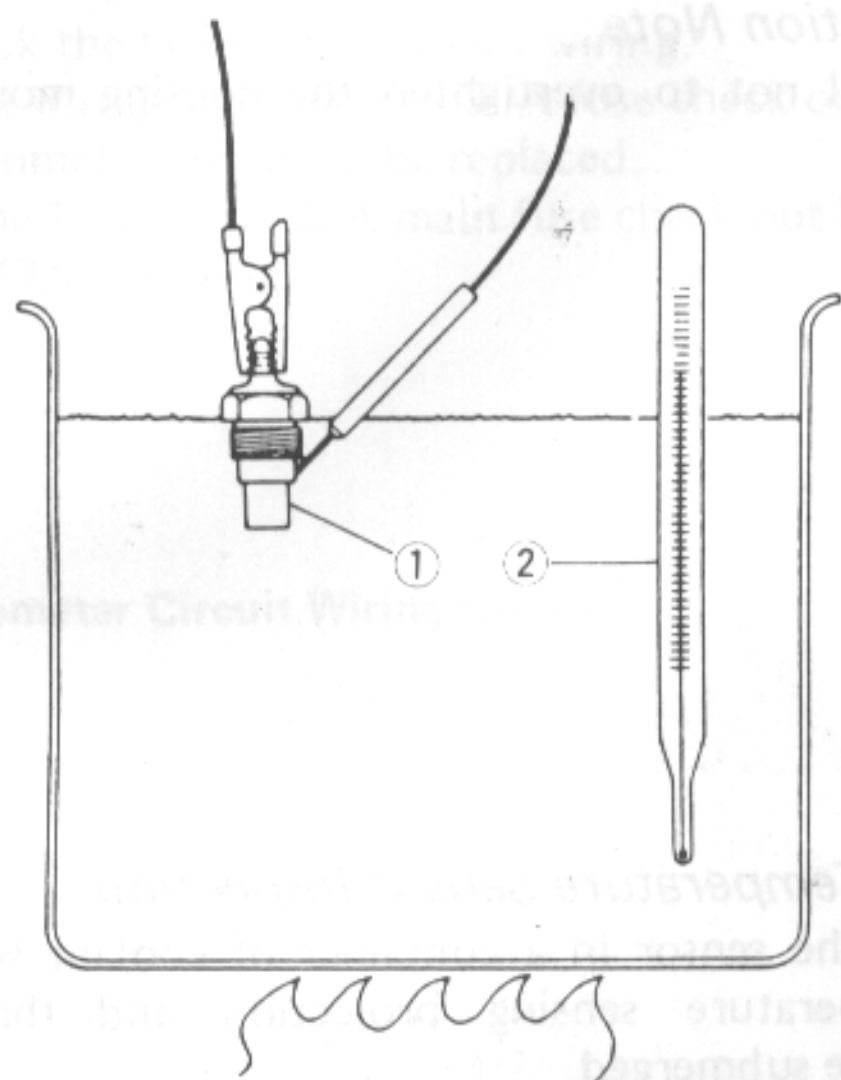


A. Brake Pedal B. 10 mm





## 15-27 ELECTRICAL SYSTEM



1. Coolant Temperature Sensor 2. Thermometer

★If the ohmmeter does not show the specified values, replace the sensor.

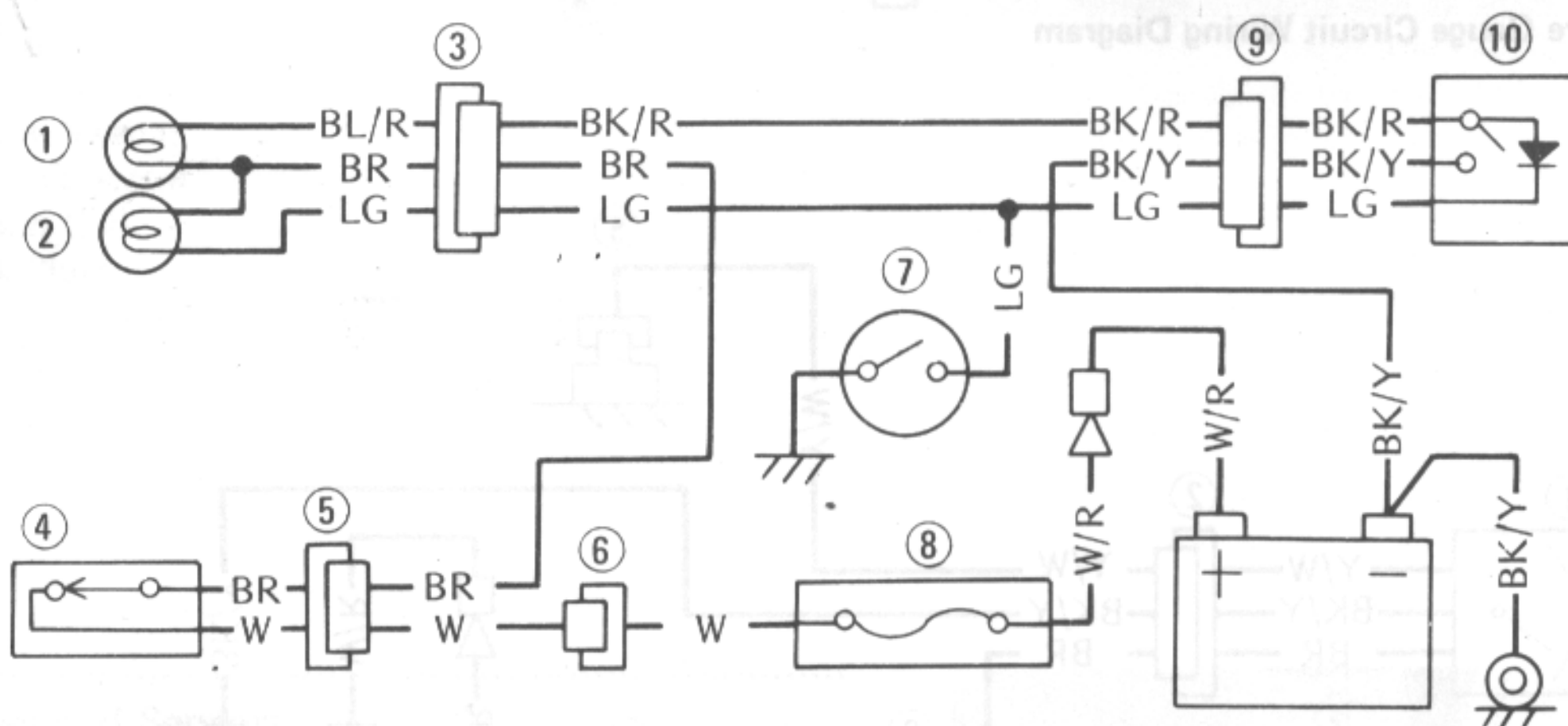
### NOTE

○The sensor and thermostat must not touch the container sides or bottom.

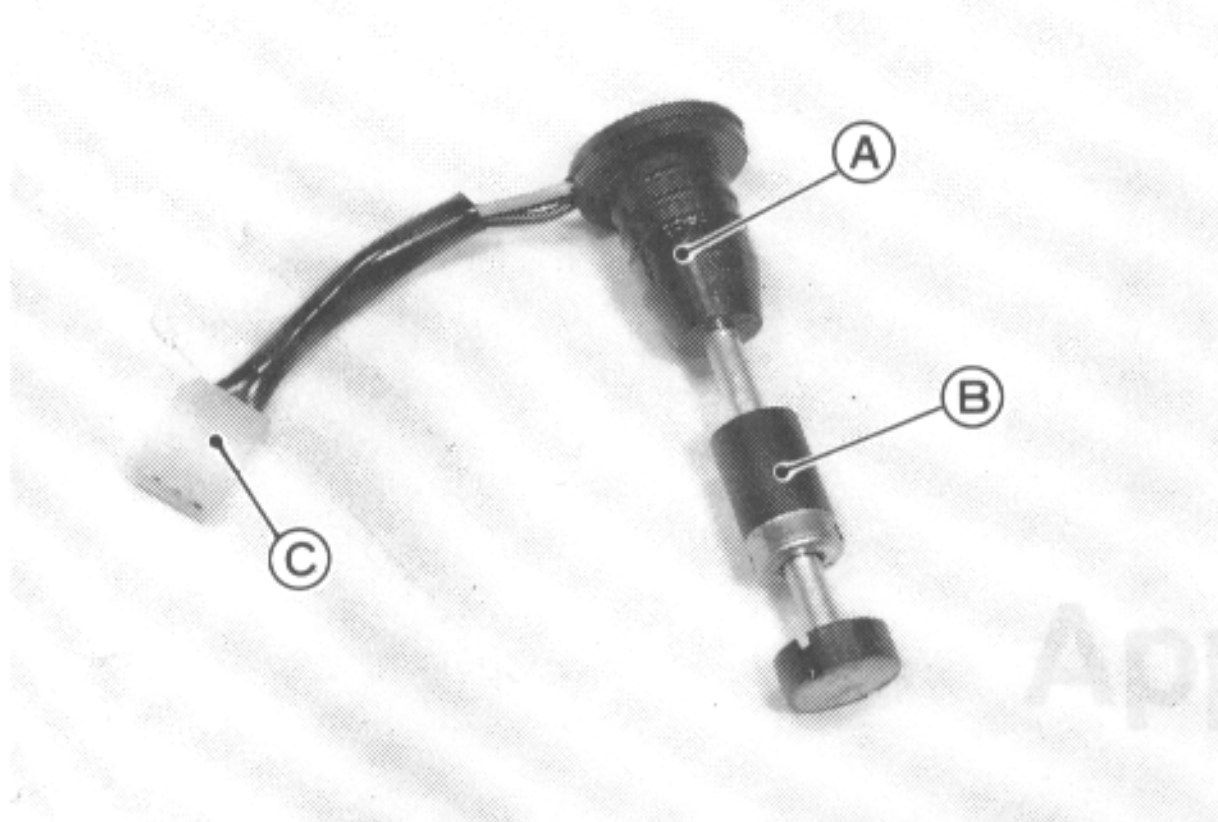
### Oil Level Warning Light Switch Inspection

- Remove the engine oil level warning light switch from the oil tank.
- Check that the float moves up and down smoothly without binding. It should go down under its own weight.
- ★If the float does not move smoothly or if the switch has visual damage, replace the switch.

### Oil Level Warning Circuit Wiring Diagram



1. Oil Level Warning Light
2. Neutral Indicator Light
3. 9-pin Connector
4. Ignition Switch
5. 6-pin Connector
6. 6-pin Connector
7. Neutral Switch
8. 20A Fuse
9. 3-pin Connector
10. Oil Level Warning Light Switch
11. Battery



A. Oil Level Warning Light Switch C. Connector  
B. Float

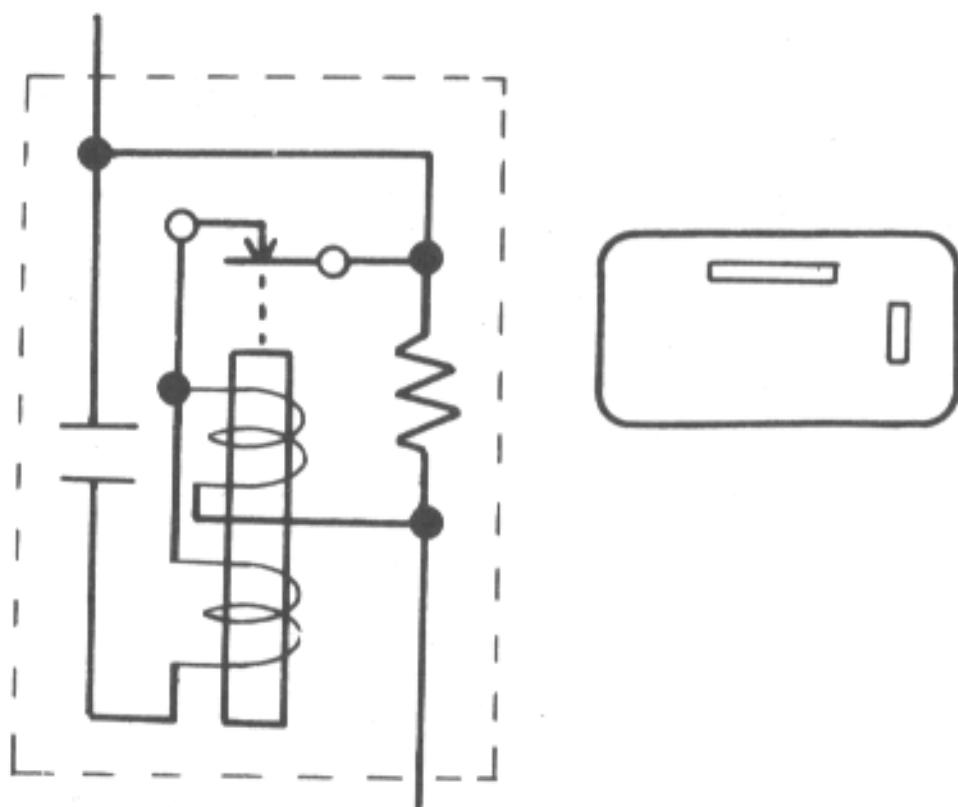
- Set the hand tester to  $\times 10 \Omega$  range.
- Measure the resistance between black/red and black/yellow leads.
- The tester should show continuity when the float is at the bottom.
- ★ If it does not, replace the sensor.
- Measure the resistance between black/red and light green lead in both direction.
- ★ If the meter does not show the specified value, replace the switch.

Meter Range	Connections		Reading
	Meter (+) Terminal	Meter (–) Terminal	
$\times 10 \Omega$	Black/Red	Light Green	$\infty$
	Light Green	Black/Red	first 1/2 of the scale

## Turn Signal Relay

### Turn Signal Relay Inspection

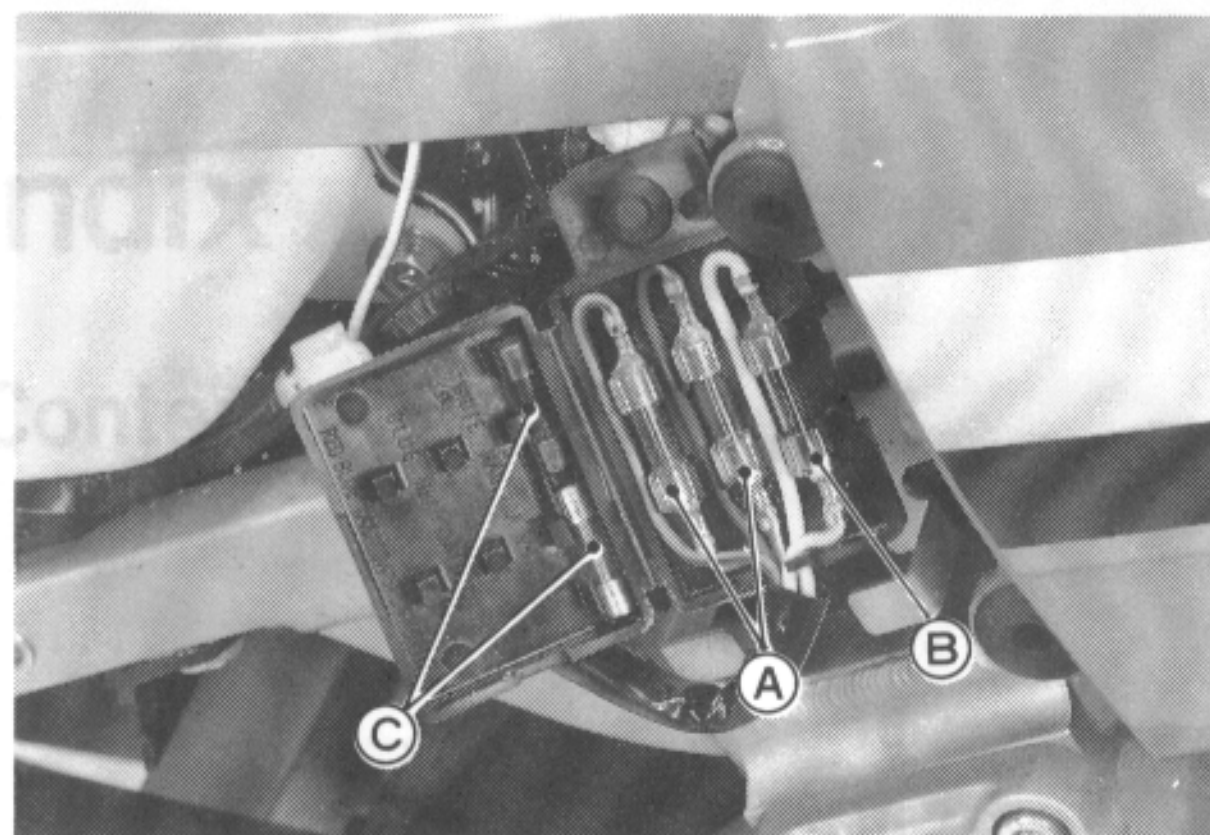
- Remove the turn signal relay.
- Set the hand tester to the  $\times 1 \Omega$  range, and measure the resistance between the terminals.



## Fuse Box

### Fuse Installation

- Install the fuses as shown.



A. 10A Fuse C. Spare Fuses  
B. 20A Fuse

### Fuse Inspection

- Inspect the fuse element.
- ★ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.

## CAUTION

- When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.