

NOTE: If you own a 1980 or later model, first check the Supplement at the back of the book for any new service information.

CHAPTER SEVEN

ELECTRICAL SYSTEM

The electrical system includes the following systems (each is described in detail in this chapter):

- a. Charging system
- b. Ignition system
- c. Lighting system
- d. Directional signals
- e. Horn

WIRING DIAGRAMS

Full color wiring diagrams are located at the end of this book.

CHARGING SYSTEM

The charging system consists of the battery, alternator and voltage regulator/rectifier. **Figure 1** is for Model D only, as it uses a mechanical contact point type voltage regulator. **Figure 2** (Models 2D, E, F, SE and SF) shows the solid state type non-adjustable voltage regulator.

The alternator generates an alternating current (AC) which the rectifier converts to direct current (DC). The regulator maintains the voltage to the battery and load (lights, ignition, etc.) at a constant voltage regardless of variations in engine speed and load.

Testing Charging System

Whenever a charging system trouble is suspected, make sure the battery is good before going any further. Clean and test the battery as described under *Battery Testing* in Chapter Three.

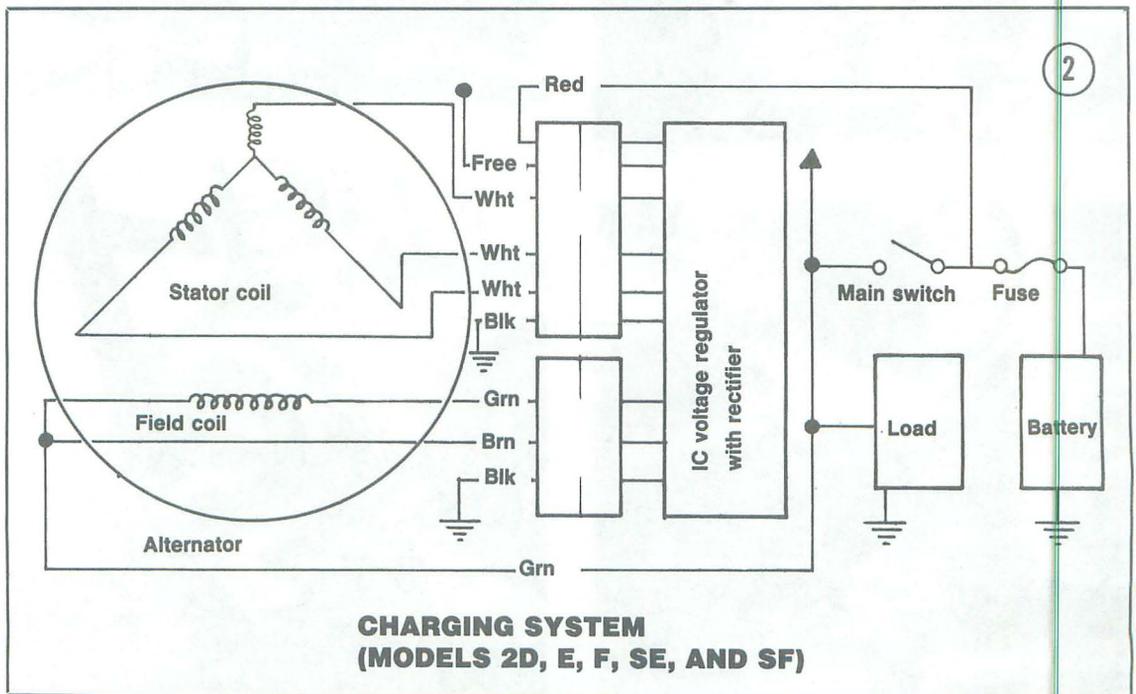
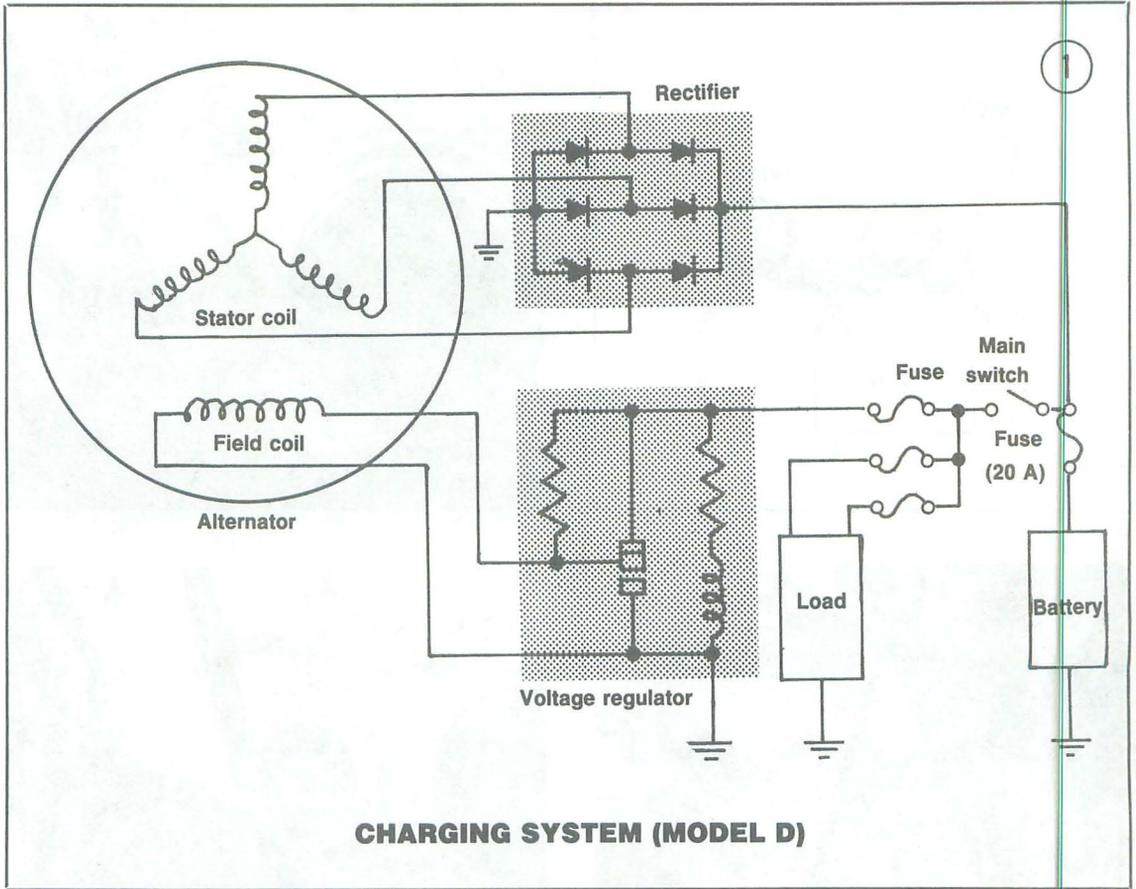
To test the charging system, disconnect the voltage regulator/rectifier black electrical wire, connect a 0-15 DC voltmeter and a 0-10 DC ammeter as shown in **Figure 3**. Connect the ammeter in series to the positive battery terminal. Connect the positive voltmeter terminal to the positive battery terminal and negative voltmeter terminal to ground.

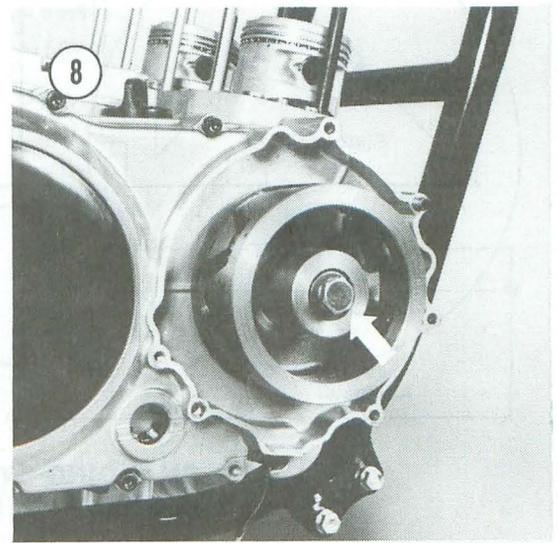
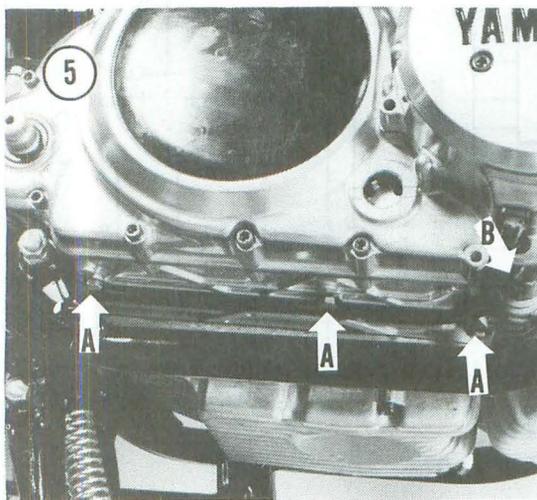
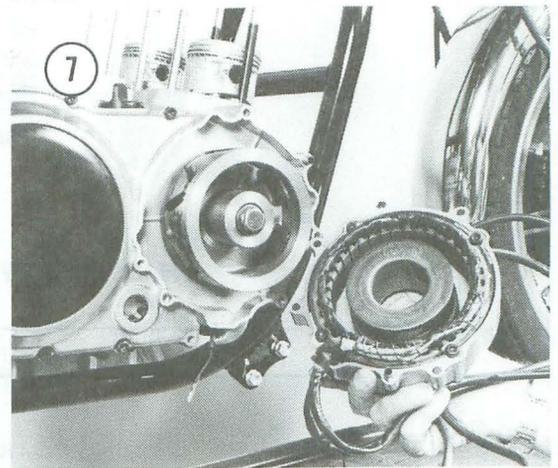
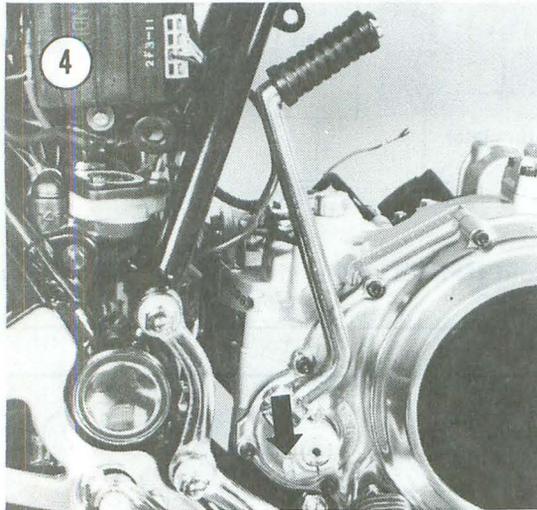
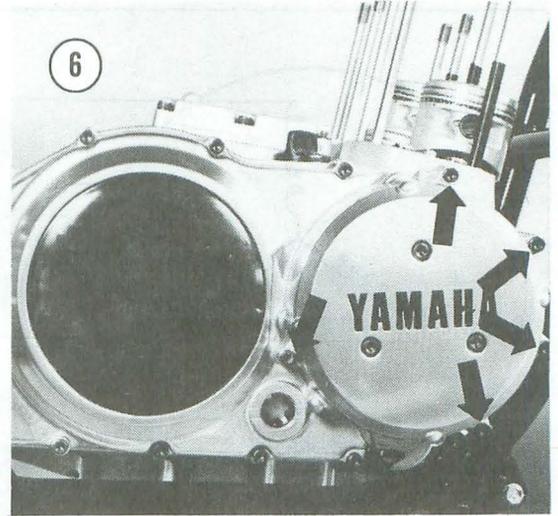
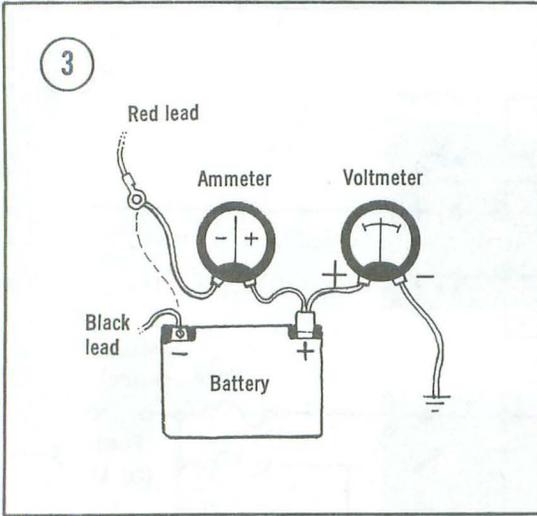
CAUTION

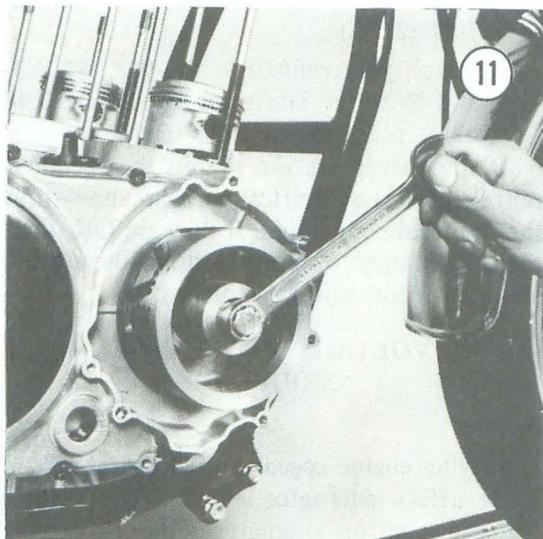
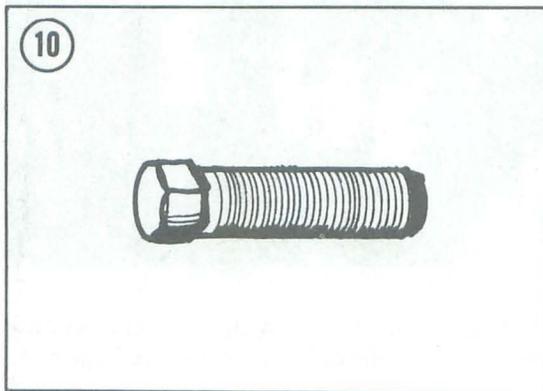
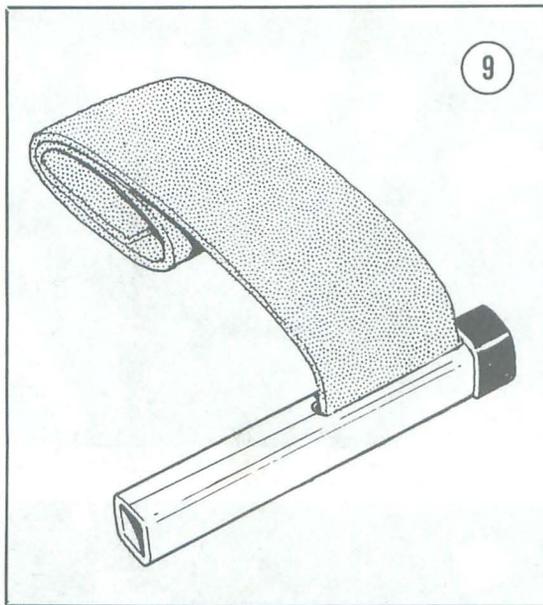
Since the ammeter is connected between the positive battery terminal and the starter cable, the ammeter will burn out if the electric starter is used. Use the kickstarter only.

Start the engine with the kickstarter and run at 2,000 rpm. Minimum charging current should be 5 amperes. Voltmeter should read 14.5 volts.

All of the measurements are made with lights on high beam. If charging current is considerably lower than specified, check the alternator and voltage regulator/rectifier. It is less







likely that the charging current is too high; in that case, the regulator is probably at fault.

Test the separate charging system components as described under the appropriate heading in the following sections.

Battery Care, Inspection, and Testing

For complete battery information refer to *Battery* in Chapter Three.

ALTERNATOR

An alternator is a form of electrical generator in which a magnetized field called a rotor revolves within a set of stationary coils called a stator. As the rotor revolves, alternating current is induced in the stator. The current is then rectified and used to operate the electrical accessories on the motorcycle and for charging the battery.

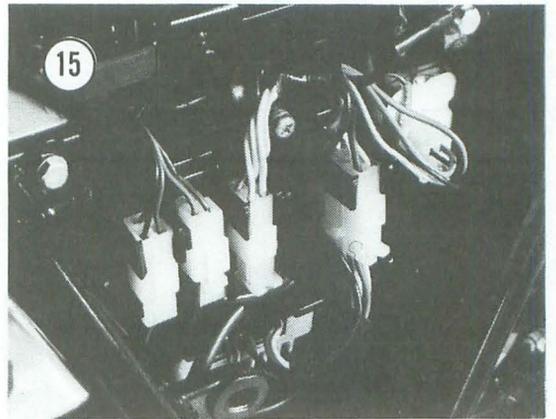
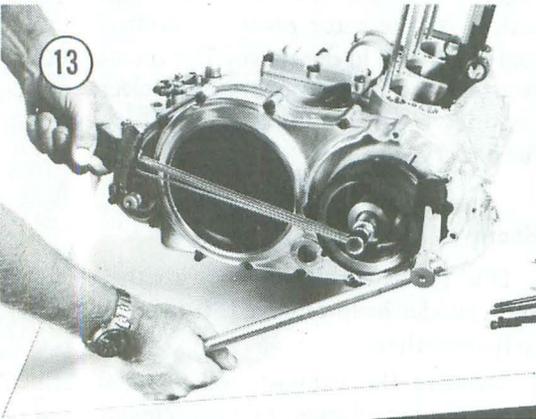
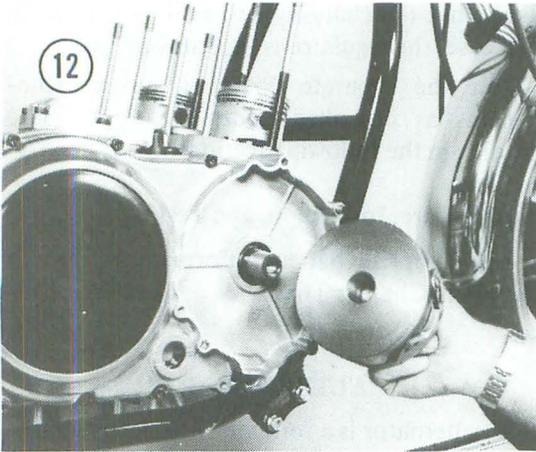
Removal/Installation

This procedure is shown with the cylinder and cylinder head removed. It is not necessary to remove them.

1. Remove the exhaust system as described under *Exhaust System Removal/Installation* in Chapter Six.
2. Loosen the bolt securing the kickstarter arm (Figure 4) to the shaft and remove the arm.
3. Loosen the 3 bolts and straps (A, Figure 5) securing the alternator electrical cable to the crankcase. Disconnect the oil pressure sending switch electrical wire (B, Figure 5).
4. Disconnect the electrical connectors from the alternator to their related components.
5. Remove the 5 Allen bolts (Figure 6) securing the alternator cover/coil assembly and remove it (Figure 7).
6. Remove the bolt (Figure 8) securing the rotor.

NOTE: If necessary, use a strap wrench (Figure 9) to keep the rotor from turning while removing the bolt.

7. Screw in a flywheel puller (Figure 10) until it stops. Use a wrench on the puller (Figure 11)



and tap on the end of it with your hand or a plastic mallet until the rotor disengages. Remove the puller and the rotor (Figure 12).

8. Install by reversing the removal steps. Secure the rotor bolt to 25 ft.-lb. (34 N•m) using a torque and strap wrench (Figure 13).

Stator and Rotor Testing

1. Remove the left-hand side cover (Figure 14).
2. Disconnect the stator electrical leads (Figure 15). The field coil connector contains 2 wires — 1 green and 1 black (A, Figure 16). The stator connector contains 3 wires — all 3 are white (B, Figure 16).

3. Remove the alternator as described under *Alternator Removal/Installation* in this chapter.

4. Visually inspect the stator (Figure 17) for signs of damage to the coils and electrical wires leading to it.

5. Use an ohmmeter and measure the resistance between the following terminals. See Figure 18.

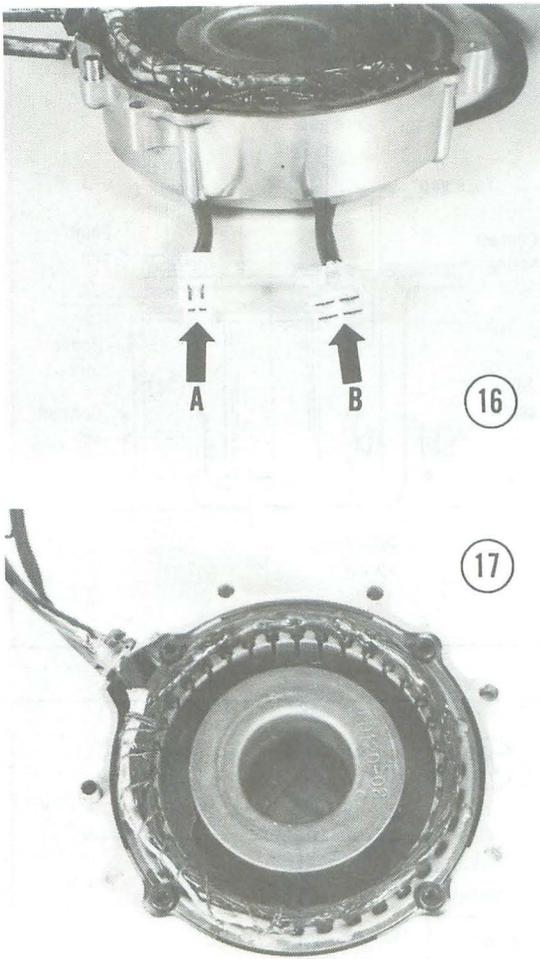
- Field coil terminals — black to green. The value should be $4.04 \text{ ohms} \pm 10\%$ at 70°F (21°C).
- Stator coil terminals — W1-W2, W2-W3, and W3-W1. The value should be $0.48 \text{ ohms} \pm 10\%$ at 70°F (21°C).

6. If the values are not within the specified range, check the electrical wires to and within the terminal connectors. If they are OK, then there is an open or short in the coils and the stator or rotor must be replaced.

VOLTAGE REGULATOR (MODEL D)

Testing

Varying engine speeds and electrical system loads affect alternator output. The voltage regulator controls alternator output by varying

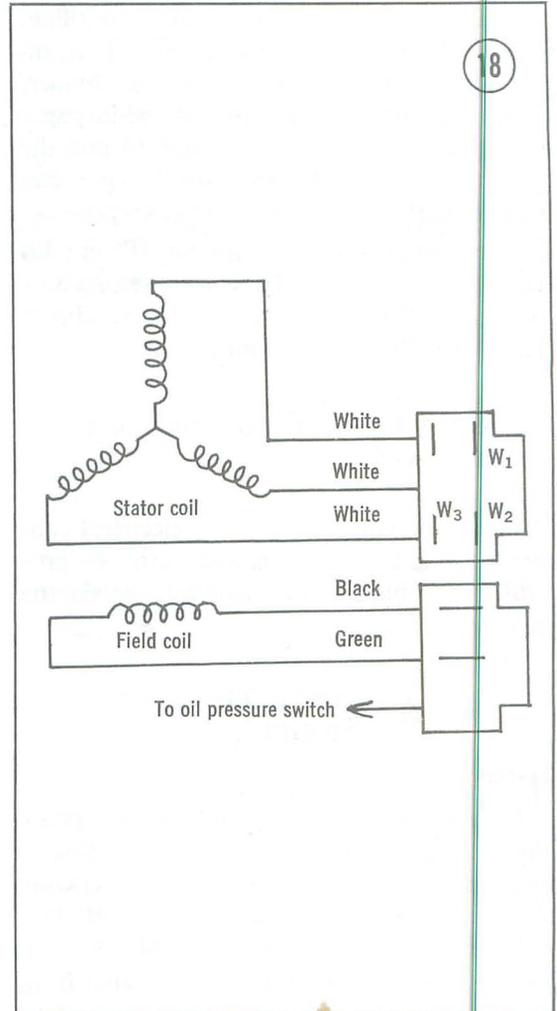


its field current. Before making any voltage regulator test, be sure that the battery is in good condition, and is at or near full charge.

1. Remove the left-hand side cover (Figure 14).
2. Disconnect electrical connector (Figure 15) containing 5 wires — 3 white, 1 red, and 1 black. Remove the red wire from the connector and connect the positive (+) lead of the 20V DC voltmeter to this red wire from the rectifier. Connect the negative (-) lead of the voltmeter to a good ground.
3. Start the engine — the reading should be 14.5-15V (DC). If the voltage fluctuates by more than 0.5V, the regulator needs adjustment.

CAUTION

Do not short the red wire as it will damage the rectifier.



Adjustment

1. Disconnect the negative battery lead from the battery.
2. Remove the left-hand side cover (Figure 14).
3. Disconnect electrical connector (Figure 15) containing 5 wires—3 white, 1 red and 1 black.
4. Remove the voltage regulator from the bike and remove the cover from it.
5. Check the condition of the breaker points. If rough, smooth them with a few strokes of a clean point file or Flexstone (available at most auto parts stores). Do not use emery cloth or sandpaper, as particles remain on the points and cause arcing and burning. If a few strokes of the file do not smooth the points completely, replace the regulator.

If the points are still serviceable after filing, remove all residue with a commercially available contact point cleaner or lacquer thinner. Close the points on a piece of clean white paper such as a business card. Continue to pull the card through the closed points until no particles or discoloration are transferred to the card.

6. Check the points and core gap (**Figure 19**) and adjust if necessary. The correct setting is — point gap 0.012-0.016 in. (0.3-0.4mm) and core gap 0.024-0.40 in. (0.6-1.0mm).

NOTE: The yoke gap does not require adjustment.

7. Install the voltage regulator, electrical connections, and battery cable. Repeat the test procedure. If voltage is still incorrect, replace the regulator.

RECTIFIER (MODEL D)

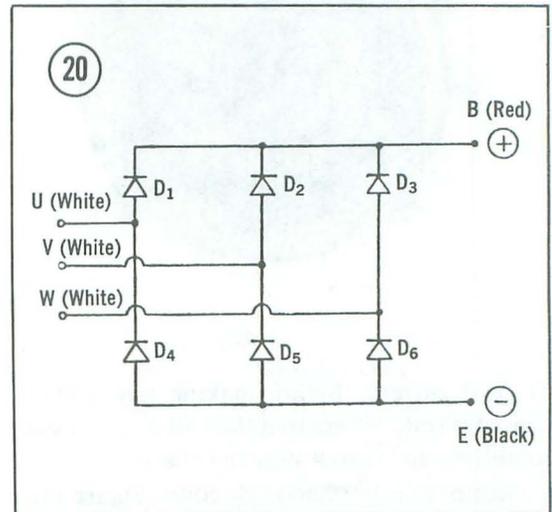
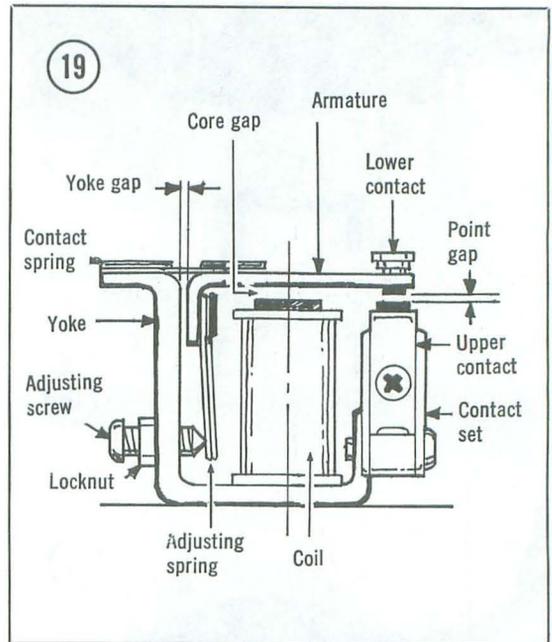
Testing

The rectifier (**Figure 20**) converts three-phase alternating current produced by the alternator into direct current, which is used to operate electrical accessories and to charge the battery.

To test the rectifier, proceed as follows:

1. Disconnect the negative battery cable from the battery.
2. Remove the right-hand side cover.
3. Disconnect the rectifier terminal connector (**Figure 16**).
4. Measure resistance between each of the following pairs of terminals with an ohmmeter. Record each of the measurements.
 - a. B and U
 - b. B and V
 - c. B and W
 - d. U and E
 - e. V and E
 - f. W and E

5. Reverse ohmmeter leads, the repeat Step 4. Each set of measurements must be high with the ohmmeter connected one way, and low with the ohmmeter leads reversed. It is not possible to specify exact meter indications, but each set of



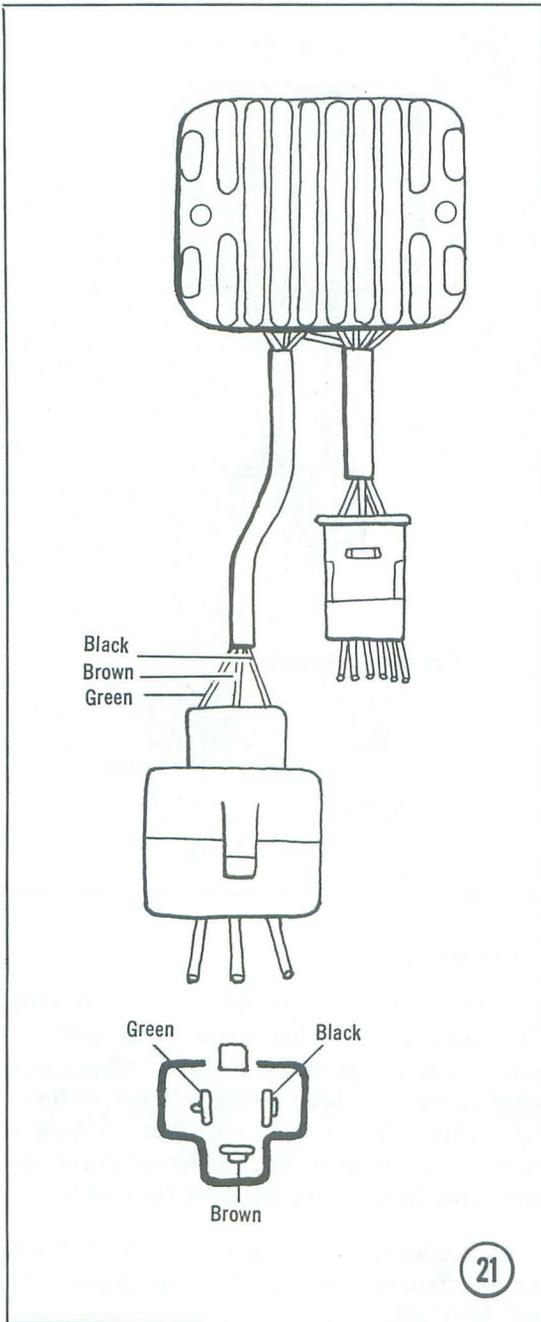
measurements should differ by a factor of not less than 10.

VOLTAGE REGULATOR/RECTIFIER (MODELS 2D, E, F, SE AND SF)

Voltage Regulator Testing

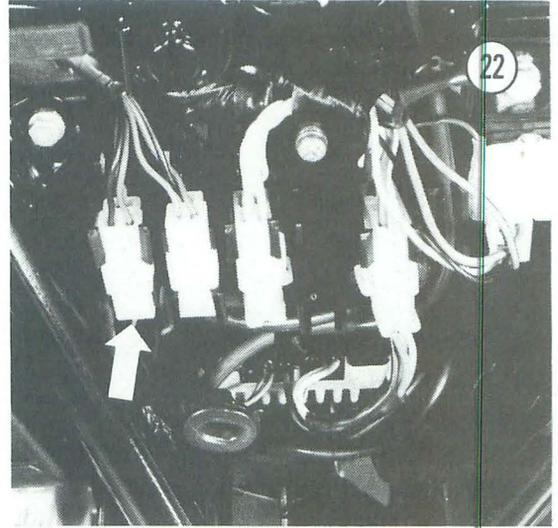
Refer to **Figure 21** for this test procedure.

1. Remove the left-hand side cover.
2. Tests are made on the electrical connector (**Figure 22**) containing 3 wires — 1 green, 1 black, and 1 brown.

**CAUTION**

Do not short-circuit the voltage regulator when connecting the test leads or it will be damaged.

3. Turn the ignition switch to the ON position. Connect a 20V DC voltmeter — negative (–) lead to black and the positive (+) lead to green. The voltage should be less than 1.8 volts.



NOTE: Do not turn on the headlight or turn signals.

4. Start the engine and recheck. This reading should gradually increase up to 9-11 volts when the engine is started and as rpm increases.
5. Connect the voltmeter — negative (–) lead to black and positive (+) to brown. The voltage should be 14.2-14.8 volts with the engine running and should remain there as engine rpm is increased.
6. If the voltage specified in Steps 3 and 4 are not met in these tests, the voltage regulator/rectifier must be replaced. It cannot be serviced.

Rectifier Testing

Refer to **Figure 23** for this test procedure.

1. Disconnect the battery negative cable from the battery.
2. Remove the right-hand cover.
3. Disconnect the voltage regulator/rectifier terminal connectors (**Figure 22**). One connector contains 5 wires — 3 white, 1 black, and 1 red. The other connector contains 3 wires — 1 brown, 1 green, and 1 black.

CAUTION

If the rectifier is subjected to overcharging it can be damaged. Be careful not to short-circuit it or incorrectly connect the battery positive and negative leads. Never directly connect the rectifier to the battery for a continuity check.

4. Measure the resistance between each of the following terminals with an ohmmeter. Record each of the measurements.

- a. B₁ and U
- b. B₁ and V
- c. B₁ and W
- d. B₁ and B₂
- e. U and G₁
- f. V and G₁
- g. W and G₁
- h. B and G₁

5. Reverse the ohmmeter leads, then repeat Step 4. Each set of measurements must be high with the ohmmeter connected one way, and low with the ohmmeter leads reversed. It is not possible to specify exact ohmmeter readings, but each set of measurements should differ by a factor of not less than 10.

6. Even if only one of the elements is defective, the entire unit must be replaced; it cannot be serviced.

Voltage Regulator Performance Test

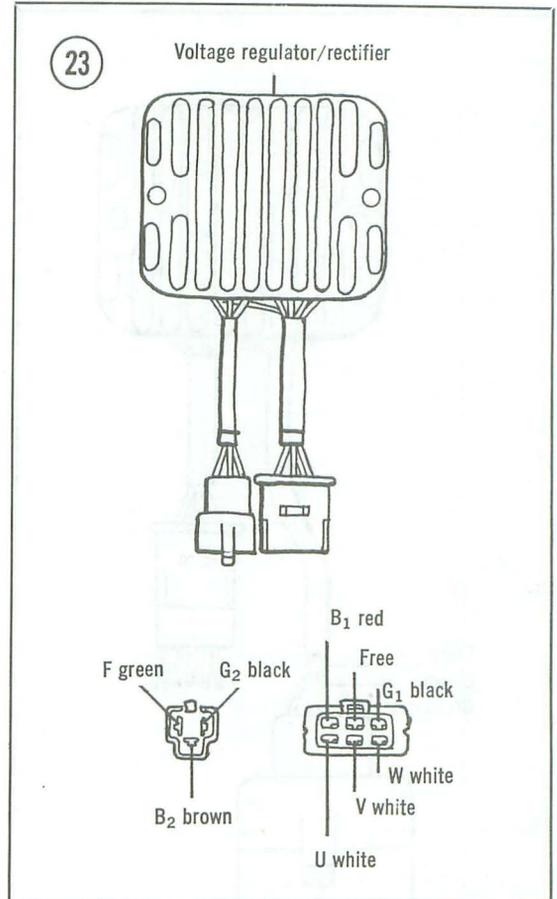
Connect a voltmeter to the battery terminals. Start the engine and let it idle; increase engine speed until the voltage going to the battery reaches 14.0-15.0 volts. At this point, the voltage regulator must prevent further voltage increase. If this does not happen, the voltage regulator/rectifier must be replaced.

IGNITION SYSTEM (CONTACT BREAKER POINT TYPE)

Figure 24 is a diagram of the ignition circuit on Models D and 2D.

When the breaker points are closed, current flows from the battery through the primary winding of the ignition coil, thereby building a magnetic field around the coil. The breaker cam rotates and is so adjusted that the breaker points open as the piston reaches the firing position.

As the points open, the magnetic field collapses. When this occurs, a very high voltage is induced (up to approximately 15,000 volts) in the secondary winding of the ignition coil. This high voltage is sufficient to jump the gap at the spark plug causing the plug to fire.



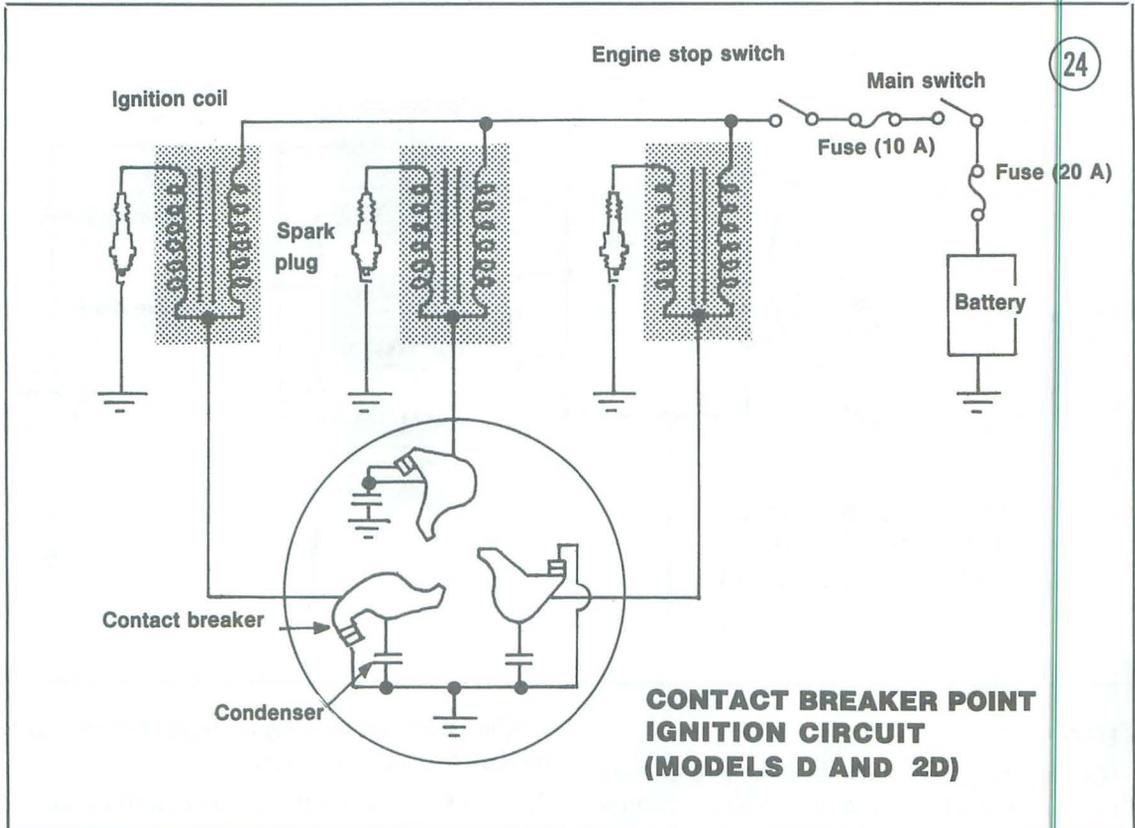
Condenser

The condenser assists the coil in developing high voltage, and also serves to protect the points. Inductance of the ignition coil primary winding tends to keep a surge of current flowing through the circuit even after the points have started to open. The condenser stores this surge and thus prevents arcing at the points.

The condenser is a sealed unit that requires no maintenance. Be sure that all connections are clean and tight.

Two tests can be made on the condenser. Measure condenser capacity with a condenser tester. Capacity should be about 0.24 microfarad. The other test is insulation resistance, which should not be less than 5 megohms, measured between the condenser pigtail and case.

In the event that no test equipment is available, a quick test of the condenser may be



made by connecting the condenser case to the negative terminal of a 12-volt battery, and the positive lead to the positive battery terminal. Allow the condenser to charge for a few seconds, then quickly disconnect the battery and touch the condenser pigtail to the condenser case. If you observe a spark as the pigtail touches the case, you may assume that the condenser is good.

Service

Two major service items are required on breaker point ignition models: breaker point service and ignition timing. Both are vitally important to proper engine operation and reliability. Refer to Chapter Three for breaker point service and ignition timing procedures.

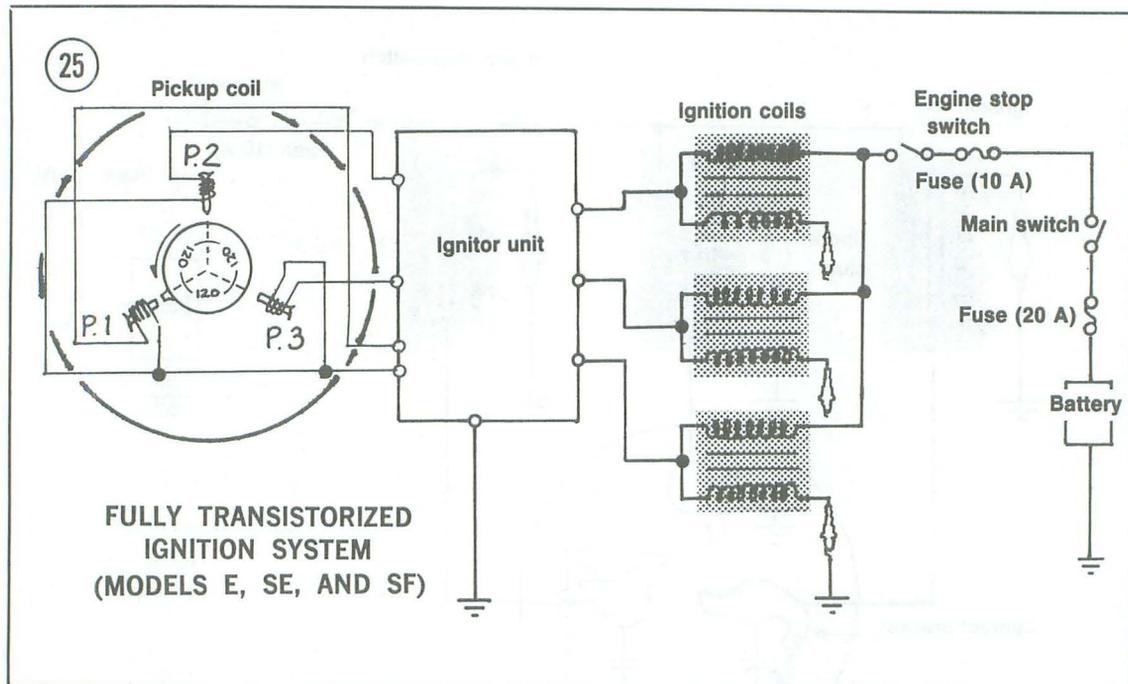
IGNITION SYSTEM (FULLY TRANSISTORIZED)

Models E, SE, and SF are equipped with a fully transistorized ignition system. This solid

state system does not use breaker points. This system provides a longer life for components and delivers a more efficient spark throughout speed range of the engine. Ignition timing is maintained for a long time without periodic adjustment.

Figure 25 is a diagram of the ignition circuit.

When the raised portion on the crankshaft driven rotor passes one of the cylinder pick-up coils, a pulse is generated within the pick-up coil. This pulse (electrical current) flows to the switching and distributing circuits in the ignitor unit. The magnetic field that has built up in the coil, from the battery, is now interrupted by this pulse and causes the field to collapse. When this happens, a very high voltage is induced (up to 15,000 volts) into the secondary windings of that cylinder's ignition coil. This voltage is sufficient to jump the gap at the spark plug of that cylinder, causing the plug to fire. The same sequence of events happens to the other two cylinders and is controlled by the rotation of the driven rotor.



Precautions

Certain measures must be taken to protect the transistorized ignition system. Instantaneous damage to the semiconductors in the system will occur if the following precautions are not observed.

1. Never connect the battery backwards. If the battery polarity is wrong, damage will occur to the voltage regulator/rectifier, alternator, and ignitor unit.
2. Do not disconnect the battery when the engine is running. A voltage surge will occur which will damage the voltage regulator/rectifier and possibly burn out the lights.
3. Keep all connections between the various units clean and tight. Be sure that the wiring connectors are pushed together firmly.
4. Do not substitute another type of ignition coil(s) or battery.
5. Each unit is mounted with a rubber vibration isolator. Always be sure that the isolators are in place when replacing any units.

Troubleshooting

Problems with the transistorized ignition system are usually production of a weak spark or no spark at all.

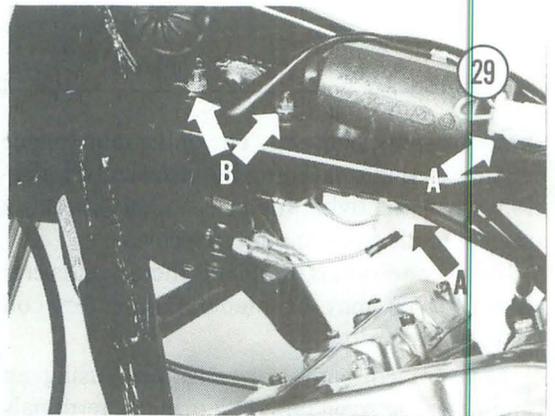
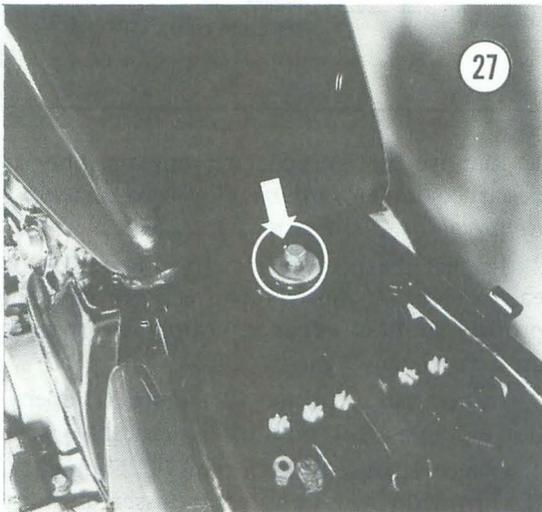
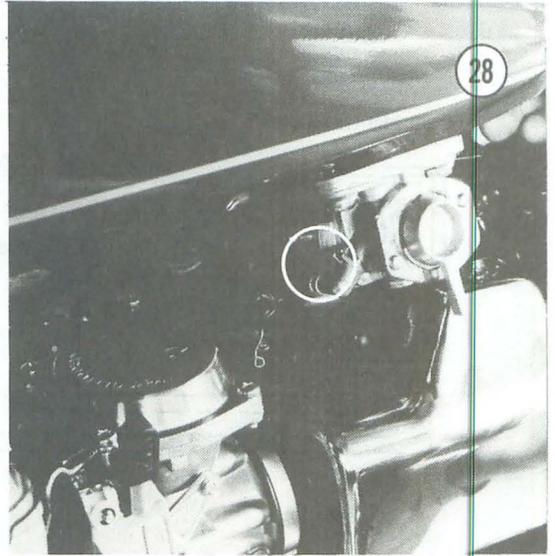
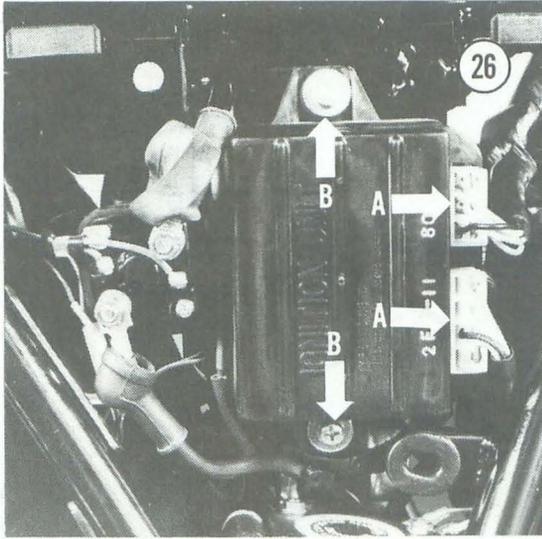
1. Check all connections to make sure they are tight and free of corrosion.
2. Check the ignition coils as described under *Ignition Coil Testing* in this chapter.
3. Check the pick-up coil assembly with an ohmmeter. The coil resistance should be $560 \text{ ohms} \pm 20\%$ at 70°F (21°C).
4. If the ignition coil and pick-up coil check out OK, the ignitor unit is at fault and must be replaced. It cannot be serviced.

Ignitor Unit Replacement

1. Hinge up the seat and disconnect the negative battery lead from the battery.
2. Remove the right-hand side panel.
3. Disconnect the 2 electrical connectors (A, **Figure 26**).
4. Remove attachment screws (B, **Figure 26**) and remove the unit.
5. Install by reversing these removal steps.

Ignitor Unit Testing

Tests may be performed on the unit but a good one may be damaged by someone unfamiliar with test equipment. To play it safe, have the tests performed by your Yamaha



dealer or substitute a unit suspected to be bad with one that is known to be good.

IGNITION COIL

Removal/Installation

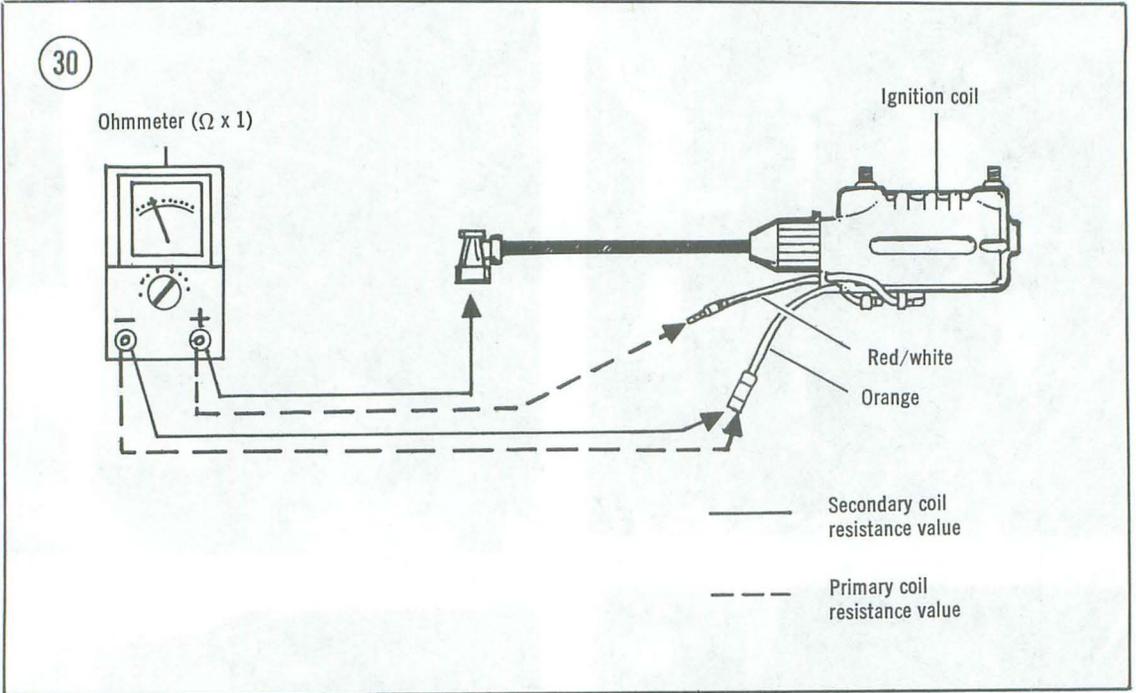
Each cylinder has its individual coil.

1. Hinge up the seat and disconnect the battery negative lead from the battery.
2. Remove the rear bolt (Figure 27) securing the fuel tank.
3. Turn both fuel shutoff valves to the ON or RES position, lift up on the rear of the tank and remove the fuel lines to the carburetors and vacuum lines to intake manifolds (Figure 28).

4. Pull the tank to the rear and remove it.
5. Disconnect the spark plug lead and the primary electrical wires (A, Figure 29) from each coil.
6. Remove the 2 nuts and lockwashers (B, Figure 29) securing each coil to the frame and remove them.
7. Install by reversing these removal steps. Make sure to correctly connect the primary electrical wires to the correct coils and the spark plug leads to the correct spark plug. Refer to the electrical schematics at the end of this book.

Testing

The ignition coil is a form of transformer which develops the high voltage required to



jump the spark plug gap. The only maintenance required is that of keeping the electrical connections clean and tight, and occasionally checking to see that the coil is mounted securely.

If coil condition is doubtful, there are several checks which may be made. Disconnect coil wires before testing.

1. Measure coil primary resistance, using an ohmmeter, between both coil primary terminals (**Figure 30**). Resistance should measure approximately: Models D and 2D — 4.0 ohms \pm 10% at 70°F (21°C) and Models E, SE, and SF — 2.75 ohms \pm 10% at 70°F (21°C).

2. Measure the coil secondary resistance between either primary lead and the high voltage cable. The secondary resistance should be approximately: Models D and 2D—11.0 K ohms \pm 10% at 70° F (21° C) and Models E, SE, and SF—7.9 K ohms \pm 10% at 70° F (21° C).

3. Replace any coil if the spark plug lead exhibits visible damage and/or if they do not test within these specified measurements.

IGNITION ADVANCE MECHANISM

Both ignition systems use the same type of ignition advance mechanism. It must be inspected periodically to make certain it operates freely.

1. Remove the ignition governor assembly as described under *Ignition Governor Assembly Removal/Installation* in Chapter Four.

2. Inspect the pivot points (A, **Figure 31**) of each weight. It must pivot freely to maintain proper ignition advance. Apply lightweight grease to the pivot pins.

3. Inspect the pivot cam (B, **Figure 31**) operation on the shaft. It must rotate smoothly.

4. Inspect surface of both cams (C, **Figure 31**). If worn, scratched, or pitted, the assembly must be replaced.

SPARK PLUGS

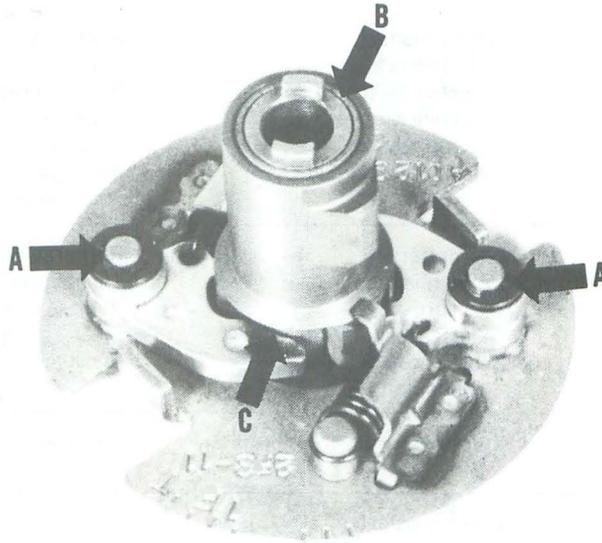
The spark plugs recommended by the factory are usually the most suitable for your machine. If riding conditions are mild, it may be advisable to go to spark plugs one step hotter than normal. Unusually severe riding conditions may require slightly colder plugs. See Chapter Three for details.

STARTING SYSTEM

The starting system consists of the starting motor, starter solenoid, and the starter button.

The layout of the starting system is shown in **Figure 32**. When the starter button is pressed, it

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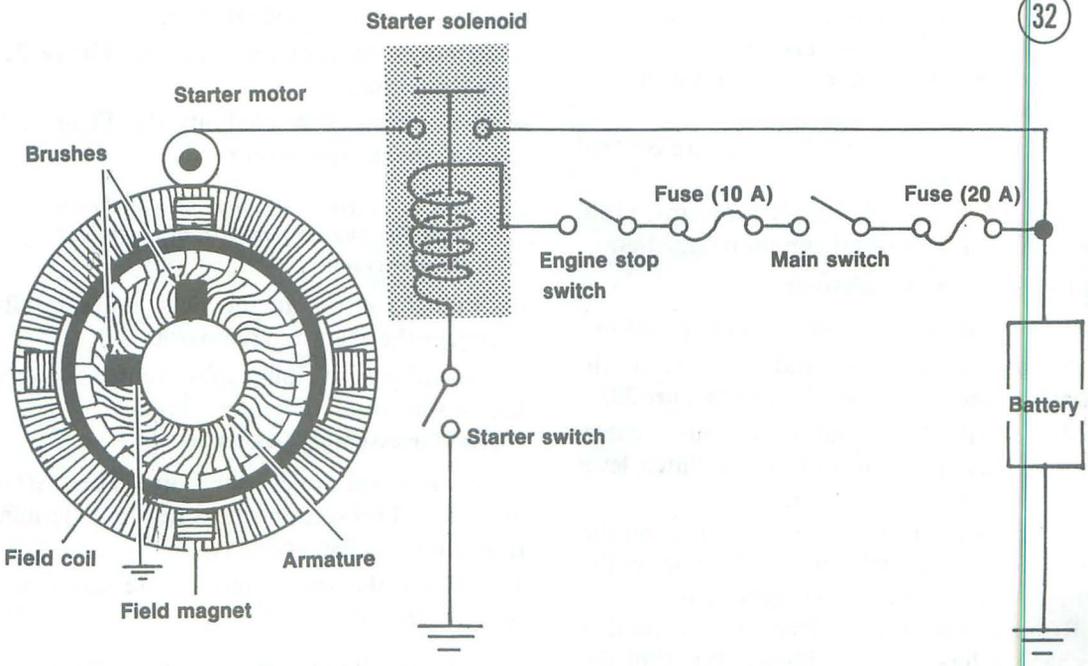


Table 1 STARTER TROUBLESHOOTING

Symptom	Probable Cause	Remedy
Starter does not work	Low battery Worn brushes Defective relay Defective switch Defective wiring or connection Internal short circuit	Recharge battery Replace brushes Repair or replace Repair or replace Repair wire or clean connection Repair or replace defective component
Starter action is weak	Low battery Pitted relay contacts Worn brushes Defective connection Short circuit in commutator	Recharge battery Clean or replace Replace brushes Clean and tighten Replace armature
Starter runs continuously	Stuck relay	Replace relay
Starter turns; does not turn engine	Defective starter clutch	Replace starter clutch

engages the solenoid switch that closes the circuit. The electricity flows from battery to the starting motor.

CAUTION

Do not operate the starter for more than five seconds at a time. Let it rest for approximately ten seconds, then use it again.

The starter gears and kickstarter are covered in Chapter Four.

Table 1 lists possible starter problems, probable causes, and the most common remedies.

Starter Removal/Installation

1. Turn the ignition switch to the OFF position.
2. Hinge up the seat and disconnect the negative battery lead from battery (Figure 33).
3. Remove the lower end of the clutch cable. Loosen the adjustment nut at the clutch lever and remove the cable from it.
4. Pull back the rubber protective flap on the lower end of the clutch cable and lift up on the clutch cable retaining clip (Figure 34).
5. Remove the cable from the actuating mechanism link arm (A, Figure 35). Pull the cable out from the sleeve leading into the actuating mechanism (B, Figure 35).

6. Remove carburetor assembly as described under *Carburetor Removal/Installation* in Chapter Six.

7. Remove the 2 Allen bolts (Figure 36) securing the motor cover and remove it.
8. Remove the electrical wire (A, Figure 37) from the motor.
9. Remove the 2 Allen bolts (B, Figure 37) securing the starting motor.

NOTE: *Figures 36 and 37 are shown with the engine partially disassembled for clarity only.*

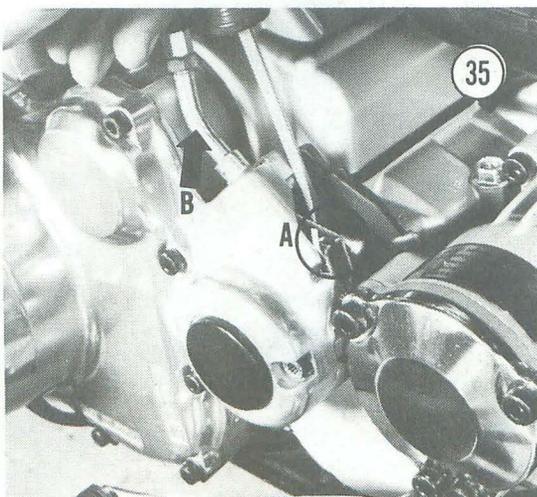
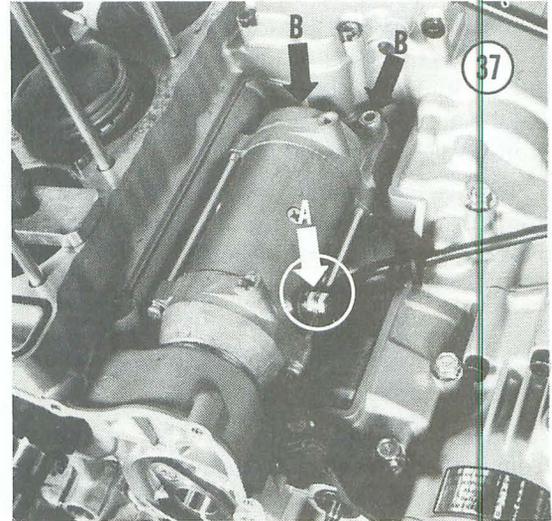
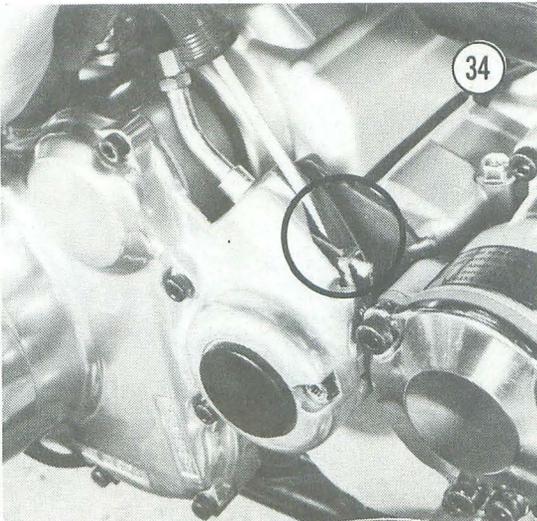
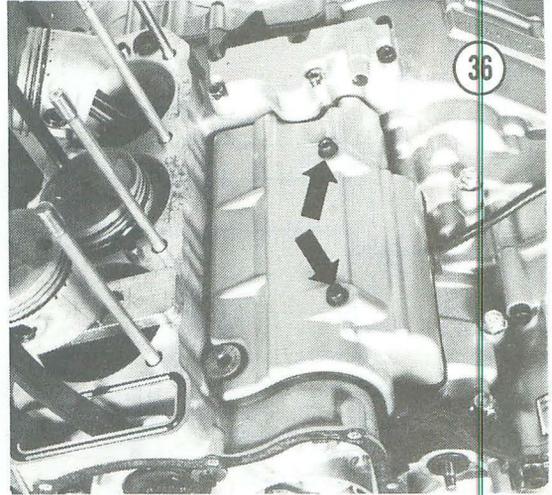
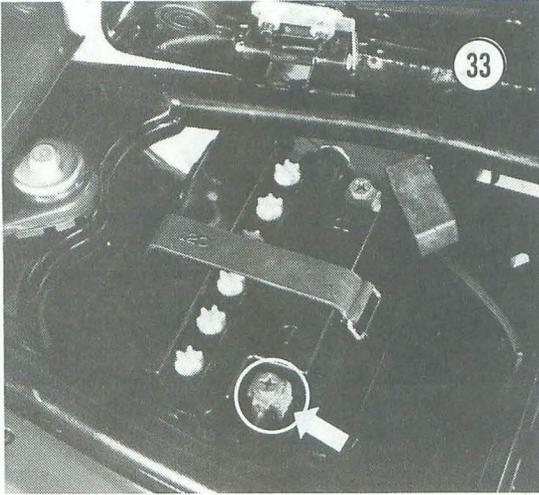
10. Pull the motor to the right and carefully disengage the gears and remove it.
11. Install by reversing these removal steps. Adjust the clutch (Chapter Three).

Starter Disassembly/Assembly

The overhaul of a starter motor is best left to an expert. This section shows how to determine if the unit is defective.

1. Remove the starter motor case screws and separate the case.

NOTE: *Write down how many thrust washers are used and install the same number when reassembling the starter.*

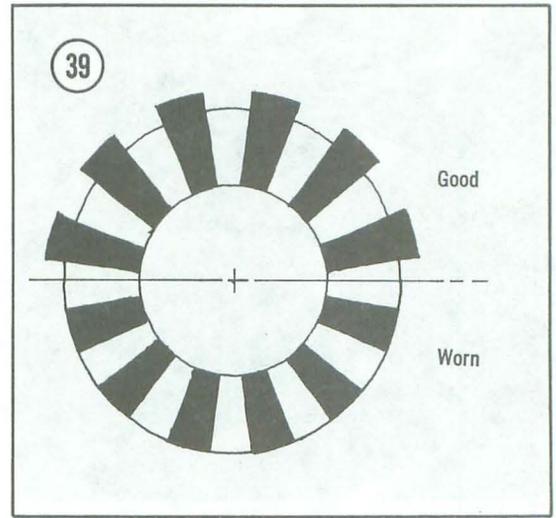
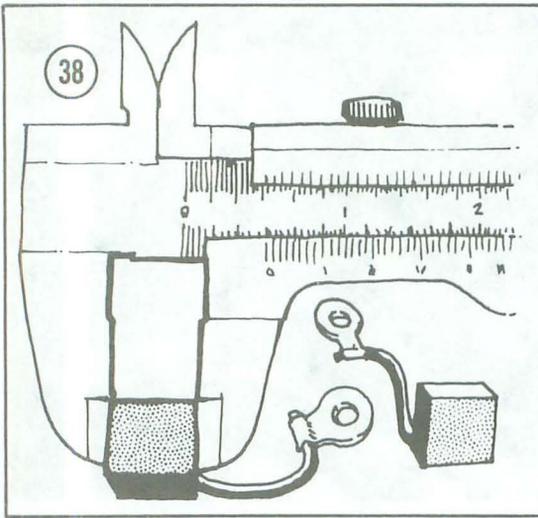


2. Clean all grease, dirt, and carbon dust from the armature, case, and end covers.

CAUTION

Do not immerse brushes or the wire windings in solvent or the insulation might be damaged. Wipe the windings with a cloth lightly moistened with solvent and dry thoroughly.

3. Remove the brushes and use a vernier caliper (Figure 38) to measure the length of the brush. If it is worn to less than 0.21 in. (5.5 mm), it should be replaced.
4. Inspect the condition of the commutator (Figure 39). The mica in the normal commutator is cut below the copper. A worn



commutator is also shown; the copper is worn to the level of the mica. A worn commutator can be undercut, but it requires a specialist. Take the job to your Yamaha dealer or motorcycle electrical repair shop.

5. Inspect the commutator bars for discoloration. If a pair of bars are discolored, that indicates grounded armature coils.

6. Check the electrical continuity between pairs of armature bars and between the commutator bars and the shaft mounting. If there is a short, the armature should be replaced.

7. Inspect the field coil by checking continuity from the cable terminal to the motor case. Also check from the cable terminal to the brush wire. If there is a short or open, the case should be replaced.

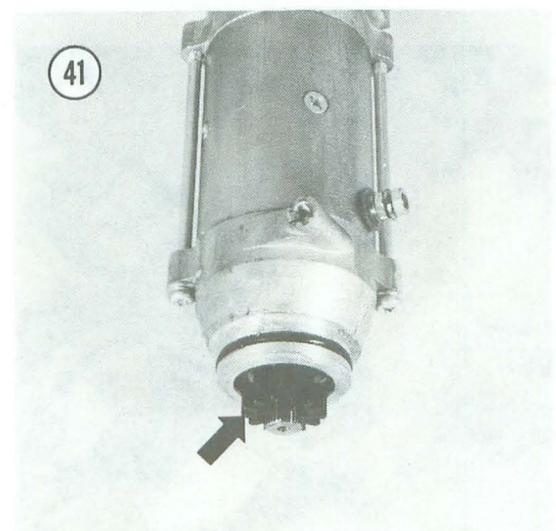
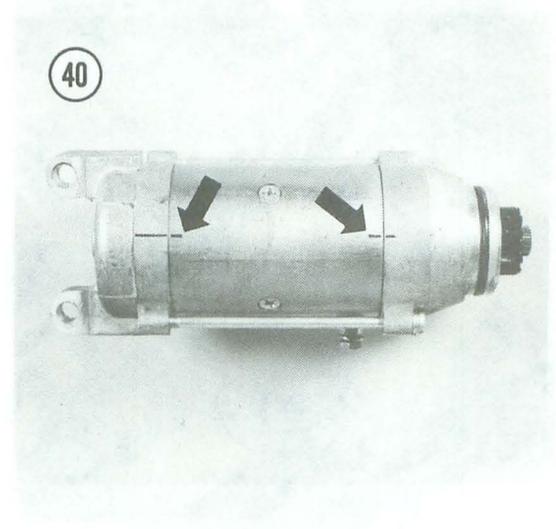
8. Assemble the case together; make sure that the punch marks on the case and covers align (**Figure 40**).

9. Inspect condition of the gears (**Figure 41**). If they are chipped or worn, remove the circlip and replace the gear.

10. Inspect the front and rear cover bearings for damage. Replace the starter if they are worn or damaged.

Starter Solenoid Removal/Installation

1. Turn the ignition switch to the OFF position.
2. Remove the right-hand side cover.



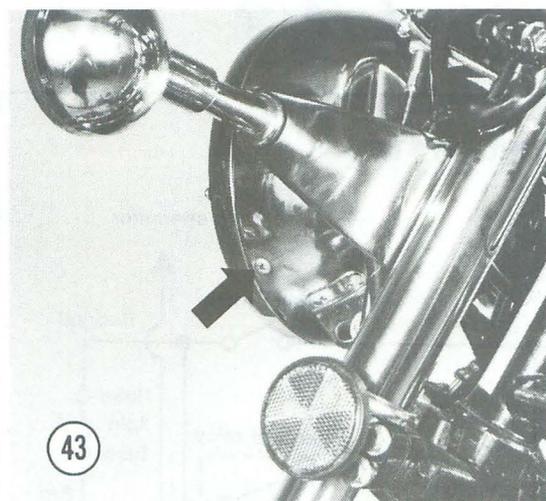
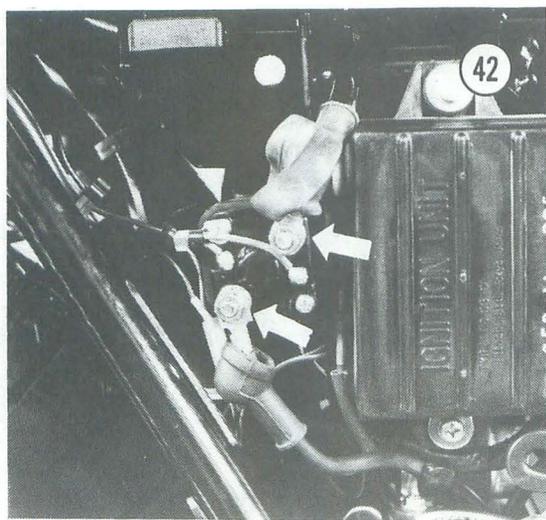


Table 2 REPLACEMENT BULBS

Item	Wattage	Candlepower
Headlight		
Models D, 2D, E, F and SE	40/50	—
Model SF	55/60	—
Tail/brakelight	8/27	3/32
Directional lights	27	32
Instrument lights	3.4	2
Meter light	3.4	2

3. Slide off the rubber protective boots and disconnect the 2 electrical wires from the large terminals (**Figure 42**).

4. Remove the solenoid from the frame along with the 2 smaller electrical wires that are attached to it.

5. Install by reversing these removal steps.

LIGHTING SYSTEM

The lighting system consists of the headlight, taillight/brakelight combination, directional signals, warning lights, and speedometer and tachometer illumination lights. **Table 2** lists replacement bulbs for these components.

The headlight circuit is equipped with a reserve lighting system that automatically switches the current from the burned out headlight filament to the reserve filament. It also notifies the rider that one filament is burned out by an indicator light on the instrument cluster.

Headlight Replacement

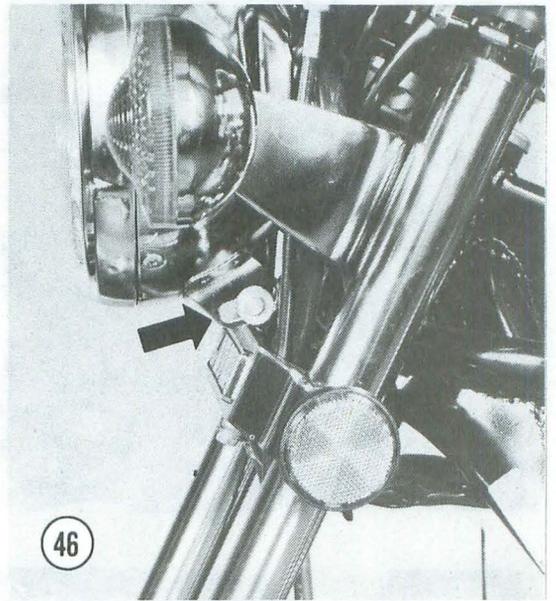
1. Remove the 2 mounting screws (**Figure 43**) on each side of the headlight housing.

2. Pull the trim bezel and headlight unit out and disconnect the electrical connector from the backside.

3. Remove the 2 screws (**Figure 44**) securing the inner ring and remove it. Remove the sealed beam unit.

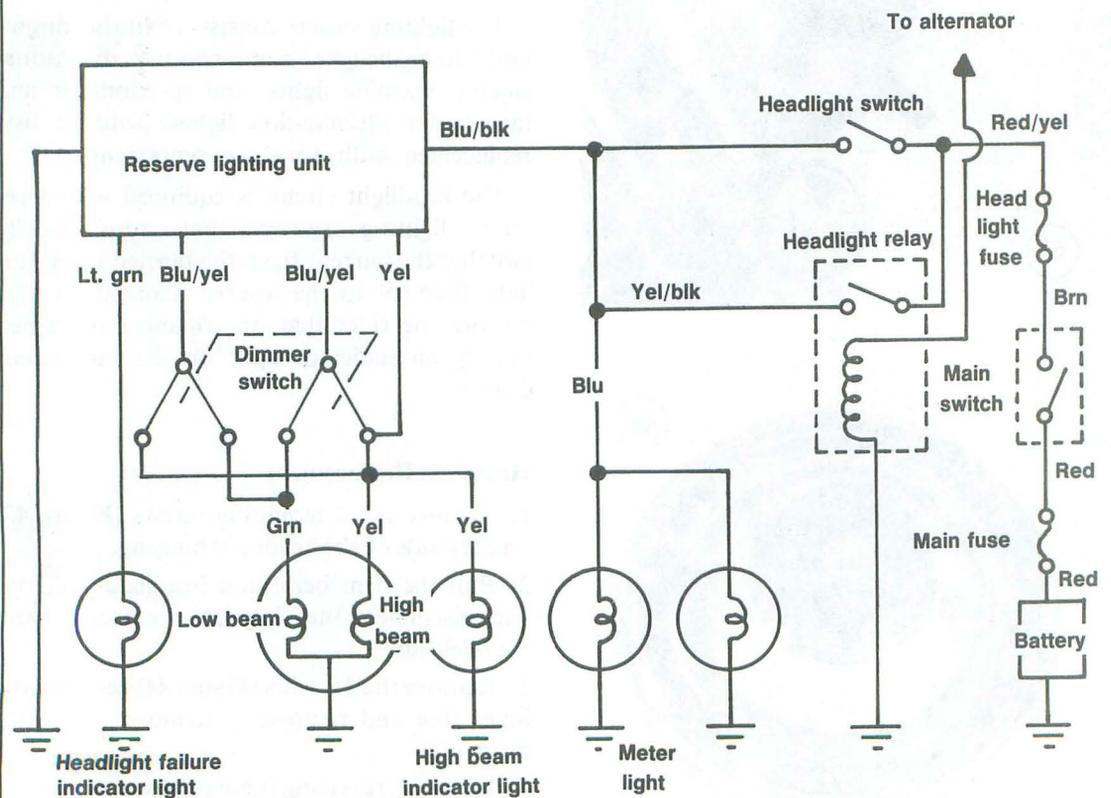
4. Install by reversing these removal steps.

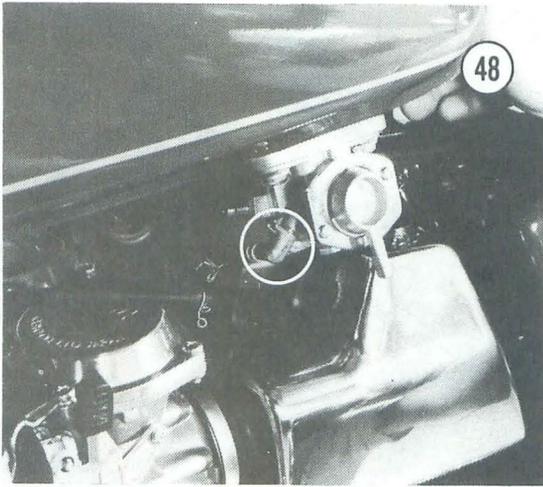
5. Adjust the headlight as described under *Headlight Adjustment* in this chapter.



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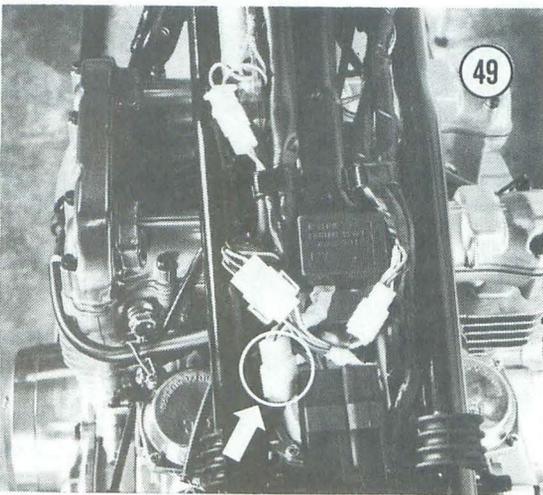
RESERVE LIGHTING SYSTEM





NOTE: This system relates to the headlight only, not to any of the other lights on the bike.

1. Hinge up the seat and disconnect the battery negative lead from the battery.
2. Remove the rear bolt securing the fuel tank.
3. Turn the fuel shutoff valves to the ON or RES position. Lift up on the rear of the tank and remove the fuel lines to the carburetors and vacuum lines to intake manifolds (Figure 48).
4. Pull the tank to the rear and remove it.
5. Disconnect the electrical connectors to the reserve lighting unit (Figure 49) and remove it from the frame.
6. Install by reversing these removal steps. Make sure all electrical connections are tight.



Headlight Adjustment

Adjust the headlight horizontally and vertically according to Department of Motor Vehicle regulations in your area.

To adjust headlight horizontally, turn the screw (Figure 45). Screwing it in turns the light to the right, and loosening it will turn the light to the left. For vertical adjustment, loosen the bolt (Figure 46) under the headlight and move the headlight assembly up or down. After adjustment is correct, be sure to tighten the bolt.

Headlight Reserve Lighting System Removal/Installation

If the reserve lighting unit becomes defective, it must be replaced as it cannot be serviced. Figure 47 is a diagram of the system.

Taillight Replacement

Remove the screws securing the lens and remove it. Wash out the inside and outside of the lens with a mild detergent and wipe dry. Wipe off the reflective base surrounding the bulb with a soft cloth. Replace the bulbs and install the lens; do not overtighten screws or the lens may crack.

Directional Signal Light Replacement

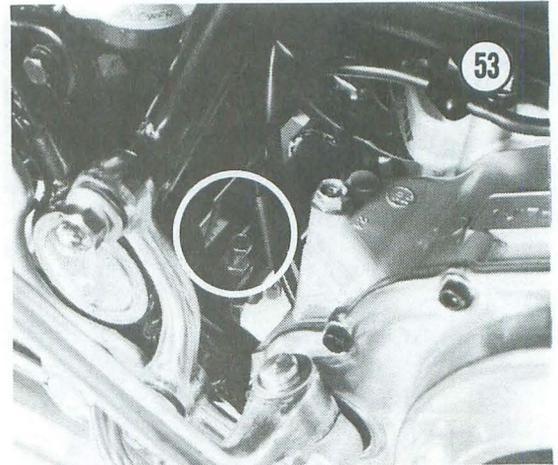
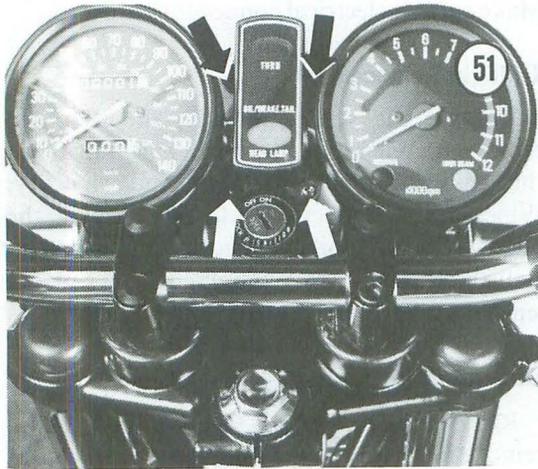
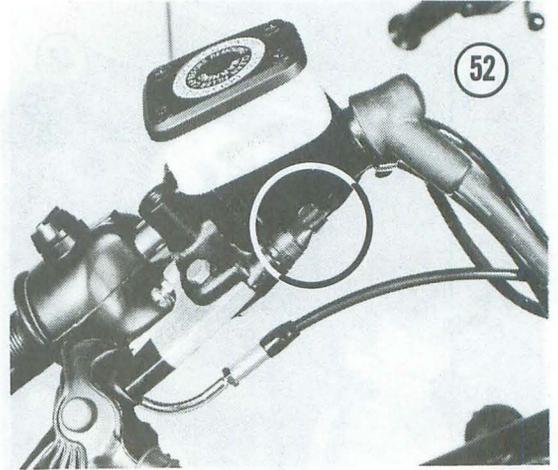
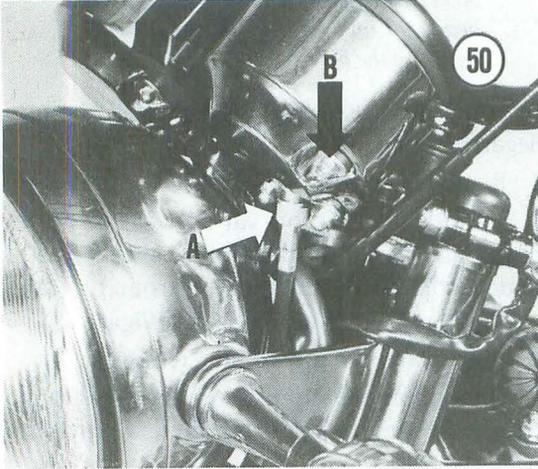
Remove the two screws securing the lens and remove it. Wash out the inside and outside of it with a mild detergent. Replace the bulb. Install the lens; do not overtighten the screws as that will crack the lens.

Speedometer and Tachometer Illumination Light Replacement

1. Disconnect the drive cable(s) from the chrome housing(s). See A, Figure 50.
2. Remove the acorn nuts and washers (B, Figure 50), 2 per unit, securing the speedometer or tachometer units into the chrome housings.
3. Pull the unit(s) and rubber ring(s) up and out of the housing(s) and remove it.
4. Replace the defective bulb(s).

Neutral Indicator and High Beam Indicator Light Replacement

Follow procedure for replacement of speedometer and tachometer illumination lights.



Turn, Oil Pressure, Headlight Failure Indicator Light Replacement

Remove the four screws (Figure 51) securing the indicator housing to the mounting bracket and remove it. Replace the defective bulb(s).

Front Brake Light Switch Replacement

Pull back the rubber protective boot on the hand lever. Pull small rubber boot (Figure 52) away from the switch and remove the switch. Disconnect the electrical wires and replace the switch.

Rear Brake Light Switch Replacement

1. Unhook spring from brake arm (Figure 53).
2. Unscrew the switch housing and locknut from bracket.

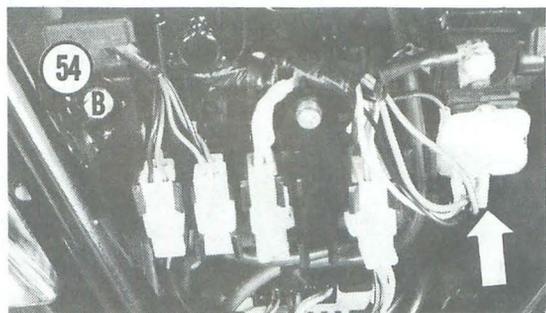
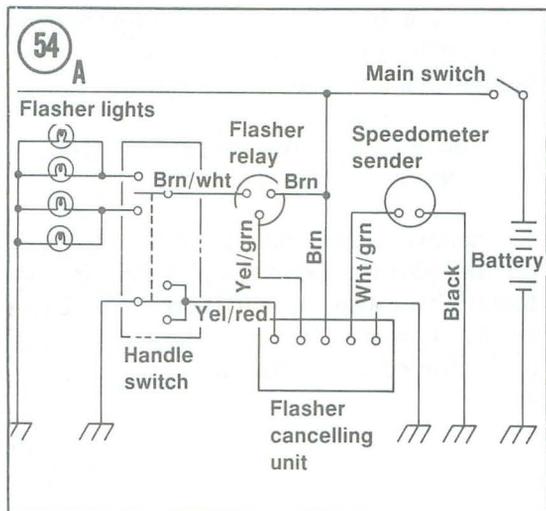
3. Pull up the rubber boot and remove the electrical wires.

4. Replace the switch; reinstall and adjust as described under *Rear Brake Light Switch Adjustment* in this chapter.

Rear Brake Light Switch Adjustment

1. Turn the ignition switch to the ON position.
2. Depress the brake pedal. Light should come on just as the brake begins to work.
3. To make the light come on earlier, hold the switch body and turn adjusting locknut clockwise as viewed from the top. Turn counterclockwise to delay the light.

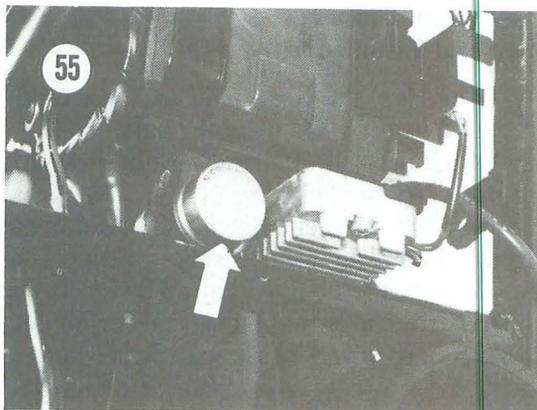
NOTE: Some riders prefer the light to come on a little early. This way, they can tap the pedal without braking to warn drivers who follow too closely.



Self-cancelling Flasher System Testing

Refer to **Figure 54A**. The self-cancelling system switches off the turn signals after either 10 seconds or 142 yards (130 meters), whichever is greater, have elapsed. Test as follows.

1. Remove the left-hand side cover and disconnect the connector from the flasher cancelling unit (**Figure 54B**).
2. Turn on either turn signal. If it operates normally, the flasher unit bulb(s), wiring and switch are okay.
3. Connect an ohmmeter between the white-green and black wires. Rotate the speedometer shaft. If the ohmmeter's needle swings back and forth between zero and infinity, the speedometer's sensor circuit is okay. If not, the sender or wire is faulty.
4. Connect the ohmmeter between the yellow-red wire and ground. With the switch off, resistance should indicate infinity; switch



on, zero ohms. If this is not the indication, the handlebar switch circuit or wiring is faulty.

5. If the system is still inoperative after the above tests, replace the flasher cancelling unit.
6. If the signal flashes only when the handlebar switch is turned to "left" or "right" and it turns off immediately after the switch lever returns to OFF, replace the flasher cancelling unit.

Flasher Cancelling Unit Replacement

Remove the left-hand side cover and pull out the old unit (**Figure 54B**). Disconnect the electrical wires and transfer them to the new unit. Install the new unit.

Flasher Relay Replacement

The flasher unit is located just behind the engine next to the voltage regulator/rectifier. Pull the old flasher relay (**Figure 55**) out of the rubber mount. Transfer wires to new relay and install the relay in the rubber mount.

NOTE

Figure 55 is shown with the engine removed for clarity only.

Horn Removal/Installation

1. Disconnect horn connector from electrical harness.
2. Remove the bolt securing horn to bracket.
3. Installation is the reverse of these steps.

Horn Testing

1. Disconnect horn wires from harness.
2. Connect horn wires to 12-volt battery. If it is good, it will sound.

Instrument Cluster Removal/Installation

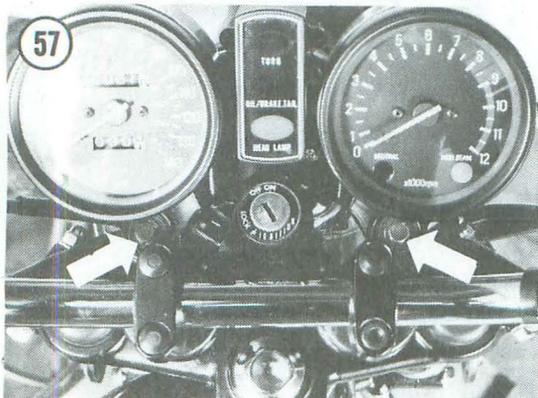
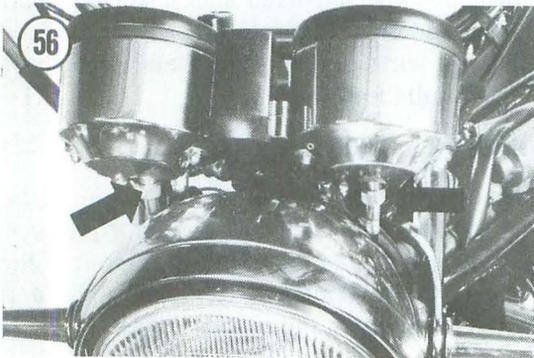
1. Hinge up the seat and disconnect the negative battery lead from the battery.
2. Disconnect all electrical terminals leading to the instrument cluster.
3. Remove the tachometer and speedometer cables (**Figure 56**) from the instrument cluster.
4. Remove the 2 bolts (**Figure 57**) securing the instrument cluster to brackets and remove it.
5. Install by reversing these removal steps.

CAUTION

Install the instrument cluster with the attachment bracket below the top fork bridge (**Figure 58**). If it is mounted above, the speedometer and tachometer drive cables will be stretched and damaged when the steering is turned to its limits.

FUSES

There are four fuses used on the XS750. All are located in the fuse panel located under the seat (**Figure 59**).



The main fuse (20A) is at the top of the panel with the headlight (10A), turn signals (10A) and ignition (10A) fuses below it.

Inside the cover are two spare fuses; always carry spares.

Whenever a fuse blows, find out the reason for the failure before replacing the fuse. Usually, the trouble is a short circuit in the wiring. This may be caused by worn-through insulation or a disconnected wire shorting to ground.

CAUTION

Never substitute tinfoil or wire for a fuse. Never use a higher amperage fuse than specified. An overload could result in fire and complete loss of the bike.

