

SECTION 5 - ELECTRICAL SYSTEM

TABLE OF CONTENTS

5

Specifications	5-2
Battery	5-3
RPM Limiter	5-3
Testing Electrical Components	5-4
Accessory Receptacle/Connector (400/500)	5-4
Brakelight Switch (Auxiliary)	5-4
Brakelight Switch (Handlebar Control)	5-5
Oil Temperature Switch (250/300/400)	5-6
Coolant Temperature Switch (500)	5-6
Fan Motor (400/500)	5-6
Fuse Block	5-7
Fuses	5-8
Ignition Coil	5-8
Indicator Lights	5-10
Ignition Switch	5-11
Handlebar Control Switches	5-12
Magneto Coils	5-13
Starter Motor	5-15
Starter Relay (250/300)	5-20
Starter Relay (400/500)	5-20
CDI Unit (250/300)	5-21
Regulator/Rectifier (250/300)	5-21
CDI Unit (400/500)	5-22
Regulator/Rectifier (400/500)	5-22
Neutral Start Relay	5-23
Headlights	5-24
Taillight - Brakelight	5-24
Ignition Timing	5-25
Wiring Diagrams	5-26

[Back to Table of Contents](#)

Specifications

250/300

IGNITION	
Ignition Timing (250)	5° BTDC below 1800 RPM 35° BTDC above 3800 RPM
Ignition Timing (300)	5° BTDC @ 1800 RPM 30° BTDC @ 3800 RPM
Spark Plug Type	NGK DR7EA
Spark Plug Gap	0.6-0.7 mm (0.024-0.028 in.)
Spark Plug Cap	8000-12,000 ohms
Ignition Coil Resistance (primary)	0.4-0.6 ohm (terminal to ground)
(secondary)	5200-7800 ohms (high tension - plug cap removed - to ground)
Ignition Coil Peak Voltage (primary/CDI)	98.3-147.5 volts (terminal to ground)
MAGNETO	
Magneto Coil Resistance (trigger)	84-126 ohms (black/yellow to green/white)
(charging)	0.44-0.66 ohm (yellow to yellow)
Magneto Coil Peak Voltage (trigger)	3.12-4.68 volts (black/yellow to green/white)
(charging)	30-45 volts (yellow to yellow)
Magneto Output (approx)	220W @ 5000 RPM

400

IGNITION	
Ignition Timing	10° BTDC @ 3000 RPM
Spark Plug Type	NGK CR7E
Spark Plug Gap	0.7-0.8 mm (0.028-0.032 in.)
Spark Plug Cap	8000-12,000 ohms
Ignition Coil Resistance (primary)	0.4-0.6 ohm (terminal to ground)
(secondary)	5200-7800 ohms (high tension - plug cap removed - to ground)
Ignition Coil Peak Voltage (primary/CDI)	160.8-241.2 volts (terminal to ground)

400 (continued)

MAGNETO	
Magneto Coil Resistance (trigger)	160-240 ohms (green to blue)
(source)	0.08-0.12 ohm (yellow to white)
(charging)	0.32-0.48 ohm (black to black)
Magneto Coil Peak Voltage (trigger)	5.04-7.56 volts (green to blue)
(source)	0.7-1.05 volts (yellow to white)
(charging)	12.5-18.6 volts (black to black #1) (black to black #2)
Magneto Output (approx)	220W @ 5000 RPM

500

IGNITION	
Ignition Timing	10° BTDC @ 1500 RPM
Spark Plug Type	NGK CR6E
Spark Plug Gap	0.7-0.8 mm (0.028-0.032 in.)
Spark Plug Cap	8000-12,000 ohms
Ignition Coil Resistance (primary)	0.4-0.6 ohm (terminal to ground)
(secondary)	5200-7800 ohms (high tension - plug cap removed - to ground)
Ignition Coil Peak Voltage (primary/CDI)	142.4-213.6 volts (terminal to ground)
MAGNETO	
Magneto Coil Resistance (trigger)	160-240 ohms (green to blue)
(source)	0.08-0.12 ohm (yellow to white)
(charging)	0.32-0.48 ohm (black to black)
Magneto Coil Peak Voltage (trigger)	4.2-6.3 volts (green to blue)
(source)	0.40-0.62 volt (yellow to white)
(charging)	9.44-14.2 volts (black to black #1) (black to black #2)
Magneto Output (approx)	325W @ 5000 RPM

Battery

⚠ WARNING

Anytime service is performed on a battery, the following must be observed: keep sparks, open flame, cigarettes, or any other flame away. Always wear safety glasses. Protect skin and clothing when handling a battery. When servicing battery in enclosed space, keep the area well-ventilated. Make sure venting tube of battery is always open once battery is filled with electrolyte.

1. Remove the battery from the ATV.

⚠ WARNING

Remove the negative cable first; then remove the positive cable.

⚠ CAUTION

Do not charge the battery while it is in the ATV with the battery terminals connected.

2. Remove the vent plugs; then fill the battery with electrolyte to the UPPER level indicated on the battery.

■ **NOTE:** Electrolyte should be at room temperature before filling. Do not use water or any other liquid to activate a battery.

⚠ WARNING

Electrolyte is a sulfuric acid solution. Avoid spillage and contact with skin, eyes, and clothing.

3. Allow the battery to stand for 15-30 minutes after filling. Electrolyte level may fall during this time. Refill with electrolyte to UPPER level line.
4. Trickle-charge the battery at 1.4 amps for 8-10 hours.
5. After charging, check electrolyte level and fill with DISTILLED WATER as necessary; then install the vent plugs. Wash off acid spillage with water and dry the battery.

⚠ CAUTION

Before installing the battery, make sure the ignition switch is in the OFF position.

6. Place the battery into position in the ATV and secure; then connect the vent hose to the battery.
7. Connect cables to the proper terminals: positive cable to the positive terminal (+) and negative cable to the negative terminal (-). Connect the negative cable last.

⚠ CAUTION

Connecting cables in reverse (positive to negative and negative to positive) can cause serious damage to the electrical system.

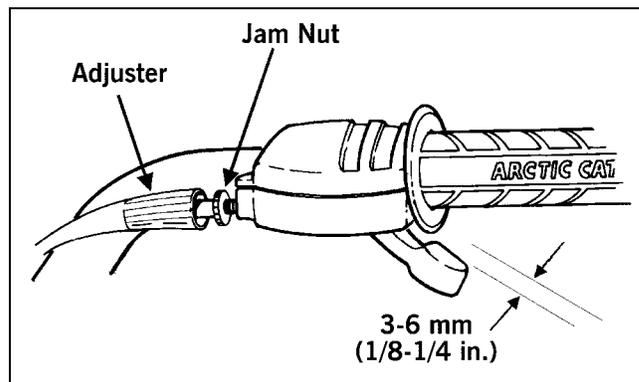
8. Check the vent tube to make sure it is not pinched or obstructed in any way and that it is properly routed down through the frame.

RPM Limiter

The ATV has an RPM limiter system to limit the engine RPM. One way to eliminate the activation of the RPM limiter is to utilize the throttle limiter screw at the throttle lever.

■ **NOTE:** The ATV is equipped with a CDI unit that retards ignition timing when maximum RPM is approached. When the RPM limiter is activated, it could be misinterpreted as a high-speed misfire.

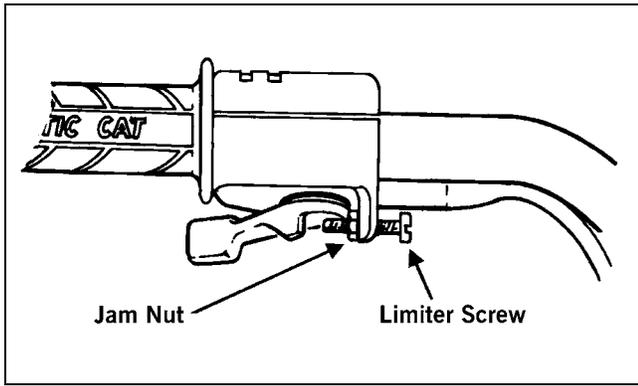
1. Ensure that the throttle cable is adjusted correctly at 3-6 mm (1/8-1/4 in.) free-play at the lever.



ATV-0047

2. Loosen the jam nut of the limiter screw and rotate the screw clockwise until RPM is limited to under 9000 RPM (250/300) or under 8300 RPM (400/500); then tighten the jam nut.

5



ATV-0053



AR606D

Testing Electrical Components

All of the electrical tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) and when testing peak voltage, the Peak Voltage Reading Adapter (p/n 0644-307) must be used. If any other type of meter is used, readings may vary due to internal circuitry. When troubleshooting a specific component, always verify first that the fuse(s) are good, that the bulb(s) are good, that the connections are clean and tight, that the battery is fully charged, and that all appropriate switches are activated.

■ **NOTE:** For absolute accuracy, all tests should be made at room temperature of 68° F.

Accessory Receptacle/Connector (400/500)

■ **NOTE:** This test procedure is for either the receptacle or the connector.

VOLTAGE

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the red/white wire or the positive connector; then connect the black tester lead to ground.

3. The meter must show battery voltage.

■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery, fuse, receptacle, connector, or the main wiring harness.

Brakelight Switch (Auxiliary)

The switch connector is the two-prong connector on the right side of the engine directly above the brake cable adjuster.

■ **NOTE:** The ignition switch must be in the ON position.

VOLTAGE (Wiring Harness Side)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester to the orange wire; then connect the black tester lead to ground.



AR627D

3. The meter must show battery voltage.

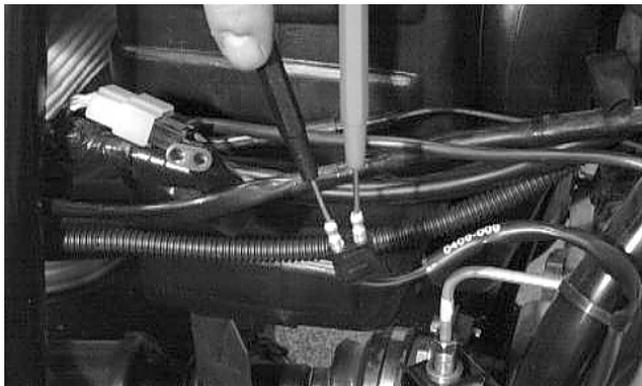
■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery, fuse, switch, or the main wiring harness.

■ **NOTE:** If the meter shows battery voltage, the main wiring harness is good; proceed to test the switch/component, the connector, and the switch wiring harness for resistance.

**RESISTANCE
(Switch Connector)**

CAUTION
Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to one black wire; then connect the black tester lead to the other black wire.



AR626D

3. When the brake pedal is depressed, the meter must show less than 1 ohm.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

**Brakelight Switch
(Handlebar Control)**

The switch connector is the two-prong black connector in front of the steering post. To access the connector, the front rack and front fenders must be removed (see Section 8).

■ **NOTE:** The ignition switch must be in the ON position.

**VOLTAGE
(Wiring Harness Connector)**

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the orange wire; then connect the black tester lead to ground.



AR622D

3. The meter must show battery voltage.

■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery, fuse, switch, or the main wiring harness.

■ **NOTE:** If the meter shows battery voltage, the main wiring harness is good; proceed to test the switch/component, the connector, and the switch wiring harness for resistance.

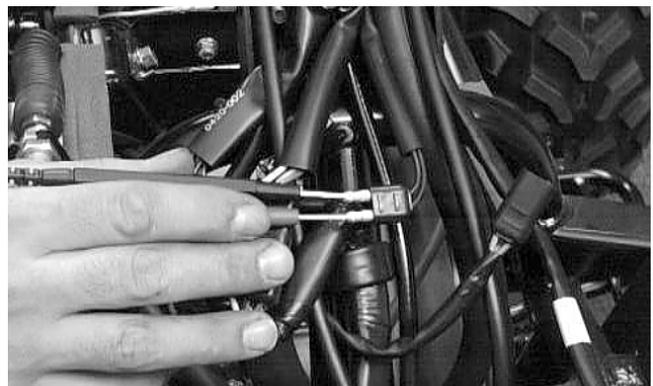
**RESISTANCE
(Switch Connector)**

CAUTION
Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

5

■ **NOTE:** The brake lever must be compressed for this test. Also, the ignition switch must be in the OFF position.

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to one black wire; then connect the black tester lead to the other black wire.



AR621D

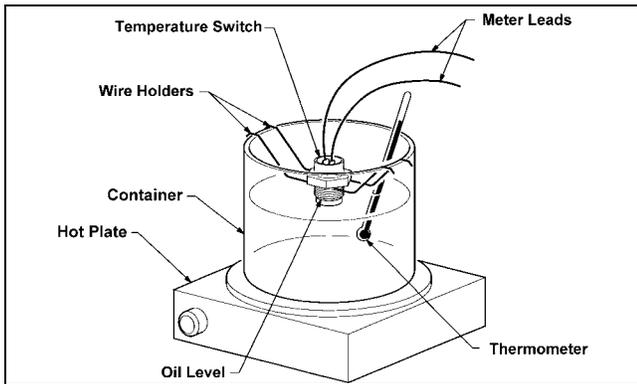
3. When the lever is compressed, the meter must show less than 1 ohm.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

Oil Temperature Switch (250/300/400)

1. Connect the meter leads (selector in the OHMS position) to the temperature switch contacts.
2. Suspend the temperature switch and a thermometer in a container of oil; then heat the oil.

■ **NOTE:** Neither the temperature switch nor the thermometer should be allowed to touch the bottom of the container or inaccurate readings will occur. Use wire holders to suspend switch and thermometer.



3. When the oil temperature reaches 160° C (320° F), the meter should read a closed circuit.
4. Allow the oil to cool, and when the temperature is at (or just before) a temperature of 140° C (284° F), the meter should read an open circuit.
5. If the readings are not as indicated, the temperature switch must be replaced.
6. Apply teflon tape to the threads of the switch; then install the switch and tighten securely.
7. Connect the temperature switch leads.

Coolant Temperature Switch (500)

1. Connect the meter leads (selector in the OHMS position) to the temperature switch contacts.
2. Suspend the temperature switch and a thermometer in a container of water; then heat the water.

■ **NOTE:** Neither the temperature switch nor the thermometer should be allowed to touch the bottom of the container or inaccurate readings will occur. Use wire holders to suspend switch and thermometer.

3. When the water temperature reaches 115° C (239° F), the meter should read a closed circuit.
4. Allow the water to cool, and when the temperature is at (or just before) a temperature of 108° C (226° F), the meter should read an open circuit.
5. If the readings are not as indicated, the temperature switch must be replaced.
6. Install the switch and tighten securely.
7. Connect the temperature switch leads.

Fan Motor (400/500)

To access the connector (located directly behind the fan), the front rack and front fenders must be removed (see Section 8).

■ **NOTE:** The ignition switch must be in the ON position.

VOLTAGE (Main Harness Connector to Fan Motor)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the black/red wire (the black 2-prong at the fan motor); then connect the black tester lead to ground.
3. The meter must show battery voltage.

■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery, fuse, motor, or the main wiring harness.

■ **NOTE:** If the meter shows battery voltage, the main wiring harness is good. The connector should be checked for resistance.

RESISTANCE (Fan Motor Connector)

CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to the OHMS position.

2. Connect the red tester lead to the blue wire; then connect the black tester lead to the black wire.



AR645D

3. The meter must show less than 1 ohm.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

■ **NOTE:** To determine if the fan motor is good, connect the blue wire from the fan connector to a 12 volt D.C. power supply; then connect the black wire from the fan connector to ground. The fan should operate.

 CAUTION
Care should be taken to keep clear of the fan blades.

Fuse Block

The main (30 Amp) fuse is located in a fuse block on the frame near the right rear tire and protected by a snap-on cover.

■ **NOTE:** To remove the fuse, compress the locking tabs on either side of the fuse case and lift out.

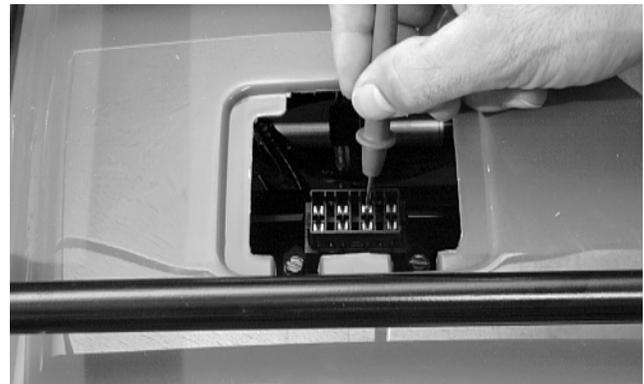
The remaining fuses are located in a fuse block under the center cover in the front fender assembly (on the 250/300) or under the seat (on the 400/500). If there is any type of electrical system failure, always check the fuses first.

■ **NOTE:** If all voltage is lost at the fuse block, check the condition of the fuses.

250/300	400/500
10 A IGN	10 A LIGHTS
15 A LIGHTS	10 A HI
10 A ACC	10 A LO
10 A SPARE	10 A IGN
	15 A FAN
	15 A ACC

■ **NOTE:** The ignition switch must be in the LIGHTS position.

1. Remove all fuses from the fuse block.
2. Set the meter selector to the D.C. Voltage position.
3. Connect the black tester lead to ground.
4. Using the red tester lead, contact each end of the fuse holder connector terminals individually.



CH095D

5. The meter must show battery voltage from one side of the connector terminal ends.

■ **NOTE:** Battery voltage will be indicated from only one side of the fuse holder connector terminal; the other side will show an open circuit.

■ **NOTE:** When testing the HI fuse holder, the headlight dimmer switch must be in the HI position; when testing the LO fuse holder, the headlight dimmer switch must be in the LO position.

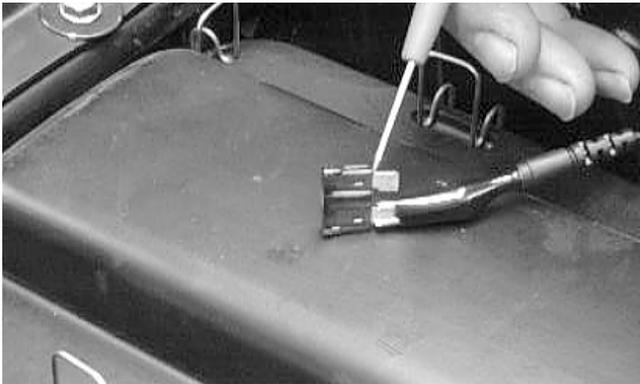
■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery, switches, fuse block, or the main wiring harness.

Fuses

⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to one spade end of the fuse; then connect the black tester lead to the other spade end.



AR610D

3. The meter must show less than 1 ohm resistance. If the meter reads open, replace the fuse.

■ **NOTE:** Make sure the fuses are returned to their proper position according to amperage. Refer to the fuse block cover for fuse placement.

Ignition Coil

On the 250/300, the ignition coil is attached to the upper frame behind the right-hand side panel. To access the coil, the seat and right-hand side panel must be removed (see Section 8).

On the 400/500, the ignition coil is on top of the engine. To access the coil, the seat and gas tank (see Section 4) must be removed.

VOLTAGE (Primary Side)

■ **NOTE:** The ignition switch must be in the ON position; the emergency stop switch must be in the RUN position. Also, the white/blue wire must be disconnected from the coil.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the black tester lead to the white/blue wire; then connect the red tester lead to ground.

3. The meter must show $31V \pm 20\%$.
4. With the tester leads connected, depress the starter button.
5. The meter must show $130V \pm 20\%$.

■ **NOTE:** If the voltage is not as specified in one or both of the above tests, inspect the main wiring harness, connectors, source/charge coil, magneto rotor and magnets, magneto rotor key, or the CDI unit.

RESISTANCE

⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

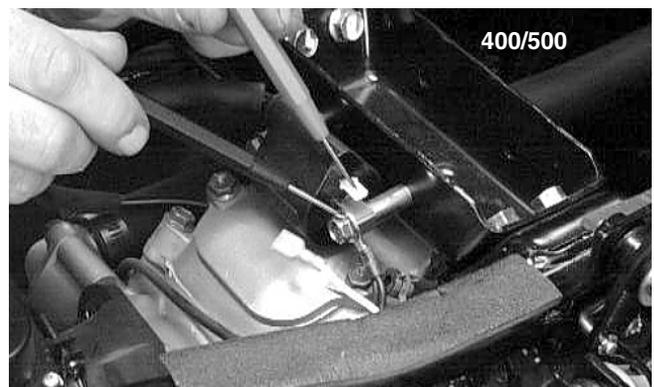
■ **NOTE:** For these tests, the meter selector should be set to the OHMS position.

Primary Winding

1. Connect the red tester lead to the terminal (with the wire removed); then connect the black tester lead to ground.



CH097D

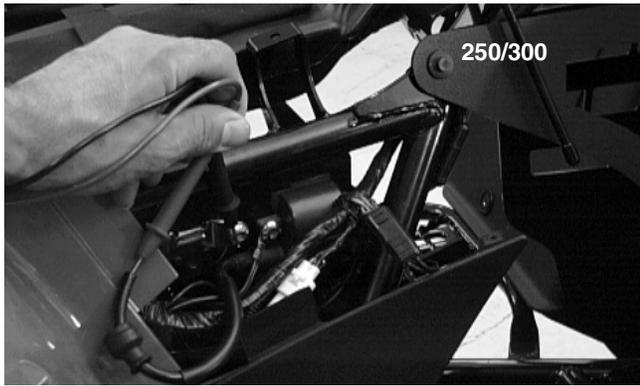


AR615D

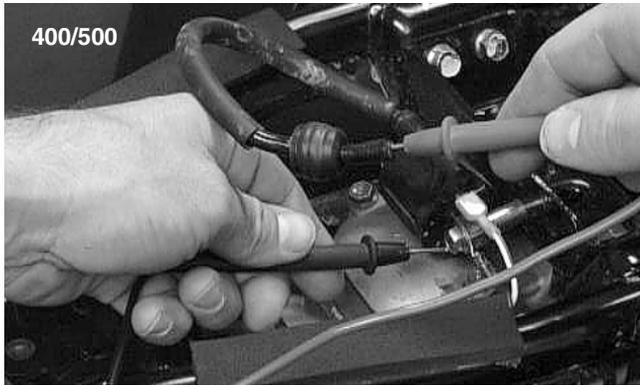
2. The meter reading must be within specification.

Secondary Winding

1. Connect the red tester lead to the high tension lead (plug cap removed); then connect the black tester lead to ground.



CH098D



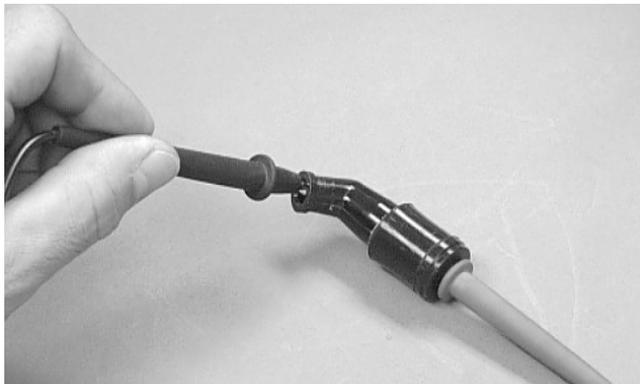
AR601D

2. The meter reading must be within specification.

■ NOTE: If the meter does not show as specified, replace ignition coil.

Spark Plug Cap

1. Connect the red tester lead to one end of the cap; then connect the black tester lead to the other end of the cap.



AR603D

2. The meter reading must be within specification.

■ NOTE: If the meter does not read as specified, replace the spark plug cap.

PEAK VOLTAGE (250/300)

■ NOTE: All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ NOTE: The battery must be at full charge for these tests.

Primary/CDI

■ NOTE: The CDI is located beneath the right rear fender panel near the battery.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the primary coil terminal; then connect the black tester lead to ground.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

PEAK VOLTAGE (400)

■ NOTE: All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ NOTE: The battery must be at full charge for these tests.

Primary/CDI

■ NOTE: The CDI is located beneath the seat and fender panel near the battery.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the primary coil terminal; then connect the black tester lead to ground.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

PEAK VOLTAGE (500)

■ NOTE: All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ NOTE: The battery must be at full charge for these tests.

Primary/CDI

■ NOTE: The CDI is located beneath the seat and fender panel near the battery.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the primary coil terminal; then connect the black tester lead to ground.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

3. The temperature warning indicator light should illuminate.

NEUTRAL POSITION LIGHT

1. Connect the jumper positive wire to the power source terminal on the indicator light connector.
2. Connect the jumper ground wire to the neutral terminal on the indicator light connector.
3. The neutral position indicator light should illuminate.

REVERSE POSITION LIGHT

1. Connect the jumper positive wire to the power source terminal on the indicator light connector.
2. Connect the jumper ground wire to the reverse terminal on the indicator light connector.
3. The reverse position indicator light should illuminate.

HI BEAM LIGHT

1. Connect the jumper positive wire to the high beam terminal on the indicator light connector.
2. Connect the jumper ground wire to the female terminal on the indicator light connector.
3. The HI beam indicator light should illuminate.

■ **NOTE:** If a light fails to illuminate in any one of the indicator light tests, the connector, wiring harness, or a bulb must be replaced.

After testing procedures are completed, use the following procedure.

1. Connect the indicator light connector to the main wiring harness.
2. Pull the instrument pod wiring with light bar upward and install the light bar into the instrument pod.
3. Secure the instrument pod with existing hardware; then secure the instrument pod wiring to the steering post using a cable tie.

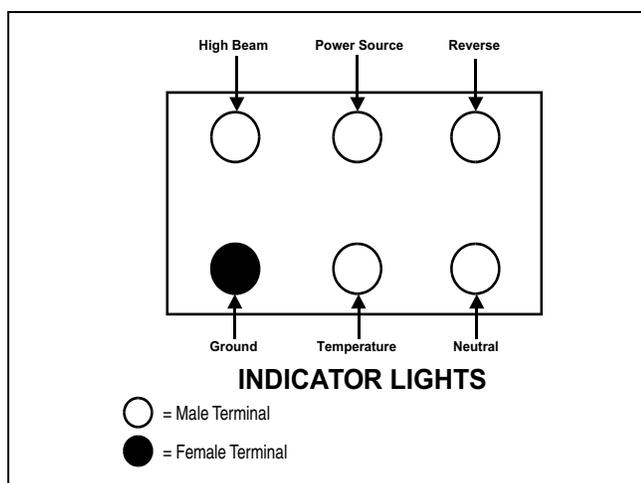
HI BEAM INDICATOR VOLTAGE

■ **NOTE:** The ignition switch must be in the LIGHTS position. Also, the dimmer switch must be in the HI position, and the test must be performed on the lower side of the connector.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the yellow wire; then connect the black tester lead to the black wire.
3. The meter must show battery voltage.

Indicator Lights

The Indicator Lights connector being tested is the black six-terminal connector (1 female and 5 male) coming from the indicator light wiring harness.



ATV-IL

To access the indicator light connector for testing purposes, use the following procedure.

1. Remove the three machine screws and key cover securing the instrument pod.
2. Remove the light bar from the instrument pod; then cut the cable tie securing the instrument pod wiring to the steering post.
3. Push the instrument pod wiring with light bar downward to access the indicator light connector; then disconnect the connector from the main wiring harness.

■ **NOTE:** For these tests, a 12-volt power supply “jumper” should be used to supply power.

TEMPERATURE LIGHT

1. Connect the jumper positive wire to the power source terminal on the indicator light connector.
2. Connect the jumper ground wire to the temperature terminal on the indicator light connector.

■ **NOTE:** The meter may show less than 12 volts due to the draw from the headlights.

OIL TEMPERATURE LIGHT VOLTAGE (250/300/400)

■ **NOTE:** The ignition switch must be in the ON position, and the test must be performed on the lower side of the switch.

1. Set the meter selector to the D.C. Voltage position.
2. Disconnect the white oil temperature switch connector from the switch (on the top right side of the engine) and ground the violet wire to the engine. The temperature light should illuminate.
3. Connect the red tester lead to the violet wire (main harness side); then connect the black tester lead to a ground.
4. The meter must show battery voltage.

WATER TEMPERATURE LIGHT VOLTAGE (500)

■ **NOTE:** The ignition switch must be in the ON position, and the test must be performed on the lower side of the switch.

1. Set the meter selector to the D.C. Voltage position.
2. Remove the violet water temperature switch wire connector from the switch (on the left side of the engine below the water hose) and ground it to the engine.
3. Connect the red tester lead to the red/black wire from the fan temperature switch; then connect the black tester lead to the violet wire from the water temperature switch.
4. The meter must show battery voltage.

NEUTRAL POSITION VOLTAGE

■ **NOTE:** The ignition switch must be in the ON position. Also, the shifter must be in the NEUTRAL position, and the test must be performed on the lower side of the connection.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the red/black wire; then connect the black tester lead to the blue/white wire.
3. The meter must show battery voltage.

REVERSE POSITION VOLTAGE

■ **NOTE:** The ignition switch must be in the ON position. Also, the reverse lever must be in the REVERSE position, and the test must be performed on the lower side of the connector.

1. Set the meter selector to the D.C. Voltage position.

2. Connect the red tester lead to the red/black wire; then connect the black tester lead to the blue wire.

3. The meter must show battery voltage.

■ **NOTE:** If the meter fails to show voltage in any of the above tests, the connector, fuse, switch, or wiring harness must be replaced.

Ignition Switch

The connector is the green one beneath the console. To access the connector, the speedometer and instrument pod must be removed.

VOLTAGE

■ **NOTE:** Perform this test on the lower side of the connector.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red meter lead to the red wire; then connect the black meter lead to ground.
3. Meter must show battery voltage.

■ **NOTE:** If the meter shows no battery voltage, troubleshoot the battery or the main wiring harness.

RESISTANCE

 **CAUTION**

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

■ **NOTE:** Perform this test on the upper side of the connector.

1. Turn the ignition switch to the ON position.
2. Set the meter selector to the OHMS position.
3. Connect the red tester lead to the red wire; then connect the black tester lead to the orange wire.
4. The meter must show less than 1 ohm.
5. Turn the ignition switch to the LIGHTS position.
6. Connect the red tester lead to the red wire; then connect the black tester lead to the orange wire.
7. The meter must show less than 1 ohm.
8. Connect the red tester lead to the red wire; then connect the black tester lead to the gray wire.
9. The meter must show less than 1 ohm.

10. With the switch in the OFF position, connect the red tester lead to the red wire and the black tester lead to each of the remaining wires (orange and gray). The meter must show an open circuit on both wires.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

Handlebar Control Switches

The connector is the yellow one in front of the steering post. To access the connector, the front rack and front fenders must be removed (see Section 8).

■ **NOTE:** These tests should be made on the top side of the connector.

 **CAUTION**

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

RESISTANCE (HI Beam)

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to the yellow wire; then connect the black tester lead to the gray wire.
3. With the dimmer switch in the HI position, the meter must show less than 1 ohm.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

RESISTANCE (LO Beam)

1. Connect the red tester lead to the white wire; then connect the black tester lead to the gray wire.
2. With the dimmer switch in the LO position, the meter must show an open circuit.

■ **NOTE:** If the meter reads resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

RESISTANCE (Starter Button)

1. Set the meter selector to the Diode position.
2. Connect the red tester lead to the orange/white wire; then connect the black tester lead to the yellow/green wire.

3. With the starter button depressed, the meter must show 0.5 - 0.7 ohm.
4. With the starter button released, the meter must show an open circuit.
5. Connect the red tester lead to the yellow/green wire; then connect the black tester lead to the orange/white wire.
6. With the starter button depressed, the meter must show an open circuit.

■ **NOTE:** If the meter does not show as specified, replace the switch/component, connector, or switch harness.

RESISTANCE (Emergency Stop)

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to the orange wire; then connect the black tester lead to the orange/white wire.
3. With the switch in the OFF position, the meter must show an open circuit.
4. With the switch in the RUN position, the meter must show less than 1 ohm.

■ **NOTE:** If the meter shows more than 1 ohm of resistance, troubleshoot or replace the switch/component, the connector, or the switch wiring harness.

RESISTANCE (Reverse Override)

The connector is the four-prong white one in front of the steering post. To access the connector, the front rack and front fenders must be removed (see Section 8).

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to one red/yellow wire (red/white wire on some models); then connect the black tester wire to the other red/yellow wire (red wire on some models). The meter must show less than 1 ohm.
3. Depress and hold the reverse override button. The meter must show an open circuit.
4. Connect the red tester lead to the blue wire (blue/white wire on some models); then connect the black meter lead to the black wire (blue wire on some models). The meter must show an open circuit.
5. Depress and hold the reverse override button. The meter must show less than 1 ohm.

■ **NOTE:** If the meter does not show as specified, replace the switch/component, connector, or switch harness.

Magneto Coils

VOLTAGE (Charging Coil - Output)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the positive battery post; then connect the black tester lead to the negative battery post.
3. With the engine running at a constant 5000 RPM (with the headlights on), the meter must show 14-15.5 D.C. volts.

⚠ CAUTION

Do not run the engine at high RPM for more than 10 seconds.

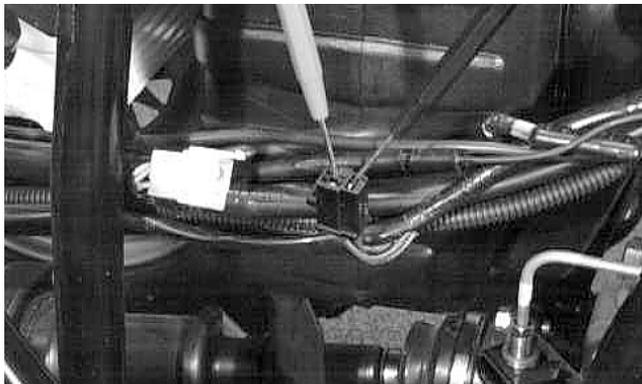
■NOTE: If voltage is lower than specified, test charging coil - no load.

VOLTAGE (Charging Coil - No Load)

The connector is the black and white one on the right side of the engine just above the brake cable adjuster.

■NOTE: Test the connector that comes from the engine.

1. Set the meter selector to the A.C. Voltage position.
2. Test between the three yellow wires (250/300) for a total of three tests or the three black wires (400/500) for a total of three tests.



AR630D

3. With the engine running at a constant 5000 RPM, all wire tests must show 60 A.C. volts.

⚠ CAUTION

Do not run the engine at high RPM for more than 10 seconds.

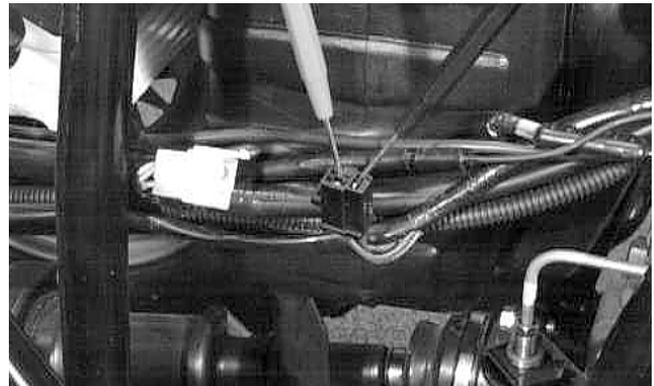
■NOTE: If both charging coil tests failed, check all connections, etc., and test again. If no voltage is present, replace the stator assembly.

RESISTANCE (Charging Coil)

⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to OHMS position.
2. Test between the three yellow wires (250/300) for a total of three tests or the three black wires (400/500) for a total of three tests.



AR630D

3. The meter reading must be within specification.

RESISTANCE (Trigger Coil)

⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to the OHMS position.
2. On the 250/300, connect the red tester lead to the black/yellow wire; then connect the black tester lead to the green/white wire. The meter reading must be within specification.
3. On the 400/500, connect the red tester lead to the green wire; then connect the black tester lead to the blue wire. The meter reading must be within specification.

RESISTANCE (Source Coil - 400/500)

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to the yellow wire; then connect the black tester lead to the white wire.
3. The meter reading must be within specification.

■NOTE: If the meter shows other than specified in any resistance test, replace the stator assembly.

PEAK VOLTAGE (250/300)

■ **NOTE:** All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ **NOTE:** The battery must be at full charge for these tests.

Magneto Coil (Trigger)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the black/yellow wire; then connect the black tester lead to the green/white wire.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

Magneto Coil (Charging)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to one yellow wire; then connect the black tester lead to the other yellow wire.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

PEAK VOLTAGE (400)

■ **NOTE:** All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ **NOTE:** The battery must be at full charge for these tests.

Magneto Coil (Trigger)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the green wire; then connect the black tester lead to the blue wire.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

Magneto Coil (Source)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the yellow wire; then connect the black tester lead to the white wire.

3. Crank the engine over using the electric starter.

4. The meter reading must be within specification.

Magneto Coil (Charging)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the black wire; then connect the black tester lead to black wire #1.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

■ **NOTE:** Repeat steps 2-4 for black wire #2.

PEAK VOLTAGE (500)

■ **NOTE:** All of the peak voltage tests should be made using the Fluke Model 73 Multimeter (p/n 0644-191) with Peak Voltage Reading Adapter (p/n 0644-307). If any other type of tester is used, readings may vary due to internal circuitry.

■ **NOTE:** The battery must be at full charge for these tests.

Magneto Coil (Trigger)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the green wire; then connect the black tester lead to the blue wire.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

Magneto Coil (Source)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the yellow wire; then connect the black tester lead to the white wire.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

Magneto Coil (Charging)

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the black wire; then connect the black tester lead to black wire #1.
3. Crank the engine over using the electric starter.
4. The meter reading must be within specification.

■ **NOTE:** Repeat steps 2-4 for black wire #2.

Starter Motor

REMOVING/DISASSEMBLING

1. Disconnect the battery.

⚠ CAUTION

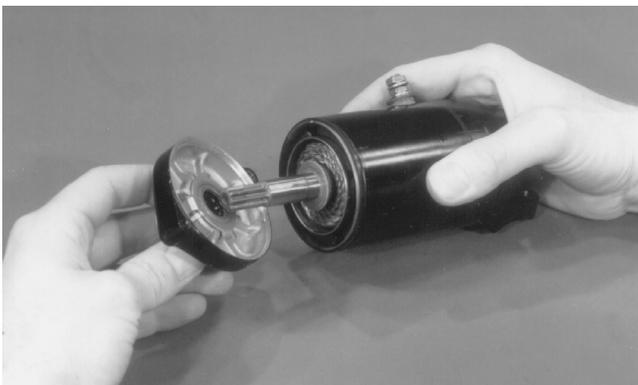
Always disconnect the negative battery cable from the battery first; then disconnect the positive cable.

2. Remove the nut securing the positive cable to the starter; then remove the cable from the starter.
3. Remove the two cap screws securing the starter to the crankcase; then remove the starter. Account for the wiring forms and an O-ring.
4. For assembly purposes, scribe a line across the outside of the starter assembly.



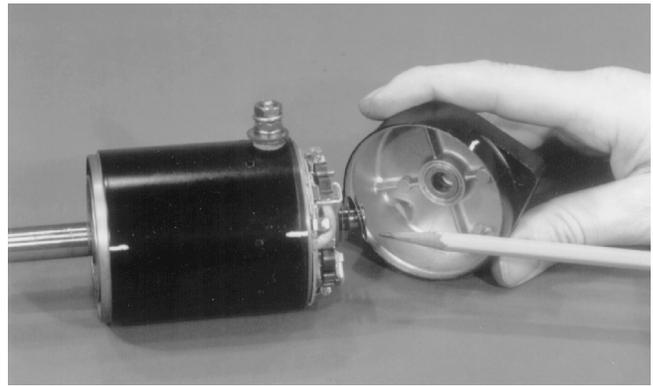
AR652D

5. Remove the two long starter cap screws securing the starter components.
6. Remove the front cover from the starter housing and armature shaft. Account for a seal protector and three washers.



BC003

7. Remove the rear cover.



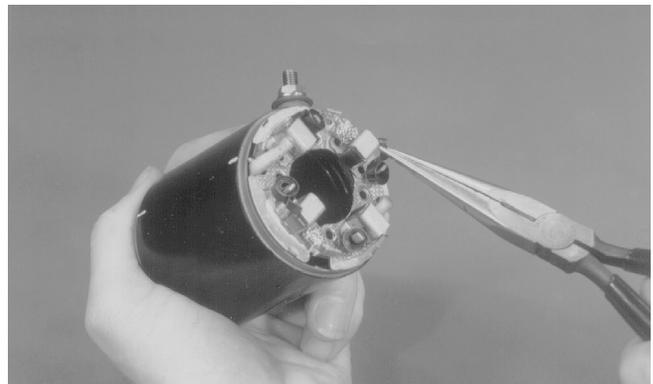
BC005

8. Slide the armature free of the starter housing.



BC006

9. Bend the two positive brushes outward; then remove the brush holder.

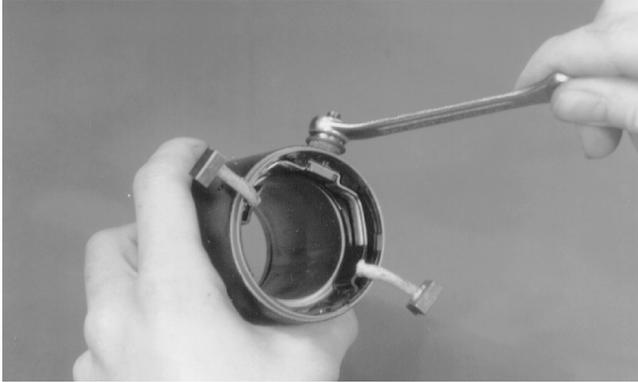


BC007



BC010

10. Remove the nut from the positive post. Account for the lock washer, flat washer, a fiber washer, and an O-ring.



BC008

11. Remove the positive brush assembly from the starter housing.



BC009

CLEANING AND INSPECTING

■ **NOTE:** Whenever a part is worn excessively, cracked, or damaged in any way, replacement is necessary.

1. Thoroughly clean all components except the armature and brushes in parts-cleaning solvent; then dry with compressed air.

CAUTION

Do not wash the armature and brushes in any kind of solvent. Use only compressed air and a clean dry, lint-free cloth.

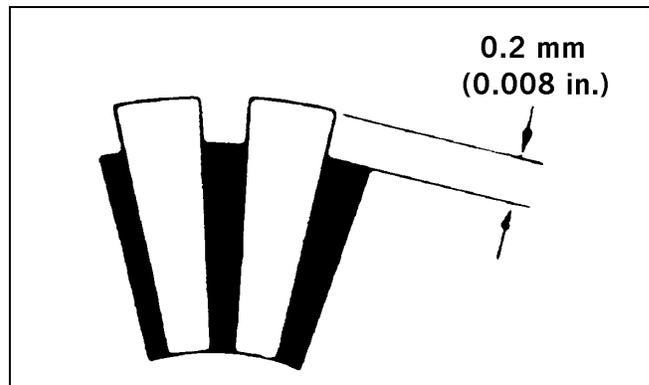
2. Inspect all threaded areas for damage or stripped threads.
3. Inspect the brush holder assembly and brushes for damage or wear. Using a caliper, measure the length of the brushes. If brush measurement is less than 10.1 mm (0.40 in.), replace with new brushes and brush springs as a set.
4. Inspect the brush leads for cracks, wear, or fraying. If any of these conditions exist, replace with new brushes and brush springs as a set.

5. Inspect the rear cover bushing for wear.
6. Inspect the front cover bearing for wear.
7. Inspect the brass commutator end of the armature for any burned spots or damage. If the commutator is lightly burned or damaged, the armature must be replaced. This is a molded commutator and turning it down in a lathe should not be attempted.

CAUTION

Do not use emery cloth to clean the commutator as emery particles will become imbedded in the brass commutator resulting in a short circuit. Use only #200 grit sandpaper.

8. Inspect the commutator end of the armature for buildup in the grooves. Carefully remove any buildup by undercutting using a thinly ground hacksaw blade. Do not undercut any deeper than the original groove which can be seen by looking at the end of the commutator.
9. Using a caliper, measure the undercut. Maximum undercut groove must be 0.2 mm (0.008 in.).



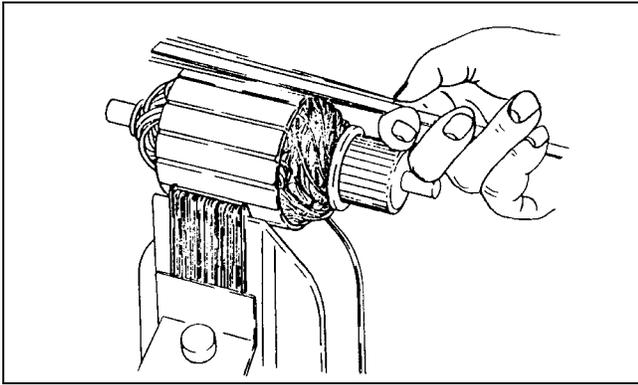
ATV-1054

CAUTION

Buildup in the grooves must be removed to prevent any chance of an electrical arc between individual sections of the commutator.

10. Inspect the commutator for shorting using a multimeter and the following procedure.
 - A. Set the selector to the OHMS position.
 - B. Touch the black lead to the armature shaft.
 - C. Using the red tester lead, probe the commutator end of the armature. The meter indicator should not change. If the indicator shows resistance, the armature is shorted and must be replaced.
11. Inspect the armature for shorting using a "growler" and the following procedure.
 - A. Place the armature in the "growler."

B. While holding a metal strip on the armature, rotate the armature an entire revolution. If the metal strip vibrates at any point on the armature, the armature is shorted and must be replaced.



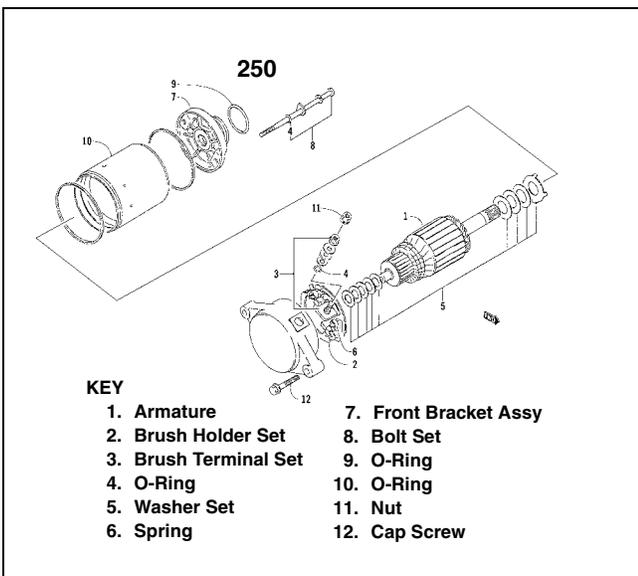
0725-653

12. Inspect the ground brushes to make sure they are properly grounded. Use a multimeter and the following procedure.

- A. Set the selector to the OHMS position.
- B. Touch the black tester lead to a ground brush.
- C. Touch the red tester lead to the brush holder assembly.

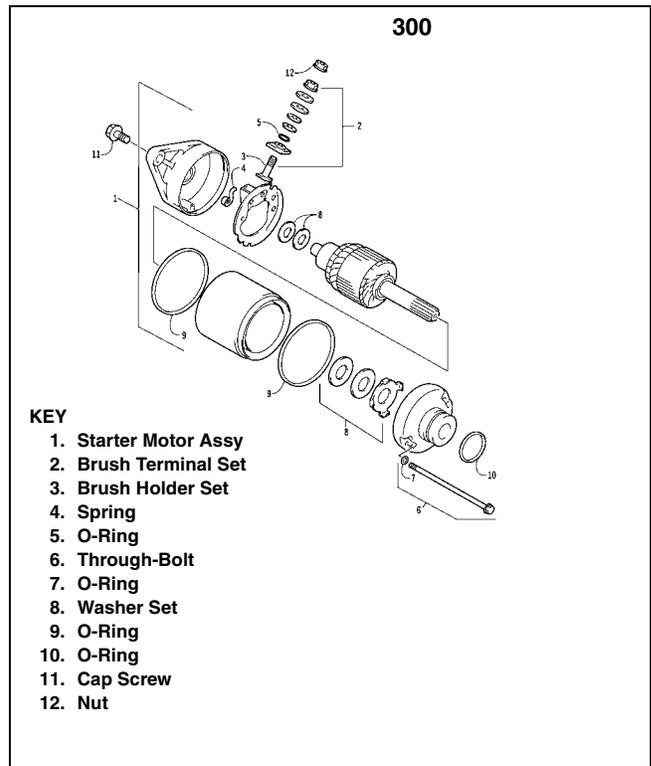
■ **NOTE:** If no resistance is indicated, check the ground connection for tightness and for cleanliness. If there is still no meter indication, replace the brush assembly.

ASSEMBLING/INSTALLING



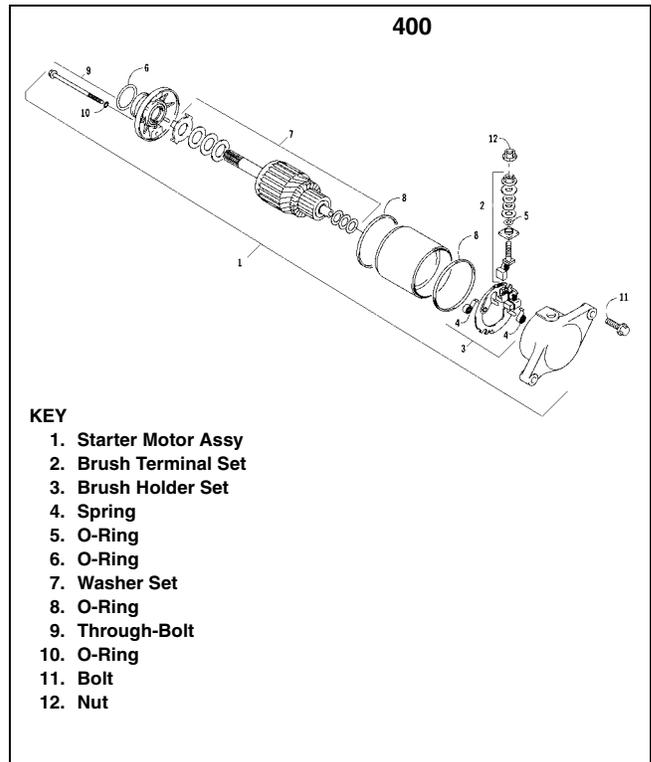
- KEY**
- | | |
|-----------------------|-----------------------|
| 1. Armature | 7. Front Bracket Assy |
| 2. Brush Holder Set | 8. Bolt Set |
| 3. Brush Terminal Set | 9. O-Ring |
| 4. O-Ring | 10. O-Ring |
| 5. Washer Set | 11. Nut |
| 6. Spring | 12. Cap Screw |

0733-760



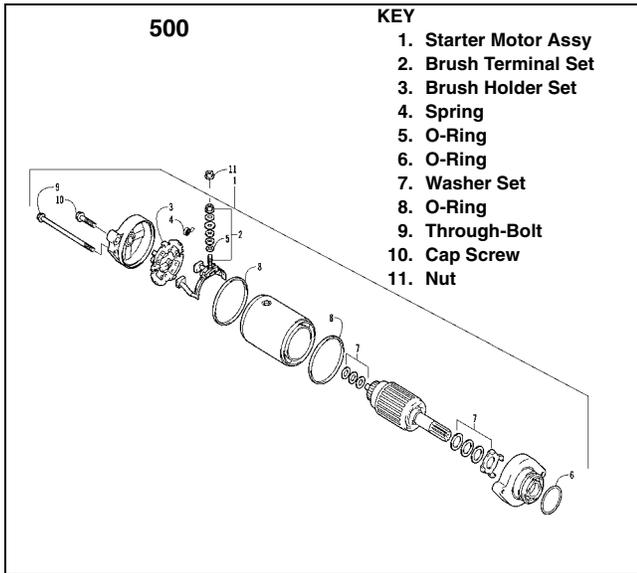
- KEY**
- 1. Starter Motor Assy
 - 2. Brush Terminal Set
 - 3. Brush Holder Set
 - 4. Spring
 - 5. O-Ring
 - 6. Through-Bolt
 - 7. O-Ring
 - 8. Washer Set
 - 9. O-Ring
 - 10. O-Ring
 - 11. Cap Screw
 - 12. Nut

0737-853



- KEY**
- 1. Starter Motor Assy
 - 2. Brush Terminal Set
 - 3. Brush Holder Set
 - 4. Spring
 - 5. O-Ring
 - 6. O-Ring
 - 7. Washer Set
 - 8. O-Ring
 - 9. Through-Bolt
 - 10. O-Ring
 - 11. Bolt
 - 12. Nut

0737-056



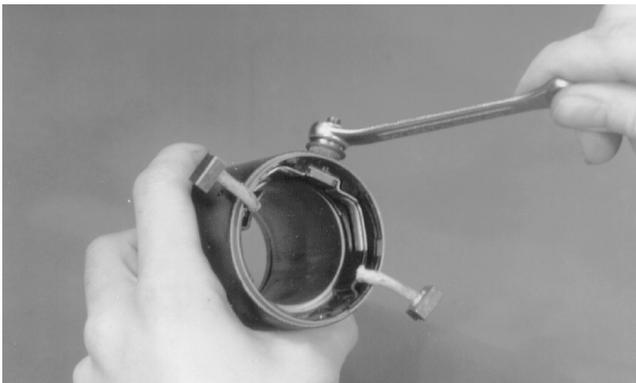
0737-779

1. Install the positive post on the positive brush assembly; then install on the starter housing.



BC009

2. On the positive post, install an O-ring washer, a fiber washer, a flat washer, and a lock washer. Secure with the nut.



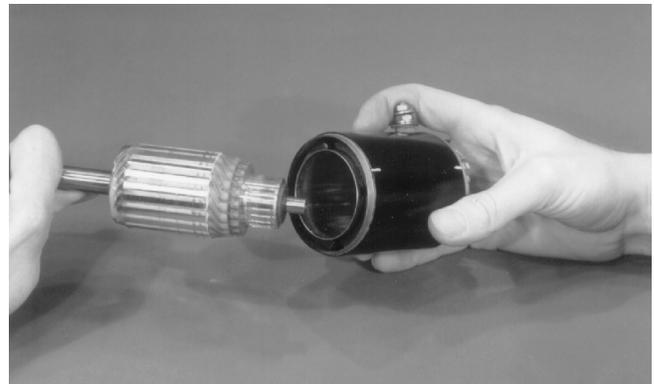
BC008

3. Align the tab on the brush holder with the notch in the starter housing; then install.



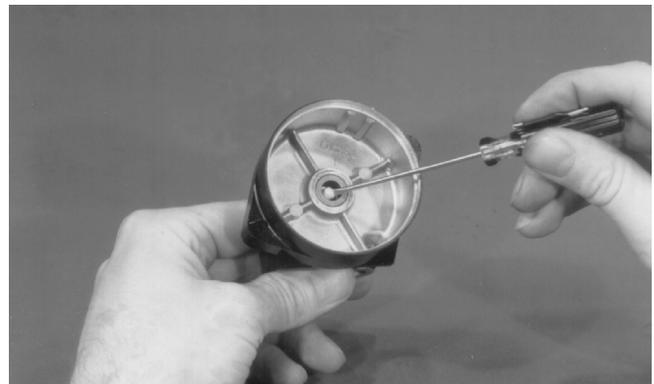
BC010

4. Install the armature into the starter housing; then while holding the brushes out, slide the commutator into the brush holder.



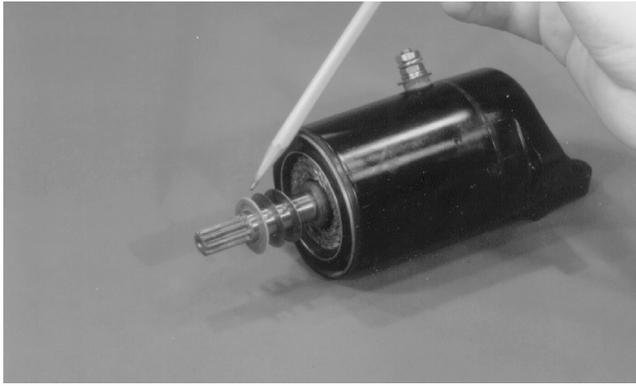
BC006

5. Apply a small amount of grease to the rear cover bushing; then install the cover on the starter housing making sure the reference marks align.



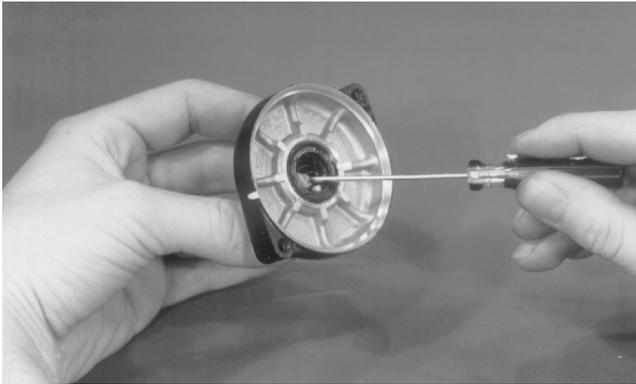
BC013

6. In order, install the thick metal washer, thin metal washer, and the fiber washer on the armature shaft; then install the housing O-ring on the starter housing.

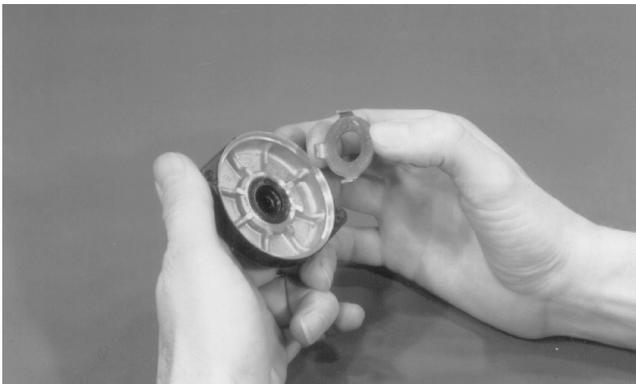


BC014

7. Apply a small amount of grease to the front cover bearing and seal; then install the seal protector.

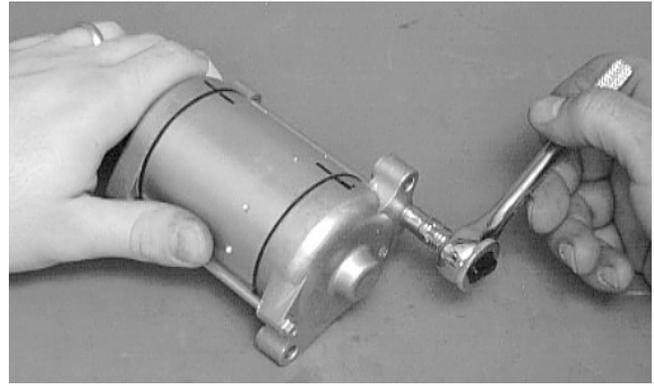


BC015



BC004

8. Place the front cover onto the starter housing making sure it seats properly.
9. Apply red Loctite #271 to the threads of the two long cap screws and install. Tighten to 0.8-1.2 kg-m (6-9 ft-lb).



AR653D

10. Apply a small amount of grease to the O-ring seal on the starter; then install the starter into the crankcase. Secure with two cap screws and wiring forms.

11. Secure the positive cable to the starter with the nut.

12. Connect the battery.

TESTING VOLTAGE

Perform this test on the starter motor positive terminal. To access the terminal, slide the boot away.

■ **NOTE:** The ignition switch must be in the ON position, the emergency stop switch in the RUN position, the reverse lever (on manual transmission models) in the FORWARD position, and the shift lever (on automatic transmission models) in the NEUTRAL position.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the starter terminal; then connect the black tester lead to ground.
3. With the starter button depressed, the meter must show battery voltage and the starter motor should operate.



AR607D

■ **NOTE:** If the meter showed battery voltage but the starter did not operate or operated slowly, inspect battery voltage (at the battery), starter motor condition, and/or ground connections.

■ **NOTE:** If the meter showed no battery voltage, inspect the main fuse, ground connections, starter motor lead, battery voltage (at the battery), or the switches.

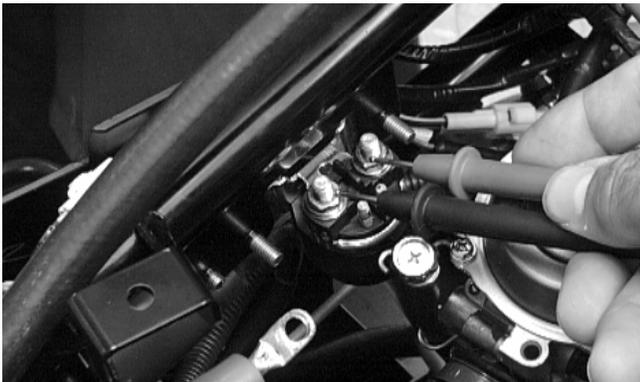
Starter Relay (250/300)

RESISTANCE

⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Disconnect the battery; then verify that the ignition fuse is good. Disconnect all wires from the solenoid.
2. Set the meter selector to the OHMS position.
3. Connect the tester leads to each of the heavy posts of the solenoid.
4. The meter must show an open circuit.

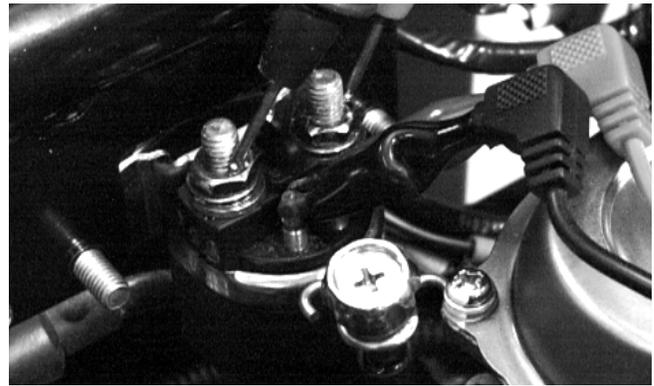


CH099D

■ **NOTE:** Leave the tester leads connected to the solenoid posts for the following procedure.

■ **NOTE:** An external 12-volt power supply “jumper” (positive and negative connections) must be used for this test. Also, it is very important that the meter leads and power supply connections are made to the appropriate terminals of the relay or damage to the multimeter will result.

5. Connect the power supply leads to each small terminal of the solenoid. There should be an audible “click” from the relay, and the meter must show less than 1 ohm.



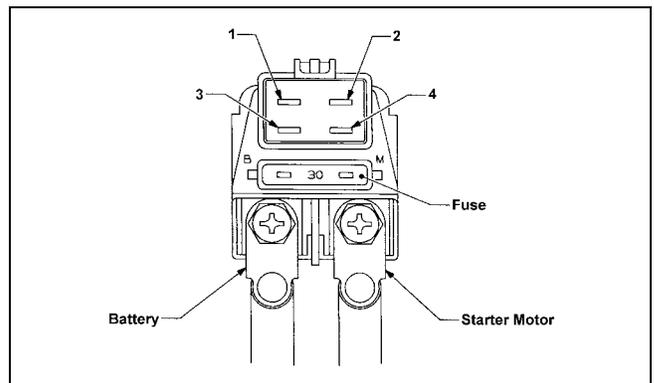
CH100D

■ **NOTE:** If there was no audible “click” from the relay or if the meter shows more than 1 ohm, it must be replaced. If there was a “click,” continue to test resistance.

6. With the 12-volt power supply still connected, connect the red tester lead to the heavy battery cable terminal; then connect the black tester lead to the heavy starter motor cable terminal.
7. The meter must show less than 1 ohm.
8. With the 12-volt power supply disconnected, connect the tester leads to each small terminal of the solenoid.
9. The meter must show 4.3 ohms \pm 20%.

■ **NOTE:** If the meter shows no resistance, the relay is out of tolerance or it must be replaced.

Starter Relay (400/500)



0732-513

RESISTANCE

CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Disconnect the battery; then verify that the starter relay 30-amp fuse is good.
2. Set the meter selector to the OHMS position.
3. Connect the red tester lead to terminal #1; then connect the black tester to terminal #2.
4. The meter must show an open circuit.

■ **NOTE:** Leave the tester leads connected to the terminals for the following procedure.

■ **NOTE:** An external 12-volt power supply “jumper” (positive and negative connections) must be used for this test. Also, it is very important that the meter leads and power supply connections are made to the appropriate terminals of the relay or damage to the multimeter will result.

5. Connect the power supply (positive) to terminal #3; then connect the power supply (negative) to terminal #4. There should be an audible “click” from the relay, and the meter must show less than 1 ohm.

■ **NOTE:** If there was no audible “click” from the relay or if the meter shows more than 1 ohm, it must be replaced. If there was a “click,” continue to test resistance.

6. With the 12-volt power supply still connected, then connect the red tester lead to the heavy battery cable terminal; then connect the black tester lead to the heavy starter motor cable terminal.
7. The meter must show less than 1 ohm.
8. With the 12-volt power supply disconnected, connect the red tester lead to terminal #3; then connect the black tester lead to terminal #4.
9. The meter must show 3.6 ohms ± 20%.

■ **NOTE:** If the meter shows no resistance, the relay is out of tolerance or it must be replaced.

CDI Unit (250/300)

The CDI is located beneath the right rear fender panel near the battery.

■ **NOTE:** The CDI unit is not a serviceable component. If the unit is defective, it must be replaced.

The CDI is rarely the cause for electrical problems; however, if the CDI is suspected, substitute another CDI unit to verify the suspected one is defective.

■ **NOTE:** Prior to replacing the CDI unit to assure the CDI unit is defective, it is advisable to perform a CDI peak voltage test (see Ignition Coil in this section) and/or perform a continuity test of the wiring harness from the CDI connector to the CDI unit.

Regulator/Rectifier (250/300)

The regulator/rectifier is located near the battery.

RESISTANCE

CAUTION

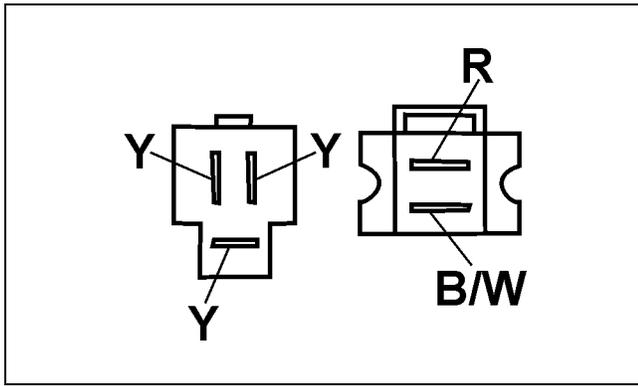
Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

1. Set the meter selector to the OHMS position.
2. Test each combination as found in the following chart.

■ **NOTE:** As an example, connect the red tester lead to the R terminal; then connect the black tester lead to a Y terminal. The meter must show 7-k ohms.

CAUTION

Before determining the regulator/rectifier is defective, perform every test combination shown in the chart.



ATV1087B

REGULATOR/RECTIFIER SPECIFICATIONS (k-ohms)

		Positive Meter Lead To:				
		Y	Y	Y	R	B/W
Negative Meter Lead To:	Y	—	∞	∞	7	∞
	Y	∞	—	∞	7	∞
	Y	∞	∞	—	7	∞
	R	∞	∞	∞	—	∞
	B/W	7	7	7	30-50	—

∞ = Infinity

CDI Unit (400/500)

The CDI is located beneath the seat and fender panel near the battery.

■ **NOTE:** The CDI unit is not a serviceable component. If the unit is defective, it must be replaced.

The CDI is rarely the cause for electrical problems; however, if the CDI is suspected, substitute another CDI unit to verify the suspected one is defective.

■ **NOTE:** Prior to replacing the CDI unit to assure the CDI unit is defective, it is advisable to perform a CDI peak voltage test (see Ignition Coil in this section) and/or perform a continuity test of the wiring harness from the CDI connector to the CDI unit.

Regulator/Rectifier (400/500)

The regulator/rectifier is located beneath the seat near the air-cleaner housing.

RESISTANCE

CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

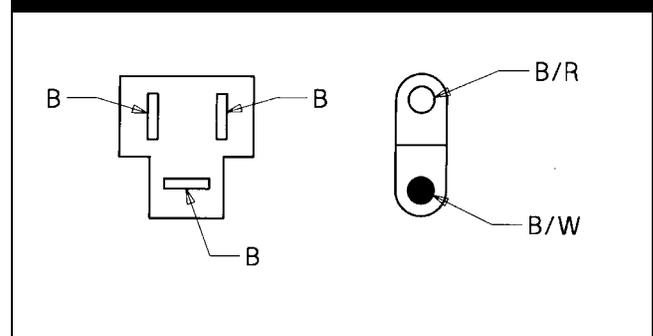
1. Set the meter selector to the OHMS position.
2. Test each combination as found in the following chart.

■ **NOTE:** As an example, connect the red tester lead to the B/R terminal; then connect the black tester lead to a B terminal. The meter must show 1-10 k-ohms.

CAUTION

Before determining the regulator/rectifier is defective, perform every test combination shown in the chart.

REGULATOR/RECTIFIER TERMINALS



0735-352

REGULATOR/RECTIFIER SPECIFICATIONS (k-ohms)

		Positive Meter Lead To:					
		B/R	B	B	B	B/W	Body
Negative Meter Lead To:	B/R	—	∞	∞	∞	∞	∞
	B	1-10	—	∞	∞	∞	∞
	B	1-10	∞	—	∞	∞	∞
	B	1-10	∞	∞	—	∞	∞
	B/W	3-15	1-10	1-10	1-10	—	∞
	Body	∞	∞	∞	∞	∞	—

∞ = Infinity

REG/REC SPEC

Neutral Start Relay

The connector is the white 4-prong one near the battery.

VOLTAGE (Connector)

■NOTE: The ignition switch must be in the ON position.

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the orange wire; then connect the black tester lead to ground.
3. The meter must show battery voltage.

■NOTE: If the meter shows no battery voltage, inspect the fuses, wiring harness, connectors, or ignition switch.

■NOTE: In the following test, the ignition switch must be in the ON position and the emergency stop switch must be in the RUN position.

4. With the black tester lead still connected to ground, connect the red tester lead to the yellow/green wire.
5. Depress the starter button. The meter must show battery voltage.

■NOTE: If the meter shows no battery voltage, inspect fuses, wiring harness, connectors, and switches.

RESISTANCE (Relay - Brass Terminals)

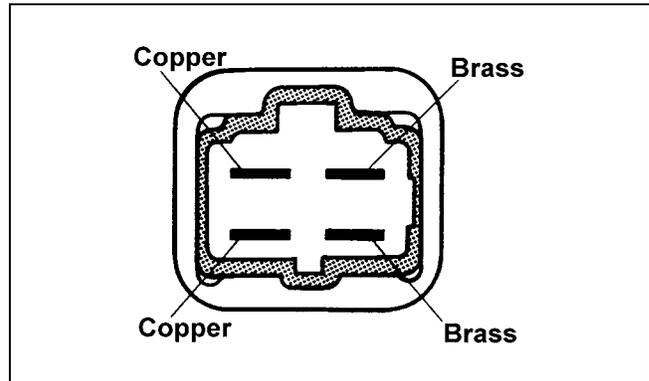
⚠ CAUTION

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

■NOTE: An external 12-volt power supply “jumper” (positive and negative connections) must be used for this test. Also, it is very important that the meter leads and power supply connections are made to the appropriate terminals of the relay or damage to the multimeter will result.

1. Set the meter selector to the OHMS position.

2. Connect the power supply (positive) to one copper terminal; then connect the power supply (negative) to the other copper terminal. There should be an audible “click” from the relay.



ATV-1075

■NOTE: If there was no audible “click” from the relay, it must be replaced. If there was a “click,” continue to test resistance.

3. Set the meter selector to the OHMS position.
4. With the power supply still connected, connect the red tester lead to one brass terminal; then connect the black tester lead to the other brass terminal.
5. The meter must show less than 1 ohm.

■NOTE: If the meter shows more than 1 ohm (even though the “click” was heard in the power supply test), the relay must be replaced.

RESISTANCE (Relay - Copper Terminals)

Always disconnect the battery when performing resistance tests to avoid damaging the multimeter.

■NOTE: The external power supply will not be used for this test.

1. Set the meter selector to the OHMS position.
2. Connect the red tester lead to one copper terminal; then connect the black tester lead to the other copper terminal.
3. The meter must show 90 ohms \pm 20%.

■NOTE: If the meter shows no resistance, replace the relay.

5

Headlights

The connectors are the two 3-prong ones secured to the front bumper supports (one on each side) with cable ties.

BULB VERIFICATION (Low and High Beam)

■ **NOTE: Perform this test on each headlight bulb. Also, a 12-volt external power supply w/jumpers will be needed.**

1. Disconnect the wiring harness from the bulb to be tested.
2. Connect the power supply (positive) to one bulb contact; then connect the power supply (negative) to the remaining bulb contact.
3. The bulb should illuminate.
4. If the bulb fails to illuminate, it must be replaced.

VOLTAGE

■ **NOTE: Perform this test in turn on the main harness side of all four connectors. Also, the ignition switch must be in the LIGHTS position.**

■ **NOTE: The LO beam is the inside bulb, and the HI beam is the outside bulb.**

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to one wire; then connect the black tester lead to the other wire.
3. With the dimmer switch in the LO position, test the two inside connectors (LO beam). The meter must show battery voltage.
4. With the dimmer switch in the HI position, test the two outside connectors (HI beam). The meter must show battery voltage.

■ **NOTE: If battery voltage is not shown in any test, inspect the fuses, battery, main wiring harness, connectors, or the left handlebar switch.**

Taillight - Brakelight

The connector is the 3-prong one located under the rear fender assembly.

BULB VERIFICATION

■ **NOTE: Perform this test on the taillight-brakelight side of the connector. Also, a 12-volt external power supply (jumper) will be needed.**

1. Connect the power supply (positive) to the yellow wire; then connect the power supply (negative) to the brown wire.
2. The taillight should illuminate.
3. With the negative power supply still connected, connect the positive supply wire to the red wire.
4. The brakelight should illuminate.

■ **NOTE: If either the taillight or brakelight fails to illuminate, inspect the bulb, the connectors, or the component wiring harness.**

VOLTAGE (Taillight)

■ **NOTE: Perform this test on the main harness side of the connector. Also, the ignition switch should be in the LIGHTS position.**

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the pink wire; then connect the black tester lead to the black wire.
3. With the ignition key in the LIGHTS position, the meter must show battery voltage.

■ **NOTE: If the meter shows no voltage, inspect fuses, wiring harness, connectors, and switches.**

VOLTAGE (Brakelight)

■ **NOTE: Perform this test on the main harness side of the connector. Also, the ignition switch should be in the ON position and the brake (either foot pedal or hand lever) must be applied.**

■ **NOTE: Make sure the brake lever (hand) and brake pedal (auxiliary) are properly adjusted for this procedure.**

1. Set the meter selector to the D.C. Voltage position.
2. Connect the red tester lead to the red/blue wire; then connect the black tester lead to the black wire.
3. With either brake applied, the meter must show battery voltage.

■ **NOTE: If the meter shows no voltage, inspect bulb, fuses, wiring harness, connectors, and switches.**

Ignition Timing

The ignition timing cannot be adjusted; however, verifying ignition timing can aid in troubleshooting other components. To verify engine timing, use the following procedure.

1. Attach the engine Timing Light (p/n 0644-197) to the spark plug high tension lead; then remove the timing inspection plug from the left-side crankcase cover.
2. With the Arctic Cat Engine Tachometer (p/n 0644-275) connected, start the engine and run at the specified RPM.

3. Ignition timing should be according to specifications.

Model	Timing
250	5° BTDC below 1800 RPM 35° BTDC above 3800 RPM
300	5° BTDC @ 1800 RPM 30° BTDC @ 3800 RPM
400	10° BTDC @ 3000 RPM
500	10° BTDC @ 1500 RPM

4. Install the timing inspection plug.

If ignition timing cannot be verified, the rotor may be damaged, the key may be sheared, the trigger coil bracket may be bent or damaged, or the CDI unit may be faulty.

WIRING DIAGRAM (250)

Harness (p/n 0486-088)

INSERT FOLD-OUT

WIRING DIAGRAM (300 2x4)

Harness (p/n 0486-086)

INSERT FOLD-OUT

WIRING DIAGRAM (300 4x4)

Harness (p/n 0486-082)

INSERT FOLD-OUT

WIRING DIAGRAM (400 Manual Transmission)

Harness (p/n 0486-096 - FIS)

Harness (p/n 0486-100 - ACT)

INSERT FOLD-OUT

0737-952

WIRING DIAGRAM (400 Automatic Transmission)

Harness (p/n 0486-093 - FIS)

Harness (p/n 0486-106 - ACT)

INSERT FOLD-OUT

WIRING DIAGRAM (500 Manual Transmission)

Harness (p/n 0486-108)

INSERT FOLD-OUT

WIRING DIAGRAM (500 Automatic Transmission)

Harness (p/n 0486-098)

INSERT FOLD-OUT

0738-009