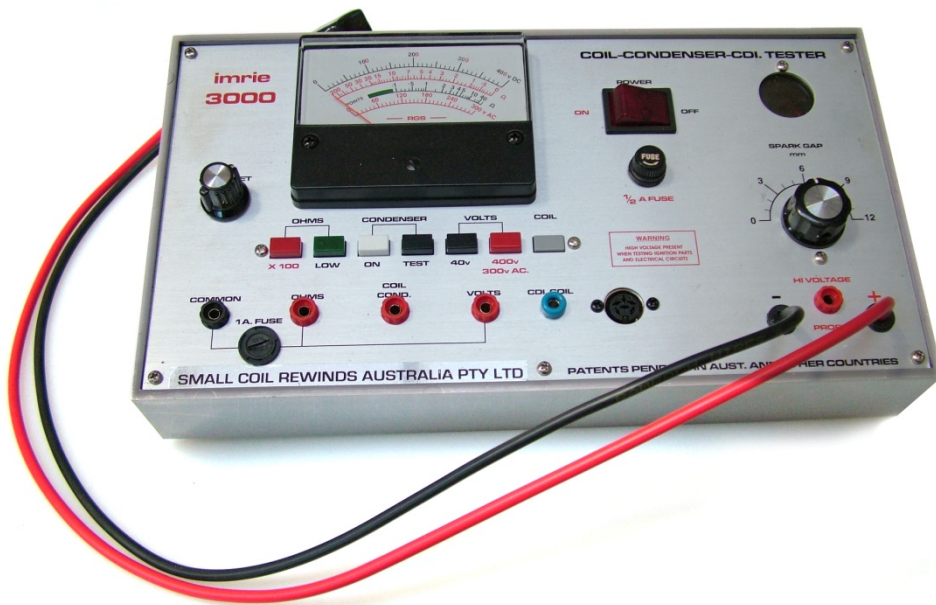


OWNERS OPERATING MANUAL

Imrie® 3000

ELECTRONIC IGNITION ANALYSER



Imrie® Diagnostic Testing

Australian Designed and Manufactured.

Imrie® Diagnostic Testing incorporated within Small Coil Rewinds Pty.Ltd.

www.imrie.com.au

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Introduction:

Your owner's operating manual shows how small engine ignition systems work and how to quickly locate and diagnose faults that develop. You will find conventional and complicated electronic ignition systems quite easy to check with your Imrie®3000.

Illustrations are clear and written instructions give step-by-step directions. The illustrations are generally typical and not of any particular model.

The owner's operating manual is the result of technical knowledge and information we have learned from years of studying and servicing ignition systems fitted to all types of 2 and 4 cycle engines. The simple test procedures will enable you to quickly find and repair faults in any small engine ignition system.

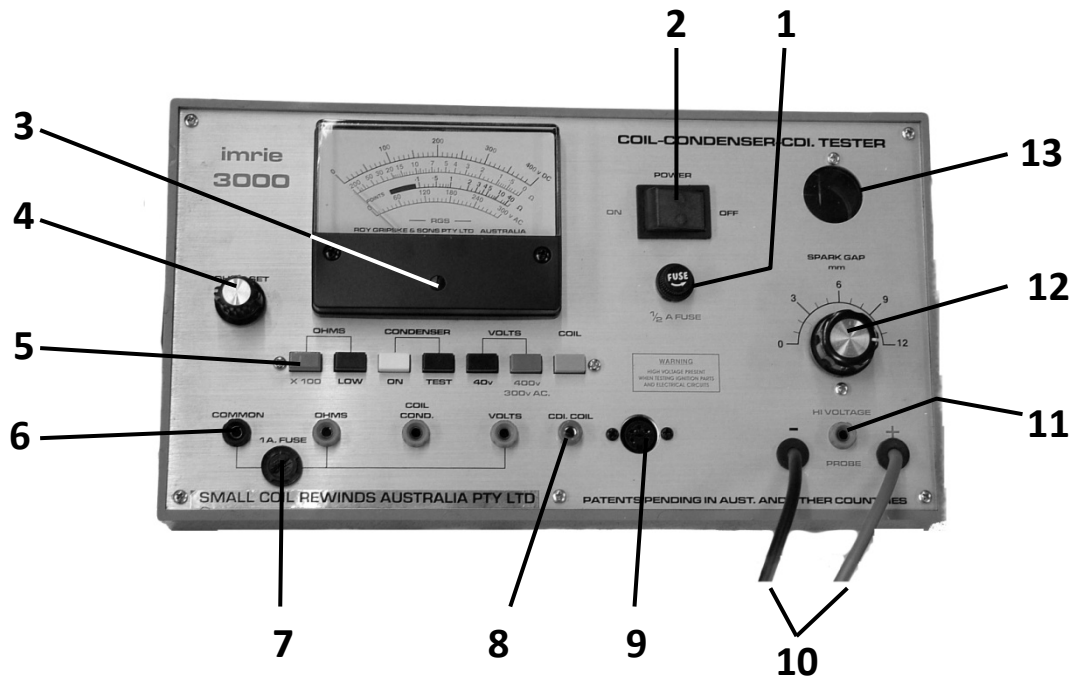
In producing this manual we have included some specification sheets on a variety of engines and ignition systems. As there are too many brands and models to list, we have included some blank specification sheets which you can be filled in when new models are available.

To get to know your Imrie®3000, try the tests on various ignition systems known to be in good working order. You will soon get the feel of the equipment and how to identify faults.

Time wasted searching for faults is frustrating and expensive. Rapidly locating and repairing faults is essential in today's workshop. The speed, simplicity and dependability of your Imrie®3000 will enable you to specialise in this highly complex field of new technology.

Small Coil Rewinds Pty. Ltd.

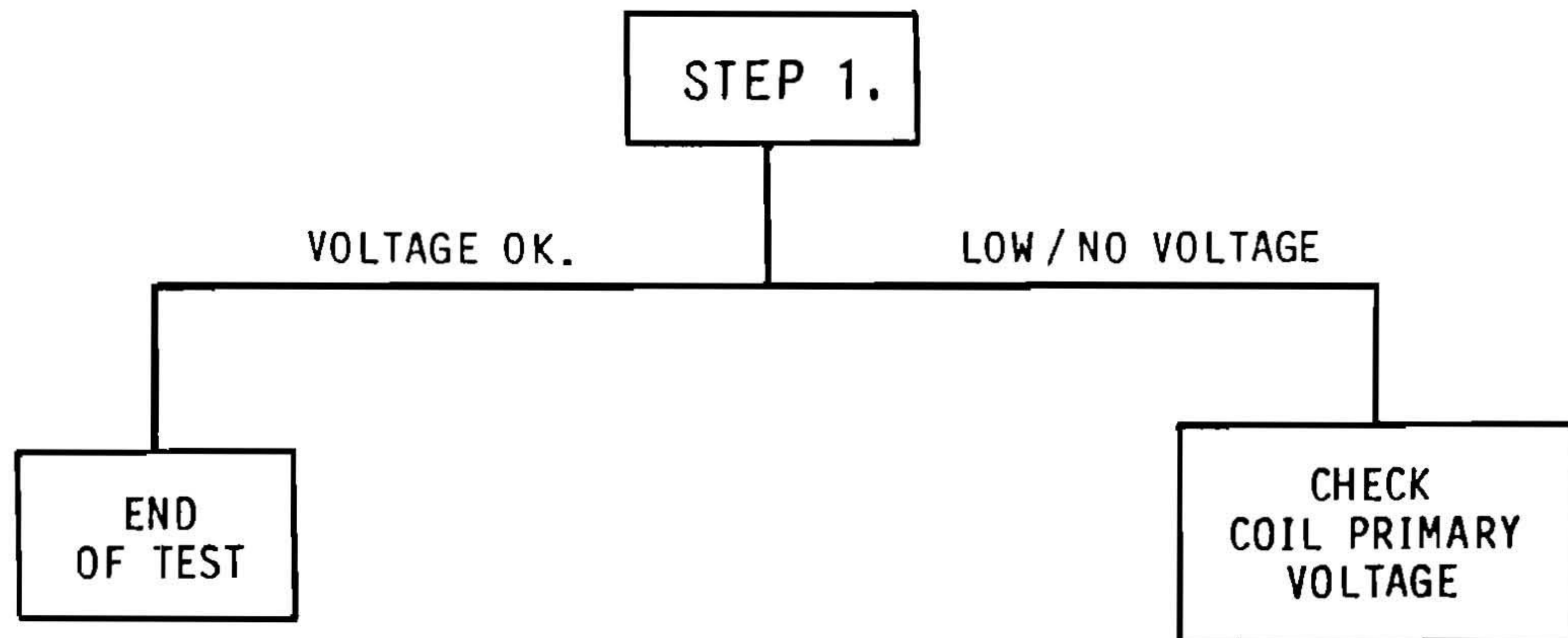
COIL – CONDENSER – CDI – TESTER



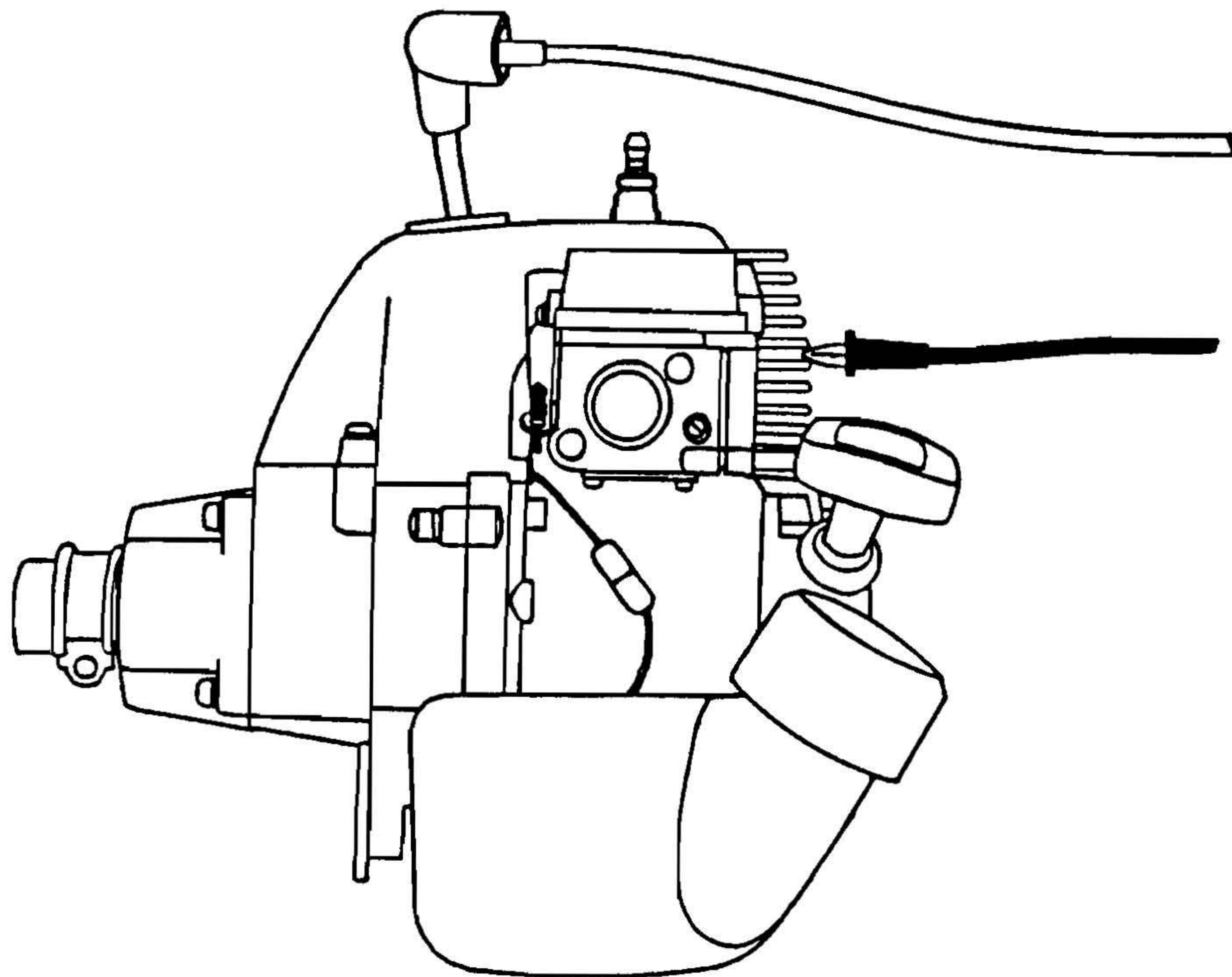
When testing ignition parts on a bench, place the “Imrie®3000”
And the ignition part on an INSULATED or WOODEN TABLE TOP
This will prevent any leakage or shock hazards.

1. 0.5 Amp fuse - AC POWER supply.
2. ON / OFF illuminated AC POWER switch.
3. Meter zero adjusting screw.
4. OHMS set knob.
5. Push buttons, for test selection.
6. Sockets, for test selection.
7. 1 Amp fuse - circuit protection.
8. Blue socket – for testing CDI coils only.
9. Flywheel simulator socket.
10. (+) and (-) High Voltage test leads.
11. RED socket – High Voltage insulation PROBE.
12. Spark gap adjustment knob.
13. Visual spark gap window.

Simple - 2 STEP - Ignition Test

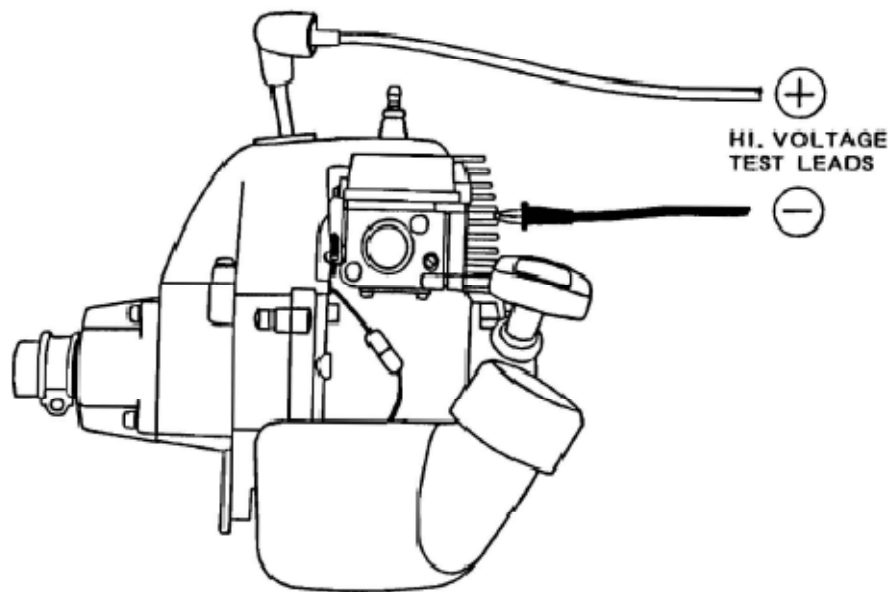


REMEMBER! Quick and Accurate diagnosis will benefit your customers and your business



STEP 1. IGNITION COIL OUTPUT (Page 2)

IGNITION COIL OUTPUT - SPARK TEST



TEST PROCEDURES :

CONNECTIONS:

1. Connect the HIGH VOLTAGE test leads as shown above.
2. Set the Spark Gap to 6mm.

ACTION:

Crank engine vigorously, and view the Spark Gap through the tester's window.

RESULTS:

- a. If spark will jump 6mm gap, then ignition system is OK.
- b. If weak, intermittent or no spark at 6 mm, then check ignition coil primary voltage. (Previous Pages).

IGNITION COIL - PRIMARY VOLTAGE

TRANSISTOR CONTROLLED IGNITION
T.C.I.

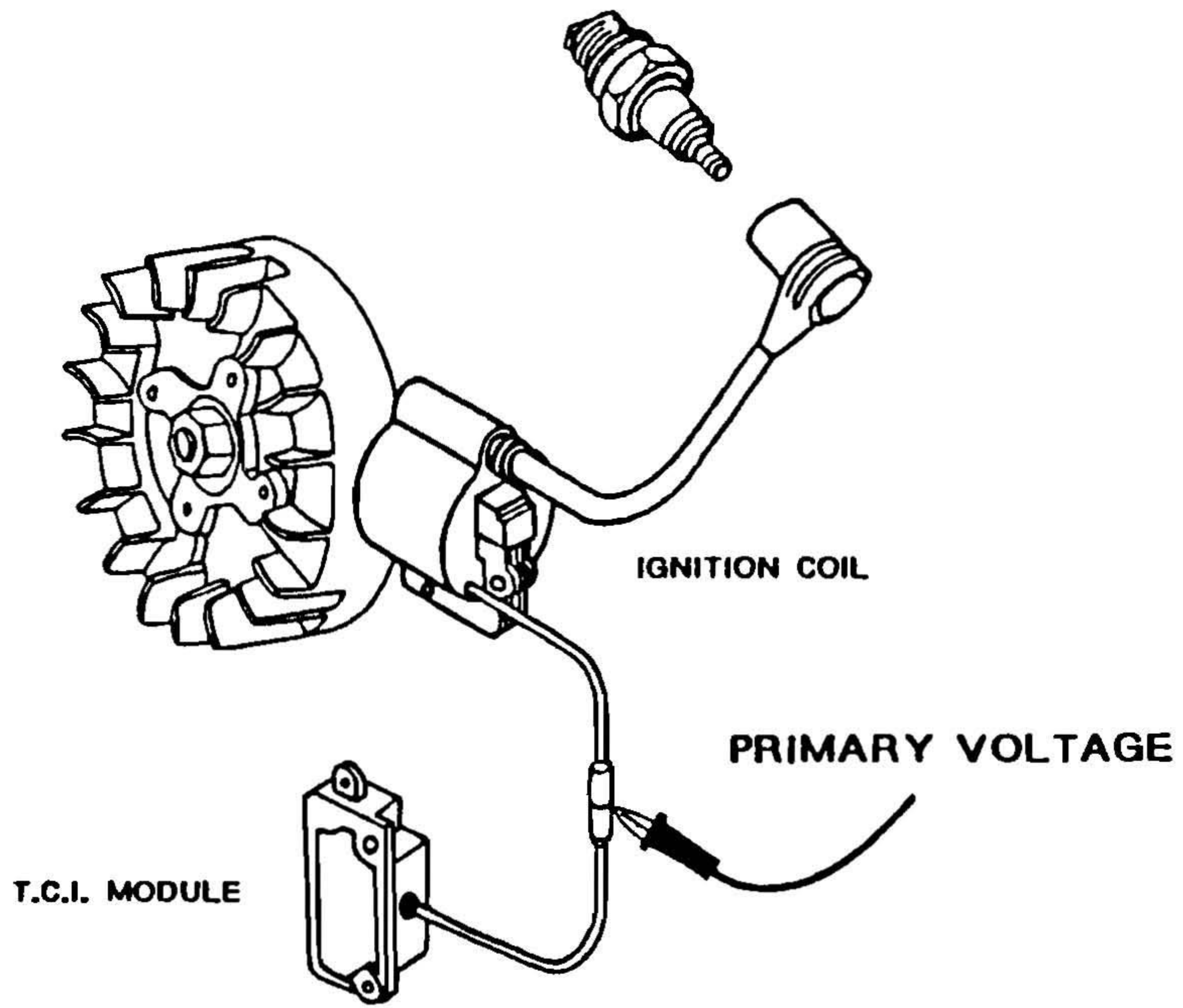


Fig.1. IN CIRCUIT TEST

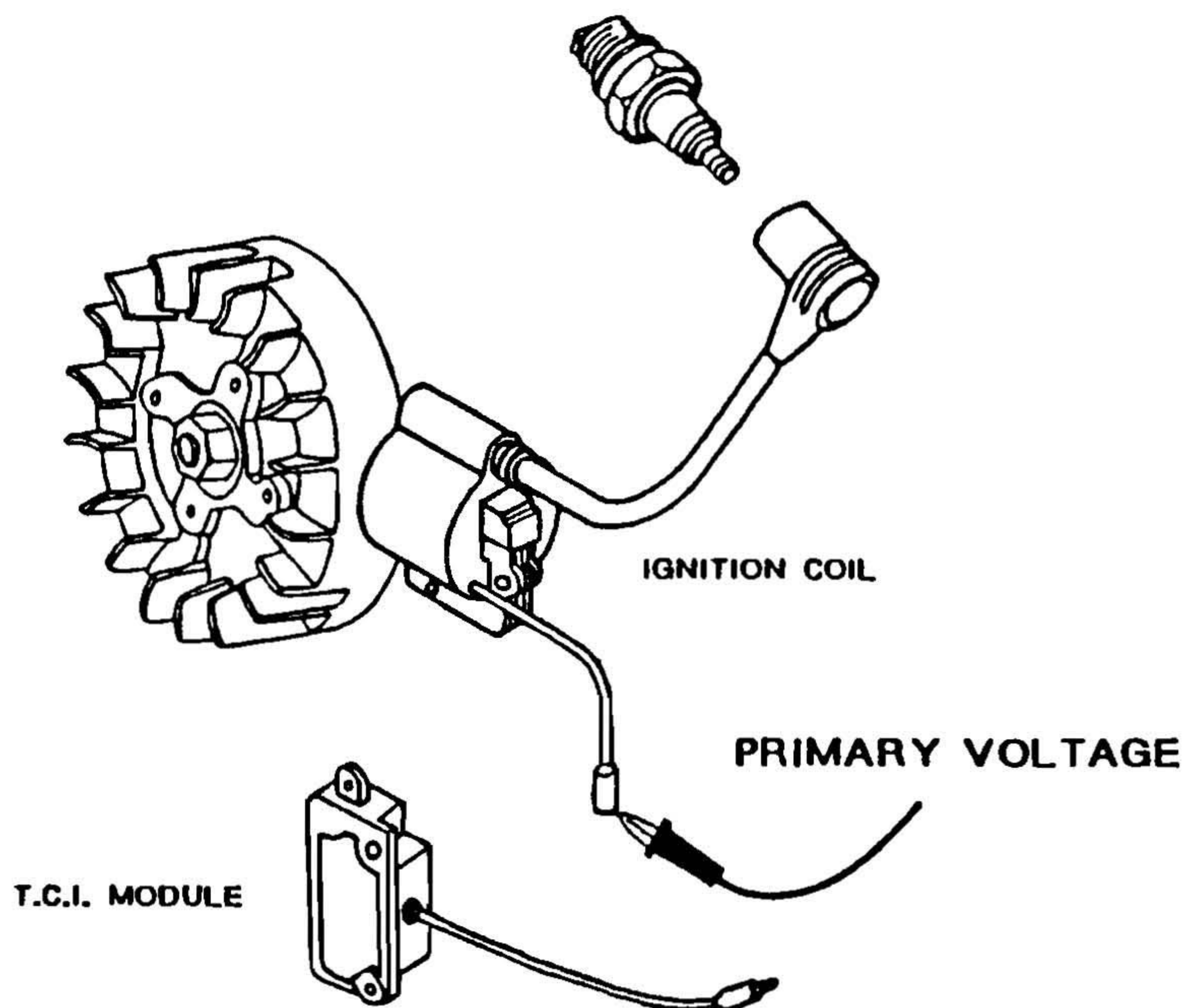


Fig.2. OPEN CIRCUIT TEST

TRANSISTOR CONTROLLED IGNITION (TCI)

IGNITION COIL - PRIMARY VOLTAGE

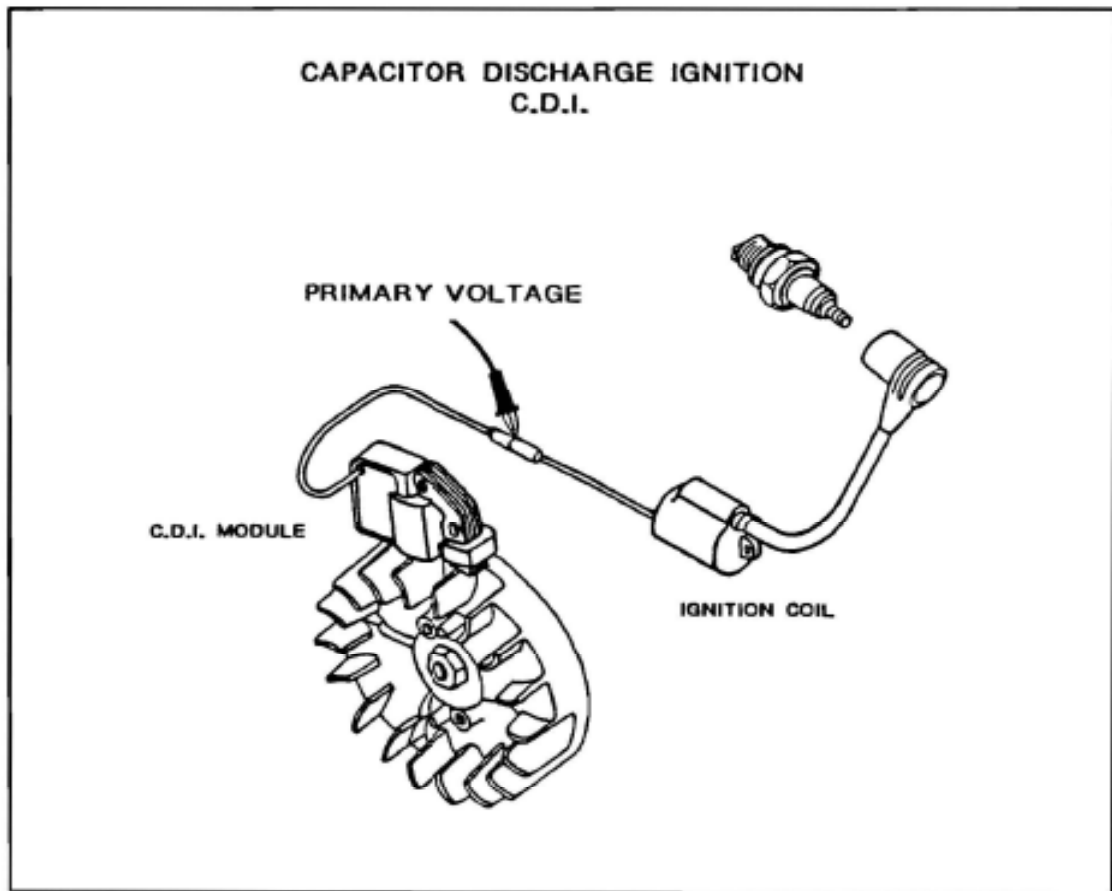
TEST PROCEDURES: (IN CIRCUIT. Fig. 1)

1. Be sure that the stop switch is in the RUN or START position.
2. Set up the meter to read 0-400 v. DC.
3. Connect the RED test lead to a good engine ground and connect the BLACK test lead to the ignition coil primary terminal fitted to the transistor ignition module
4. Crank the engine vigorously and note the voltage reading on the meter 0-400v. scale.
5. An -in circuit-voltage reading of around 120v. to 150v. would be considered normal. (Depending on engine under test.)
6. If low or no voltage, then reverse the test lead connections and re-test.
7. If voltage reading is still low, or no voltage, then proceed with the -open circuit-tests below to determine if the ignition coil or the transistor ignition module is faulty.

TEST PROCEDURES: (OPEN CIRCUIT. Fig.2)

1. Connect the RED test lead to a good engine ground.
2. Disconnect the ignition coil primary wire from the transistor module and connect the BLACK test lead to the coil primary wire or terminal on the ignition coil.
3. Set up the meter to read 0-40v. DC.
4. Crank the engine vigorously and note the voltage reading on the 0-40v. scale.
5. An - open circuit - voltage reading from about 10v. to 20v. would be considered normal.
6. If the voltage reading is as specified in step 5. then the ignition coil is OK, but the transistor ignition module is faulty, or a poor grounding of the transistor module. But, if there is low or no voltage reading, then the ignition coil is faulty or the air gap between the coil and flywheel may only need re-adjusting.

IGNITION COIL – PRIMARY VOLTAGE



OPERATION.

1. As the flywheel rotates and the magnets pass by the CDI unit, approximately 150 volts is generated within the CDI unit.
2. This voltage is then passed on to the ignition coil primary, where it is then "stepped up" in the secondary windings of the ignition coil to approximately 15,000 volts (15kv).
3. This high voltage is then transmitted through the High-Tension lead to the spark plug, which ignited the compressed air / fuel mixture within the cylinder.

CAPACITOR DISCHARGE IGNITION (CDI)

IGNITION COIL - PRIMARY VOLTAGE

*******AC. POWER IS NOT REQUIRED FOR THIS TEST*******

TEST PROCEDURES:

1. Be sure that the stop switch is in the RUN or START position.
2. Set up the meter to read 0-400v. DC.
3. Connect the RED test lead to a good engine ground and connect the BLACK test lead to the primary terminal fitted between the C.D.I. module and the ignition coil.
4. Crank the engine vigorously and note the voltage reading on the meter 0-400v. scale.
5. A voltage reading of around 150v would be considered normal.
6. If low or no voltage, then reverse the test lead connections and re-test.
7. If voltage reading is still low or no voltage, then the C.D.I. module is faulty, but before replacing the module check the flywheel / C.D.I. module air gap, the edge gap, the kill switch and the wire from the C.D.I. module to the ignition coil primary terminal for possible shorts, loose connections or open circuits. Also check that the C.D.I. module, the ignition coil and their ground wires are tight and have a good ground connection.

IGNITION COIL - PRIMARY VOLTAGE

BREAKER POINT IGNITION
B.P.I.

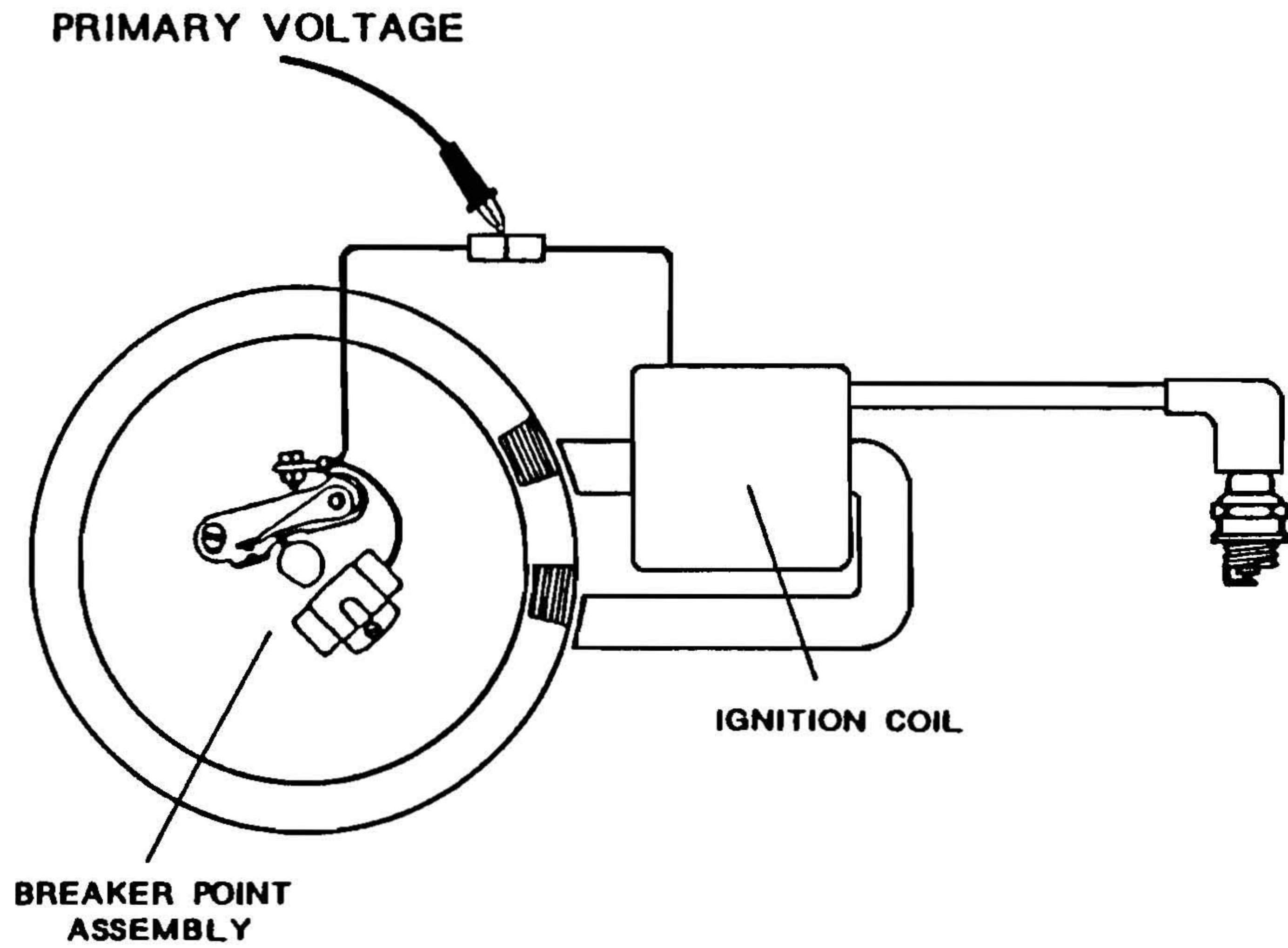


Fig.1. IN CIRCUIT TEST

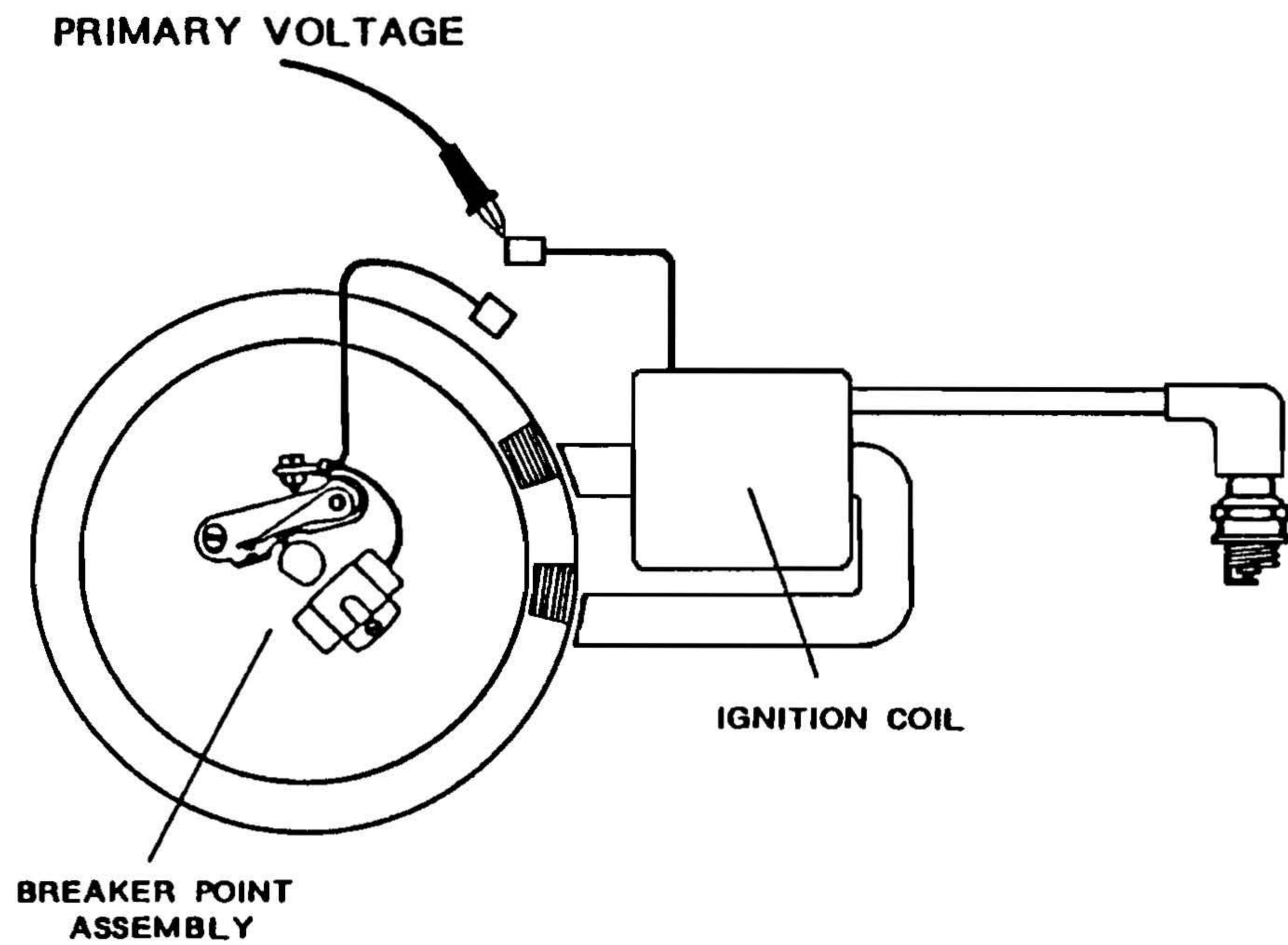


Fig.2. OPEN CIRCUIT TEST

BREAKER POINT IGNITION

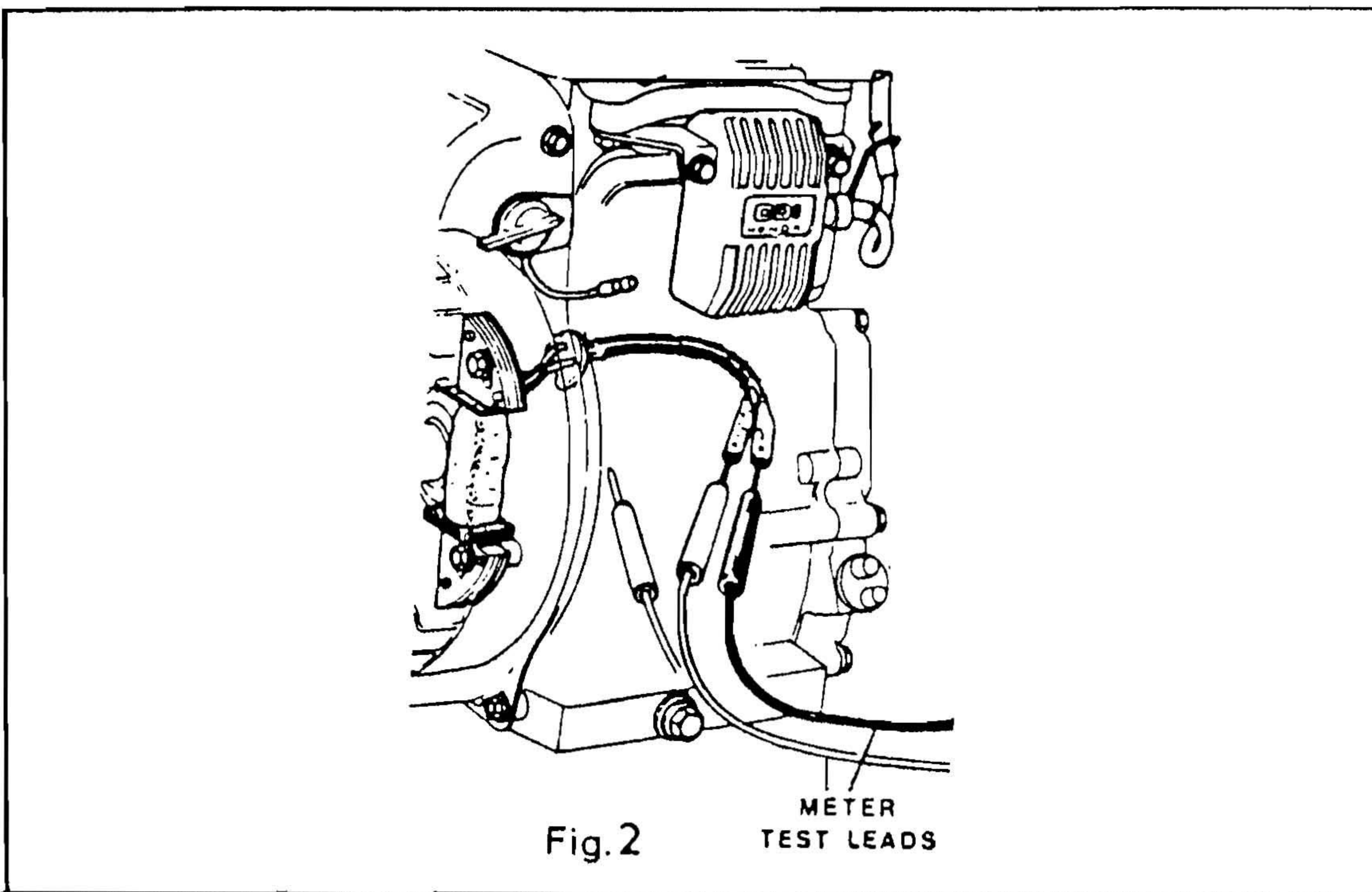
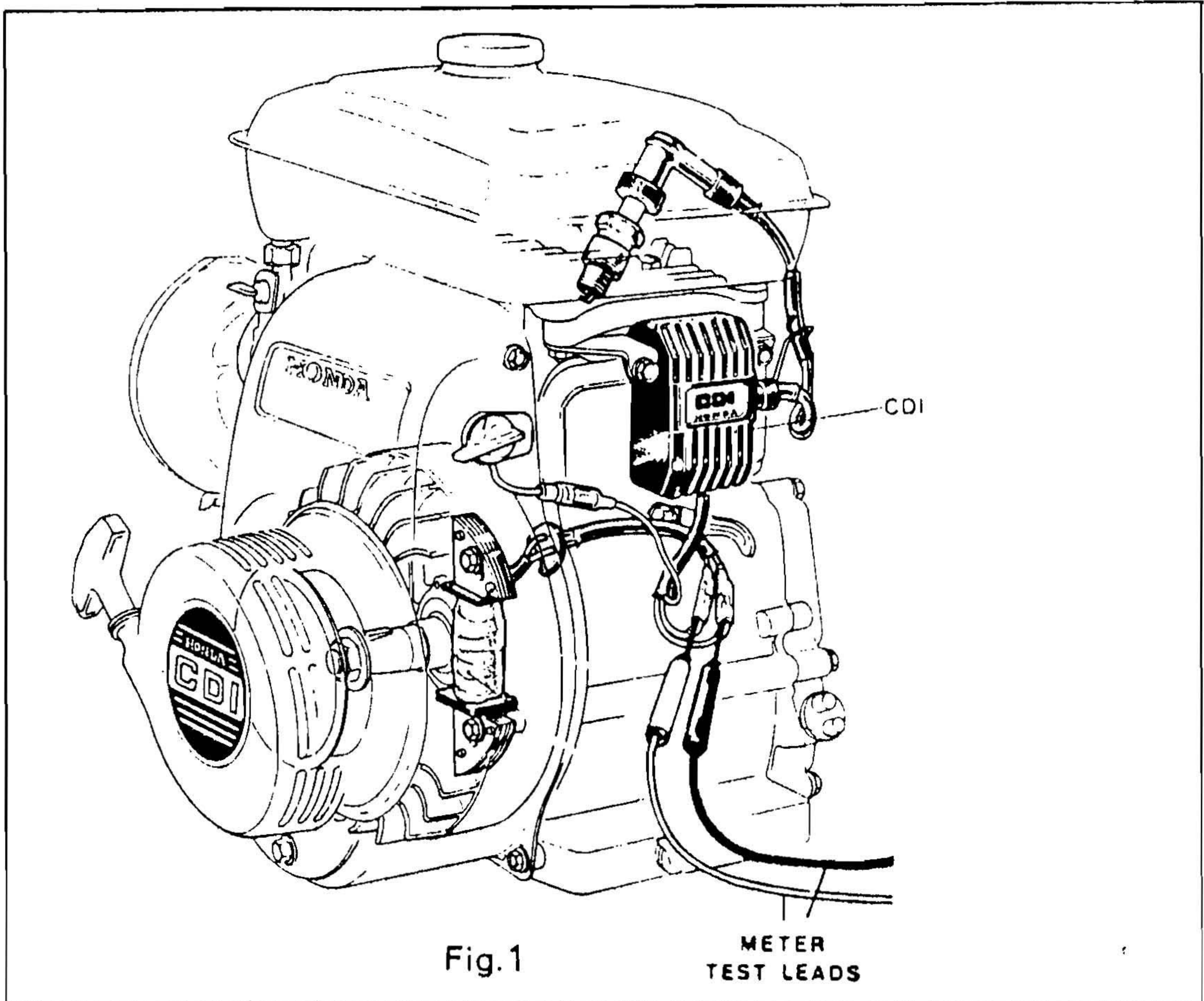
IGNITION COIL - PRIMARY VOLTAGE -

TEST PROCEDURES: (IN CIRCUIT. Fig. 1)

1. Be sure that the stop switch is in the RUN or START position.
2. Set up the meter to read 0-400 v. DC.
3. Connect the RED test lead to a good engine ground and connect the BLACK test lead to the ignition coil primary terminal fitted to the breaker points
4. Crank the engine vigorously and note the voltage reading on the meter 0-400v. scale.
5. An -in circuit- voltage reading of around 120v. to 150v. would be considered normal. (Depending on the engine under test.)
6. If low or no voltage, reverse the test lead connections and re-test.
7. If the voltage reading is still low, or no voltage, proceed with the "open circuit" tests below to determine if the ignition coil or the breaker point assembly are faulty.

TEST PROCEDURES: (OPEN CIRCUIT. Fig. 2)

1. Connect the RED test lead to a good engine ground.
2. Disconnect the ignition coil primary wire from the breaker points and connect the BLACK test lead to the coil primary wire or terminal on the ignition coil.
3. Set up the meter to read 0-40v. DC.
4. Crank the engine vigorously and note the voltage reading on the 0-40v. scale.
5. An -open circuit- voltage reading from about 10v. to 20v. would be considered normal.
6. If the voltage reading is as specified in step 5. the ignition coil is OK, the breaker points and/or condenser may need attention. If there is low or no voltage reading, the ignition coil is faulty or the air gap between the coil and flywheel may need to be adjusted.



| EXCITER COIL - VOLTAGE OUTPUT | | | |
|-------------------------------------|-------|-------|-------|
| MANUAL START - RED & BLACK wires | -150v | -350v | -400v |
| ELECTRIC START - BLUE & BLACK wires | -120v | -260v | -280v |

HONDA EXCITER COIL (Other CDI models are similar).

*******AC. POWER IS NOT REQUIRED FOR THIS TEST*******

TEST PROCEDURES: -IN CIRCUIT TEST - (fig 1)

1. Be sure that the ignition/kill switch is in the RUN or START position.
2. Set up meter to read 0-400v DC.
3. Connect the RED test lead to the BLACK exciter coil terminal.
4. Connect the BLACK test lead to the RED or BLUE exciter coil terminal.
5. If the engine will run, then start and run engine.
6. Note the reading on the 400v DC scale. The meter reading should be close to the voltage specified. If low or no voltage, check or isolate the kill switch and re-test.
7. If the engine won't start, or is hard to start, Crank the engine vigorously and note the voltage on the meters 400v DC scale. If low or no voltage, check or isolate kill switch and re-test.

If the meter reading is still low, or no voltage, then test the exciter coil output voltage -open circuit - steps 8 to 14.

TEST PROCEDURES: -OPEN CIRCUIT TEST - (fig 2)

8. Disconnect the exciter coil from the CDI unit.
9. Connect the RED test lead to the BLACK exciter coil terminal.
10. Connect the BLACK test lead to the RED or BLUE exciter coil terminal.
11. Crank the engine vigorously and note the voltage on the meters 400v DC scale. The meter readings should be close to the voltages specified.
12. If voltage reading is as specified, the CDI unit or kill switch is faulty, if the kill switch is OK then replace the CDI unit.
13. If low or no voltage, check for "shorts to ground", by connecting the BLACK test lead to a good engine ground, connect the RED test lead to each exciter coil terminal in turn.
14. Crank engine, if there is any meter reading other than zero, the exciter coil or its leads are shorted to ground. Repair the shorts or replace the exciter coil. If there is no voltage, check for broken wire using a resistance test, before replacing exciter coil.

NOTE: After fitting a new CDI unit, the exciter coil position must be adjusted to suit the timing symbol provided on the CDI unit (refer to the HONDA workshop manual for full details of adjustments).

HONDA CDI UNIT (Not for all CDI types)!!

****** TEST FOR FIVE (5) SECONDS ONLY !!!!! ******

-ON ENGINE TEST-

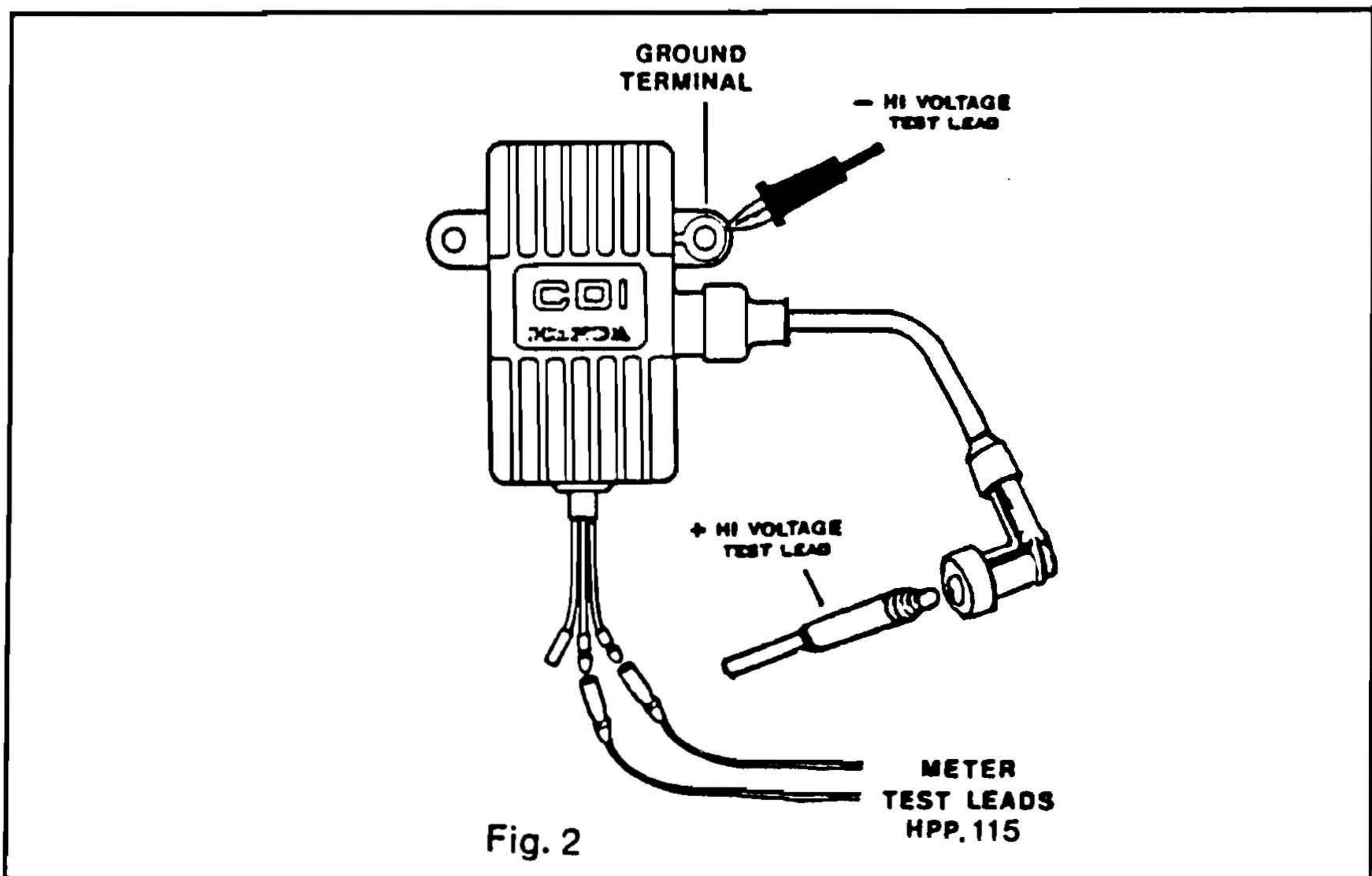
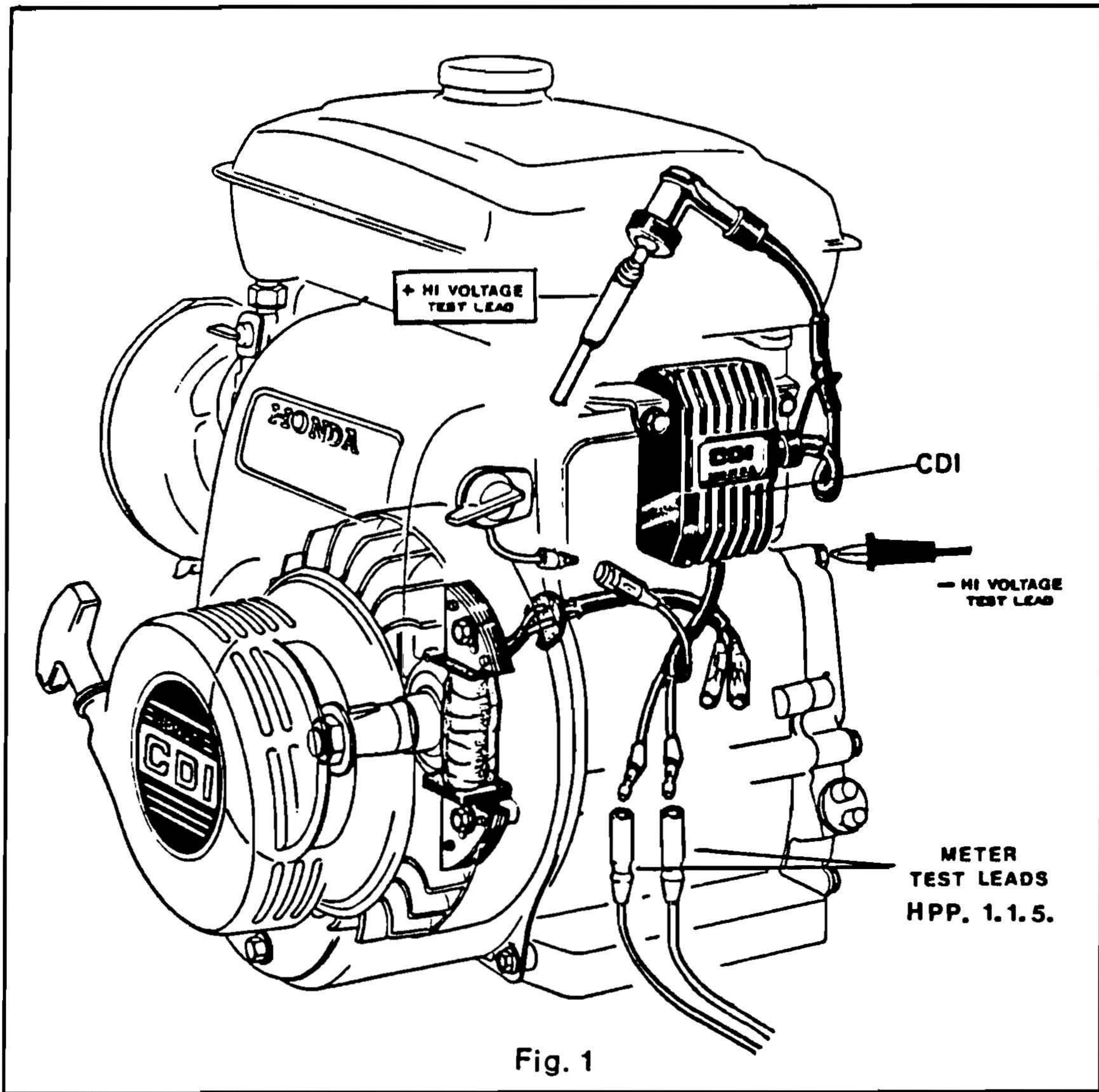
1. Disconnect CDI wires from the exciter coil and connect the special test lead # HPP 1.1.5 to the CDI unit (see figure 1).
2. Disconnect the wire from the CDI unit to the ignition switch.
3. Connect the (+) HIGH VOLTAGE test lead to the spark plug wire.
4. Connect the BLACK common test lead and the (-) HIGH VOLTAGE test lead to good engine ground.
5. Press the RED volts button.
6. Set the SPARK GAP to approximately 4mm.
7. Switch the power ON, spark should jump across the spark gap, if not, the CDI unit is faulty.
8. Increase spark gap to engine manufacturer's specifications (usually 8-10 mm). Spark should fire steady at recommended specifications. If the spark is faint, intermittent or no spark at 9 mm then the CDI unit is faulty and must be replaced (see note).

-OFF ENGINE TEST -

1. Connect the special test lead # HPP 1.1.5 to the CDI.
2. Connect the (+) HIGH VOLTAGE test lead to the spark plug wire.
3. Connect the BLACK common test lead and the (-) HIGH VOLTAGE test lead to the CDI ground terminal (see figure 2).
4. Press the RED volts button.
5. Set the SPARK GAP to approximately 4mm.
6. Switch the power ON, spark should jump across spark gap, if not, the CDI unit is faulty.
7. Increase spark gap to engine manufacturer's specifications (usually 8-10 mm.). Spark should fire steady at recommended specifications: If the spark is faint, intermittent or no spark at 9mm. then the C.D.I. unit is faulty and must be replaced (see note).

NOTE: After fitting a new C.D.I. unit, the exciter coil position must be adjusted to suit the timing symbol provided on the CDI unit (refer to the HONDA workshop manual for full details of the adjustment).

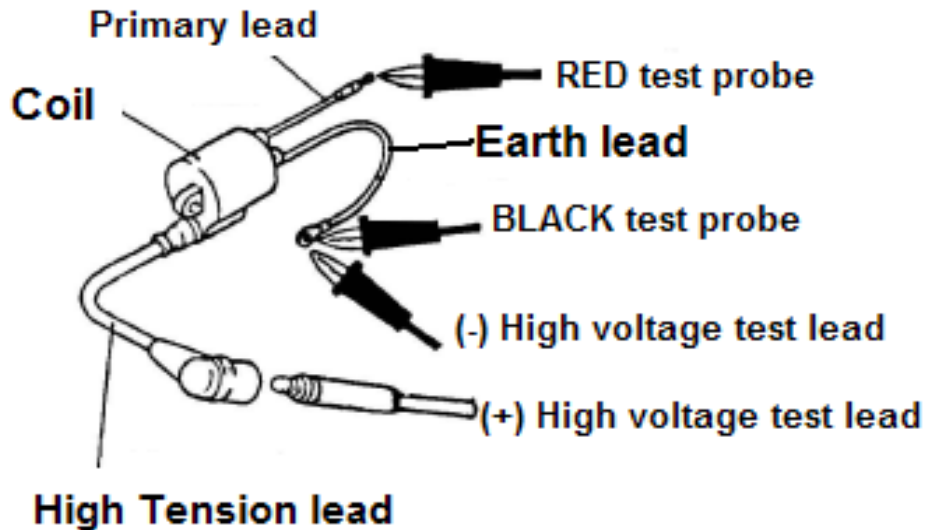
HONDA



COIL POWER TEST

***** OTHER THAN CDI COILS *****

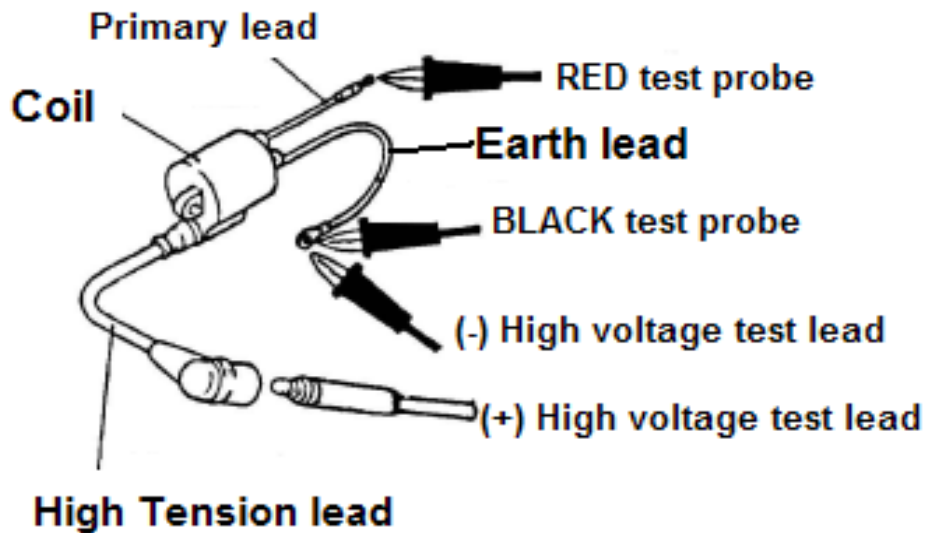
Magneto (points & TAI), 6 & 12 volt battery (points & TAI) etc.



1. Fit the BLACK test lead in to the BLACK socket on the meter.
2. Fit the RED test lead to the RED (COIL/COND) socket on the meter.
3. Press the GREY coil test button.
4. Disconnect the coil primary wire from the points or module.
5. Connect the RED test clip to the coil primary wire or terminal.
6. Connect the (+) HIGH VOLTAGE test lead to the spark plug wire.
7. Connect the BLACK test lead and the (-) HIGH VOLTAGE test lead to a good engine ground. If the coil is removed from the engine connect these to the EARTH or other primary terminal/wire.
NOTE: If the ignition coil has TWO secondary outputs then connect the (-) HIGH VOLTAGE test lead to the other spark plug wire. Instead of the engine ground lead or (-) negative primary terminal.
8. Set the SPARK GAP to approximately 4mm.
9. Switch the power ON, spark should jump across the gap. If not the coil is faulty and should be replaced.
10. Increase the spark gap to the manufacturer's specifications (usually 6 – 8mm). Spark should fire steady at the specified gap, if it is faint, intermittent or no spark the coil must be replaced.

COIL POWER TEST

***** CDI COILS ONLY *****



1. Fit the BLACK test lead in to the BLACK socket on the meter.
2. Fit the RED test lead to the BLUE (CDI COIL) socket on the meter.
3. Press the GREY coil test button.
4. Disconnect the coil primary wire from the CDI unit.
5. Connect the RED test clip to the coil primary wire or terminal.
6. Connect the (+) HIGH VOLTAGE test lead to the spark plug wire.
7. Connect the BLACK test lead and the (-) HIGH VOLTAGE test lead to a good engine ground. If the coil is removed from the engine connect these to the EARTH or other primary terminal/wire.
NOTE: If the ignition coil has TWO secondary outputs then connect the (-) HIGH VOLTAGE test lead to the other spark plug wire. Instead of the engine ground lead or (-) negative primary terminal.
8. Set the SPARK GAP to approximately 4mm.
9. Switch the power ON, spark should jump across the gap. If not the coil is faulty and should be replaced.
10. Increase the spark gap to the manufacturer's specifications (usually 9mm). Spark should fire steady at the specified gap, if it is faint, intermittent or no spark the coil must be replaced.

COIL SURFACE INSULATION TEST.

Please note: Older models of the Imrie 3000 have an **earth** wire from the **High Voltage Black(-)** terminal to the **Probe** socket, this should be removed. This allows insulation testing to be performed on both leads of **Twin Outlet High Tension coils**.

When using the SIMULATORS, be sure there is a wire connecting the COMMON socket to the COIL'S earth or laminations.

Also note that with the wire removed the Spark Gap section of the tester can be used whilst the engine is running, this allows you to check **Reserve Voltage** and engine misfiring. **Start the test with a zero spark gap.**

Surface Insulation testing will detect:

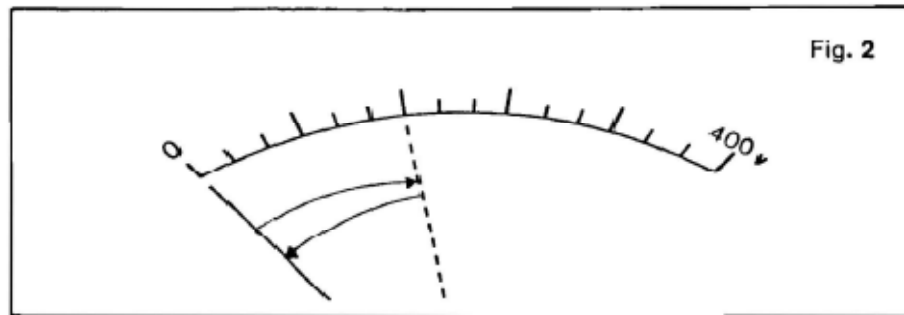
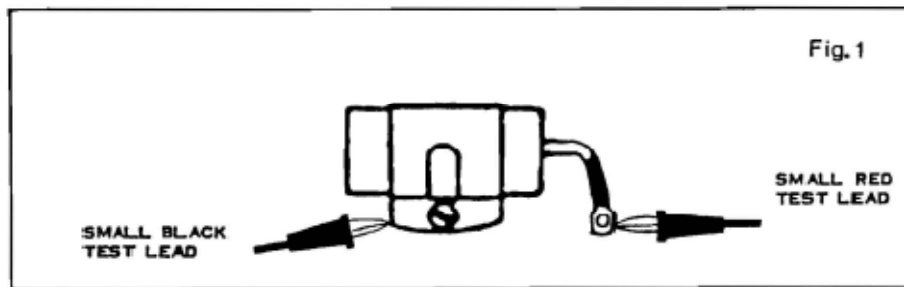
- Cracked spark plug caps.
- Leakage from HIGH TENSION leads.
- Cracks or holes on ignition coil surfaces.

PROCEDURE: (performed during COIL POWER TEST).

1. The test leads stay connected as they were for the COIL POWER TEST.
2. Select a suitable test lead (any 4mm test lead in good condition, preferably with a stiff insulated but exposed end) into the PROBE socket, situated on the front panel between the HIGH VOLTAGE test leads.
3. Set the spark gap to approximately 6mm.
4. Switch the power ON.
5. Pass the exposed end of the PROBE test lead over the insulating surfaces of the coil, high tension lead and spark plug cap.
6. If the insulation is cracked or damaged, a spark discharge will be noticed.
7. Do not allow the test probe to linger too long at any point while conducting this test.

NOTE: A faint spark occurring around the coil insulation during probing is a CORONA and does not indicate a faulty coil.

CONDENSER LEAKAGE and SHORT TEST



BEFORE DOING THIS TEST, CHECK THAT THE METER NEEDLE IS ON ZERO (0) AT THE LEFT SIDE OF THE METER SCALE. IF NOT, GENTLY TURN THE ZERO ADJUSTING SCREW UNTIL IT LINES UP ON ZERO. THIS IS SET AT THE FACTORY, BUT SHOULD BE CHECKED.

1. Press the WHITE condenser button to ON.
2. Disconnect the condenser lead from the breaker points/terminal.
3. Connect the small BLACK test lead to the stator plate if the condenser is mounted, otherwise to the body of the condenser.
4. Connect the RED test lead to the condenser lead.
5. Switch the power to ON.
6. Press the BLACK condenser TEST button and hold for a minimum of 10 seconds.
7. The meter needle will move to the right and must return to zero, (see figure 2).
8. Any reading other than ZERO, indicates that the condenser is leaking or shorted and must be replaced.
9. If the needle does not move when the test button is depressed, the condenser is open circuit and must be replaced.
10. While testing, move or "wiggle" the lead coming from the condenser, observe the needle for movement. Any movement indicates loose internal connections, replace the condenser.

SETTING UP THE Imrie®3000 TO READ OHMS

HIGH OHMS

– OHMS X 100 –

1. Press the RED OHMS X 100 button.
2. Fit the RED and BLACK test leads to the meter sockets.
3. Switch the AC. POWER to ON.
4. ***Clip the small RED and BLACK test leads together.***
5. Turn the OHMS SET knob until the meter needle lines up with zero on the RED scale.
6. Unclip the small RED and BLACK clips.
7. The meter is now set to read all resistance values from 0 to 20,000 (20 KΩ) OHMS on the RED OHMS scale.

LOW OHMS

–0-40 OHMS –

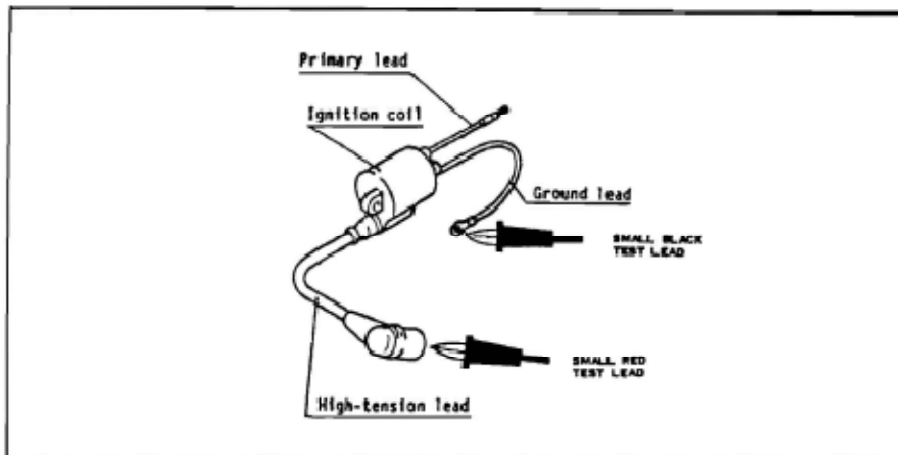
1. Press the GREEN OHMS LOW button.
2. Fit the RED and BLACK test leads to the meter sockets.
3. Switch the AC POWER to ON.
4. ***DO NOT clip the RED and BLACK test leads together.***
5. Turn the OHMS SET knob until the meter needle lines up with the "0" zero on the right hand side of the meter RED scale.
6. The meter is now set to read all resistance values from 0 to 30 OHMS on the BLACK OHMS scale.

LOW OHMS

–GREEN BLOCK–

1. Press the GREEN OHMS LOW button.
2. Fit the RED and BLACK test leads to the meter sockets.
3. Switch the AC POWER to ON.
4. ***Clip the small RED and BLACK test leads together.***
5. Turn OHMS SET knob until meter needle lines up with the left hand side of the **GREEN BLOCK.**
6. Unclip RED and BLACK test leads.
7. Meter is now ready to read any resistance which may develop on breaker points, starter solenoids, wiring connectors, etc. and poor ground connections on any electronic and electrical components.

COIL CONTINUITY and RESISTANCE TEST



It is important to check the ignition coil secondary windings for continuity and resistance.

Most ignition coil breakdowns occur in the secondary windings because of the extremely fine wire used and the high voltage which tends to break down the insulation on the wire. One useful feature of this test is that a break in the secondary windings may not immediately cause the coil to cease operating as the high voltage will jump the gap, although the ohmmeter shows a break. In a short time however, arcing at the fault will cause the coil to miss-fire when hot or under load and eventually will lead to complete failure of the ignition coil.

1. Set up meter to read OHMS X 100.
2. Connect the BLACK test lead to the coil primary ground wire if coil is off the engine, or to a good engine ground if coil is fitted to the engine.
3. Connect the RED test lead to the spark plug HIGH TENSION lead.

NOTE: Ignition coils with 2 HIGH TENSION outputs, connect the BLACK test lead to one spark plug lead, and the RED test lead to the other spark plug lead.

4. The meter reading must be between the two values as per the manufacturer's specifications or as compared against a new coil of the same type.

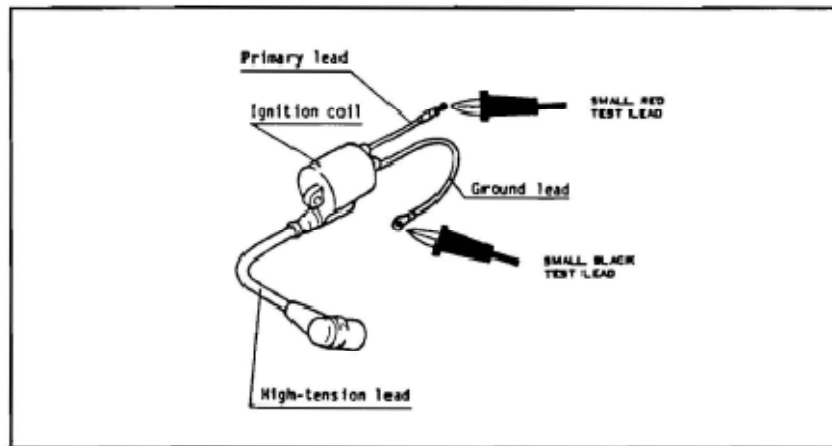
Continued

COIL CONTINUITY and RESISTANCE TEST Continued

5. Readings lower than the lowest value indicates the secondary winding is shorted.
6. Readings higher than the highest value indicates high resistance in the secondary windings or internal connections.
7. If no reading then the secondary winding or the spark plug lead and/or spark plug cap (especially if resistor type) is open circuit.
8. If no reading, remove the HIGH TENSION lead from coil and connect the RED test lead to the coil output connection.
If there is no reading, then the secondary winding is open circuit.
9. In either case the coil is faulty and must be replaced.
10. If the reading is normal then the secondary winding is OK. Check the HIGH TENSION lead and spark plug connector, especially if spark plug cap is the resistor type, repair or replace the spark plug lead or cap, then test again.

NOTE: The above tests also apply to CDI coils and solid state ignition modules. In cases where there is no ground wire coming out of the solid state module, connect the small BLACK test lead to the metal laminations and the RED test lead to the spark plug HIGH TENSION lead.

COIL PRIMARY RESISTANCE TEST



1. Set up the meter to read LOW OHMS.
2. Connect the BLACK test lead to the coil ground lead/terminal if the coil is off the engine, or to a good engine ground if it is still fitted to the engine.
3. Connect the RED test lead to the other primary lead/terminal.
4. Readings must be within manufacturer's specifications.
5. Readings HIGHER than the manufacturer's specifications indicate that the primary winding is open, has a high resistance or is of the wrong type.
6. Readings LOWER than the manufacturer's specifications indicate that the primary winding has SHORTED TURNS or is of the wrong type.
7. In either case, the coil is faulty or not suitable and must be replaced.

STATIC TIMING TEST

1. Set the breaker points to the manufacturer's specifications. USE A FEELER GAUGE, DON'T GUESS. Be sure the breaker rubbing block is on the highest part of the cam when setting the points gap. Check that the movable arm is free on its pivot pin, if not lubricate the pivot pin with fibre grease. Be sure that all screws are tight and all wires are in their proper place.
2. Clean the points before testing, DO NOT FILE.
3. Set up the meter to read LOW OHMS.
4. Connect the small BLACK test lead to stator plate or a good engine ground close to breaker points.
5. Connect the small RED test lead to the breaker point terminal screw.
6. After wiring hook-up is made, rotate magneto or distributor in the advance direction. It will be noted that when points are closed, that the meter needle will be in the GREEN Block. The moment that the breaker points start to open, the meter needle will move into the high resistance area. In this manner, the timing can be set in relation to movement to the piston.

BREAKER POINT TEST

1. Set up meter to read LOW OHMS (GREEN block).
2. Connect the small RED test lead to the breaker point terminal.
3. Connect the small BLACK test lead to the stator plate, or any part of engine close to breaker points which is a good ground.
4. Turn crankshaft until the cam allows the breaker points to close.
5. The meter needle must return to within the GREEN block.
6. If the meter needle is in the high resistance area, this indicates that there is foreign matter between breaker points.
7. See Note.
8. Breaker points not meeting this test should be replaced.

NOTE: Although breaker points are made of non-corrosive metal, a current resisting tough film may form after the engine stands for a period of time, especially if stored in a damp place. This film will cause hard starting of the engine. By running a piece of stiff paper (such as a business card) between the points under tension several times, the film will wear and the dirt or oil will be removed from between the breaker points. After cleaning the points in the above manner the meter needle should be in the GREEN block. If not, replace the breaker points.

CONDENSER TEST FOR PROPER GROUNDING

DUE TO THE SENSITIVITY OF THIS TEST, MAKE CERTAIN THE TEST CLIPS AND THE PARTS THAT THE TEST CLIPS ARE ATTACHED TO, ARE CLEAN OR FALSE READINGS WILL BE OBTAINED.

1. Set up the meter to read LOW OHMS (GREEN block).
2. Connect the small BLACK test lead to the stator plate.
3. Connect the small RED test lead to the outer metal casing of the condenser.
4. The meter needle must be in the GREEN block.
5. If the meter needle reads in the high resistance area, this indicates that the condenser is not properly grounded.

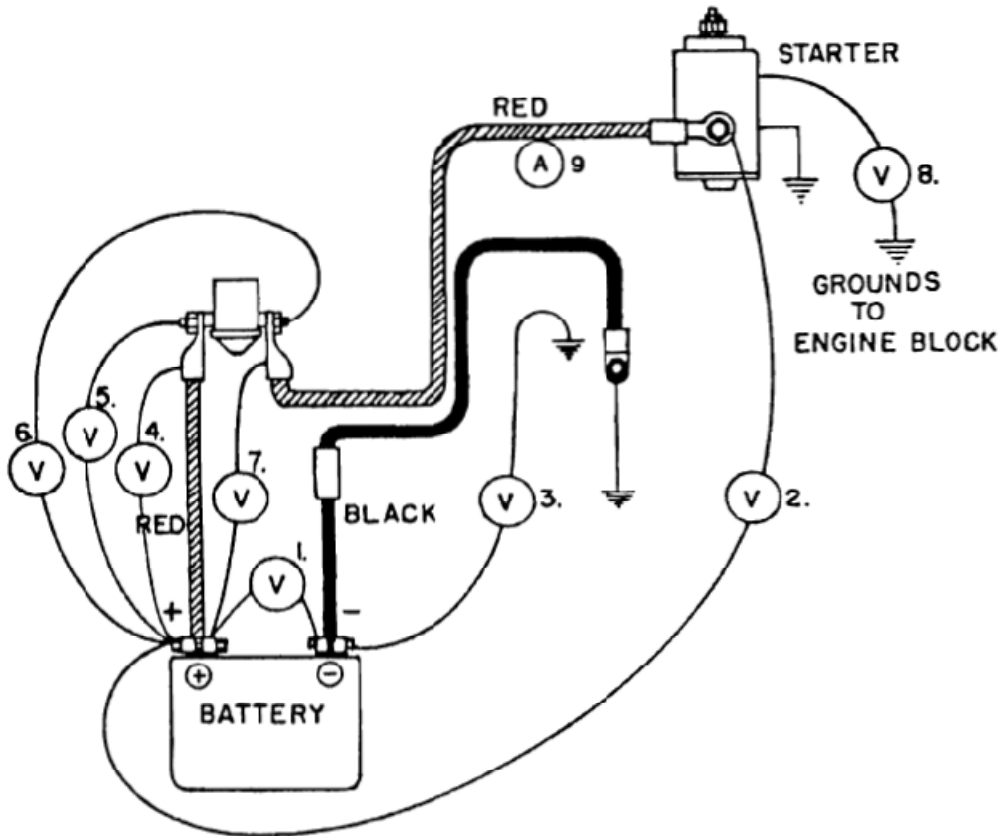
CDI AND TCI MODULE TEST FOR PROPER GROUNDING

DUE TO THE SENSITIVITY OF THIS TEST, MAKE CERTAIN THE TEST CLIPS AND PARTS THAT THE TEST CLIPS ARE ATTACHED TO, ARE CLEAN OR FALSE READING WILL BE OBTAINED.

1. Set up meter to read LOW OHMS (GREEN block).
2. Connect the small BLACK test lead to the stator plate.
3. Connect the small RED test lead to the outer metal of the T.C.I. module. casing
4. The meter needle must be in the GREEN block.
5. If the meter needle reads in the high resistance area, this indicates that the T.C.I. module is not properly grounded.

Using the “METER” to check for VOLT-DROP

Starter motor circuit.



VOLTAGE DROP is the drop in voltage due to resistance between two points in an electrical circuit.

In a perfect system, all the above tests (except for #1), **with the starter motor CRANKING the engine**, would read (0) ZERO volts.

NOTE : Before testing make sure that all connections are clean & tight, check cables for frayed or damaged insulation or corrosion.

Refer to Table opposite for suggested results.

DON'T FORGET that the EARTH cable can also be a problem !!

All circuits, Ignition, Battery charging, Lighting, Instruments and Safety circuits can be checked in a similar manner.

Starter Motor – VOLT-DROP test chart.

| Approximate Meter Readings | | | | |
|----------------------------|------------------|------------------------------|-------------------------------------|---|
| Step# | ** As Hooked Up. | With Starter Button Pressed. | If it Reads. | Cause. |
| 1. | * 12 volts | *10->11 volts | Below 10 volts Still at 12 volts | Weak Battery. Open Circuit. |
| 2. | * 12 volts | 0 -> 1 | Over 1 volt | Loose terminals. Open Circuit. High resistance. |
| 3. | 0 volts | 0.5->1 volt | Over 1 volt | Loose terminal or broken wire. |
| 4. | 0 volts | 0.5->1 volt | Over 1 volt | Loose terminals. |
| 5. | 0 volts | 0.5->1 volt | Over 1 volt | Loose or corroded terminals. |
| 6. | * 12 volts | 0.5->1 volt | Over 1 volt | Defective solenoid. |
| 7. | * 12 volts | 0.5->1 volt | Over 1 volt | Loose terminal. |
| 8. | 0 volt | 0 volt | Above 0 volts | Poor ground, loose bolts. |
| 9. | 0 Amps | See Note Below. | | Starter Motor. |

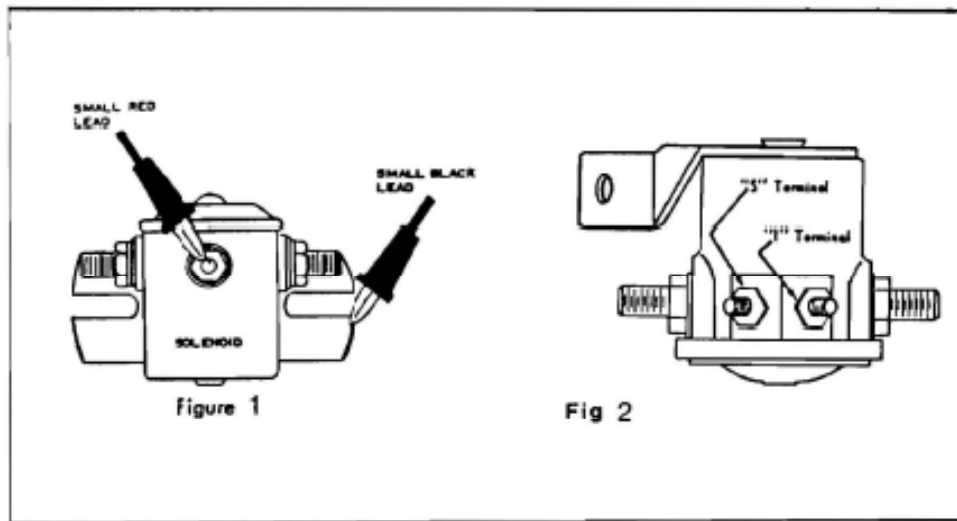
NOTE: In step # 9 check the manufacturers current draw specifications for each motor being tested.

Use a “Clamp” type Ammeter over the battery to solenoid high current cable.

* Meter set on 0 -> 30 volts. All other readings are set on 0 -> 6 volts

** Voltage readings are taken before starter button is pressed.

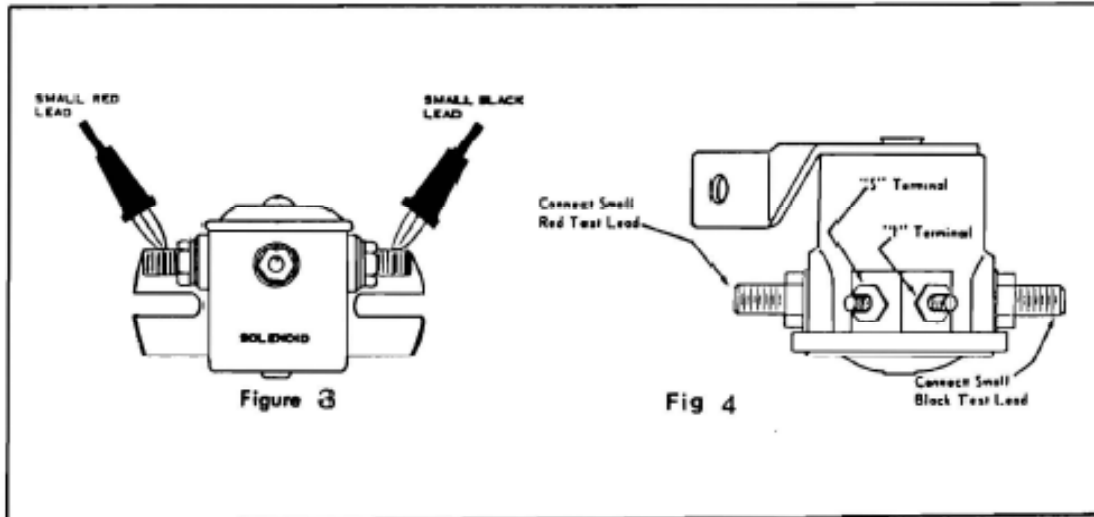
SOLENOID – COIL TEST



CAUTION: DO NOT CONNECT THE BATTERY LEADS TO THE LARGE TERMINALS OF THE SOLENOID OR THE METER WILL BE DAMAGED.

1. Remove all the wires from the solenoid.
2. Set the meter to read LOW OHMS.
3. There are many types of solenoids. Most types are similar to the ones that are shown in Fig. 1 & 2.
4. To test the type shown in Fig. 1, connect the small BLACK test lead to the solenoid bracket and the small RED test lead to the small solenoid terminal.
5. An OHM reading within the manufacturer's specifications indicates a good solenoid.
6. To test a solenoid as shown in Fig. 2, connect the small RED test lead to the "S" terminal and the small BLACK test lead to the "I" terminal.
7. An Ohm reading within manufacturer's specifications indicates a good solenoid.

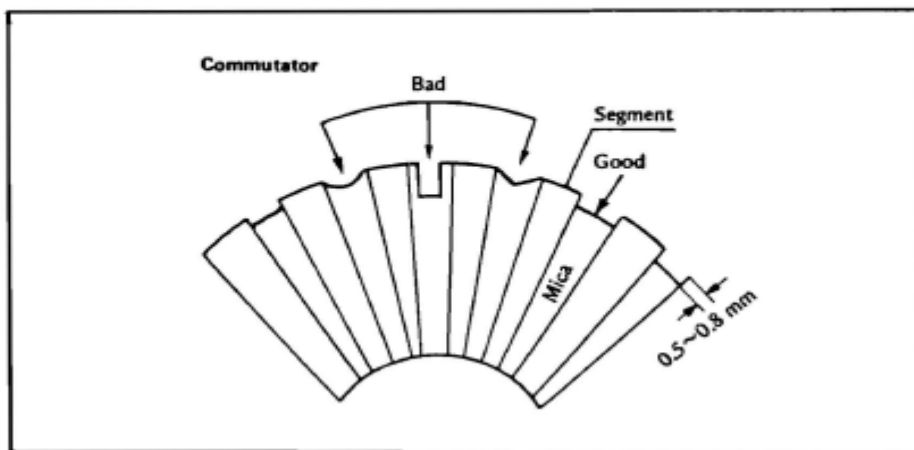
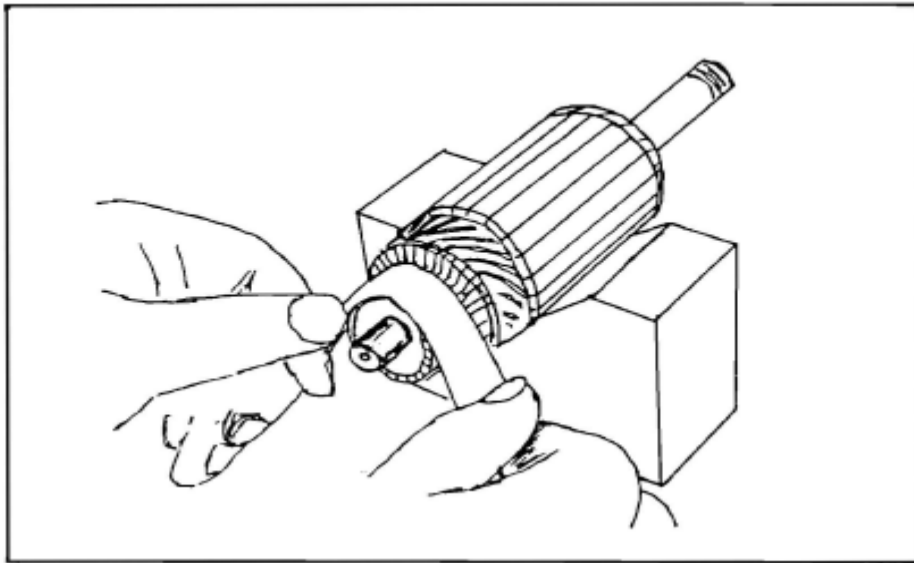
SOLENOID – CONTACTS TEST



CAUTION: DO NOT CONNECT THE BATTERY LEADS TO THE LARGE TERMINALS OF THE SOLENOID OR THE METER WILL BE DAMAGED.

1. Disconnect the battery and starter motor leads from the solenoid.
2. Set the meter to read LOW OHMS (GREEN Block).
3. Connect the small BLACK test lead to one of the large terminals and the RED test lead to the other large terminal.
4. Turn the ignition key to start position or press the start button, the solenoid should click once. If not, check the solenoid coil as the previous page.
5. The needle must move into the GREEN Block section, or the solenoid is faulty and must be replaced.

ARMATURE REPAIR



A dirty or damaged commutator will result in poor brush contact and cause the brushes to wear down quickly. Inspect the commutator segments for discolouration and arcing on the edges. Arcing and discolouring indicate grounded or shorted armature windings.

Smooth the commutator surface if necessary with very fine emery cloth, and clean out the grooves as illustrated. Replace the armature with a new one if the groove depth and commutator diameter are less than manufacturer's limits.

ARMATURE TESTING

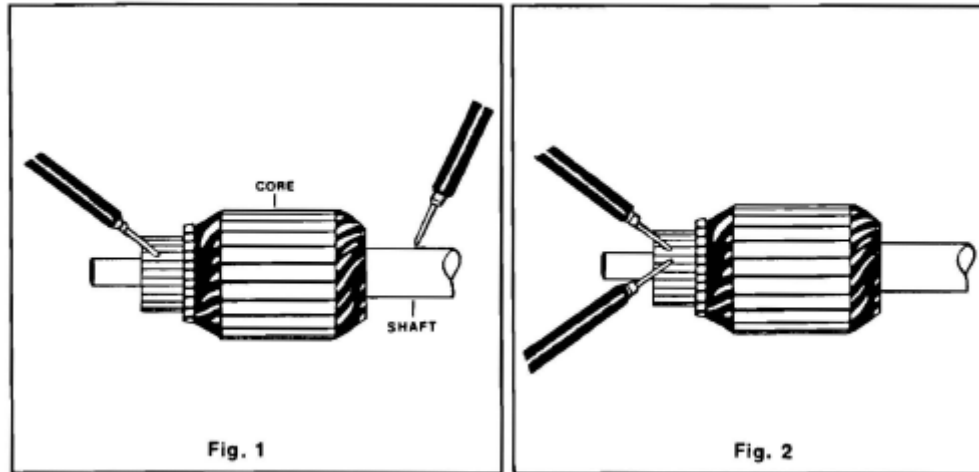


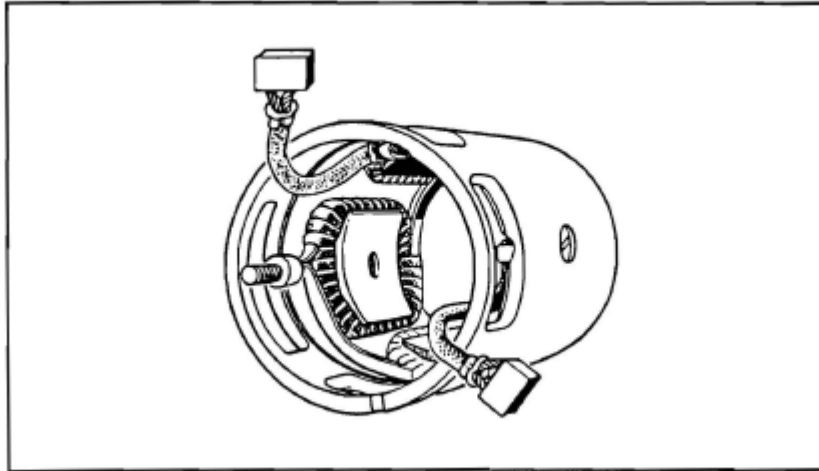
Fig. 1 GROUND TEST

1. Set the meter to read OHMS X 100.
2. Check the continuity between the armature shaft and each commutator segment, then between the armature core and each commutator segment.
3. If the meter indicates any movement as the segments are contacted, then the armature is grounded and must be replaced.

Fig. 2 OPEN CIRCUIT AND SHORT CIRCUIT TEST

1. Set the meter to read LOW OHMS.
2. Measure the resistance of the armature windings by placing the probes of the tester on two segments side by side and note the meter reading.
3. **NOTE:** The armature winding resistance is extremely low, check with manufacturer's specifications.
4. Repeat tests until all segments have been tested.
5. If no reading is obtained from any pair of adjacent segments, the armature is open circuit and must be replaced.
6. If any reading is lower than the average reading, the windings have shorted turns, to confirm this test, clean out the commutator segments to ensure the condition is not caused by shorting between them, and re-test.
7. If any reading is higher than the average reading, then check to ensure that the armature to commutator leads are correctly soldered to the commutator.

FIELD COILS TEST



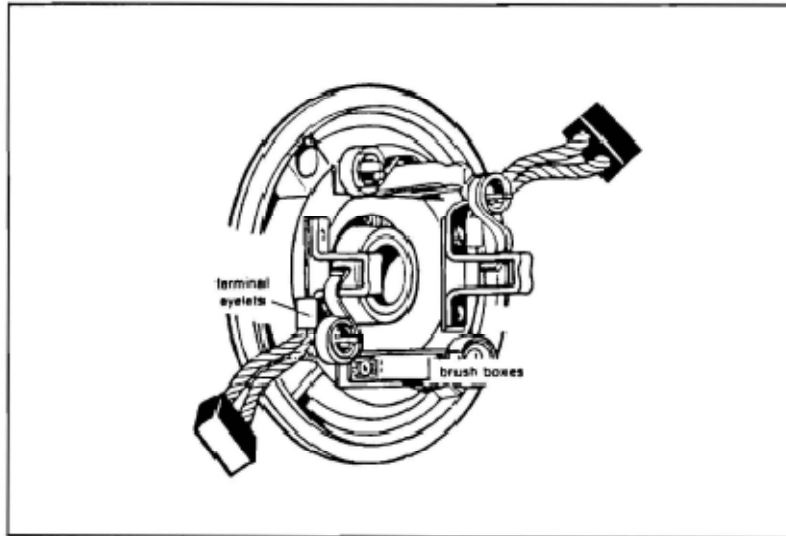
GROUND TEST

1. Set the meter to read OHMS X 100.
2. Connect one test lead to the starter motor terminal or carbon brush.
3. Connect the other test lead to the yoke (housing).
4. If there is any meter reading, the coils are shorted to ground, replace the field coil and yoke assembly.

OPEN CIRCUIT TEST

1. Set the meter to read OHMS X 100.
2. Connect one test lead to the starter motor terminal.
3. Connect the other test lead to the carbon brush.
4. The meter should read zero OHMS, if not the field coils are open circuit, replace the field coil and yoke assembly.

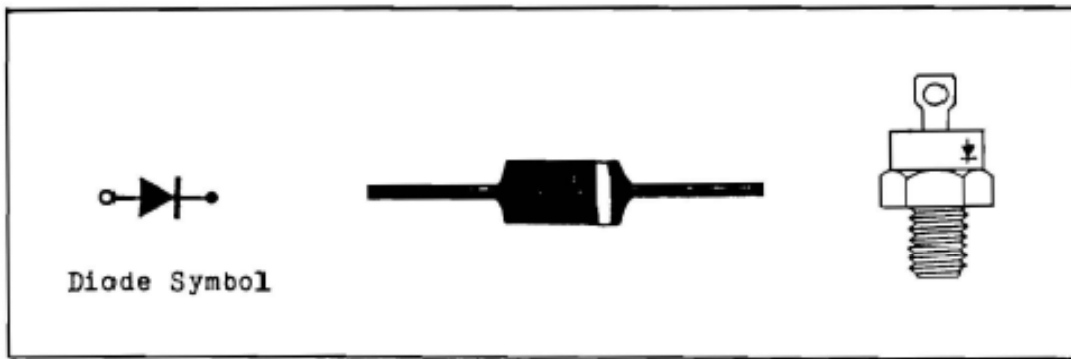
BRUSH HOLDER TEST



BRUSHES AND BRUSH HOLDERS

1. Set the meter to read OHMS X 100.
2. Connect one test lead to the (+) POSITIVE brush holder.
3. Connect the other test lead to the commutator end bracket.
4. If the meter indicates any movement, the insulation is faulty. Repair the insulation or replace the brush holder bracket.
5. If the commutator end bracket has a ground brush holder, then connect one test lead to the ground brush holder.
6. Connect the other meter lead to commutator end bracket.
7. Meter should read zero OHMS if not the brush holder is not grounded properly to the end bracket.
8. Check for corrosion or loose brush holder attaching rivets, repair or replace end bracket.
9. Check the brushes and replace if they are worn down more than half of their original length.
10. Check that the brushes move freely in their holders, if the brush is inclined to stick, clean the sides of the holder with a solvent moistened rag, if the brush is still inclined to stick, ease the sides of the brush by lightly polishing on a smooth file.

DIODE TESTING



A diode is an electronic component. The basic function of a diode is to allow voltage / current to flow in one direction only.

Diodes come in many shapes and forms, the most common style that is used in the engine / auto industry is in a plastic or metal case.

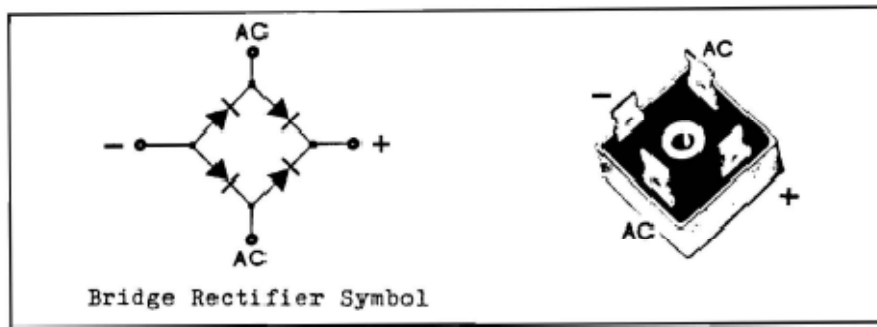
Diodes have two basic types of failures.

1. **OPEN CIRCUIT.** This means that no voltage / current will flow in a circuit.
2. **SHORT CIRCUIT.** This means that the voltage / current will flow in both directions.

DIODE TEST

1. If the diode is in circuit with other components then it may be necessary to disconnect one end of the diode before testing.
2. Set up meter to read OHMS X 100.
3. Connect one test lead to one end of the diode.
4. Connect other test lead to other end of the diode and note the meter reading.
5. Reverse the test lead connections and note the meter reading.
6. The meter reading should be **LOW** in one test and **OPEN CIRCUIT (∞)** in the other.
7. If low in both tests then diode is shorted. If high in both tests then diode is open circuit. In either case the diode is faulty and must be replaced.

BRIDGE RECTIFIERS



A bridge rectifier is an electronic component which has 4 or 6 diodes within a plastic or metal housing or mounted on an aluminium plate.

The basic function of a bridge rectifier is to change AC voltage from an alternator to DC voltage.

There are two basic types of failures to a bridge rectifier.

1. Open circuit.
2. Short circuit.

BRIDGE RECTIFIER TEST

1. Remove all wires from bridge rectifier.
2. Set up meter to read OHMS X 100.
3. Connect the RED test lead to the (+) positive terminal.
4. Connect the other test lead to each AC terminal in turn and note meter reading.
5. Reverse the test lead connection and note the meter reading.
6. Meter reading should be **LOW** in one test and (∞) **OPEN CIRCUIT** in the other test.
7. Connect the BLACK test lead to the (+) positive terminal.
8. Meter reading should be (∞) **OPEN CIRCUIT** in one test and **LOW** in the other test. Opposite to test # 6.
9. If low in both tests then rectifier is shorted. If high in both tests then rectifier is open. In either case rectifier is faulty and should be replaced.
10. Connect the test leads on to each AC input terminal, in turn and reversed, and note the meter reading.
11. The reading must be **OPEN CIRCUIT (∞)** in all tests. Any reading indicates that there is a **SHORTED** diode, the rectifier must be replaced.

Some rectifiers have only 3 terminals, 2 AC. and 1 (+) positive terminal. The metal case or mounting stud is the (-) negative connection.

Suggested Test Sheet No. 1

| MODEL | Primary Voltage | | | Type |
|--------------|------------------------|-------------|---------------|-------------|
| | Crank | Idle | Hi RPM | |
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Notes:

Suggested Test Sheet No. 2

| MODEL | Secondary (H.T.) Voltage | | | Open Circuit (H.T.) Volts |
|-------|--------------------------|------|--------|------------------------------|
| | Crank | Idle | Hi RPM | |
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| <p>Notes:</p> |
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FLYWHEEL SIMULATORS
(OPTIONAL EXTRA)



FS-2

FS-1

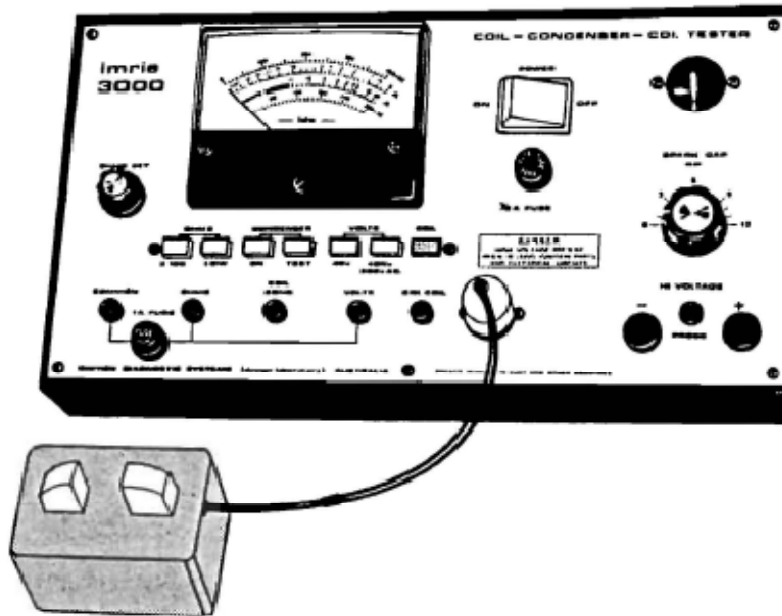
FS-1 Simulator is used for models with the ignition coil/module situated on the **OUTSIDE** of a flywheel.

FS-2 Simulator is used for models where the ignition coil/module is **UNDER** a flywheel.

By using the Flywheel Simulators FS-1 and FS-2 the mechanic can visually observe the operation of the Ignition module or TCI Trigger Module. This operation is similar to the components operating on the engine under load without running the engine, thus ruling out other mechanical engine malfunctions eg. Carburettor and/or fuel problems, faulty gaskets and seals etc.

These tests are invaluable, in routine service work, for counter sales of spare parts and for the engine manufacturers testing of electronic ignition parts returned for warranty.

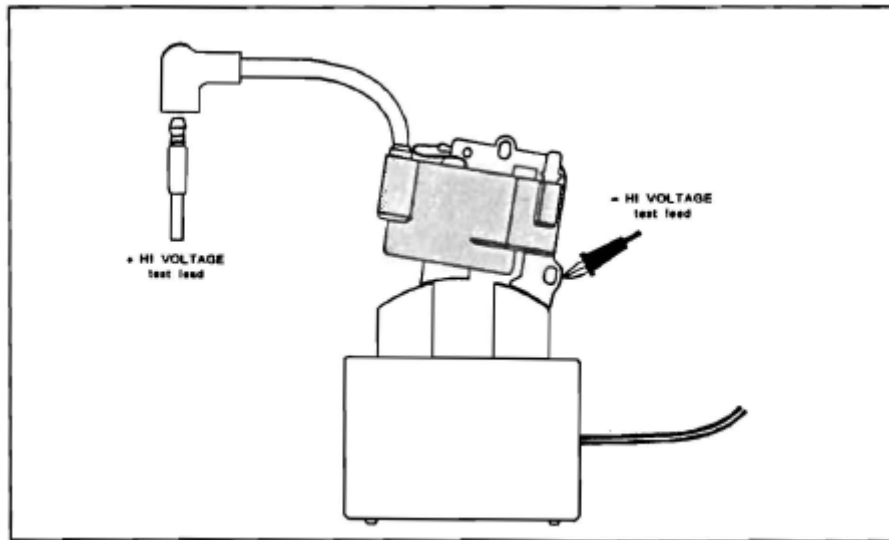
SETTING UP TO USE THE FLYWHEEL SIMULATORS



1. Fit the Flywheel Simulator FS-1 or FS-2 to the tester socket.
2. Position the Simulator to the LEFT HAND side of the tester as illustrated above.
3. Follow the TEST PROCEDURES on the following pages for other HOOK-UPS, most will only need the HIGH Voltage leads.

NOTE: Positioning the Simulator to the LEFT as above is important because some of the following testing procedures will not work properly if the Simulator is reversed.

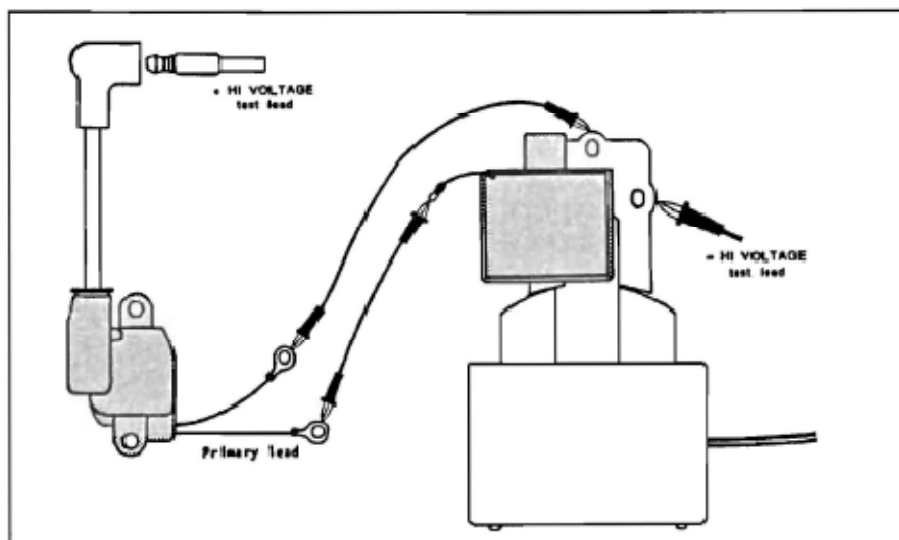
TESTING ONE PIECE SOLID STATE IGNITION MODULE



Be sure that the AC power switch is in the OFF position.

1. Fit the Flywheel simulator (FS1) to meter.
2. Set spark gap to 3mm.
3. Press GREY coil button.
4. Connect the (-) HIGH Voltage test lead to the metal laminations of the Ignition coil.
5. Connect the (+) HIGH Voltage test lead to the spark plug lead.
6. Place the Ignition unit onto the simulator. Line up the metal laminations of the Ignition unit with the metal laminations of the simulator.
7. Switch power to ON.
8. Slowly move the Ignition unit into different positions on the simulator until there is a steady spark across the gap.
9. If there is no spark across a 3mm spark gap, then the Ignition unit is faulty.
10. If there is a steady spark across the gap, then slowly increase the spark gap to 6mm.
11. If the spark is weak or intermittent at 6mm, then ignition unit is faulty.
12. If the ignition unit is OK then connect the insulation probe into the socket on meter and pass it over the spark plug lead and around the ignition unit for a high voltage leakage test.

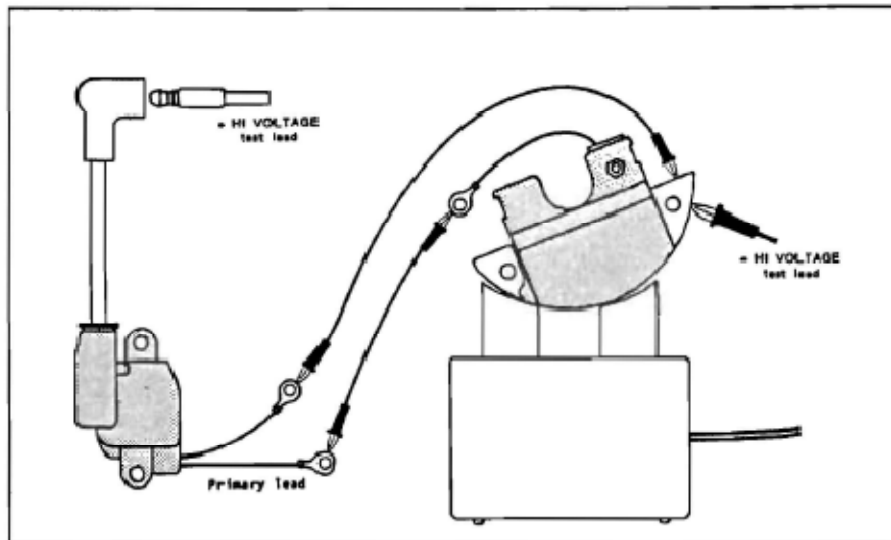
TESTING TWO (2) PART CDI IGNITION SYSTEMS



Be sure that the AC. power switch is in the OFF position.

1. Test the ignition coil using the **CDI Coil Test feature** on the meter. (see previous pages).
2. If the coil is OK, then proceed with steps 4 to 15.
3. If the coil is faulty, then connect another coil (any type of coil will do for this test) to the CDI unit using the jumper leads provided.
4. Fit Flywheel simulator FS1 to meter.
5. Set the spark gap to 3mm.
6. Press the GREY coil test button.
7. Connect the (-) HIGH Voltage test lead to the metal base of the CDI unit.
8. Connect the (+) HIGH Voltage test lead to the spark plug lead.
9. Place the CDI unit on to the simulator.
10. Switch the power to ON.
11. Slowly move the CDI unit into different positions on the simulator until there is a steady spark across the gap.
12. If there is no spark across a 4mm spark gap, then the CDI unit is faulty.
13. If there is a steady spark across the gap, then slowly increase the spark gap to 6mm.
14. If the spark is weak or intermittent at 6mm, then CDI unit is faulty.
15. If CDI unit is OK, then connect the insulation probe in to the PROBE socket on meter and pass over the spark plug lead and around the ignition coil for a high voltage leakage test.

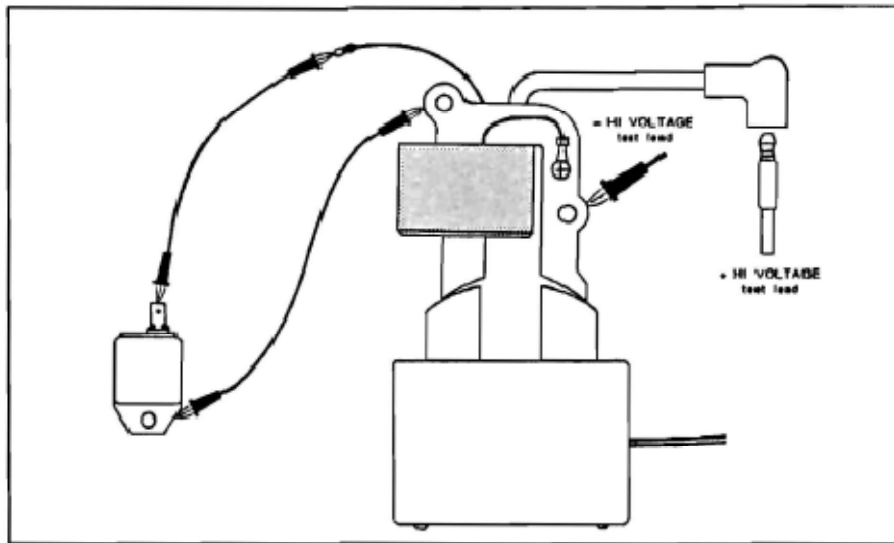
TESTING TWO (2) PART CDI SYSTEM #2



Be sure that the AC. power switch is in the OFF position.

1. Test the ignition coil using the **CDI Coil Test feature** on the meter. (see previous pages).
2. If the coil is OK, then proceed with steps 4 to 14.
3. If the coil is faulty, then connect another coil (any type of coil will do for this test) to the CDI unit using the jumper leads provided.
4. Fit Flywheel simulator FS2 to the meter.
5. Set the spark gap to 3mm.
6. Press the GREY coil test button.
7. Connect the (-) HIGH Voltage test lead to the metal base of the CDI unit.
8. Connect the (+) HIGH Voltage test lead to the spark plug lead.
9. Place the CDI unit on to the simulator.
10. Switch the power to ON.
11. Slowly move the CDI unit into different positions on the simulator until there is a steady spark across the gap.
12. If there is no spark across a 4mm spark gap, then the CDI unit is faulty.
13. If there is a steady spark across the gap, then slowly increase the spark gap to 6mm.
14. If the spark is weak or intermittent at 6mm, then CDI unit is faulty.
15. If the CDI unit is OK, then connect the insulation probe in to the PROBE socket on meter and pass over the spark plug lead and around the ignition coil for a high voltage leakage test.

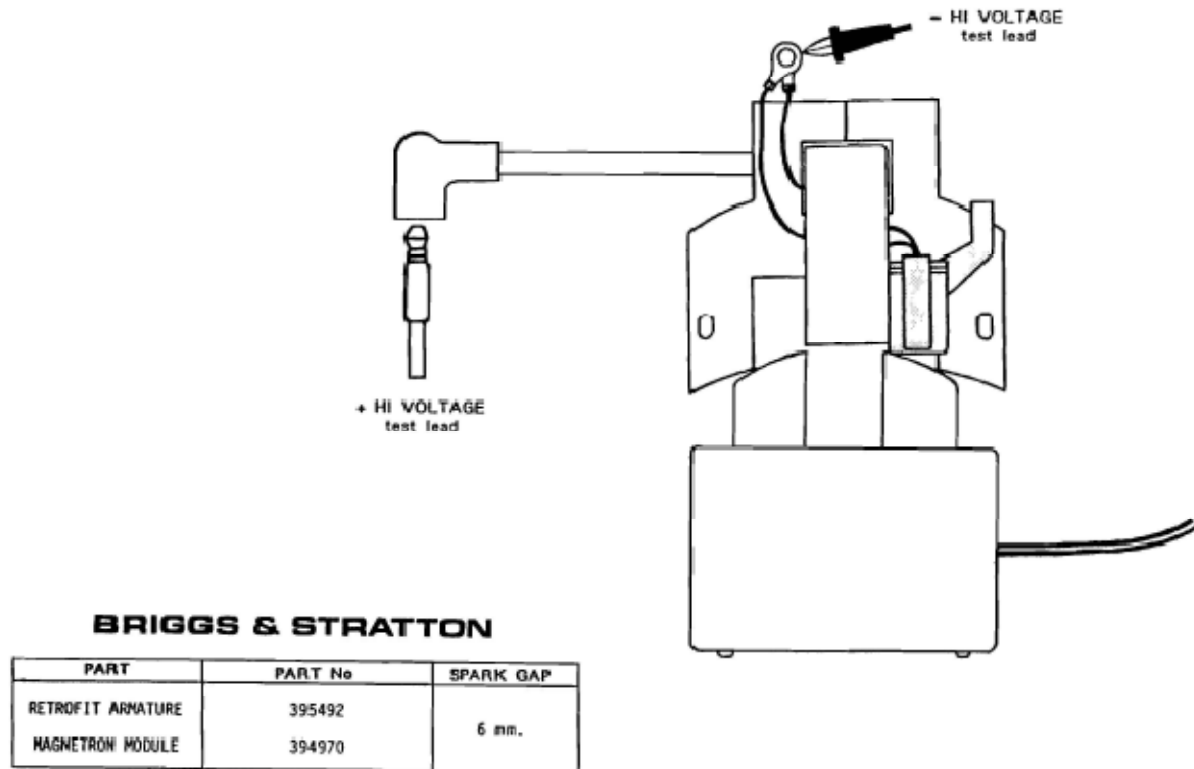
TESTING T.C.I. TRIGGER MODULE



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS1) to meter.
2. Set the spark gap to 3mm.
3. Press the GREY coil button.
4. Connect the (-) HIGH Voltage test lead to metal laminations of ignition coil, or the ground wire coming out of coil.
5. Connect the (+) HIGH Voltage test lead to the spark plug lead.
6. Connect a *jumper lead* between the Ignition coil primary terminal and the coil primary terminal on the trigger plate.
7. Connect another *jumper lead* to metal lamination of the ignition coil (or ground wire) and to the TCI module ground.
8. Place the ignition coil onto the simulator, line up the metal laminations of the coil with the metal laminations of the simulator.
9. Switch the power to ON.
10. Slowly move the ignition coil into different positions on the simulator until there is a steady spark across the gap.
11. If there is no spark across a 3mm spark gap, then trigger plate is faulty.
12. If there is a steady spark across the gap, slowly increase the spark gap to approximately 6mm.
13. If the spark is weak or Intermittent at 6mm, the TCI unit is faulty.

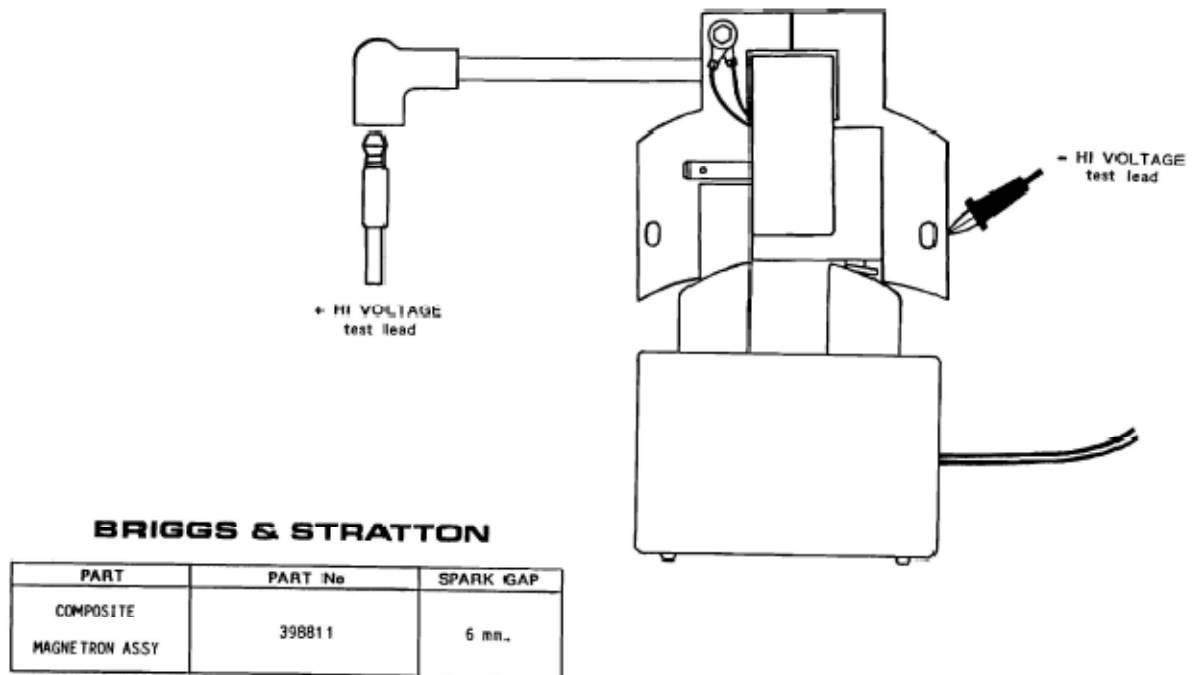
TESTING BRIGGS & STRATTON IGNITION MODULE MAGNETRON MODULE



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Check that the set up is as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

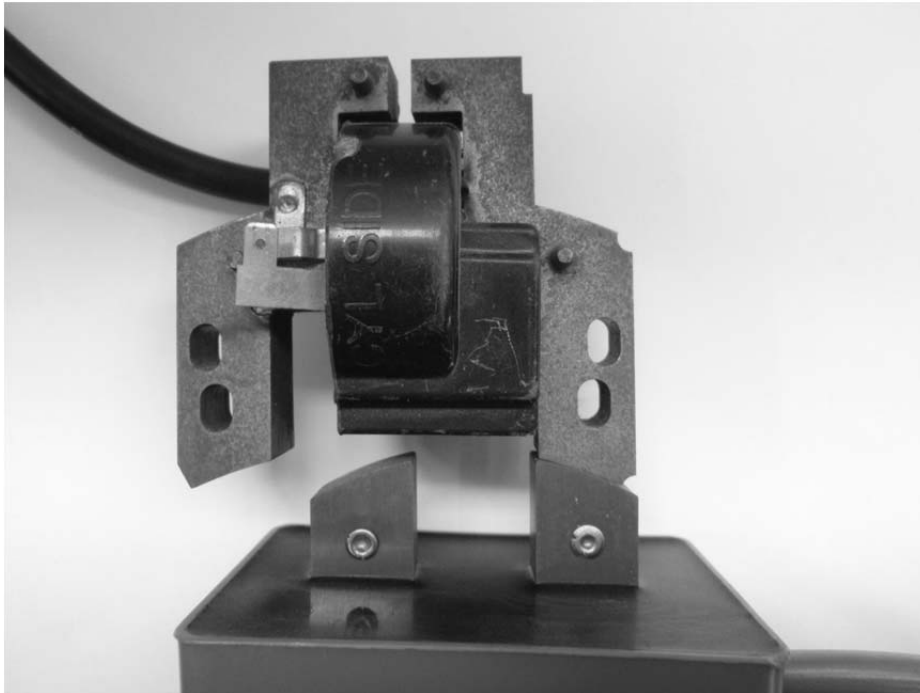
TESTING ONE PIECE SOLID STATE IGNITION MODULE COMPOSITE MAGNETRON ASSY



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Check that the set up is as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

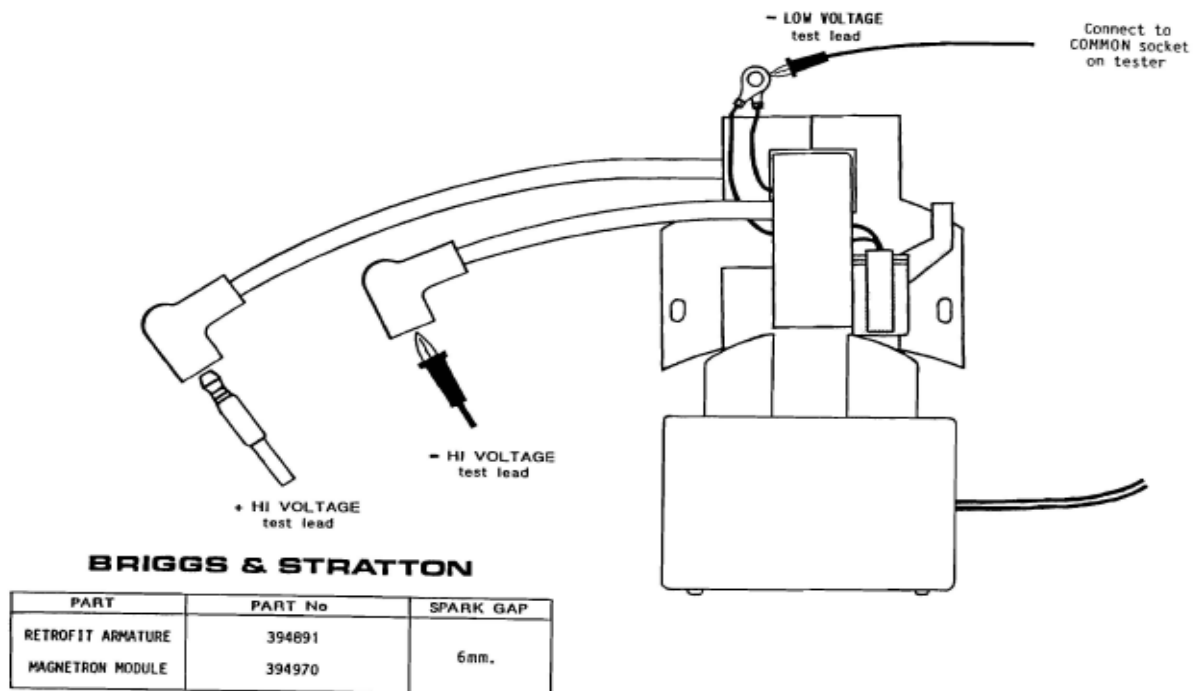
TESTING BRIGGS & STRATTON IGNITION MODULE
COMPOSITE MAGNETRON ASSY-2



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Check that the set up is as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

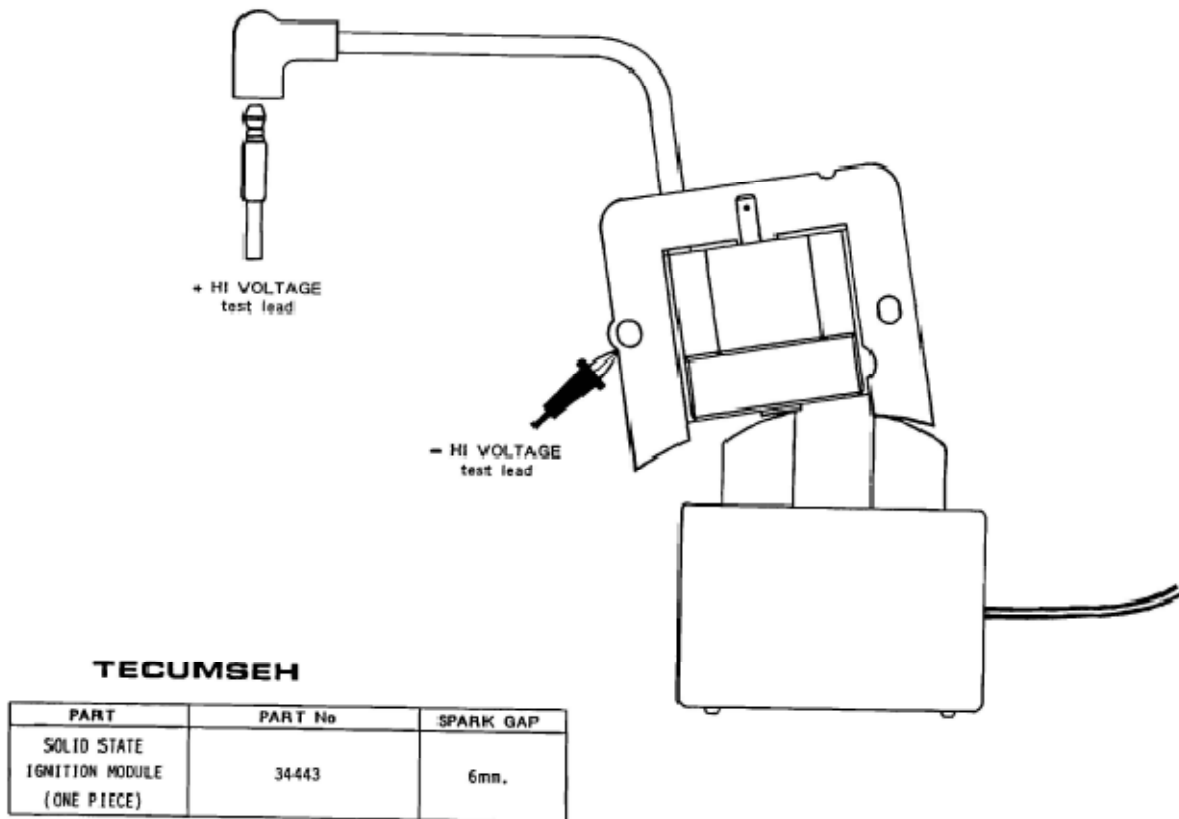
TESTING BRIGGS & STRATTON IGNITION TWIN CYLINDER WITH MAGNETRON MODULE



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the one spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the other spark plug lead.
4. Connect a small BLACK test lead as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage. Swap the HIGH Voltage leads around and perform the insulation test again, as the (-) HIGH Voltage lead was GROUND in early model Imrie® 3000s.

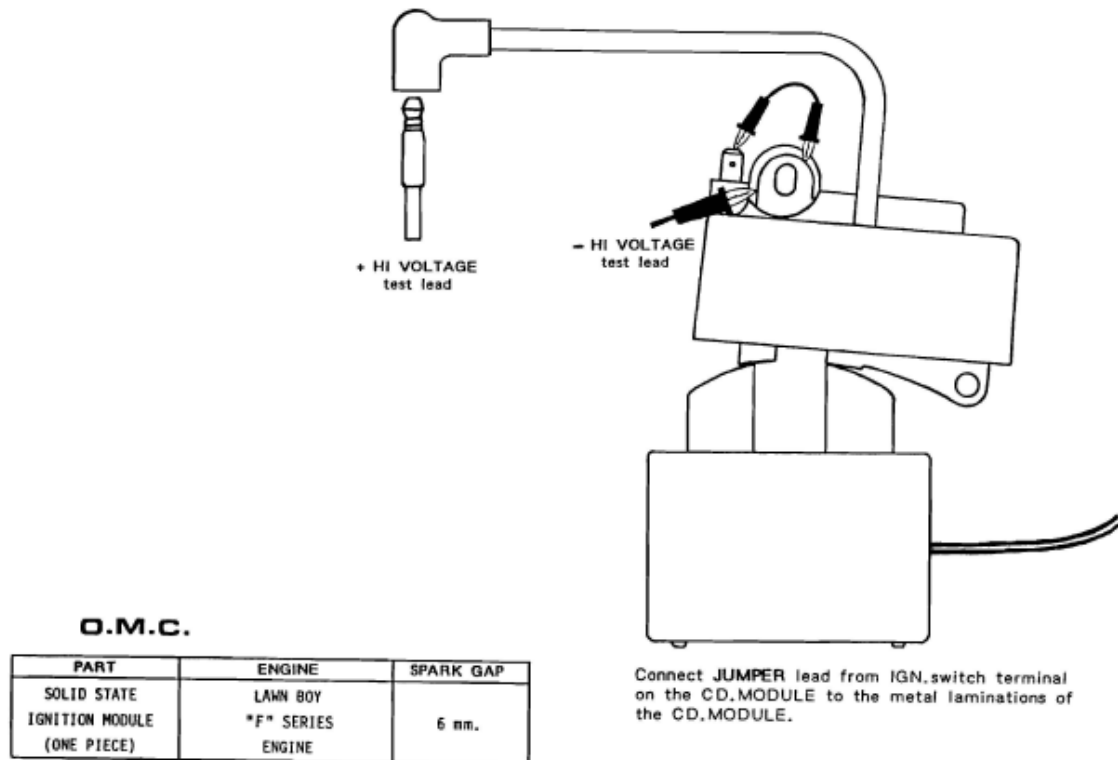
TESTING TECUMSEH IGNITION MODULE



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Check that the set up is as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

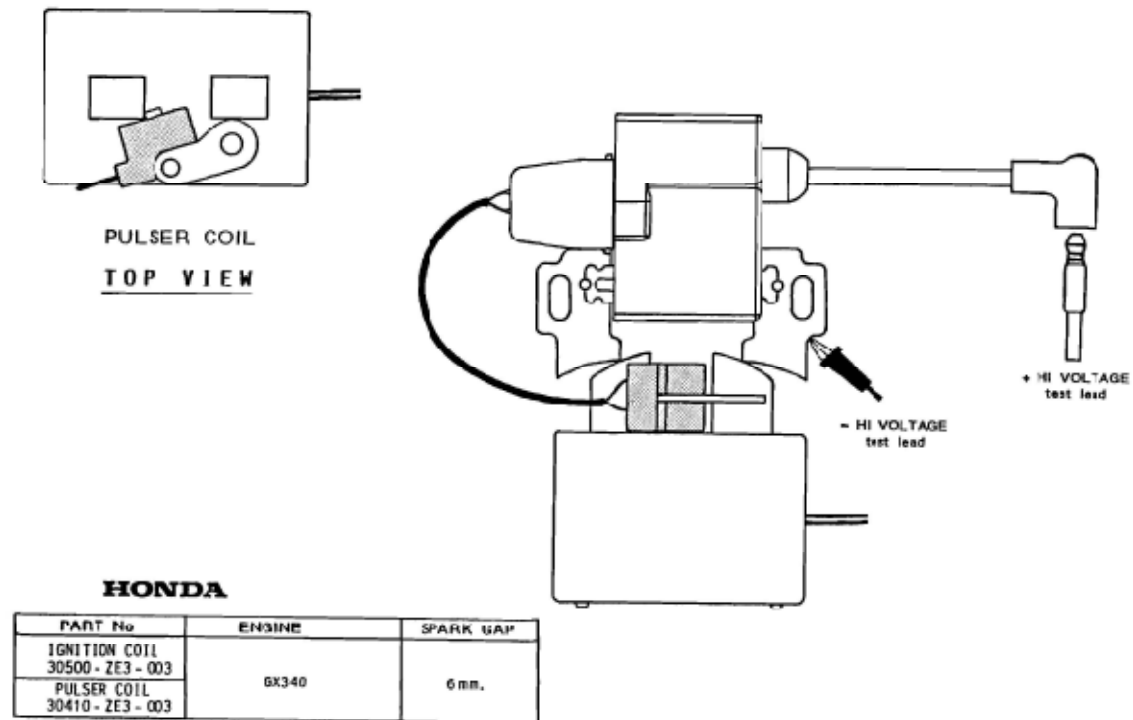
TESTING O.M.C. SOLID STATE IGNITION



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Connect a jumper wire as shown in the diagram above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

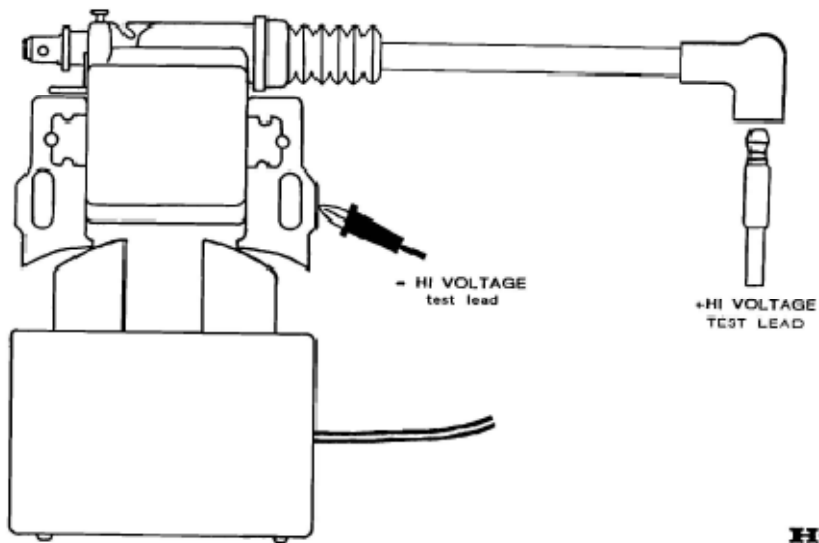
TESTING HONDA TWO (2) PIECE IGNITION



Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Place the PULSE coil as above and connected to the module.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

TESTING HONDA ONE PIECE IGNITION



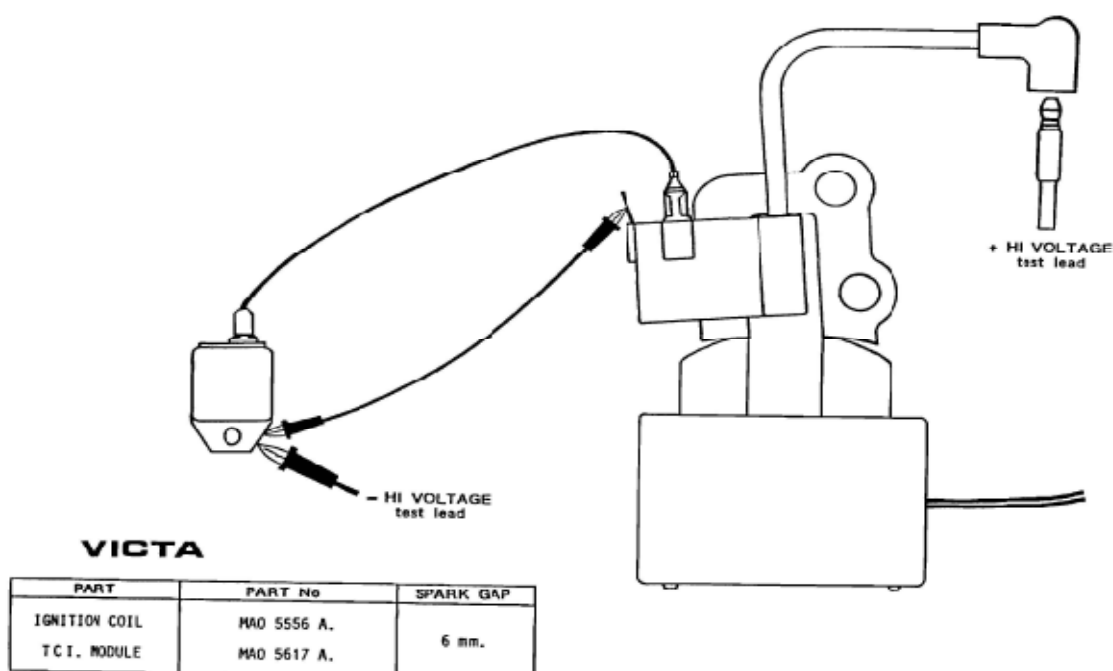
HONDA

| PART No | ENGINE | SPARK GAP |
|---|-----------------|-----------|
| SOLID STATE IGNITION MODULE (ONE PIECE) | GX. 110 | 3mm. |
| | GX. 140 GX. 240 | |

Be sure that the AC. power switch is in the OFF position.

1. Fit the Flywheel Simulator (FS-1) to the meter.
2. Connect the (+) HIGH Voltage test lead to the spark plug lead.
3. Connect the (-) HIGH Voltage test lead to the ignition module.
4. Check that the set up is as shown above.
5. Set the spark gap to 3 mm.
6. Press the GREY coil button.
7. Switch the power to ON.
8. If there is no spark across a 3mm spark gap, the ignition unit is faulty.
9. If there is a steady spark across the gap, slowly increase the gap to the above recommendation.
10. If spark is weak or intermittent at the recommended gap, the ignition unit is faulty.
11. If ignition unit is OK, then connect the insulation probe into the PROBE socket on meter and pass over the spark plug lead and around the ignition unit for high voltage leakage.

TESTING VICTA "C-COIL" TYPE TCI MODULE

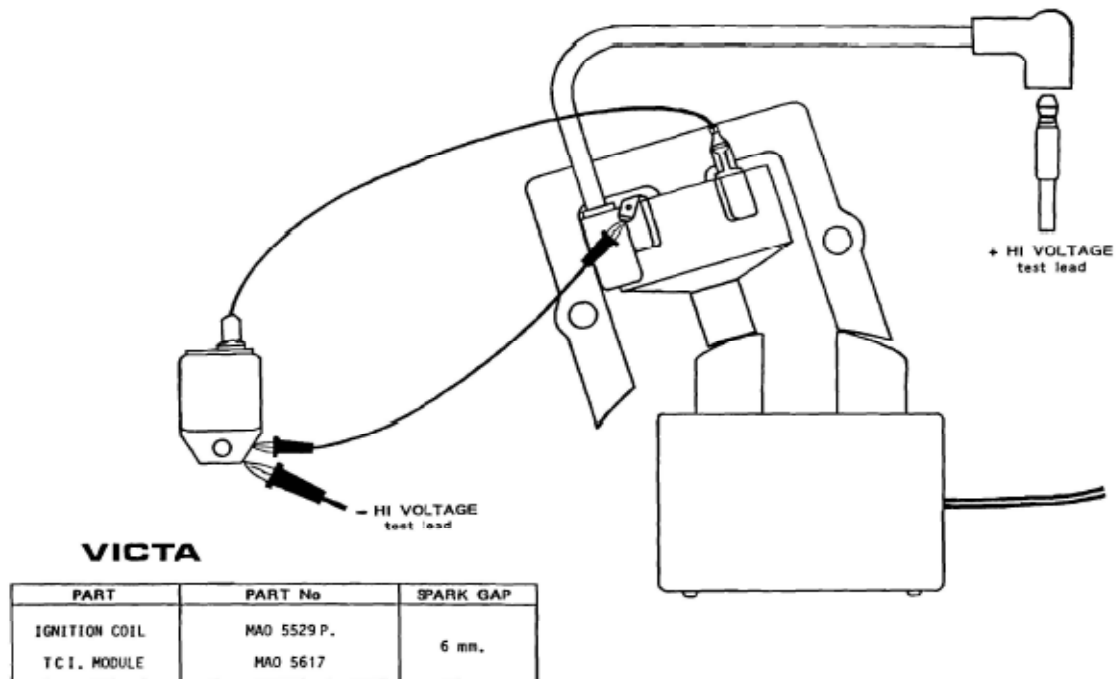


TESTING THE TCI MODULE (with a known good coil).

Be sure that the AC. power switch is in the OFF position.

1. Test the ignition coil using the **Coil Power Test** feature on the meter. (see previous pages). If the coil is OK, proceed with steps 2 to 12. If the coil is faulty then use a known good coil.
2. Fit the Flywheel Simulator (FS-1) to the meter.
3. Connect (+) HIGH Voltage test lead to spark plug lead.
4. Connect (-) HIGH Voltage test lead to ignition module as above.
5. Connect the TCI module between ignition coil PRIMARY and GROUND as shown above, using small jumper leads.
6. Set the spark gap to 3mm.
7. Press the GREY coil button.
8. Set the ignition coil on the simulator as shown above.
9. Switch the power to ON.
10. If there is no spark across a 3mm spark gap, the TCI module is faulty.
11. If there is a steady spark across the gap, then slowly increase the spark gap to the above recommendation.
12. If spark is weak or intermittent at the recommended gap, the TCI module is faulty.

TESTING VICTA "E-COIL" TYPE TCI MODULE



TESTING THE TCI MODULE (with a known good coil).

Be sure that the AC. power switch is in the OFF position.

1. Test the ignition coil using the **Coil Power Test** feature on the meter. (see previous pages). If the coil is OK, proceed with steps 2 to 12. If the coil is faulty then use a known good coil.
2. Fit the Flywheel Simulator (FS-1) to the meter.
3. Connect (+) HIGH Voltage test lead to spark plug lead.
4. Connect (-) HIGH Voltage test lead to ignition module as above.
5. Connect the TCI module between ignition coil PRIMARY and GROUND as shown above, using small jumper leads.
6. Set the spark gap to 3mm.
7. Press the GREY coil button.
8. Set the ignition coil on the simulator as shown above.
9. Switch the power to ON.
10. If there is no spark across a 3mm spark gap, the TCI module is faulty.
11. If there is a steady spark across the gap, then slowly increase the spark gap to the above recommendation.
12. If spark is weak or intermittent at the recommended gap, the TCI module is faulty.

IGNITION RESERVE VOLTAGE.

IGNITION RESERVE VOLTAGE is the difference between the ignition coil output voltage and the sparkplug voltage. There has to be considerable ignition reserve voltage available for the ignition system to be capable of overcoming requirements under normal or heavy load conditions; for rapid acceleration and to take care of wear of both spark plug and ignition parts.

Example -Ignition coil output of 15 Kv and spark plug using 5Kv. This leaves 10Kv of ignition reserve voltage.

If there is little or no reserve voltage, then the ignition system may fail under varying load conditions when the engine is hot, but may operate normally when not loaded.

