

Ignition Coil		Charge Coil	Sensor Coil	Ignition Module/ Power Pack	
Primary Ohms	Secondary Ohms	Ohms	Ohms	Min. Output Voltage	
				Cranking	Running
0.1 ± 0.05	275 ± 50	900 ± 100	40 ± 10	175	200

IGNITION OUTPUT TESTS – CD II

⚠ All cranking output tests must be performed with spark plugs installed and torqued in the cylinder head. If necessary to remove the spark plugs, be sure to keep the spark tester away from open spark plug holes.

Note The following series of steps will systematically isolate a problem area in the ignition system. To reduce your troubleshooting time and to avoid incomplete results, perform these steps in the order written.

STEP 1 – TOTAL OUTPUT TEST

- 1** 1. Twist and remove the leads from both spark plugs.
- 2** 2. Adjust the gap on the spark tester to $\frac{1}{2}$ in. (12 mm). Connect tester leads to the spark plug leads. Secure tester clip to a clean engine ground.

Note To prevent possible arcing of high voltage, route tester leads at least 2 in. (51 mm) from any metal surface.

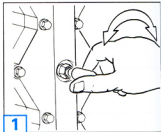
⚠ To avoid possible shock hazard, do not handle ignition coils or spark tester during cranking tests.

3. If equipped, install the emergency stop switch clip and lanyard assembly. Crank the engine. Spark should jump each tester gap alternately.

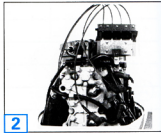
- If tester shows good output on both cylinders, go to **STEP 6 – RUNNING OUTPUT TEST.**
- If tester shows good output on one cylinder, go to **STEP 5 – POWER PACK OUTPUT TEST.**
- If tester shows no output, go to **STEP 2 – STOP CIRCUIT TEST.**

Note It is possible for the ignition system to have a problem but still produce good output. If the engine “pops” or “backfires” during starting, the ignition may be out of time. Check the following:

- Coil primary wire routing
- Spark plug lead routing
- Flywheel condition and location
- Synchronization and linkage adjustments



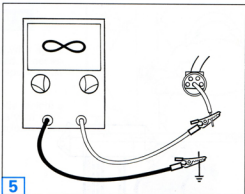
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Ohmmeter Test – Stop Button

Note

All ohmmeter tests must be performed with the engine NOT running.

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1. Most steering handles contain a combination stop button/emergency stop device.

- When the clip and lanyard assembly is removed, the emergency stop device is in the STOP position.
- When the clip and lanyard assembly is installed, the emergency stop device is in the RUN position.
- To stop the engine when the clip and lanyard assembly is in place, press the stop button until the engine stops.

2. Install the clip and lanyard.

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3. Calibrate an ohmmeter on appropriate scale. Connect meter leads between ignition plate end of connector, terminal "E", and a clean engine ground.

- The meter must show a high reading.

4. Momentarily, press inward on the stop button.

- The meter must show a low reading.

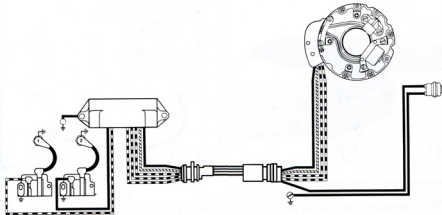
5. Remove the clip and lanyard.

- The meter must show a low reading.



To avoid sudden loss of control, replace the stop button assembly if your test results vary.

6. Complete all circuits disconnected during this test.



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STEP 2 – STOP CIRCUIT TEST

Elimination Test



To avoid possible shock hazard, do not handle ignition coils or spark tester during cranking tests.

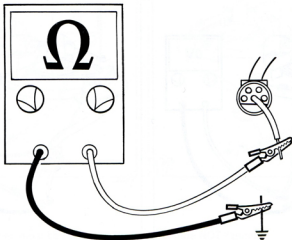
1. Disconnect 5-pin *Amphenol* connector between ignition plate and power pack.

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2. Insert jumper wires between the "A", "B", "C", and "D" terminals of the 5-pin connector.

3. Crank engine and observe results at spark tester.

- If spark now jumps alternately at each gap, the problem is in the stop circuit. Go to [Ohmmeter Test – Stop Button](#) or [Ohmmeter Test – Key Switch](#).
- If there is no spark at one gap, go to [STEP 5 – POWER PACK OUTPUT TEST](#).
- If there is no spark at both gaps, go to [STEP 3 - CHARGE COIL TEST](#).



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Ohmmeter Test – Key Switch

Note All ohmmeter tests must be performed with the engine NOT running.

1. Install emergency stop switch clip and lanyard assembly.

6 2. Calibrate ohmmeter on appropriate scale. Connect meter leads between ignition plate end of connector, terminal “E”, and a clean engine ground.

- Key OFF, meter must show a low reading
- Key ON, meter must show a high reading

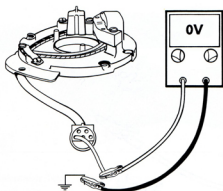
3. If Step 2, Key ON reading is a low one, disconnect harness black/yellow leads from key switch “M” terminal.

- If meter now shows a high reading, test key switch. Refer to [Electrical](#) Section.
- If meter shows a low reading, go to Step 4.

4. Separate emergency stop switch lead from harness black/yellow lead at key switch.

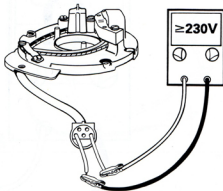
- If meter now shows a high reading, test emergency stop switch.
- If meter shows a low reading, test wiring harness.

5. If engine fails to shut off, test for open black/yellow lead, damaged key switch, or damaged power pack.



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STEP 3 – CHARGE COIL TEST

Ground Test

1. Disconnect 5-pin *Amphenol* connector between ignition plate and power pack.

2. Set peak-reading voltmeter to:

- 9.9/15 – “NEG” and “500”.
- 20 thru 30 – “POS” and “500”.

3. Alternately, connect voltmeter between ignition plate connector terminals “A”, “D”, and a clean engine ground. Crank engine and observe meter at each connection.

- Any reading on either test indicates charge coil or leads are grounded.
- Locate and repair ground, or replace charge coil.

4. If no reading is indicated in Step 3, go to [Output Test](#).

Output Test

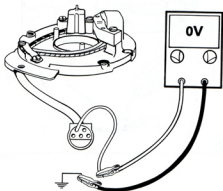
1. Set peak-reading voltmeter to:

- 9.9/15 – “NEG” and “500”.
- 20 thru 30 – “POS” and “500”.

2. Attach voltmeter black lead to ignition plate connector, terminal “A”. Attach meter red lead to terminal “D”.

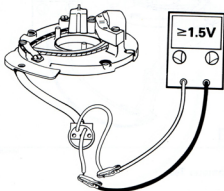
3. Crank engine and observe meter.

- If meter shows 230 volts or higher, go to [STEP 4 – SENSOR COIL TEST](#).
- If meter shows less than 230 volts, check condition of wiring and connectors.
- If wiring and connector condition is good, go to [Ohmmeter Test](#).



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STEP 4 – SENSOR COIL TEST

Ground Test

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1. Disconnect 5-pin *Amphenol* connector between ignition plate and power pack.

2. Set peak-reading voltmeter to:

- 9.9/15 – “NEG” and “5”, or “SEN” and “5” on *Stevens* CD-77 meter.
- 20 thru 30 – “POS” and “5”, or “SEN” and “5” on *Stevens* CD-77 meter.

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3. Alternately, connect voltmeter between ignition plate connector terminals “B”, “C”, and a clean engine ground. Crank engine and observe meter at each connection.

- Any reading indicates sensor coil or leads are grounded.
- Locate and repair ground, or replace sensor coil.

4. If no reading is indicated in Step 3, go to **Output Test**.

Output Test

1. Set peak-reading voltmeter to:

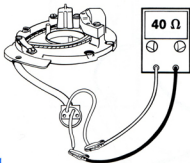
- 9.9/15 – “NEG” and “5”, or “SEN” and “5” on *Stevens* CD-77 meter.
- 20 thru 30 – “POS” and “5”, or “SEN” and “5” on *Stevens* CD-17 meter.

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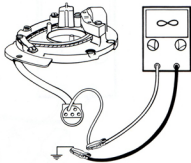
2. Attach voltmeter black lead to ignition plate connector, terminal “C”. Attach meter red lead to terminal “B”.

3. Crank engine and observe meter.

- If meter shows 1.5 volts or higher, go to **STEP 5 – POWER PACK TEST**.
- If meter shows less than 1.5 volts, check condition of wiring and connectors.
- If wiring and connector condition is good, go to **Ohmmeter Test**.



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Ohmmeter Test

Note All ohmmeter tests must be performed with the engine NOT running.

1. Calibrate ohmmeter on appropriate scale.

13 2. Insert jumper wires in ignition plate connector, terminals "B" and "C".

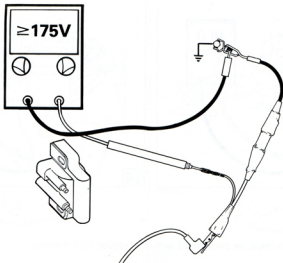
3. Calibrate ohmmeter on appropriate scale. Connect between jumpers.

- Meter must show 40 ± 10 ohms.

14 4. To test for a grounded condition, connect ohmmeter alternately between each jumper and a clean engine ground.

- Any needle movement indicates sensor coil or leads are grounded.
- Locate and repair ground, or replace sensor coil.

5. Complete all circuits disconnected during this test.



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STEP 5 – POWER PACK OUTPUT TEST

⚠ To prevent accidental starting of engine while testing, twist and remove both spark plug leads.

1. Twist and remove primary leads from ignition coils.

15 2. Connect No. 1 ignition coil primary lead to *Stevens Instrument* load adapter No. PL-88 red lead. Connect adapter black lead to a clean engine ground.

Note If *Stevens Instrument* No. PL-88 is not available, you can make an adapter using a 10-ohm, 10-watt resistor, *Radio Shack* No. 271-132, or equivalent.

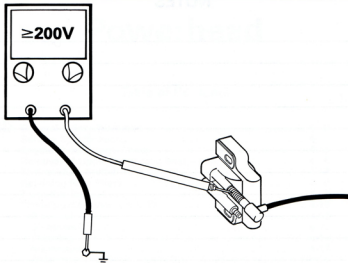
15 3. Connect peak-reading voltmeter red lead to adapter red lead and meter black lead to a clean engine ground.

4. Adjust voltmeter to settings listed in following chart. Crank engine and observe meter. Meter must show at least:

Models	Voltmeter	Output
9.9/15	"NEG", 500	175
20 thru 30	"POS", 500	175

5. Repeat Step 4 for No. 2 ignition coil primary lead.

- If both primary leads have good output, test ignition coils. Refer to [Ignition Coil Tests](#), Page 3-10.
- If one primary lead has no output, replace power pack.
- If both primary leads have no output, go to [STEP 3 – CHARGE COIL TEST](#). If charge coil tests good, replace the power pack.



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STEP 6 – RUNNING OUTPUT TEST

1. Twist and remove primary leads from ignition coils.

16 2. Use a clockwise twist to install *Stevens Instrument* No. TS-77 terminal extenders, or equivalent, on ignition coil primary posts.

16 3. Install primary leads on terminal extenders. Observe proper wire routing. Orange/blue primary lead must be connected to the No. 1 ignition coil.

Note Route all tester leads so they do not interfere with moving engine parts.

16 4. Connect peak-reading voltmeter red lead to No. 1 terminal extender. Connect meter black lead to a clean engine ground.

5. Adjust voltmeter to setting listed in following chart. Start engine and run it under load at RPM where ignition problem exists. Meter must show at least:

Models	Voltmeter	Output
9.9/15	"NEG", 500	200
20 thru 30	"POS", 500	200

6. Repeat Step 5 for No. 2 ignition coil.

- If either cylinder shows less than specified output, test charge coil. Refer to **STEP 3 – CHARGE COIL TEST**.
- If charge coil tests good, replace the power pack.

7. Remove terminal extenders. Install ignition coil primary leads. Observe proper wire routing. Orange/blue primary lead must be connected to the No. 1 ignition coil.