


# **Spitronics - ECU - Spark Problems – Troubleshooting**

## **1. Overview**

This guide helps diagnose no spark or weak spark conditions. Work through the steps in order.

 Do not skip steps.

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## **2. Basic Principle**

Spark requires the following:

- Correct setup (ECU configuration)
- Power supply to coils
- Earth (ground) path
- Trigger signal from ECU

 If any one is missing → no spark

 If any one has poor conductivity → weak spark


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## **3. Step-by-Step Troubleshooting**

### **Step 1 – Check Installation**

Ensure installation follows the manuals:

- Correct wiring
- Correct harness used
- No mixing of old and new harnesses
- Correct fuses

 Ensure that you have smart coils or basic coils as the wiring is different. Each harness has a number that must correlate to its wiring diagram

 Note:

Harnesses includes spike protection diodes except Callisto, it has protection built into the design. Callist is not affected by this protection if it is included on other harnesses.

Using old harnesses may cause ECU damage or interference.

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### **Step 2 – Check ECU Setup**

Verify setup before connecting outputs:

- Correct coil type selected
- Correct coil combination selected
- Correct coil min and max charge times are selected
- Startup procedure followed

👉 Ensure during cranking:

- No trigger errors present ( press C to clear errors)
- RPM show 100 to 200 rpm
- Injector time is present usually 10 to 15 milli seconds

⚠️ Incorrect setup can:

- Prevent spark
  - Weaken spark
  - Damage ECU drivers or coils
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### **Step 3 – Check ECU Operation During Cranking**

While cranking:

- Real-time timing should read  $\pm 10^\circ$
- No crank or cam signal error codes should be present

👉 If not:

Problem is in trigger setup or configuration

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### **Step 4 – Check Coil Power Supply**

Ensure coils are powered correctly:

- Must be powered from ECU relay
- Do NOT use original vehicle power

Check:

- Relay switch on for  $\pm 3$  seconds with ignition on
  - Relay pin 30 → direct battery positive via fuse
  - Relay pin 87 → direct to coil positive
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### **Step 5 – Test Coil Power (No Load Test)**

Using a multimeter (DC volts):

1. Measure between:
  - Battery negative
  - Coil positive
2. Switch ignition ON

👉 You should see:

- $\pm 12V$  for  $\pm 3$  seconds

If not:

- Check ECU earth (thick black wire earth strap to chassis)
  - Check relay operation
  - Check relay 86 power → 12V battery supply volts
  - Check fuse
  - Check wiring to coil power
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### **Step 6 – Test Basic Coil Condition**

(Only for basic coils – no built-in driver)

Measure:

- Coil primary resistance  $\pm 0.5$  to 1.0 Ohm
- Coil negative to battery negative when the relay is switched on for 3 seconds

👉 You should see:

- $\pm 12V$

If not:

- Coil is faulty (open circuit)
- Replace coil

⚠ Smart coils cannot be tested this way

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### **Step 7 – Test Power Under Load**

Bad connections may pass no-load tests but fail under load.

Test:

- Set meter to AC volts
- Measure between:
  - Battery negative
  - Coil positive
- Crank engine

👉 Expected:

- Close to 0V

If above 2V:

- Power supply line is unstable

Possible causes:

- Bad connections
  - Poor fuse contact
  - Wiring too thin
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### **Step 8 – Test Earth (Ground) Path**

Check coil ground under load:

- Set meter to AC volts
- Measure between:
  - ECU ground (coil driver ground)
  - Battery negative

Crank engine

👉 Expected:

- Close to 0V

If above 1V:

- Bad ground connection
  - High resistance in earth path
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### **Step 9 – Check Trigger Output (Basic Coils)**

Test coil negative:

- Set meter to highest AC volts
- Measure between:
  - Coil negative
  - Battery negative

Crank engine

👉 Expected:

- Above 100V

Result:

- Voltage present → driver + primary OK
- No voltage → no ECU earth to driver side – damaged ECU driver – setup issue

⚠ Important:

Never lift HT leads to test spark → may damage ECU.

Rather install a spark plug in the lead and earth it on the engine.

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### **Step 10 – Check Smart Coils**

Measure trigger signal:

- Set meter to AC volts
- Measure at trigger input

Crank engine

👉 Expected:

- ±12V AC

Result:

- Voltage present → coil faulty
  - No voltage → no power to ECU positive driver side – damaged ECU driver – setup issue
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### **Step 11 – External Coil Driver Systems**

Check ECU trigger output: (Step 10)

- Measure ECU output → ±12V AC

If present:

- Check coil negative → ±100V (Step 9)

Results:

- No ECU pulse → setup or ECU issue – no power to ECU positive driver side

- No coil pulse → driver faulty


 Note:

Some OEM smart coils require 5V trigger → resistor divider may be required

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## **Step 12 – Multiple Faults**

More than one fault may exist.

 After fixing one issue:  
Repeat the test from Step 1

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## **4. Result**

At the end of this process, you should identify:

- Power issue
  - Ground issue
  - Coil failure
  - Driver failure
  - Setup/configuration error
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## **5. Notes / Warnings**

- Do not skip steps
  - Always test under load
  - Never test spark by pulling HT leads
  - Incorrect wiring or setup can damage components
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## **6. Reference Links**

**i** More Info:

Documentation → Hardware Manuals → Ignition System

Documentation → Software Manuals → Coil Setup