

# VRS SENSOR

## Technical Spec

ECOTRONS LLC

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Note: If you are not sure about any specific details,  
please contact us at [info@ecotrons.com](mailto:info@ecotrons.com).

**Product:**                    **VRS sensor**

**Type:**                        **EVS02B**

**Comment:**                    All data given in this document are nominal values and might  
be subject of change at all time

Index	Page	Revision	Date	Note
1	----	<b>First Edition</b>	9.3.2013	V1.2
2	----	<b>Second Edition</b>	12.20.2013	V1.3
3	----	<b>Third Edition</b>	1.3.2014	V1.3.1
4	----	<b>Fourth Edition</b>	3.15.2013	V1.3.2

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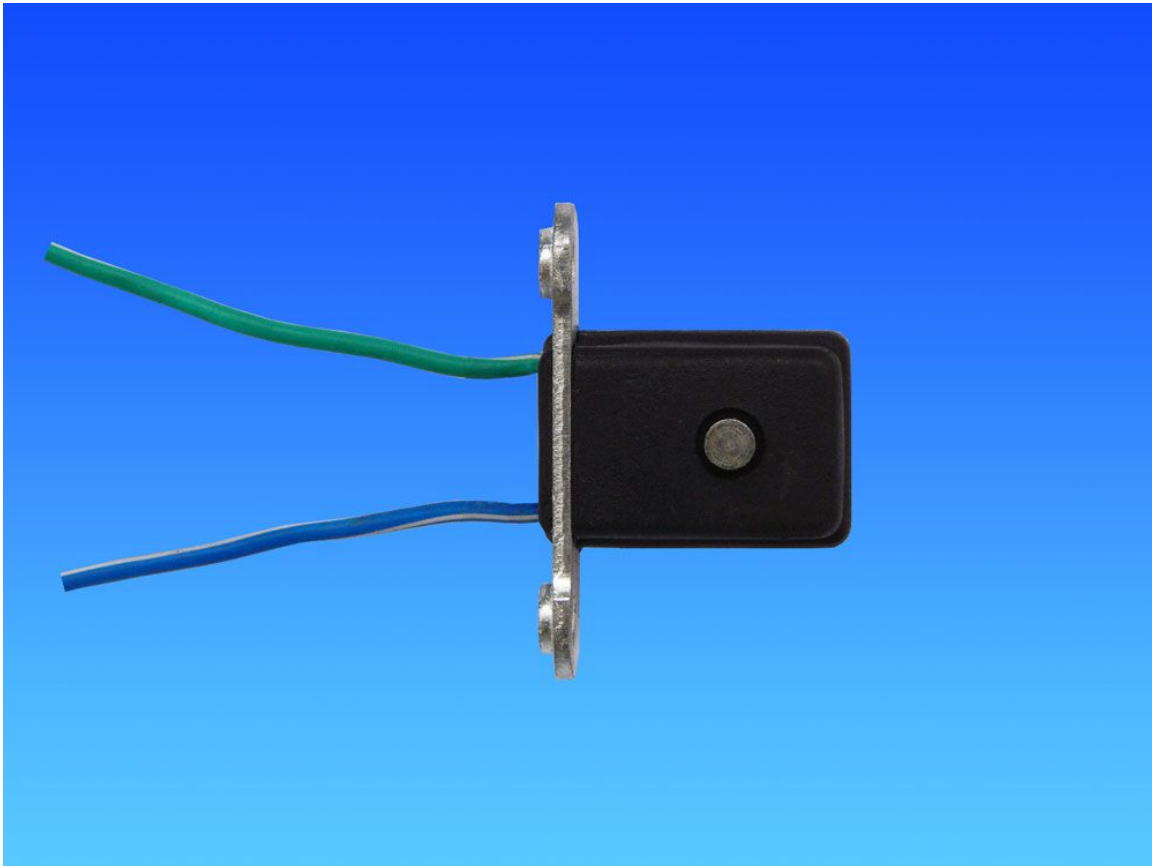
## General Description

This VRS sensor is Magneto electric induction type crankshaft sensor. It is triggered by magnetic medium or tooth.

And it Generates AC pulses instead of square waves.

## 1 Characteristic

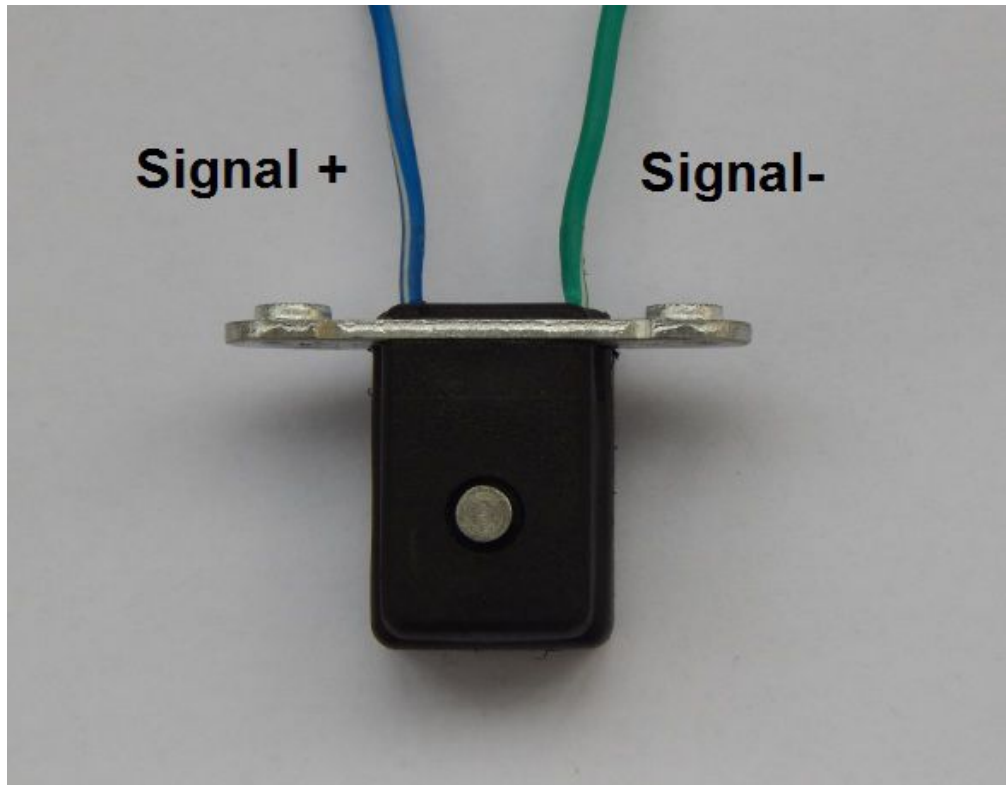
### 1.1 Sensor picture



### 1.2 Electrical Characteristics

Maximum output voltage.....	16v
DC resistance .....	190±10Ω
Inductance .....	70-80mH
Operating temperature.....	(-35~+80)° C
Diameter of Sensing head.....	5±0.1mm

## 1.3 Wire color and Pin-outs definitions



Signal +: **Blue**/white

Signal-: **Green**/white

## 2 Applications and Installation instructions

### 2.1 typical applications

The VRS sensor is usually used as crankshaft sensor to detect the position of crankshaft, and then the signal is used by ECU to control the ignition system.

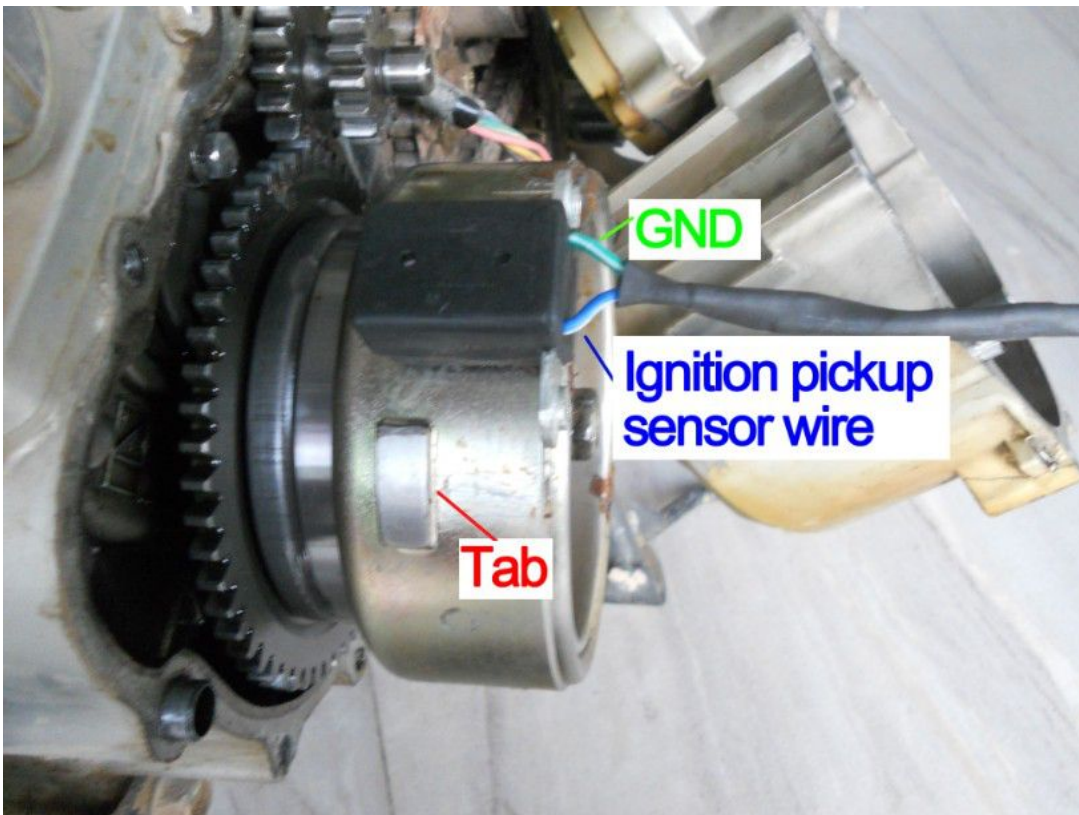
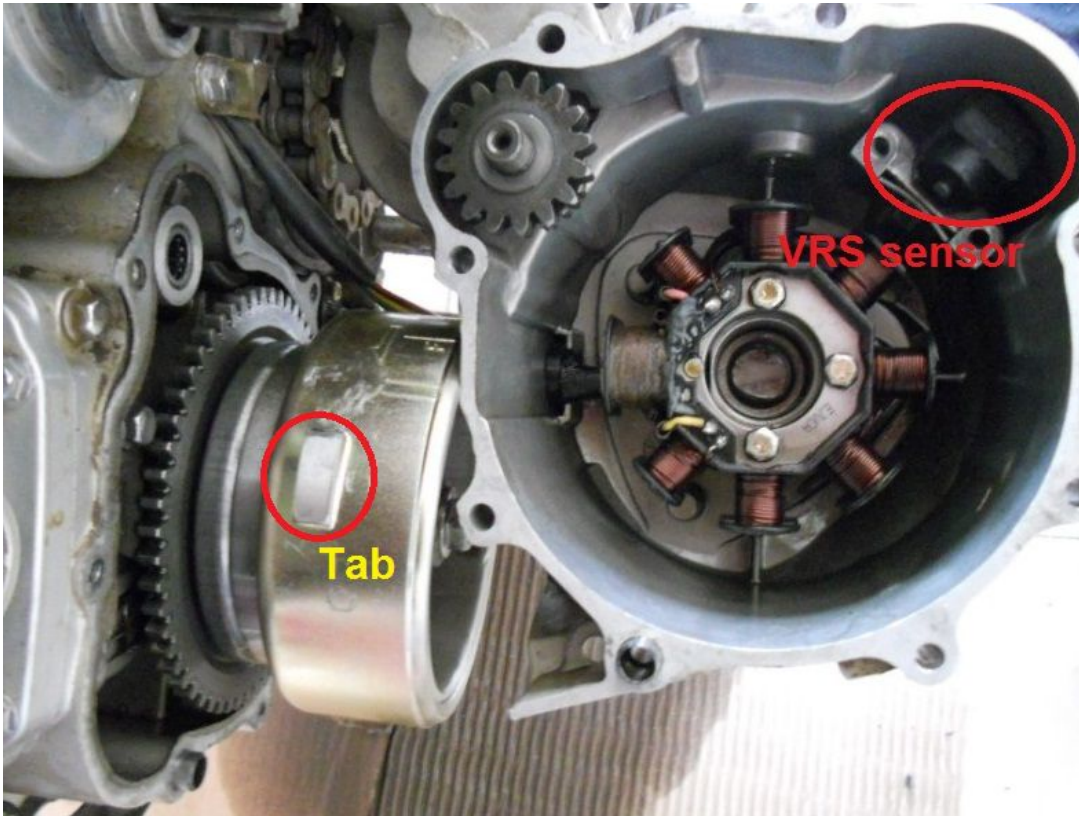
### 2.2 Installation instructions

#### 2.2.1 VRS sensor is used in CDI ignition system

For most engines, they need an ignition pick-up signal to trigger the CDI. And there is a tab on the flywheel, when the bolt pass through the VRS sensor, the VRS sensor will be triggered and produce a signal.

The CDI-unit gets the signal, and then it works and then triggers the spark to fire. And our ECU also read the signal, to control the ignition and fuel injection.

If ECU doesn't read the VRS signal, it will not work.



**Note: the signal + wire (Blue/white) from VRS sensor is connected to orange**

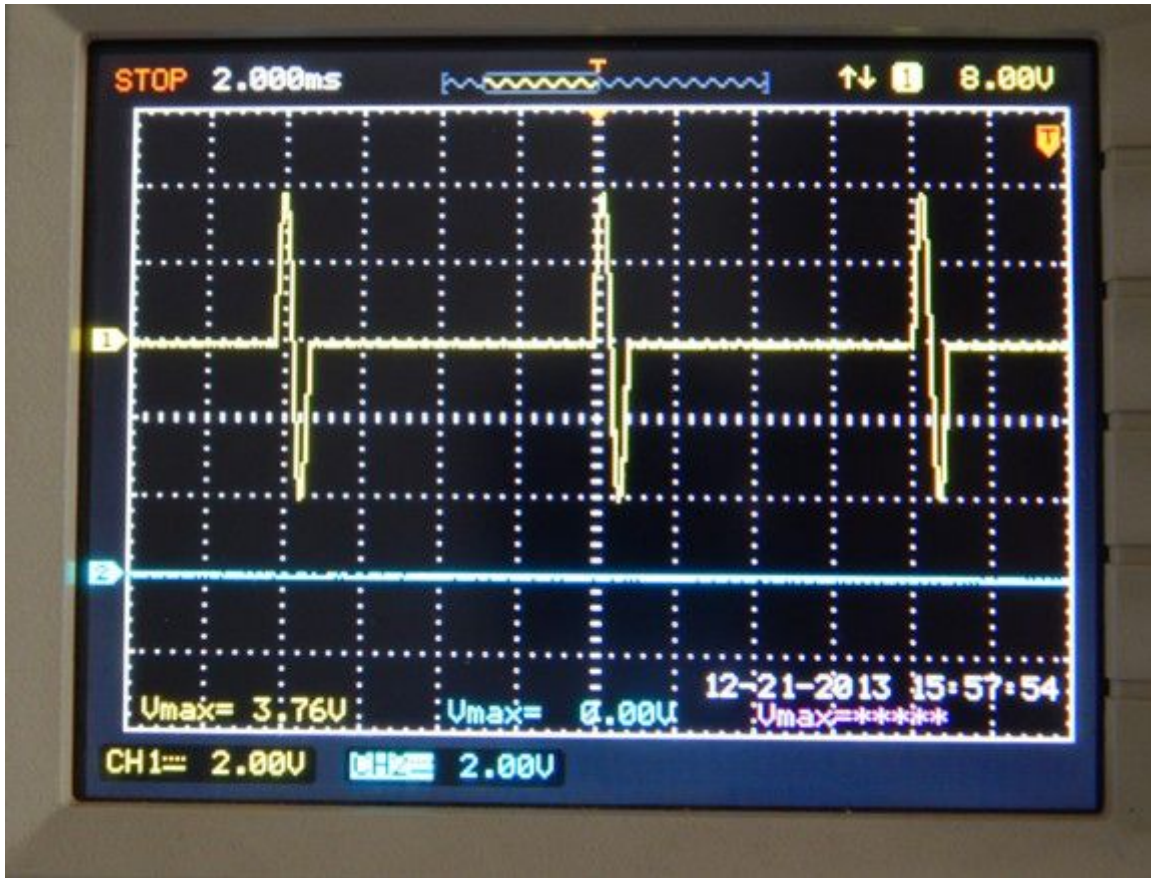
wire (CKP) from ECU harness.

And the signal – wire (Green/white) from VRS sensor is connected to negative of battery.

Measure the signal + wire and signal – wire output with oscilloscope

Note: Signal+: CH1 (yellow)

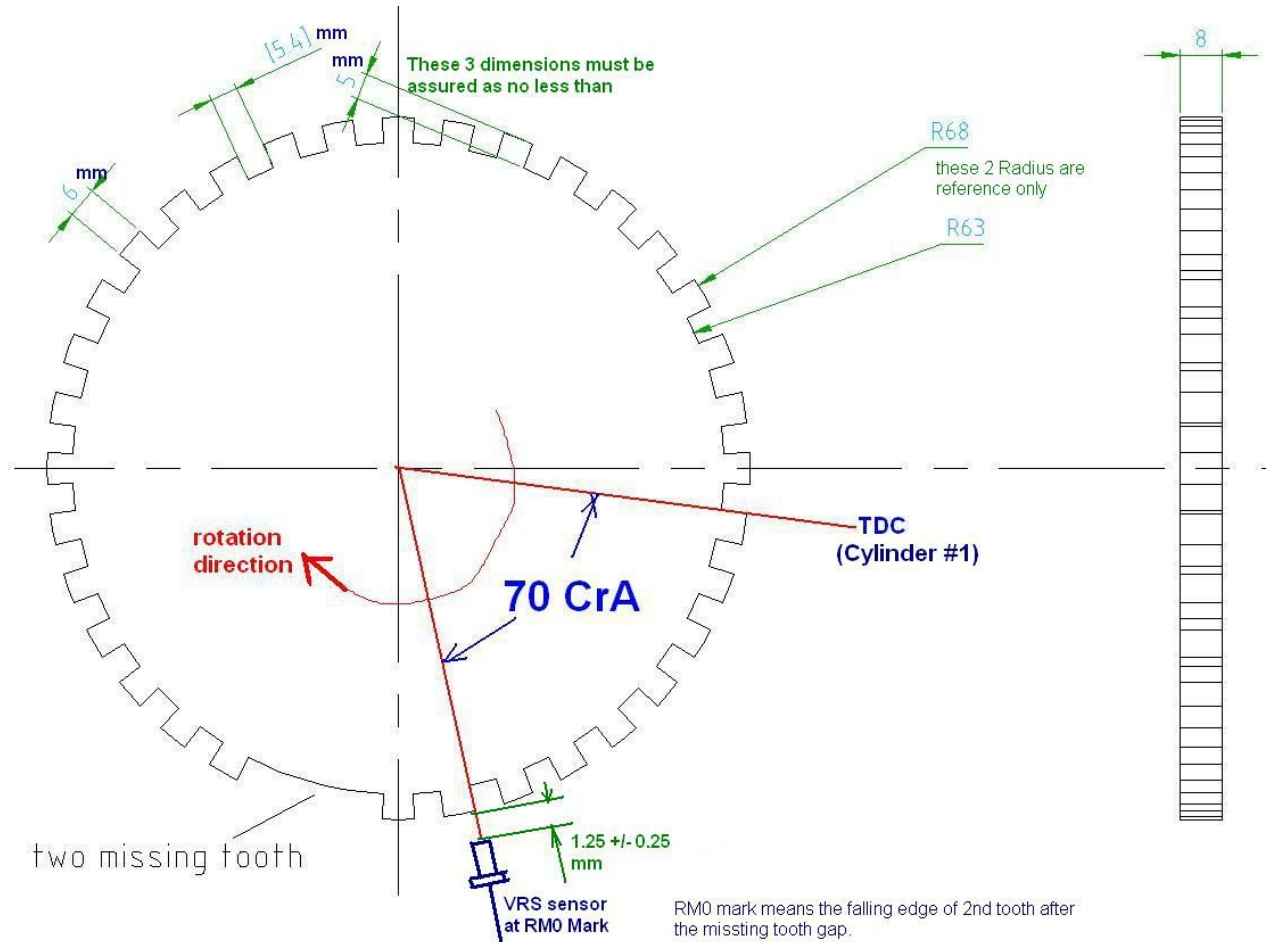
Signal -: CH2 (Blue)



## 2.2.2 VRS sensor is used to detect multi-tooth trigger wheel.



**Note: the signal + wire (Blue/white) from VRS sensor is connected to orange wire (CKP+) from ECU harness.  
And the signal – wire (Green/white) from VRS sensor is connected to purple wire (CKP-) from ECU harness**



**Note:** the VRS sensor need be installed 50-80 degrees before TDC, and the missing tooth should be at 80-110 degrees before TDC. See above picture as a reference.

The metal sensing element (sensor head) needs to align well with the multi-tooth wheel.

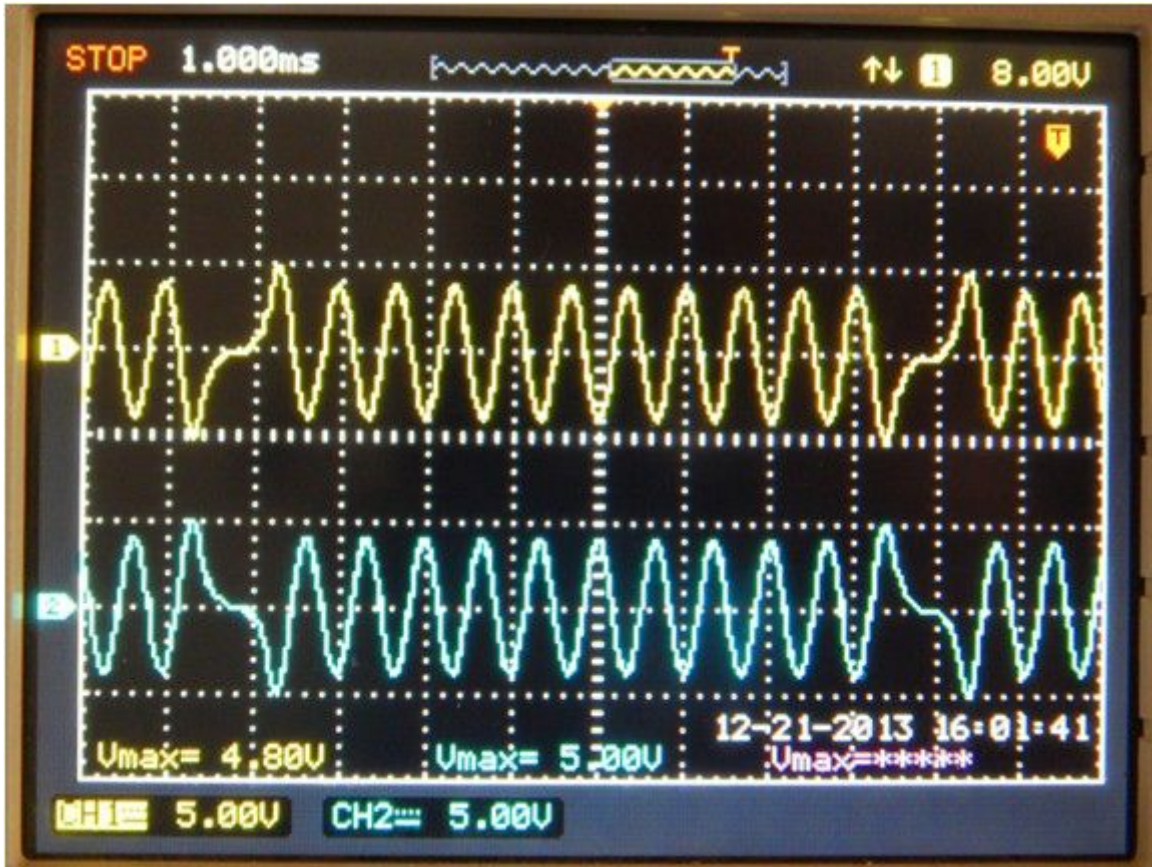
And the tooth width need be bigger than the sensing head, if the sensing head of VRS is much bigger than the tooth, the signal will not be correct, and ECU will not get the correct tooth signal.

**Measure the signal + wire and signal – wire output with oscilloscope (12-1 tooth-wheel)**

**Note: Signal+: CH1 (yellow)**

**Signal -: CH2 (Blue)**



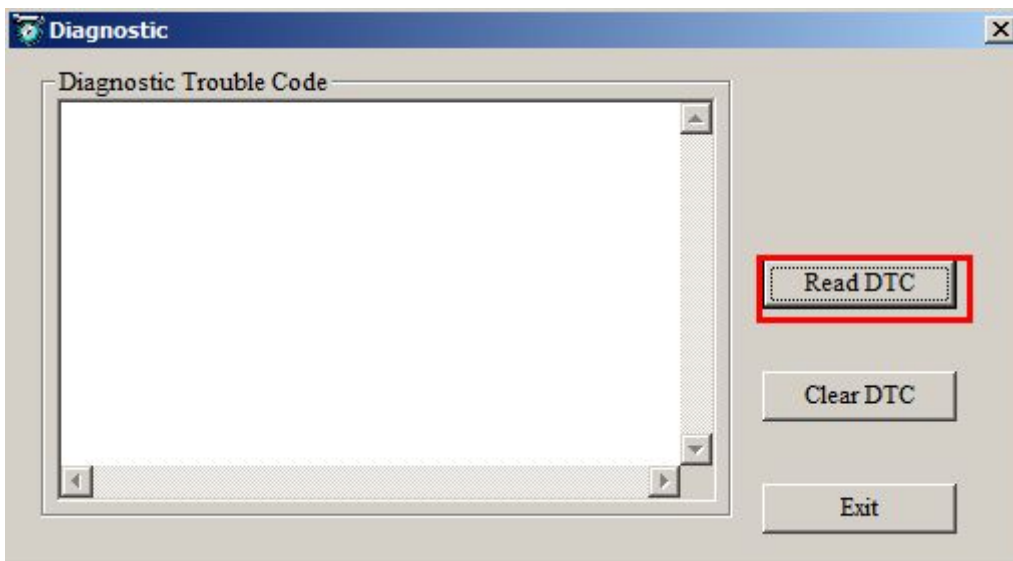


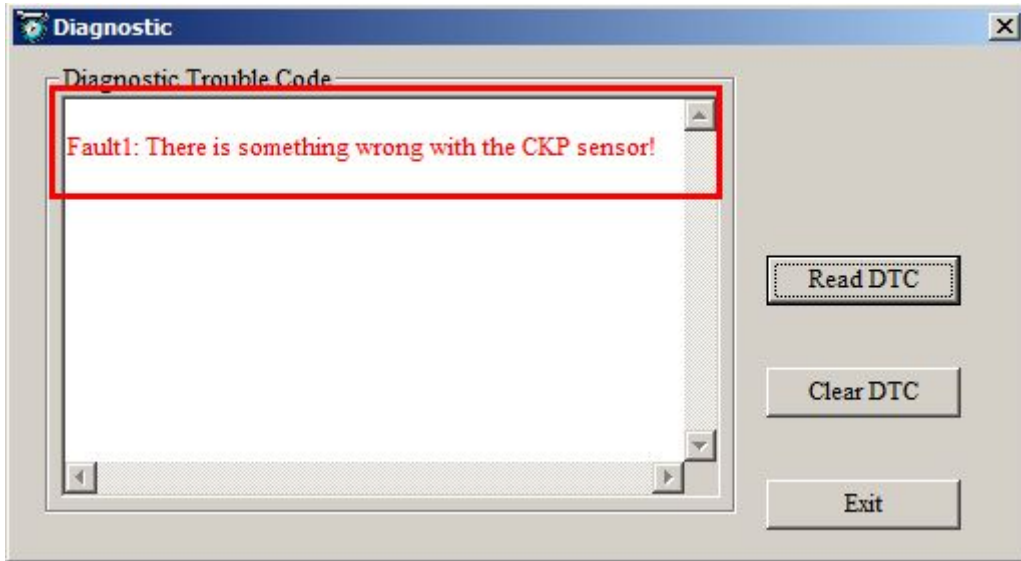
### 3 Diagnostics and Service (with Ecotrons EFI)

If you crank the engine to start, but the engine can't go to start and the Mil-lamp is on.

You use the ProCAL to read the DTC code, and it reports CKP error:

Go to menu->Diagnostic:





This Error shows the ECU doesn't read the pick-up signal (CKP), you need re-check the connections and make sure all ground wires are connected to voltage of battery well.

**Note:** If you have other problems, please connect us, [info@ecotrons.com](mailto:info@ecotrons.com)  
<http://www.ecotrons.com>

## 4 Appendixes: Mechanical CAD Drawing

