



2010 Mazda 5 How to Troubleshoot Oxygen Sensor

One year after replacing the rear oxygen sensor...

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INTRODUCTION

One year after replacing the rear oxygen sensor of my 2010 Mazda 5, the yellow engine warning symbol came on again. I read out the error code, with my 'OBD 2' device, and it was again reporting fault code P0138 ("bank 1 sensor 2") problem <https://cartreatments.com/p0138/>

As the device was fairly new, I suspected it was something else. Clearing the fault code while the engine was warm, seemed to work, so I suspected the built-in heat element was not working. However the fuse #37 was OK (see <https://www.autogenius.info/mazda-5-2007...>)

I then removed the sensor and cleaned it using ultrasound (and gazonline), but that did not solve the problem.

In disbelief I went on and checked all (!) the relays, but they all seemed OK

Finally I decided to order a new sensor from a webshop (somehow all webshops I found seem to share the same Berlin address...). This is the part I ordered:

<https://www.motordoc.dk/products/8126...>

Before mounting the new sensor, I did a non-scientific check of the pins (see the steps below) and the results are listed in this table:

Pins	New sensor	Old defect sensor
1-2	5.06 Ohm	6.2 Ohm
1-3	48 pF	6.5 Ohm
1-4	49 pF	52 kOhm
2-3	46 pF	0.9 Ohm
2-4	49 pF	53 kOhm
3-4	46 pF	53 kOhm

As you can see from the table above, there clearly is a difference in the behaviour of the new and the old device.

I installed the new device and followed the instructions:

- clear the error codes
- disconnect the car battery for some minutes
- take the car for a 10 minute drive

After this, the problem was gone.



TOOLS:

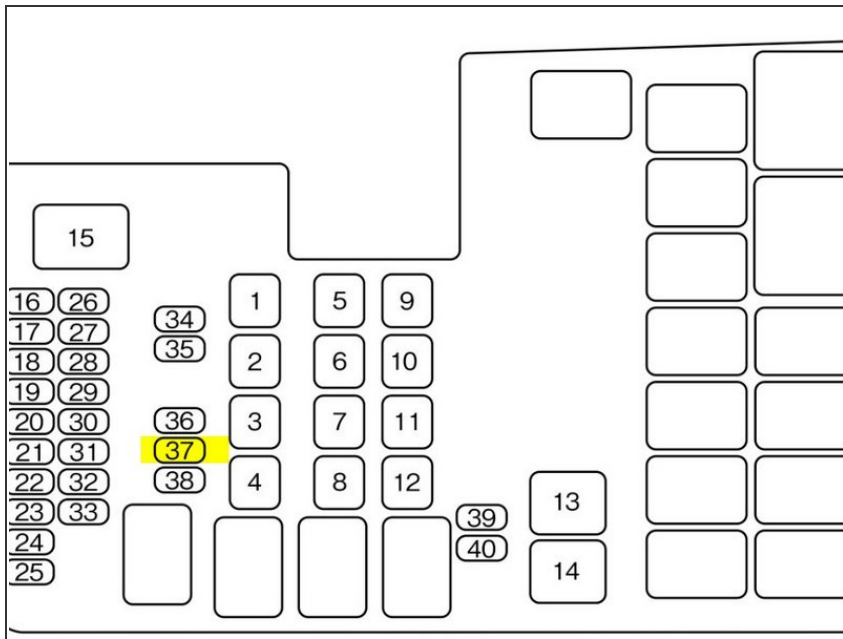
- [Multimeter](#) (1)
- [Transistor tester](#) (1)



PARTS:

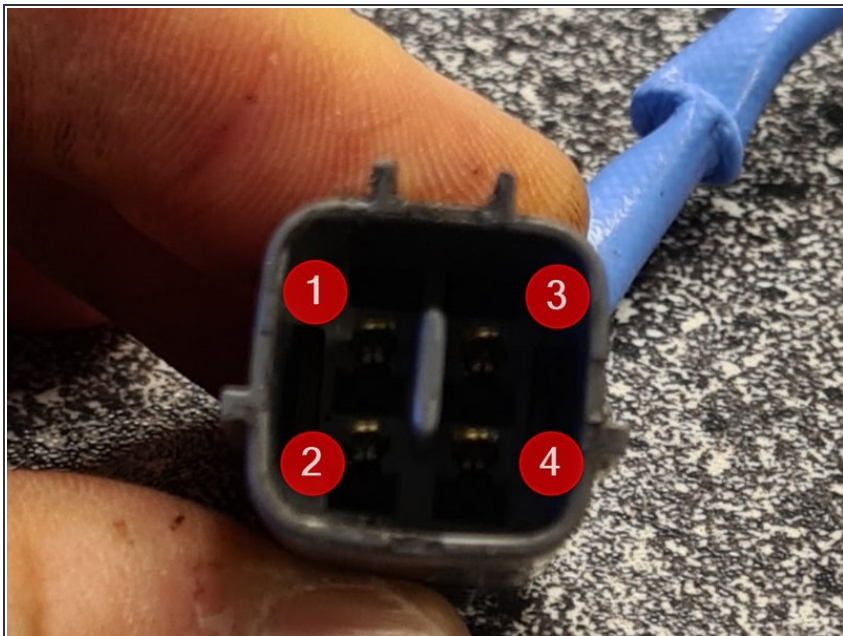
- [Oxygen Sensor](#) (1)

Step 1 — Fuse box check



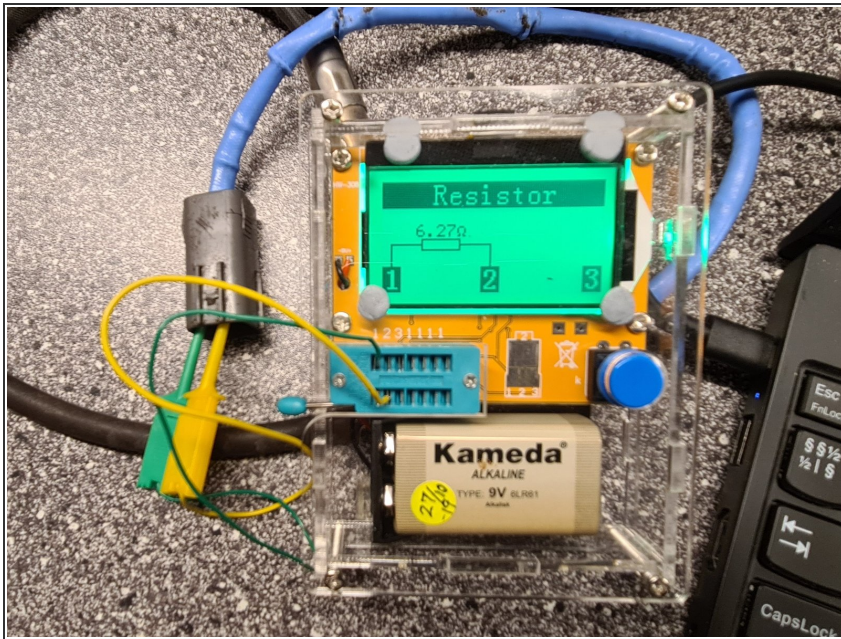
- Check the fuse for the pre-heating of the oxygen sensor (in this case #37)

Step 2 — Enumerate pins



- Unplug the sensor and decide on a numbering scheme. Also clean the pins to ensure this is not a connection problem

Step 3 — Measure



- Check all combinations of the pins of problematic sensor. See comparison chart above (with the new replacement sensor).
- If you do not have such a tester, a normal multimeter (resistance and capacitance) should be sufficient
- If you would like a transistor tester, you can search Aliexpress for one. It is an amazing little device.

<https://www.aliexpress.com/item/10050015...>

Lesson learned: probe the oxygen sensor pins if you experience problems:

- Pin 1-2 is the pre-heating element, and should show around 5-6 Ohm (meaning that the pre-heating must be using around 60W)
- All other combinations of pins should show a capacitance around 50 pF

There is a clear difference in the measurements when comparing the defect part and the new replacement part.

Here are some good resources on Mazda and oxygen sensors, but remember: measure the pins and look for signs of a defect device before you start taking things apart

<https://www.youtube.com/watch?v=jFFR4307...>

<https://www.youtube.com/watch?v=XC5HWd7P...>

<https://www.youtube.com/watch?v=fiOxH14J...>

<https://www.700r4transmissionhq.com/p013...>