

Diagnosics for EX02 Dashboard



Introduction

This manual try to solve the most common problems found on the MRT / Tango series and provide a quick and easy solution.

When you turn on the bike (or switch on main lights) the dashboard performs a total self diagnostic check. If during this process is a fault is detected such as a faulty LED, Temperature sensor, Air temp sensor, Relay malfunction or faulty needle we can then work out the origin of the fault.

For incorrect or erratic speed readings please check this guide thoroughly before contacting Rieju



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1.- Don't works (Turn to ON and OFF)

If the dashboard goes ON but turn OFF when we put gas on the bike check the next points:

- 1.1.- Check the spark plug.
- 1.2.- Check the spark plug cover.
- 1.3.- Check the voltage on the Dashboard.
 - 1.3.1.- Check the voltage OUT of the regulator.

1.1.- Check the spark plug (dashboard or speed crazy)

Check that the bike has the correct spark plug. If the bike don't has assembled the correct spark plug the parasites can goes to the electronics and damage it. All sparks will be with internal resistance ("R").

Model			
MRT / Tango 50	Marathon 125 WR	Marathon / Tango 125 AC	Tango 250
NGK BR9ES	NGK CR8 E	NGK DR8EA	NGK CR8 E



1.2.- Check the spark plug cover (dashboard or speed crazy)

Disassembly the spark plug cover:

IMPORTANT : Don't throw from the spark plug cover to disassembly it.

Disassembly the spark plug cover → Turn in counter clockwise.

Assembly the spark plug cover → Turn in clockwise.

Before connect the spark plug cover check the H.T. cable and cut this around 5 mm

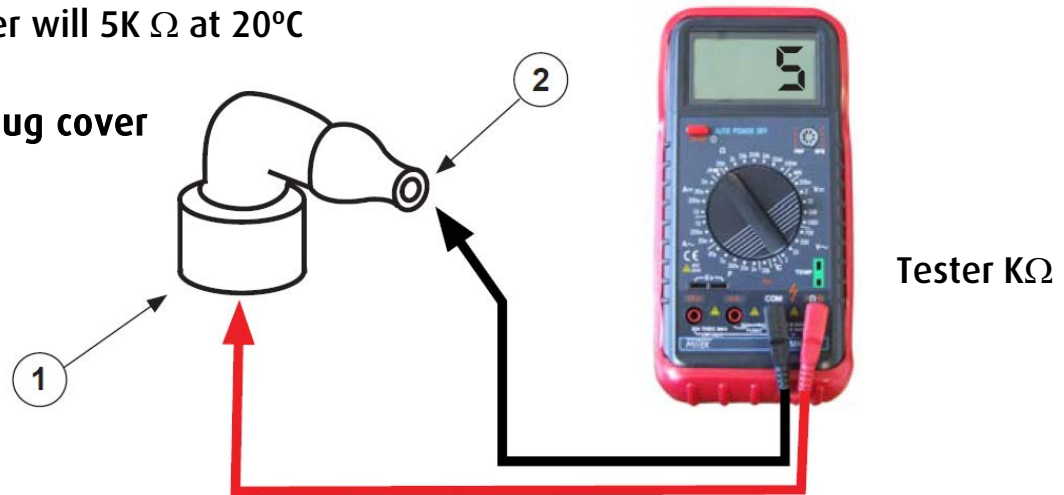
Connect the multimeter (K) on the spark plug cover on the next way:

- + ve meter → Point (1) of the spark plug cover (side spark).

- - ve meter → Point (2) of spark plug cover (side H.T. cable).

The resistance of the spark plug cover will $5K \Omega$ at $20^{\circ}C$

IF INCORRECT: Change the spark plug cover



1.3.- Check the voltage on the Dashboard

Verify power is being supplied to the dashboard.

Put the ignition key to **ON**, with the help of a 20V DC position tester to check the following pin connector that goes to the dashboard

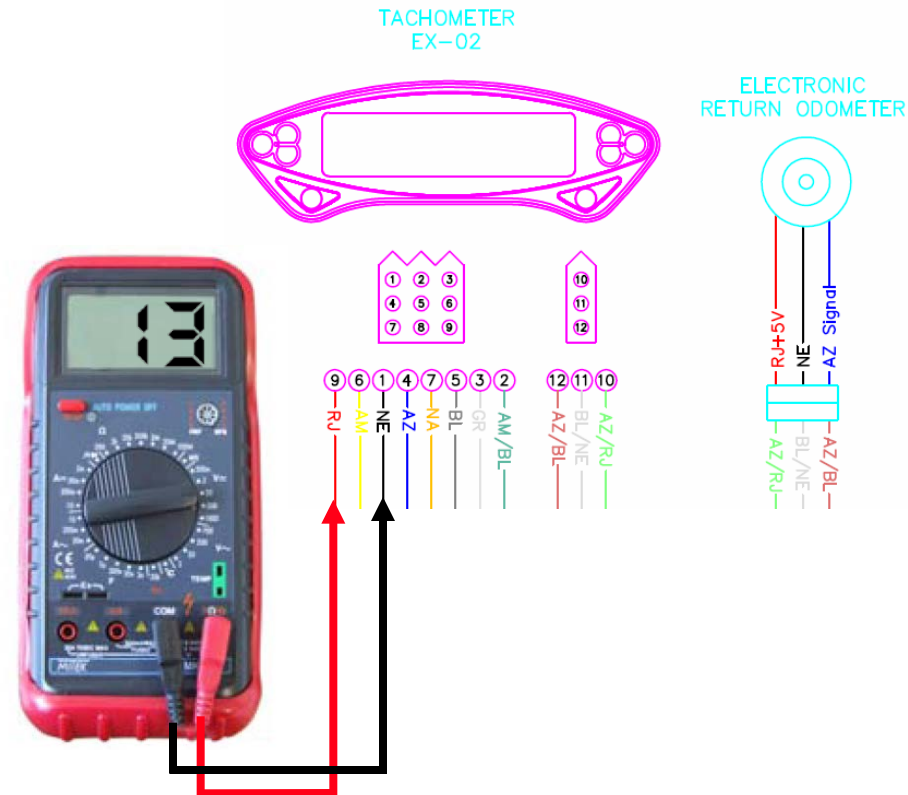
- +ve meter → Pin 9, to red (2)
- -ve meter → Pin 4, to black
- Meter set to 12V

(2) Pin 9 can be a different colour in function of the model tested, colour used are RED, YELLOW OR PURPLE, check the electrical schema of the model tested.

If the voltage between the Pin 9 and 4 is lower than 10 V or upper 16, always with the multimeter in the correct option according to the model (1), check the regulator because it doesn't work correctly and can burn the dashboard. In the cases that the voltage is lower the regulator can produce electrical parasites that can damage the electronics.

If the values are NOK check the point 1.3.1. Check the voltage OUT of the regulator.

(1) Models MRT 50 and Tango 50 produced before 2012, Multimeter will be in AC position, other models put the multimeter on DC position



1.3.1. Check the voltage OUT of the regulator

MODELS WITH BATTERY (MARATHON 125, TANGO 125/250)

Check the correct status of the battery

Nominal voltage will 12,5 V en DC

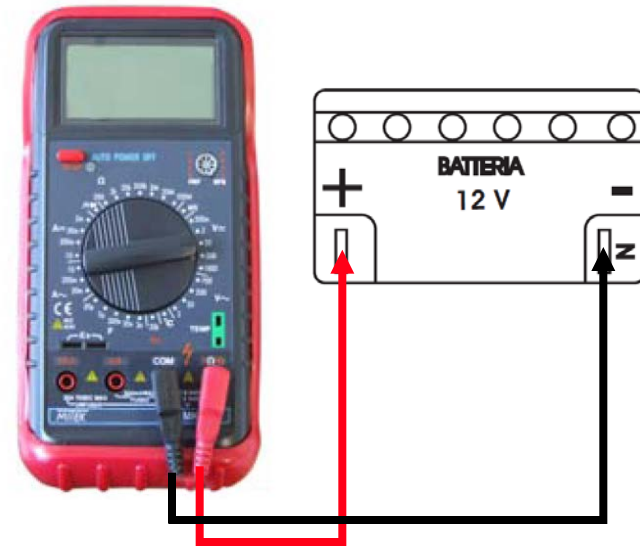
Clean the terminal and check the correct contact between the terminals and the harness.

Put the key in **ON** position and run the bike, with a multimeter in 20V DC position check the correct charge of the battery.

- Multimeter will show one value between 13,5 and 15V.

If the battery is damaged can produce that the regulator don't work correctly and damage the electronics of the bike.

If the battery is good but the values are incorrect you will check the system of the charge (regulator, magnetic fly, etc.).



1.3.1. Check the voltage OUT of the regulator

MODELS WITHOUT BATTERY (MRT OR TANGO 50 MAGNETIC WHEEL DUCATI 6 POLES)

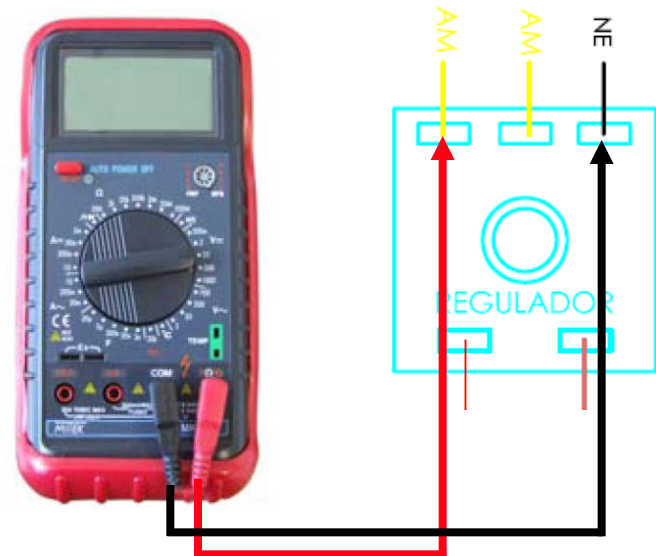
This models working in AC current, all the measures will do with the multimeter on position 20 V AC. Is very important check the correct earth of the regulator (one earth cable will connected with the regulator case) and the correct earth between the harness and the engine.

Put the key in ON position, with the multimeter in 20 V AC check the next pins of the regulator:

- +ve meter → Yellow cable.
- -ve meter → Black cable.
- Multimeter will show one value between 12V and 15V AC.

This models have one regulator square with 3 or 5 pins (according the model).

If the values are NOK check the electrical system of the bike (regulator, magnetic wheel, etc...)



1.3.1. Check the voltage OUT of the regulator

MODELS WITHOUT BATTERY (MRT OR TANGO 50 MAGNETIC WHEEL MORIC 12 POLES)

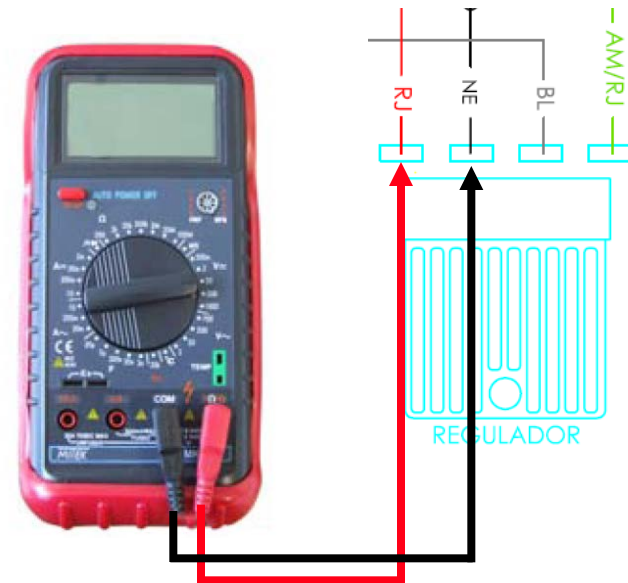
This models are one connection for the lights that works in AC current and other for the electronics that works in DC current. Is very important that the capacitor will connected and works correctly because the capacitor make battery function, if the capacitor is not connected or is damaged the regulator don't work correctly and send parasites to the system that burn the electronic.

Check that the capacitor is assembled on the harness.

Put the key in **ON** position and run the bike. With one multimeter in 20 V DC check the next values between the pins of the capacitor:

- +ve meter → Red cable
- -ve meter → Black cable
- Multimeter will show a value between 13 and 15 V

If the value found is 6V that goes to 4V when we put gas the capacitor is NOK, check it and the connections. Other values the problem will related to the regulator or magnetic wheel check this components.



2.- The dash is not showing speed reading

If the Dashboard does not register speed then we have to check the following:

- 2.1. Check the speed sensor voltage
- 2.2. Sensor signal to dashboard
 - 2.2.1. Distance from the sensor to the screw
- 2.3. Wiring continuity

2.1.- Check if the speed sensor is REED or HALL type

Between May 2015 and June 2016 Rieju was assembling speed sensors type REED, this type of sensors has produced too many problems because the adjustment it was too difficult and after the use of the bike the speed sensor can be disadjusted.

On these cases Rieju suggests changing the speed sensor type REED by the speed sensor type Hall, all the harness and dashboards EX02 are 100% compatible with 2 types of speed sensors

HALL Sensor



REED Sensor



Wheel circumference pulses are different according to the type used. Hall sensors are 3 pulses per wheel and Reed sensors are 1 pulse.

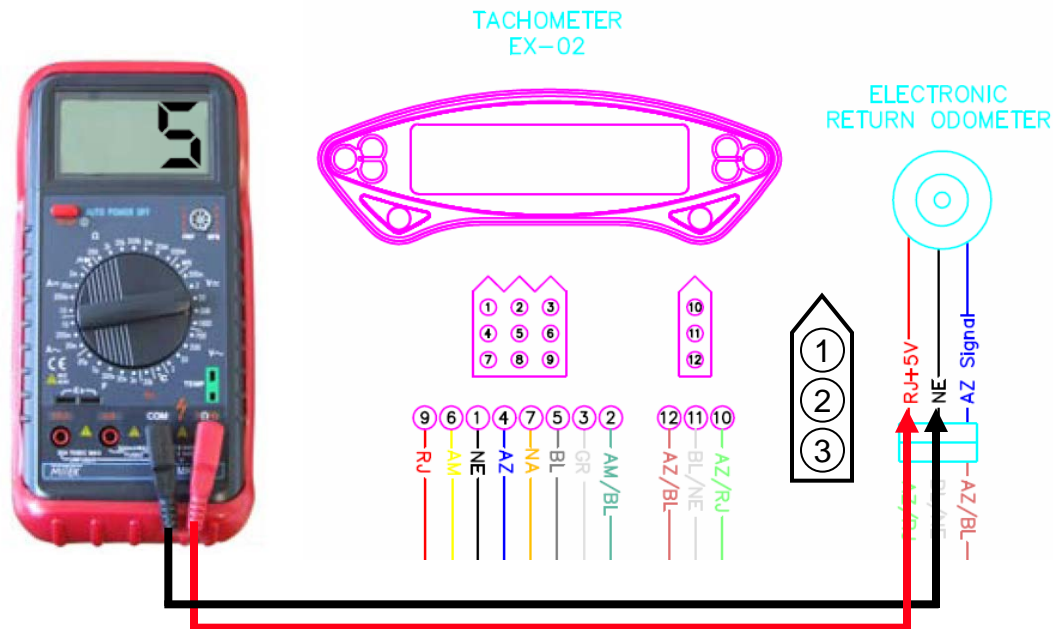
2.2.- Check the speed sensor voltage

Connect the multimeter (DC 20V) as follows:

- +ve meter → Red cable (1)
- -ve meter → Black cable (2)
- Turn the key to "ON"

The tester must indicate the voltage of +5 V. If correct, check the sensor signal 2.2.

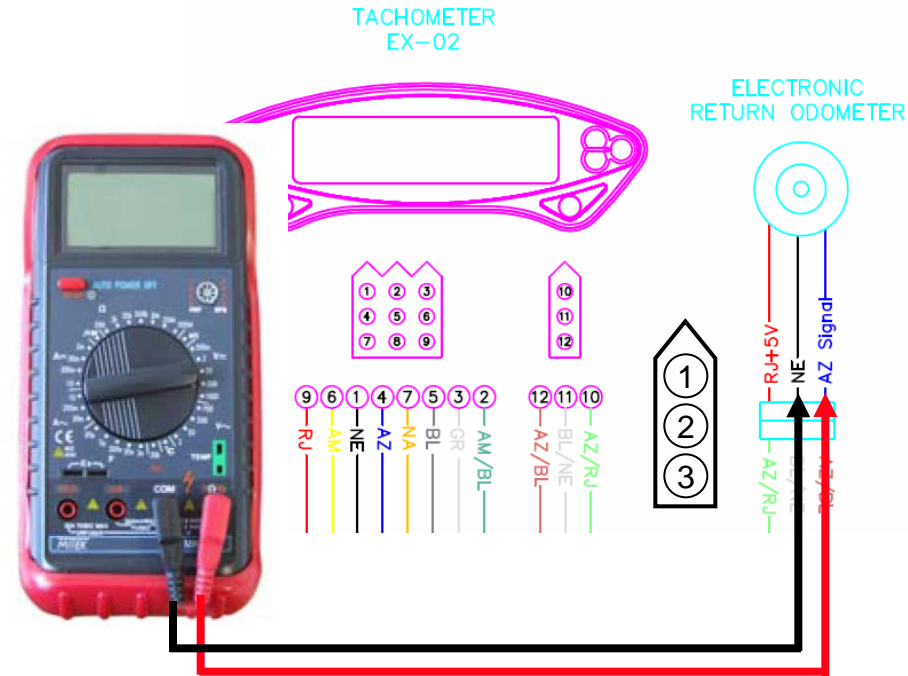
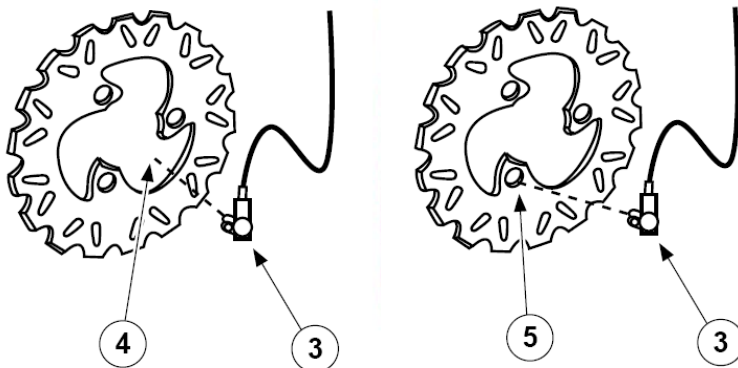
If the voltage is correct we must verify cable continuity black (-) and red (+) according to the wiring diagram, if incorrect cables must override the account Km.



2.3.- Sensor signal to the Dashboard

To verify that the sensor sends the signal correctly to the dashboard, connect a meter (DC 20V) 3-way connector without disconnecting as follows:

- +ve meter → White cable (3)
- -ve meter → Black cable (2)
- Turn the key to “ON” position and run the bike
- Turn the wheel in the direction of travel & check voltage as follows:
 - a) Sensor (3) → Front disc (4)
Voltage : 5 V
 - b) Sensor (3) → Disk bolt (5)
Tensión : 0 V



If incorrect values see section 2.2.1 to verify correct sensor distance to disc bolt

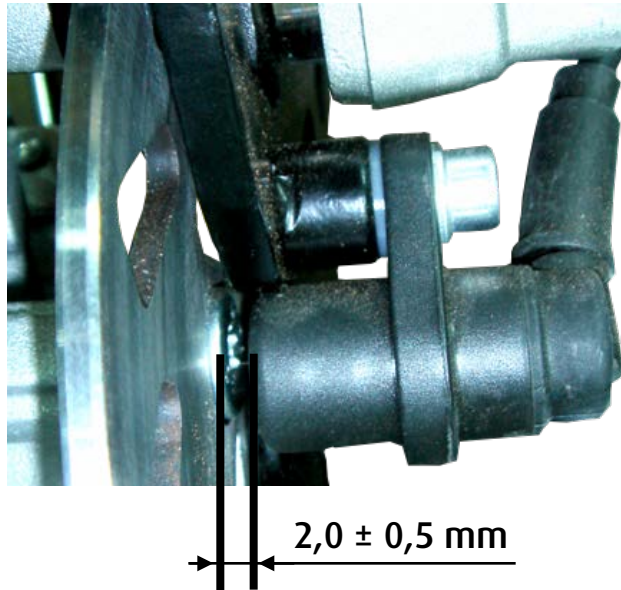
If the values are correct verify wiring continuity 2.3.



2.3.1.- Distance from the sensor to the disc bolt

If the sensor is located too far away from the bolt of the disc it may fail to detect it and therefore not give an accurate reading. The same fault can occur if the sensor is too close to the disc causing erratic performance. Solution is to insert one plastic spacer to ensure the correct air gap.

The correct distance for the sensor is de $2,0 \pm 0,5$ mm



We can vary the distance with the help of a plastic washer until the correct distance is achieved . Verify that the distance is correct by checking the speed displayed on the clocks

2.4.- Continuity of the sensor cable

Check continuity of sensor cable, if continuity is correct replace dashboard otherwise you have to replace the sensor cable

3.- The speed indicated is incorrect

If the dashboard displays the incorrect time then the following points must be checked:

a) Verify the wheel circumference- The correct values are :

Model	SM			OFF ROAD				
	MRT / Tango	MRT 50	MRT / Tango	MRT	Tango	MRT 50	MRT	Tango
Family	MRT / Tango	MRT 50	MRT / Tango	MRT	Tango	MRT 50	MRT	Tango
Engine type	50cc and 125cc E3	Power Up	125cc EURO 4	50cc and 125cc E3	50cc and 125cc E3	Power Up	125cc EURO 4	125cc Euro 4
Pneumatic dimension Dimensión neumático	130/70-17	100/80-17	130/70-17	110/80-18	129/90-16	80/90-21	110/80-18	120/90-16
Wheel circumference Desarrollo rueda	1854	1788	2030	1912	1890	2045	2100	2075
Wheel turn pulses Pulsos sensor (nº tornillos)	3	6	6	3	3	6	6	6

b) Check the display is displaying speed in the correct units Miles Per Hour.

c) Check the speedo sensor distance as described in 2.3.1.

The owner's manual will tell you how change the values for a) and b). If the problem persists and all the values are correct then the dashboard must be replaced.



4.- Erratic Speed Reading

When the dashboard displays erratic speeds it is likely due to interference along the speedo sensor. To rectify these problems follow these steps:

- Check the spark plus cap: the spark plug cap must be an anti-interference plug. Check the correct plug has been installed. The owner's manual will detail the correct plug for each model.
- Check the spark plug lead. Same as before this must be an original Rieju part.
- The sensor cable is near the coil or spark plug lead or spark plug. The proximity of the sensor cable to the coil or spark plug lead can cause interference this cable must be positioned as far as possible from these elements to avoid problems.

If the erratic readings only appear when the vehicle is in motion then usually the fault is with the sensor being too close to the disc. (See 2.2.1 Sensor Distance from the Disc) If the distance is correct but the problem persists then the sensor must be replaced.

ONLY MODELS MARATHON 125: Frame number before VTPMRT20D00A01393 can have one problem of compatibility ECU ↔ Sensor. Contact with Rieju After Sales service to check the problem.



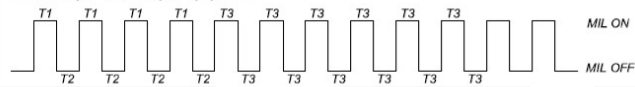
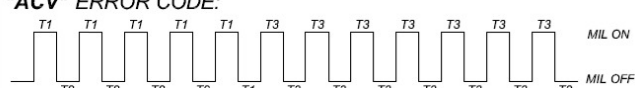


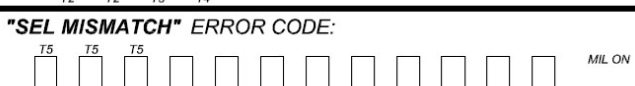
5.- Intermittent Oil / Temperature Light flashing (Only models 125 cc Euro 3)

This oil light warning light is used in 125 models for the ECU can communicate errors found in the components. The sequence in which the light flashes will indicate one, some or all of the following faults.

If Air temp sensor then you must replace with new sensor part 0/005.070.6017

If Water temp sensor then could indicate sensor broken (if illuminated when engine cold) or temperature level too high,

At start up and when we change the ignition switch from normal position to lights position the ECU detects change and checks all the system will show 2 times 2 short lights, if the lights stopped after this then all the system is ok, if flashing continuous for more time then a malfunction is detected as below

<p>ABNORMALITIES DETECTION ECU WARNING LAMP (MIL) IS TURNED ON/OFF ACCORDING TO OCCURRED ERROR CODES</p> <p>T1 = 1 SEC T2 = 1,5 SEC T3 = 0,5 SEC T4 = 3 SEC T5 = 0,3 SEC</p>	<p>"ALIM.C." ERROR CODE:</p>  <p>"ACV" ERROR CODE:</p>  <p>"TENG" ERROR CODE:</p>  <p>"TAIR" ERROR CODE:</p>  <p>"SEL MISMATCH" ERROR CODE:</p> 	<p>no battery (or low) AND no condensator</p> <p>solenoid malfunction</p> <p>water temp sensor malfunction</p> <p>air temp sensor malfunction</p> <p>CDI 50cc assemble on 125cc engine (or viceversa)</p>
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6.- OBD tail light ON (Only models 125cc Euro 4)

Models 125cc EURO 4 has one The ECU is providing by the OBD system, the OBD when detects one fail show the next symbol on the dashboard.



To know what is the fail and how proceed you can check the "On Board Diagnostic (OBD) Manual" that describes step by step how solve the errors show bu OBD tail light