



User's guide for DT-M003

MEASURING WHEEL SPEED



EXOTEST[®]
EDUCATION

DM No. 00308617-v1

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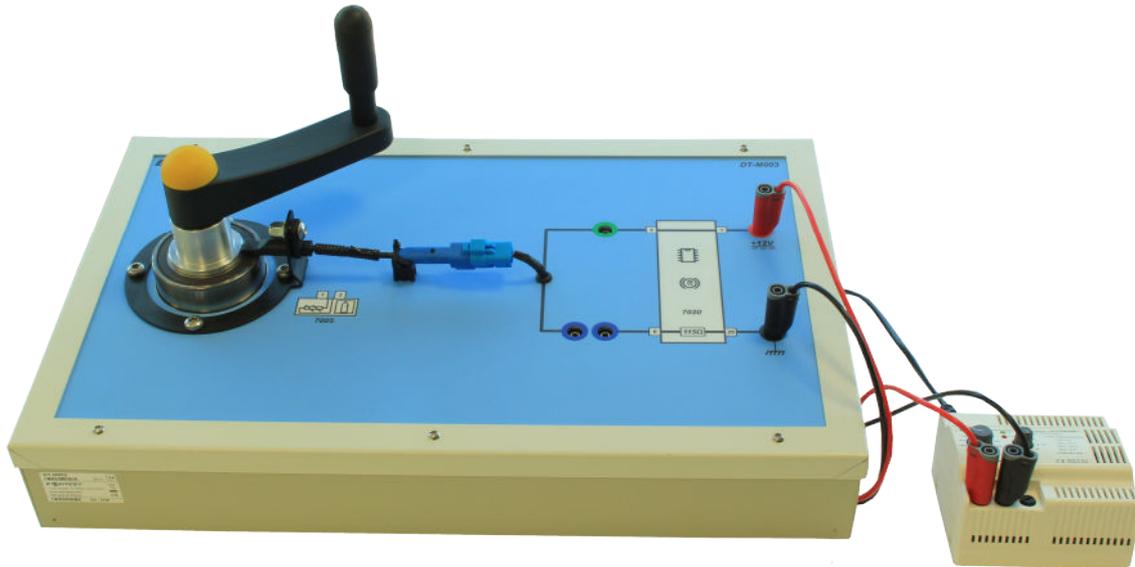
1. USER FILE

1.1. Instruction manual

1.1.1. Installing and starting up module DT-M003

Connect the module to the ELC ALF2002M power supply unit provided (adjustable from 5 to 29 volts – 3A).

Then wire up the magnetoresistive sensor as illustrated below.



1.1.2. Environment

Learning module DT-M003 is designed for benchtop use. It must be installed in a dry place away from dust, steam and combustion fumes.

The module requires approximately 400–500 lux of light

The module must be operated in a practical exercise room. Its operating noise level does not exceed 70 decibels.

The module is protected against potential user error.

1.1.3. Putting out of operation

Switch off the power supply by setting the switch to 0.

Unplug from the 230 V supply.

Store module DT-M003 in a secure room while out of use.

The module should only be opened by certified and authorised persons.

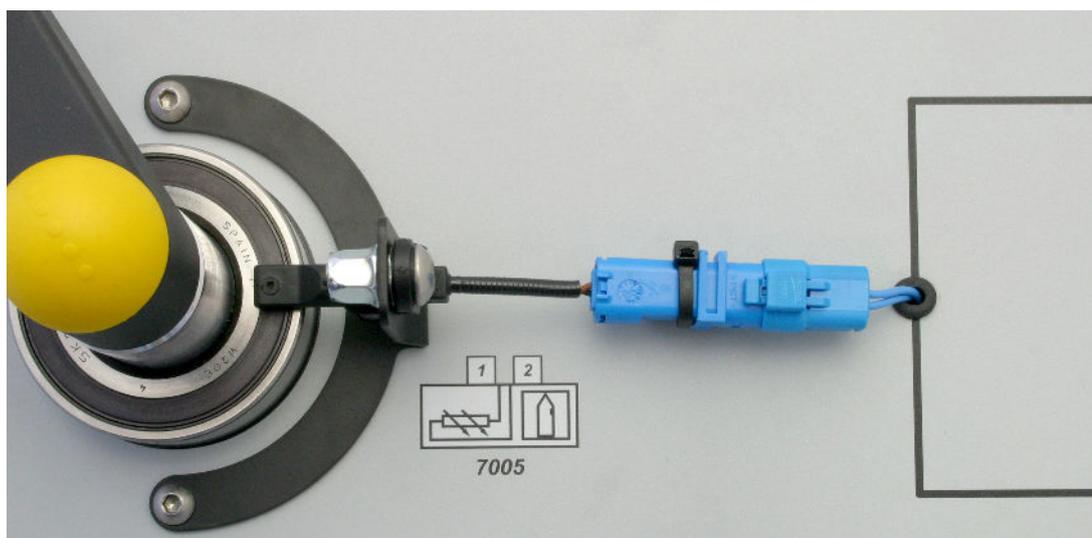
1.1.4. Module composition

Module DT-M003 comprises a bearing equipped with a magnetic target, a magnetoresistive sensor and its original wiring harness.

The module is protected against operating errors such as reversing the polarity and against surges.

These components are taken from a Citroën C3.

Description	Device number	PSA reference
Front bearing		3350 86
Wheel sensor A	7005	4545 97
ABS/ESP electronic control unit	7020	

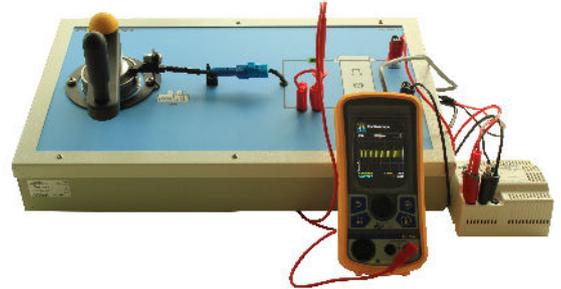


1.2. Study of the magnetoresistive sensor

The alternating pattern of ridges and troughs on the metallic target varies the magnetic field inside the sensor.

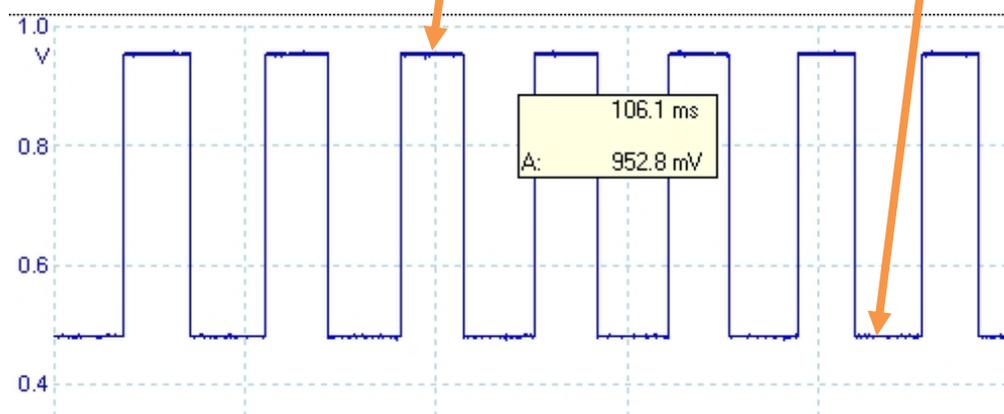
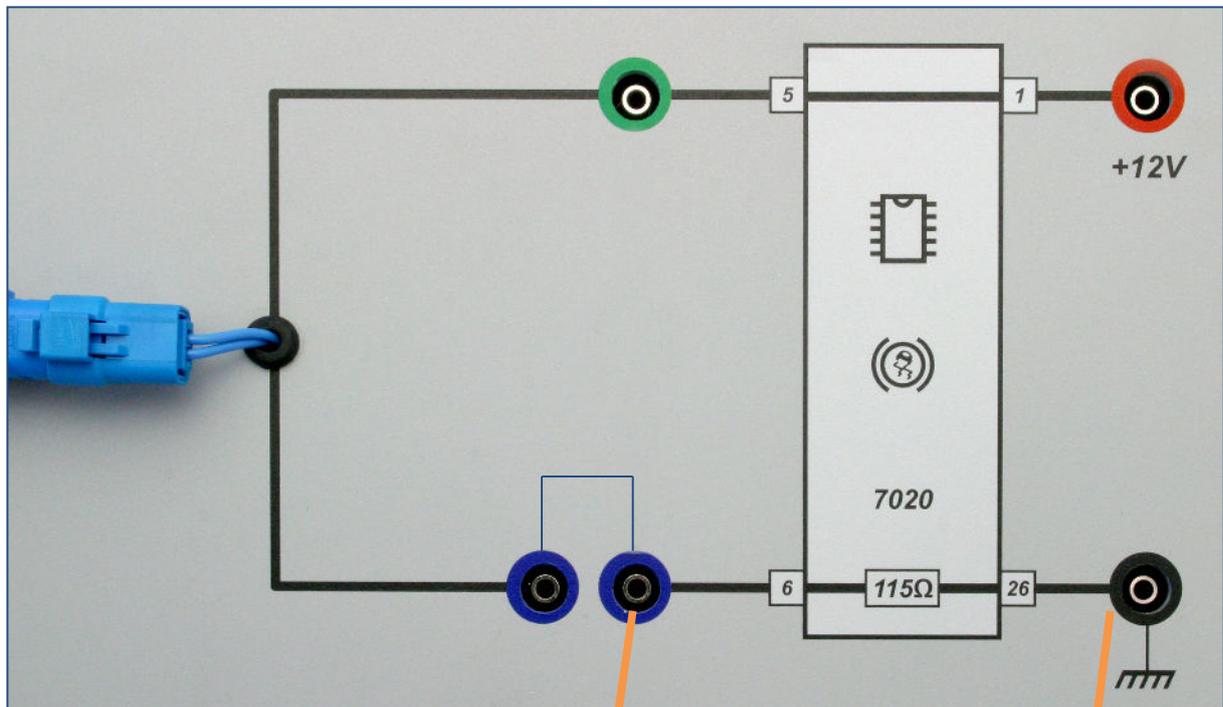
Measuring the magnetoresistive sensor signal with an oscilloscope

The signal from these sensors can be measured with an oscilloscope by placing it in parallel on the signal return wire (connector channel 2).

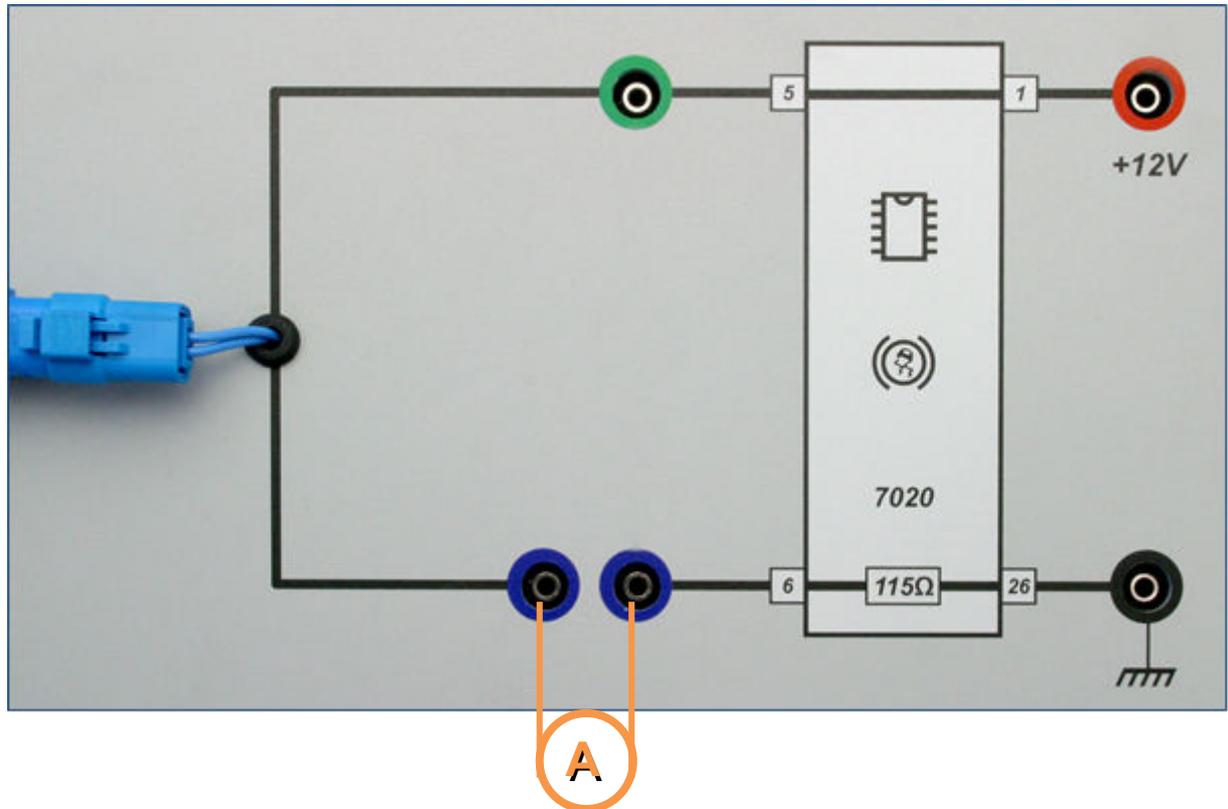


The sensor must be powered by the electronic control unit and the target rotated to alternate the magnetic poles.

The voltage recorded depends on the load resistance value placed in the ABS or ESP electronic control unit.



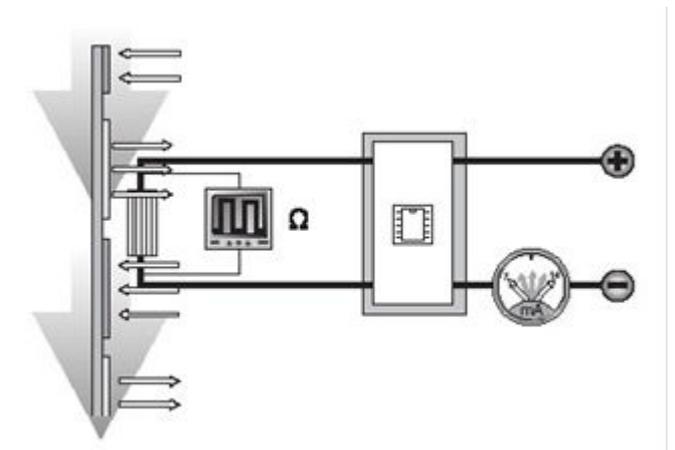
Measuring the current with an ammeter



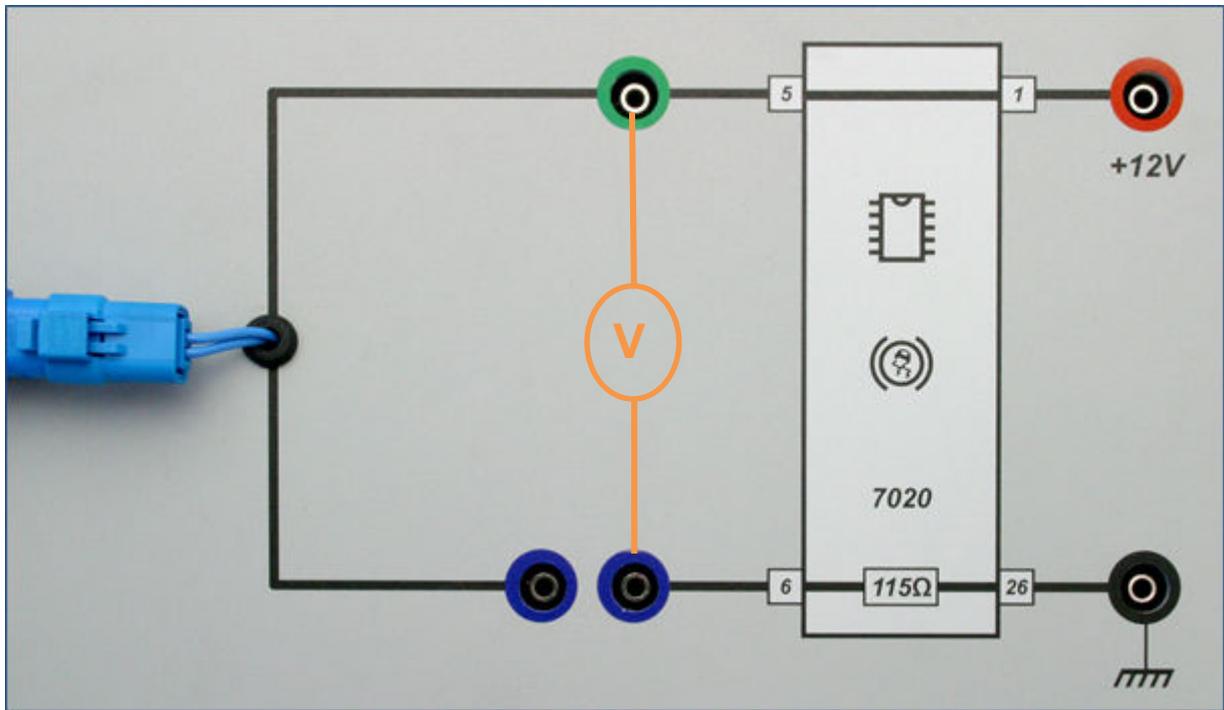
Given the reading track design (alternating pattern of north and south poles), a rectangular-wave signal varying between 7 and 14 mA is recorded. The frequency of this signal represents the speed of wheel rotation.

If the resistance of the magnetoresistive element increases (passage of the field lines through the sensing element), the current is at the minimum level (7 mA).

If the resistance of the magnetoresistive element decreases (reversed field lines), the current is at the maximum level (14 mA).

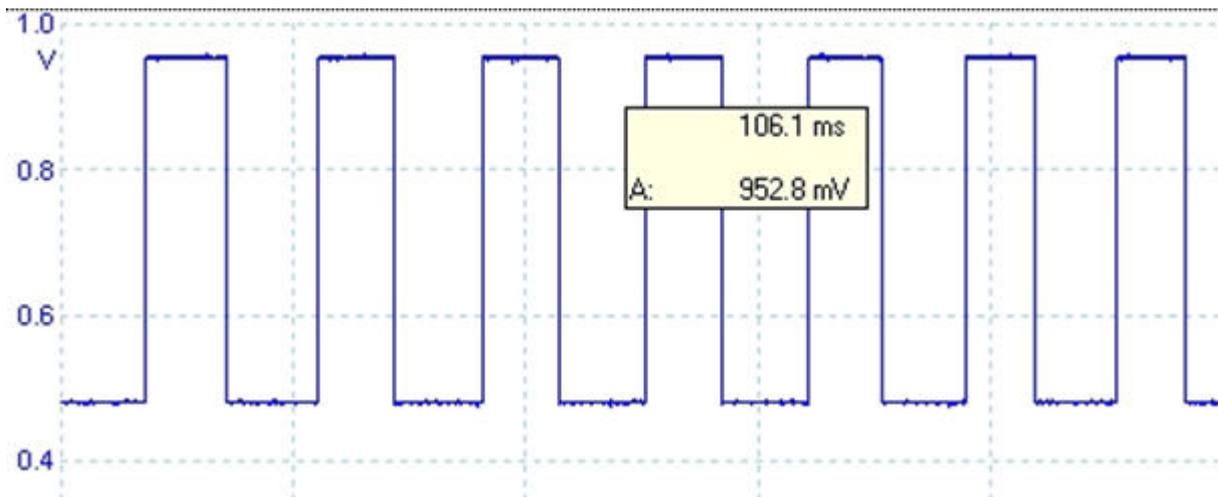


Measuring the voltage with a voltmeter

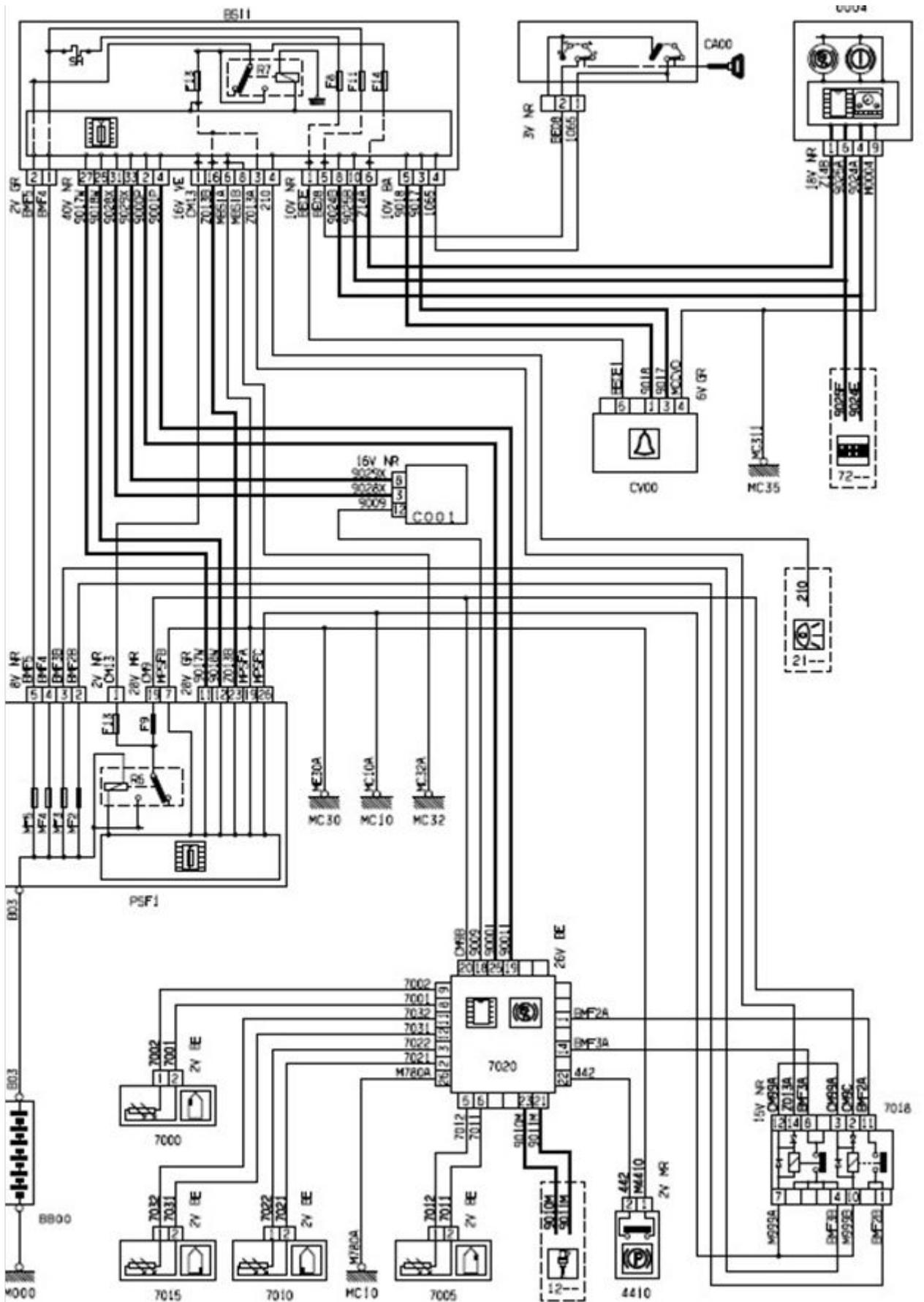


To wake up and deliver a signal once again, the sensors must detect six rising edges. They are energised with +12 V power.

The signal recorded is between 0.8 V and 1.6 V (amplitude 0.5 V/div.).



Wiring diagram





DECLARATION OF CONFORMITY



Manufacturer Name: **ANNECY ELECTRONIQUE SAS**
Street: **1, rue Callisto - Parc Altaïs**
Town: **74650 CHAVANOD**
Country: **FRANCE**

Represented by the signatory below, declares that the following product:

Product reference	Description	Make
DT-M003	Benchtop learning module: Measuring wheel speed with a magnetoresistive sensor on an ABS wheel bearing	EXXOTEST

complies with all requirements of European directives relating to the design of Electrical & Electronic Equipment (EEE) and the management of Waste Electrical & Electronic Equipment (WEEE) in the EU:

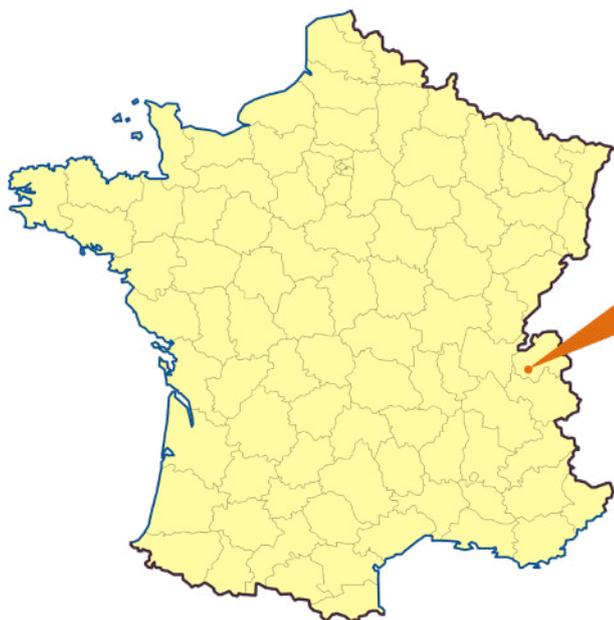
- Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS)
- Electromagnetic Compatibility Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004.

The product has been manufactured in accordance with the requirements of European directive:

- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Signed in Chavanod on 28/07/2015

Stéphane Sorlin, Chairman



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Original Instructions



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