Ryme worldwide

User manual

RYME_CalConf – Version 2

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Index

1 Introduction

This document describes the procedures to be carried out for the correct calibration of brake testers for light and heavy vehicles and motorcycles, and for the calibration of pressure sensors.

The existing settings for each machine are also described, as well as the settings of the pressure sensors.

Depending on the type of communication between the software and the machine (serial or TCP/IP), applicable settings may vary. This document is made assuming a TCP/IP configuration, since it is the most complete, it covers all the possibilities of serial communication and also adds possibilities that can only be done through TCP/IP communication.

To change the type of communication, please refer to the **RYME_MultiNet** application user's manual.

2 Access to the application

To launch the application, run the file **RYME_CalConf.exe**. Once this file has been executed, a window will appear where you will be asked to enter the password. Because an incorrect setting or calibration can render the machines unusable, it is necessary to have a password to use this application.

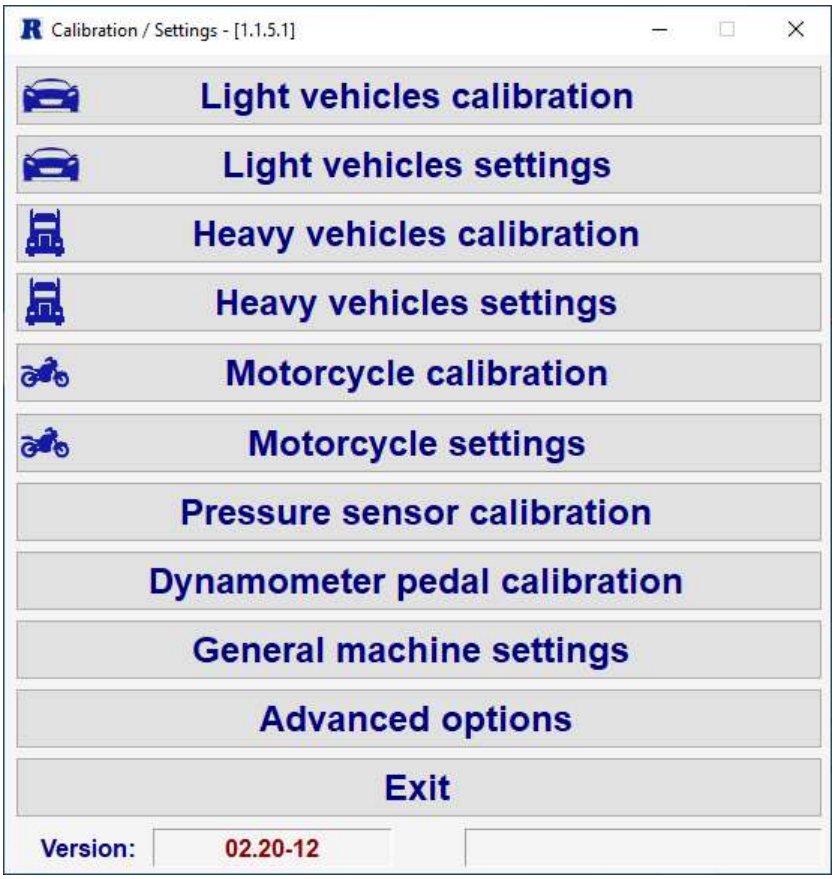
1 Password request window

The default password is GJ94 (not case sensitive). The passwords and their levels can be added or modified from the RYME_MultiNet application.

If an incorrect password is entered, a message will pop up indicating this and the application will close.

2 Incorrect application login

If you enter a password with the necessary privileges to access the application, the main menu will be displayed, from which you will be able to access all the functions of the program.



3 Main menu

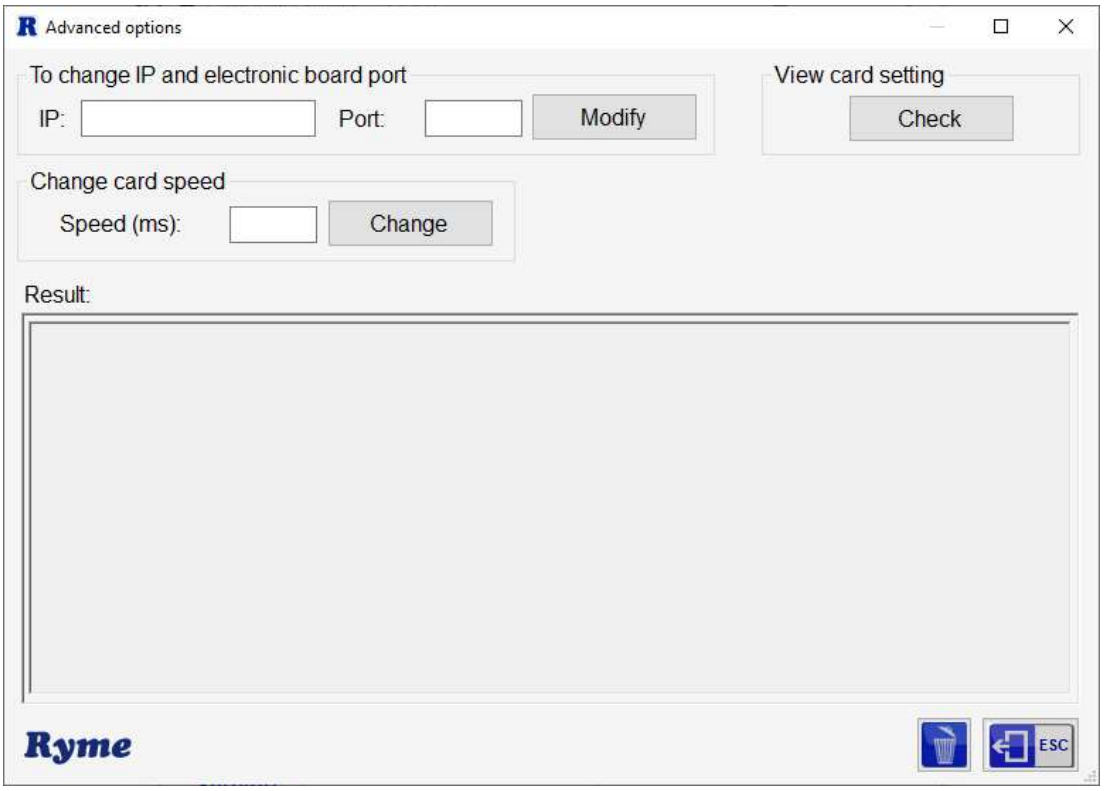
In the main menu, information about the electronic board is displayed: in the lower left part, its version is indicated, and in the lower right part, the serial number. If this information is not displayed when the application is run, it means that there is no connection between the software and the machine.

Both to calibrate and to configure (in all the options except in the General machine settings), it is necessary that there is a communication between the software and the electronic board. In case you do not see the version or serial number information, please contact RYME technical support.

3 Advanced options

The advanced options will only be available if the connection between the software and the machinery is made through the **TCP/IP communication type**.

This option allows you to check the settings and make some changes to the software on the electronic board.



4 Advanced options

3.1 Modify IP and card port

In a TCP/IP connection there are two fundamental elements, a server computer (the one that sends information at the request of a client), and the client's computer (the one that requests and receives information from a server). These communicate with each other by means of an IP address and a port number.

In this case the server computer is the electronic board, and the client's computer is the software installed on the PC. For the communication to be correct, both the electronic board and the PC software must have the same IP address and port number configured.

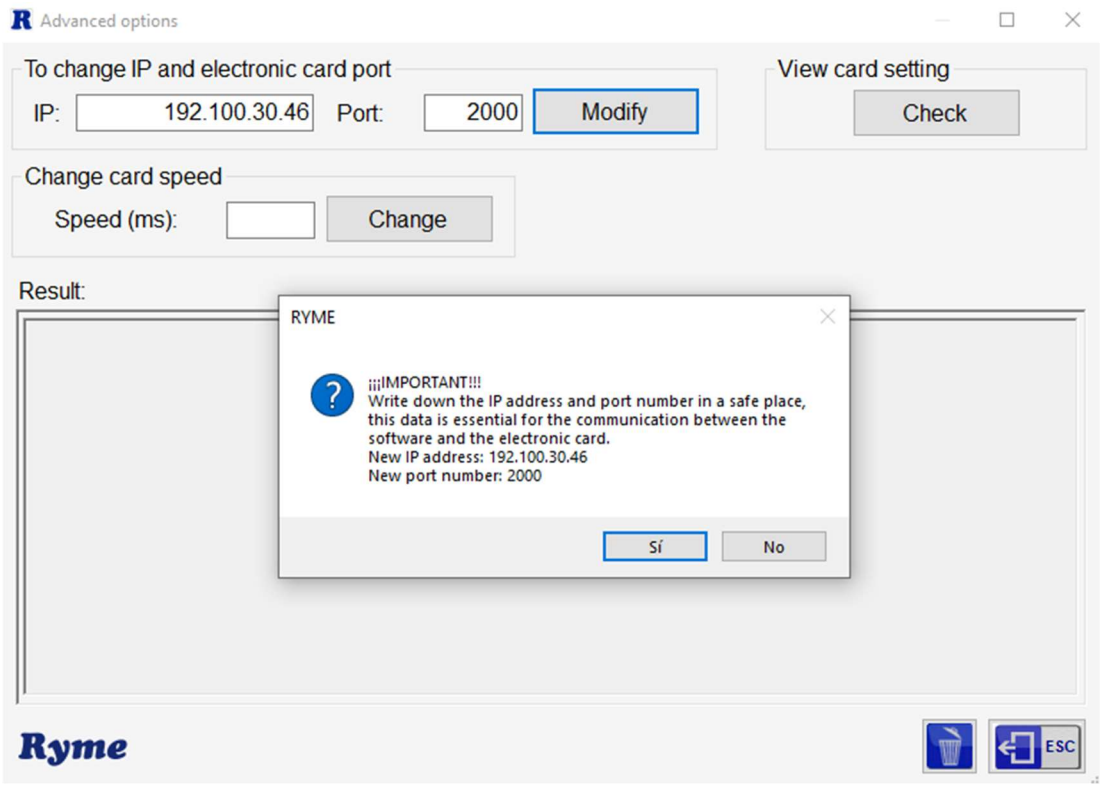
To change the IP address and port number through which the software tries to communicate with the electronic board, please refer to the **RYME_MultiNet** application documentation.

Initially, the board is configured at the factory with the following values:

IP address: **192.100.30.44**

Port: **2000**

In case it is necessary to change these values, write the new address and port number in the corresponding text boxes, and press the **Modify** button (it is mandatory to write both the IP address and the port number).



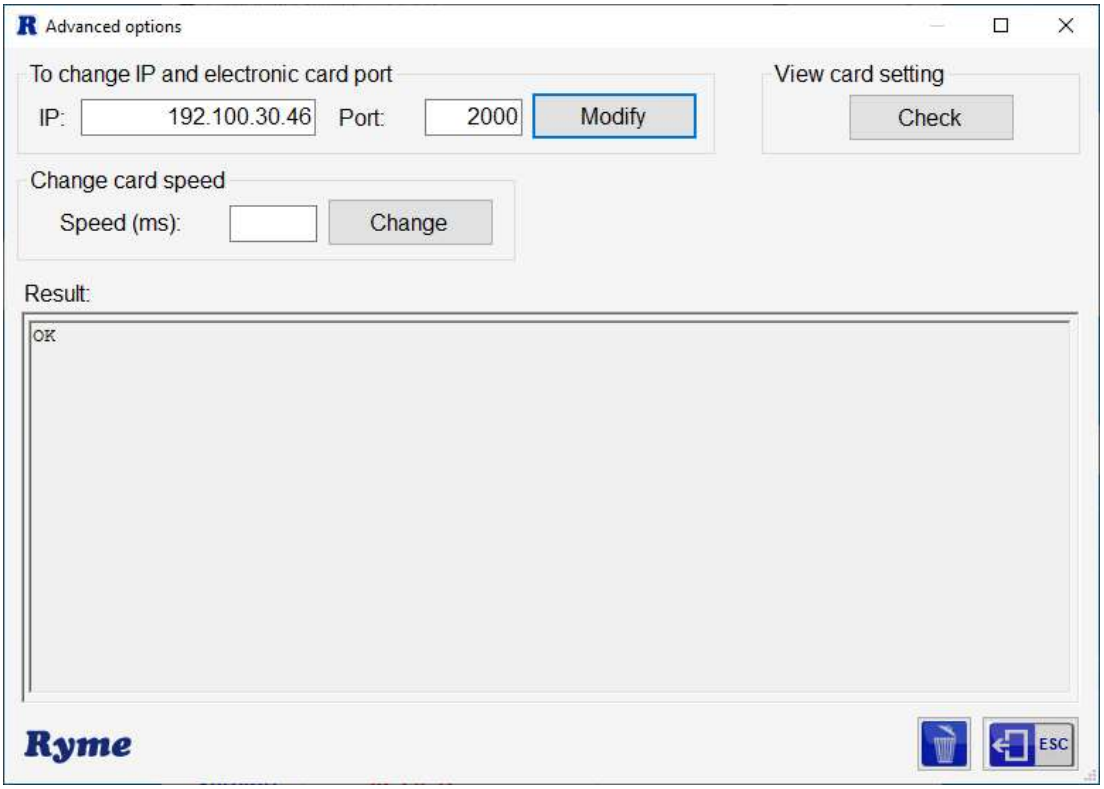
5 Change of IP address and board port number

By changing the IP address and port number, the connection between the PC software and the board software will be lost. To reconnect them, run the **RYME_MultiNet** application and set the new Setting in the **Communications Setting** section of this application.

Because of this, a window will be displayed advising the user to remember what new values he or she has set when clicking on the **Modify** button.

If the change could be done correctly, the board will send an OK, which will be shown in the **Result** window.

In figure 6 you can see how the board has returned an OK, indicating that the change has been made successfully.

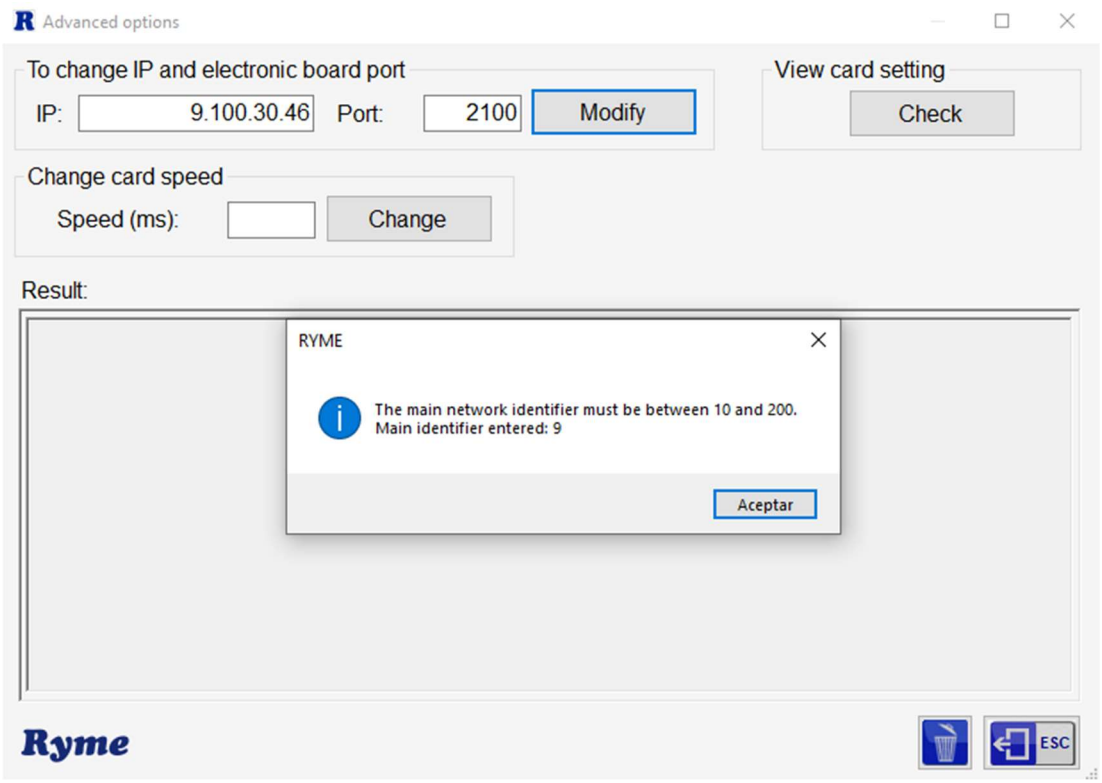


6 Confirmation of IP address and port number change

Valid values for the IP address comprise the range:

10..200.0..255.0..255.0..255

If you enter a wrong value, a window will be displayed notifying this, and no change will be made.

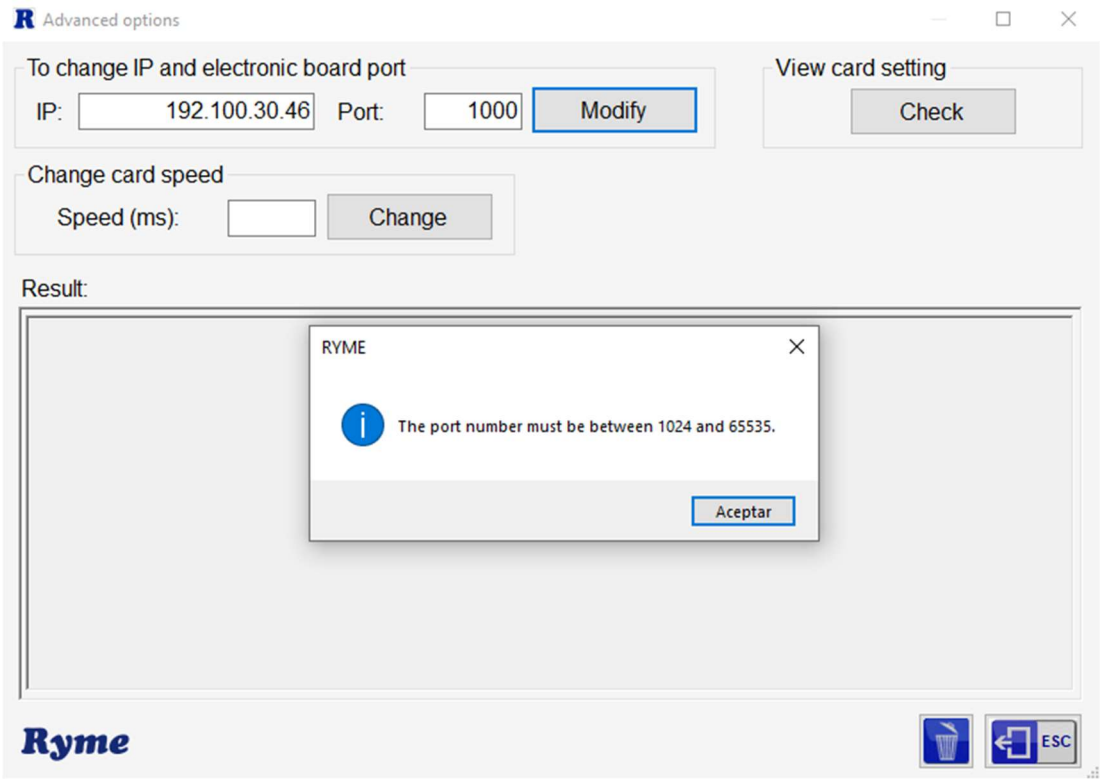


7 Incorrect attempt to modify IP address

Valid values for the port number comprise the range:

1024..65535

If you enter a wrong value, a window will be displayed notifying this, and no change will be made.



8 Incorrect attempt to modify IP address

3.2 See Board Setting

With this option you can command the electronic board to show you the settings it has stored. This information appears in the **Result** window, and it will serve you to check what IP address and port number it has stored. The rest of the values shown are not described in this manual, since they are indicators used by **RYME's** qualified technical staff.

Of all the values shown, note:

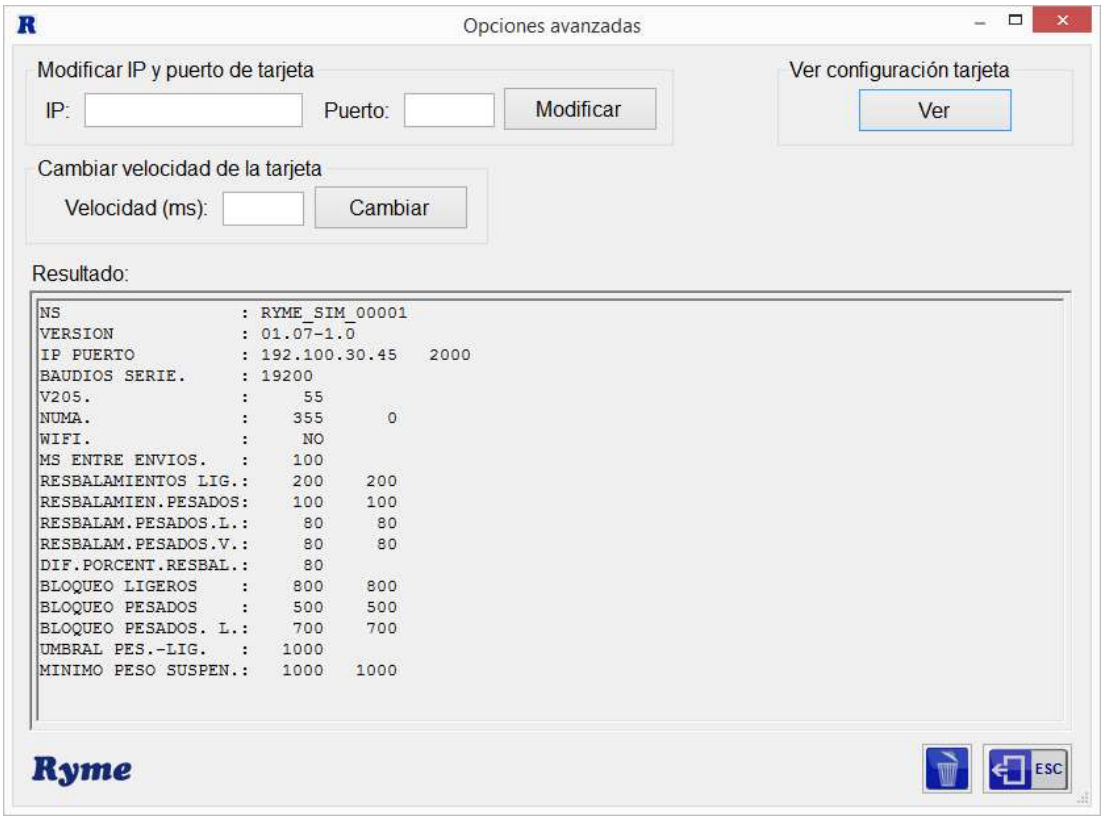
SN: Serial number of the electronic card.

VERSION: Version of the software stored on the electronic card.

PORT IP: IP address and port number configured on the board.

MS BETWEEN TRANSMISSIONS: Waiting time in milliseconds between transmissions, during which the board sends data continuously.

If you want to clean the **Result** window, click on the button with the image of a trash bin.



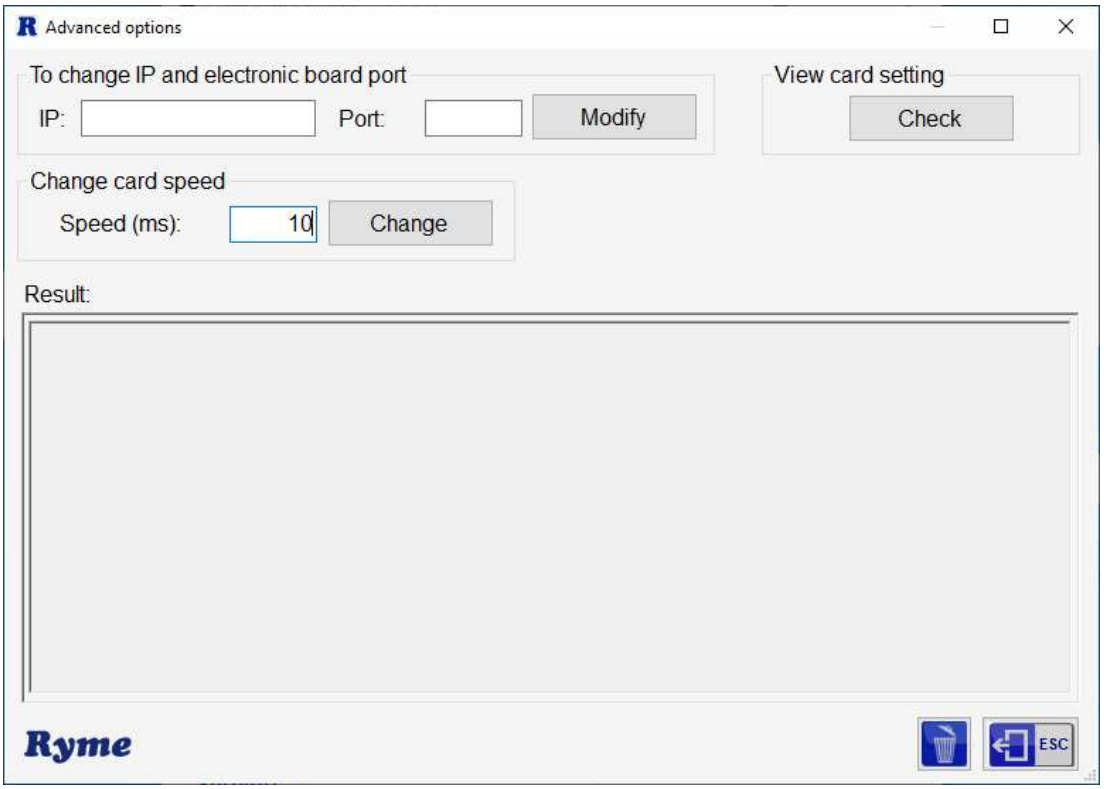
9 Information provided by the electronic board

3.3 Changing board speed

When the PC software requests data from the electronic board, the latter sends them as a frame every N milliseconds.

The range of values must be between 10 and 250 milliseconds. If a value lower than 10 is entered, the electronic board will not make any changes, and if a value higher than 250 is entered, the board will be set to the maximum value (250 ms.).

If the board has successfully changed the speed between sends, it will display an **OK** in the **Result** window.



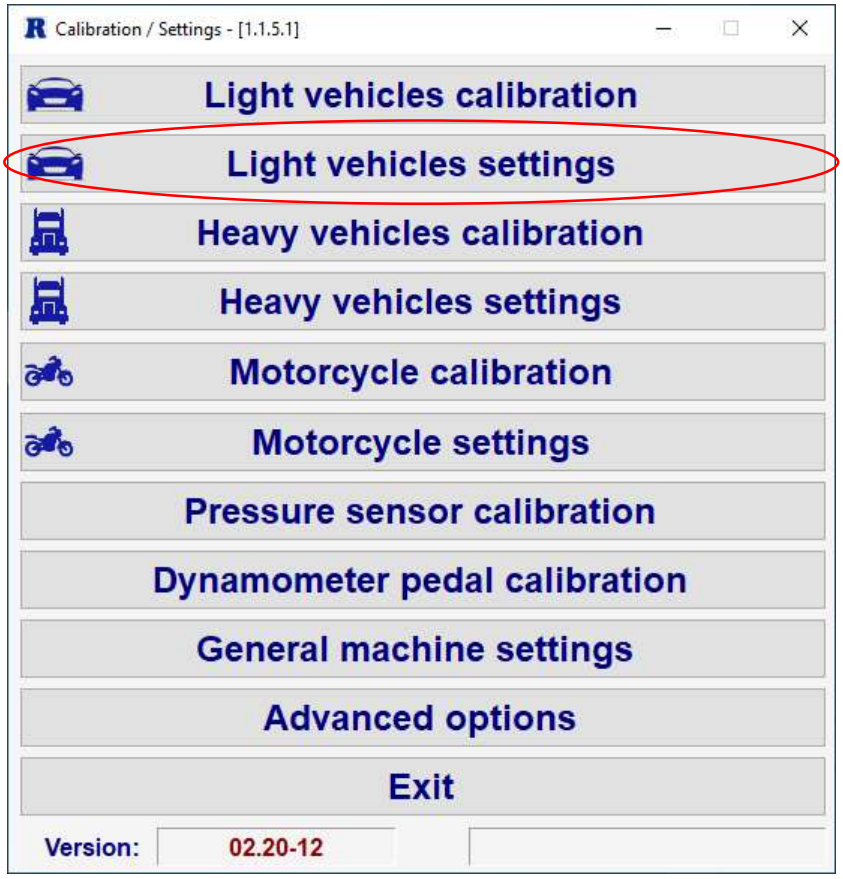
10 Board transmission speed changed to 10 milliseconds

4 Light Vehicles Settings

In order to configure the line, open the application RYME_CalConf_PCE.exe:

11 RYME_CalConf_PCE.exe application

The settings window will open. You can select here the operation you want to perform. To configure the parameters, click with the mouse on the icon Light vehicle settings, located at the top of the menu:



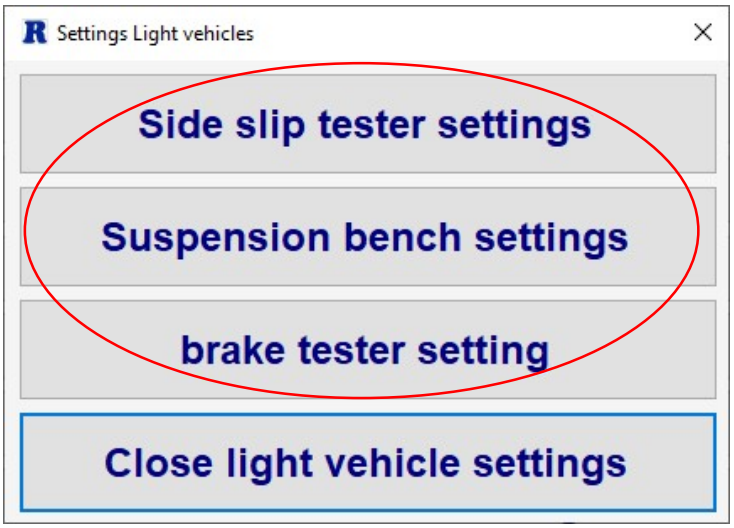
12 PCE Calibration/Settings Menu

You can establish the Setting options for the following measuring devices:

- Side slip tester

- Suspension bench
- Brake tester

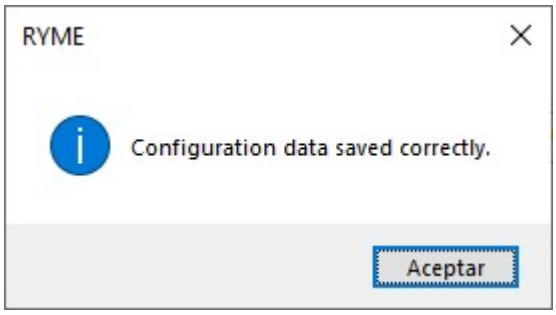
When you click on this option, a new menu will appear for you to select the device you want to configure.



13 Settings menu: light vehicles

In all the windows, once the necessary changes have been made, you must click with the mouse on the 

icon or the 'F3' key, so that the changes are saved (otherwise they will be lost).



14 Settings saving confirmation

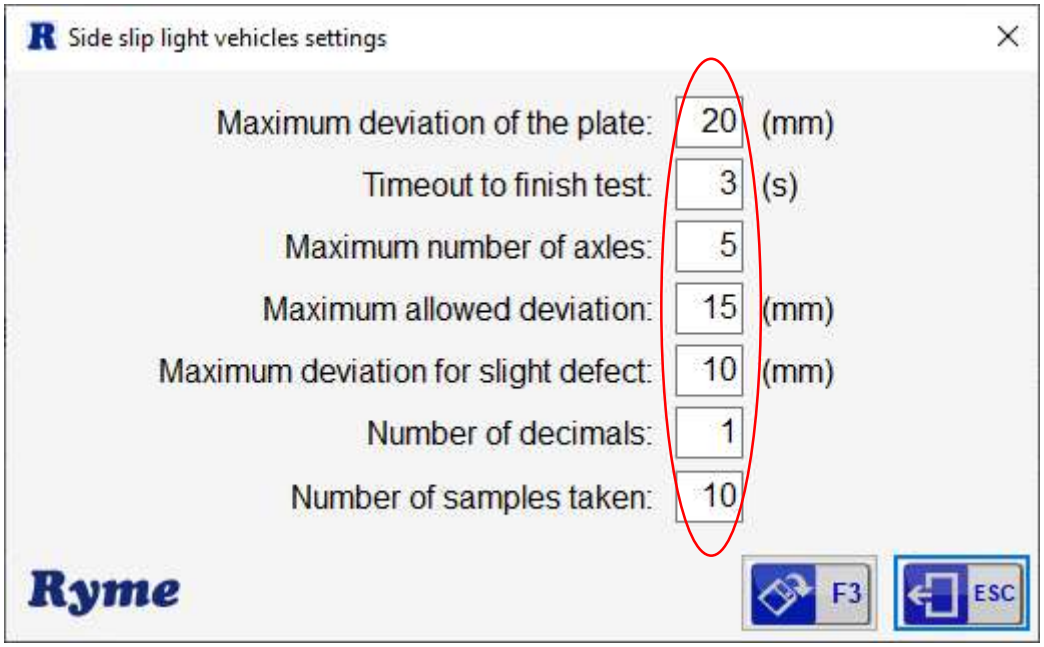
By pressing the 'Esc' key on the keyboard or the corresponding button on the remote control you will exit this window without saving any of the changes made.

4.1 Light Vehicles Side Slip Tester Settings

Settings of the different variables that can be used in the measurement with the side slip tester. Click with the mouse on the **Side slip tester settings** icon to access its menu.

15 Settings Menu: Side Slip Tester

Click on the different boxes to configure the different parameters:

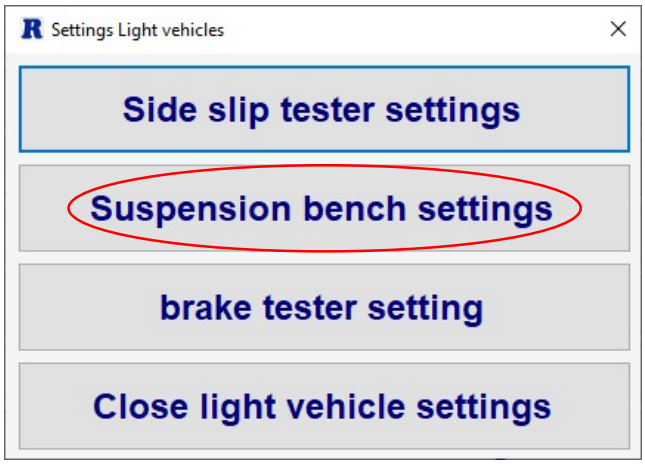


16 Light Vehicles Side Slip Tester Settings

- **Maximum deviation of the plate (millimeters)**: Maximum deviation that the slip tester plate can reach to the left and right.
- **Timeout to finish test (seconds)**: Time the alignment is being measured until the value of the maximum deviation is taken.
- **Maximum number of axles**: Number of axles on which the alignment test will be performed.
- **Maximum allowed deviation (millimeters)**: Value from which the alignment is considered defective.
- **Maximum deviation for slight defect (millimeters)**: Value from which (and without reaching the maximum allowed deviation), the alignment value is considered to indicate slight defect.
- **Number of decimals**: Number of decimals shown (and stored), when taking the deviation value.
- **Number of samples taken**: Number of samples taken to filter the information obtained from the deviation.

4.2 Suspension Bench Setting

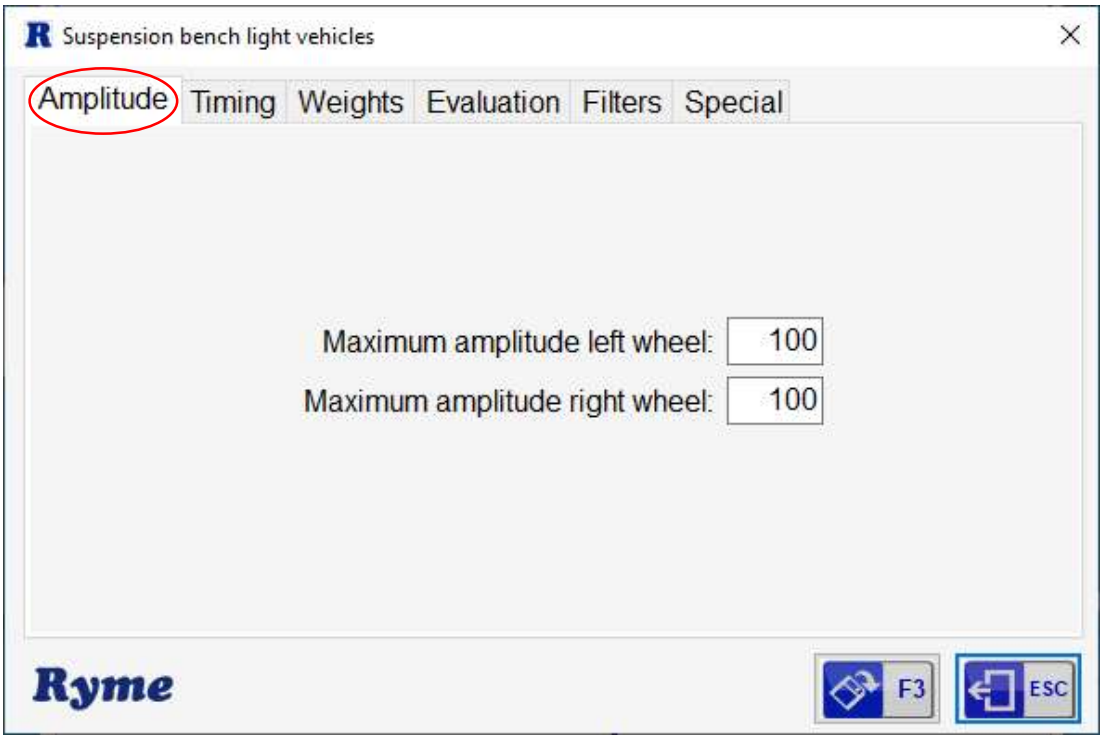
Settings of the different variables that can be used in the measurement with the suspension bench. Click with the mouse on the **Suspension bench settings** icon to access its menu.



17 Settings Menu: Suspension Bench

Click on the different tabs to configure the different parameters:

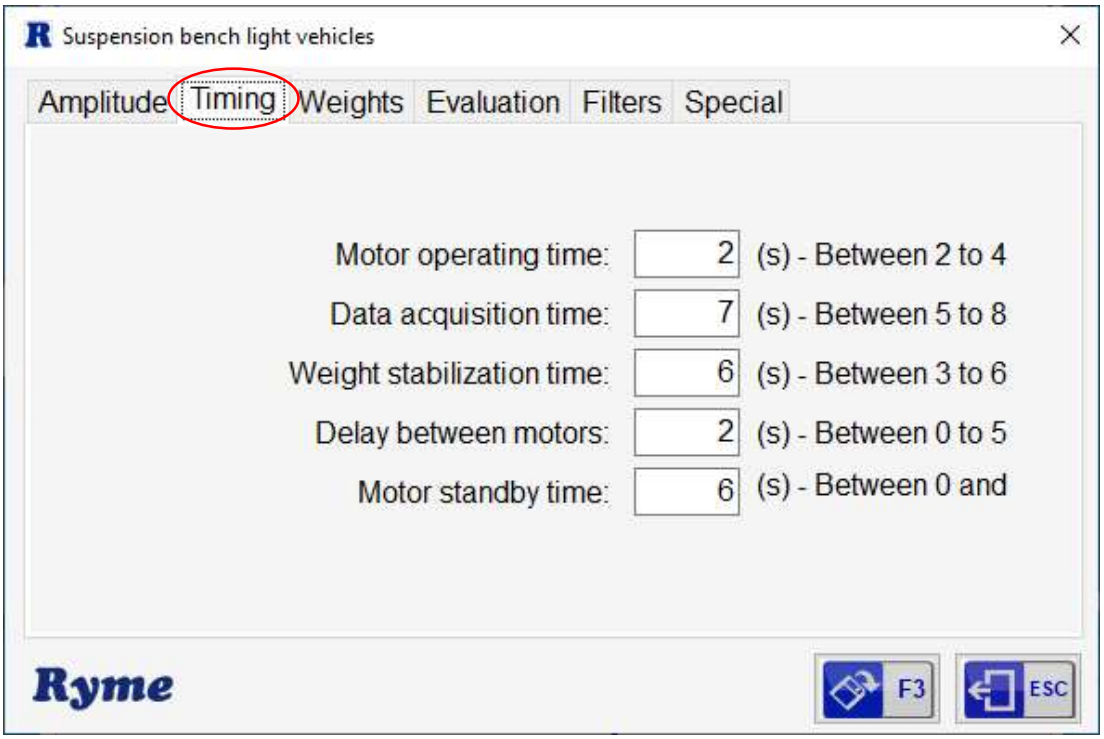
4.2.1 Amplitude



18 Suspension Bench Settings: Amplitude

- **Maximum amplitude (left wheel)**: Maximum amplitude value to be displayed on the measurement graph for the left wheel.
- **Maximum amplitude (right wheel)**: Maximum amplitude value to be displayed on the measurement graph for the right wheel.

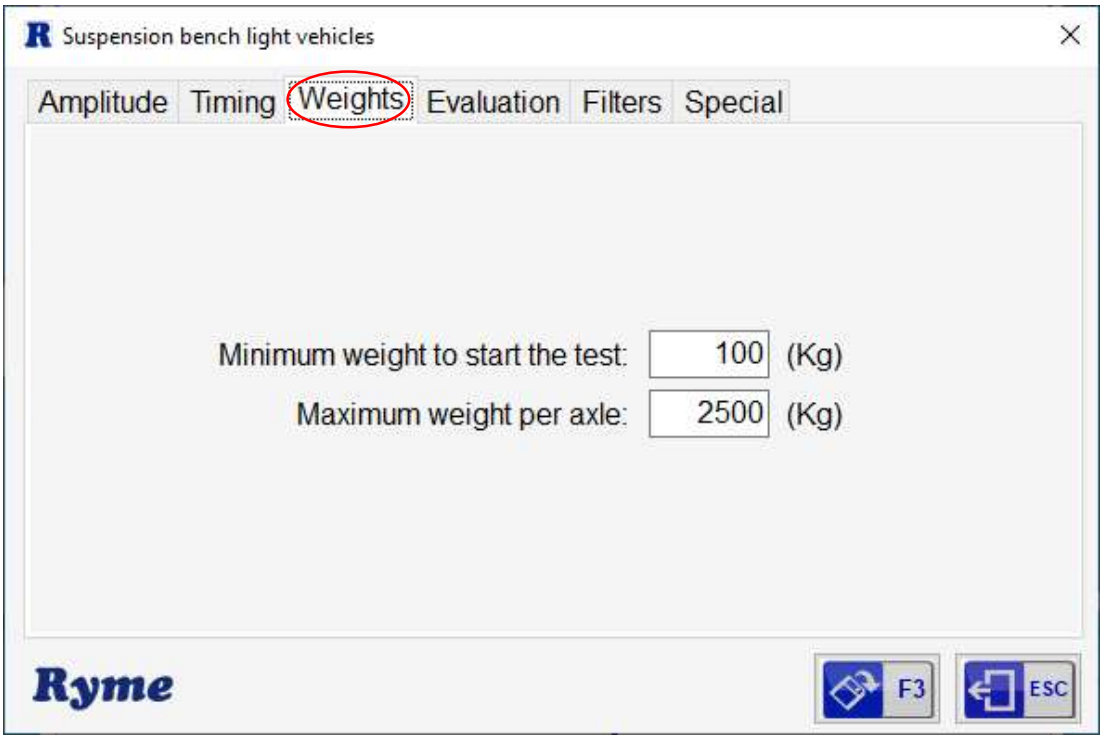
4.2.2 Timings



19 Suspension Bench Settings: Timings

- **Motor operating time (seconds):** Time that the motor remains running after taking the static weight of the vehicle. This time applies to both wheels. (Between 2 and 4 seconds).
- **Data acquisition time (seconds)**: Time the amplitude graph is being displayed. This time is applied to both wheels. (Between 6 and 10 seconds).
- **Weight stabilization time (seconds)**: Time to consider that the weight is stabilized and valid. (Between 3 and 6 seconds).
- **Delay between motors (seconds)**: Time of waiting between the measurement of the left wheel and the right wheel. (Between 0 and 5 seconds).
- **Motor standby time**: Time that elapses from the moment the vehicle is detected until the motors are started.

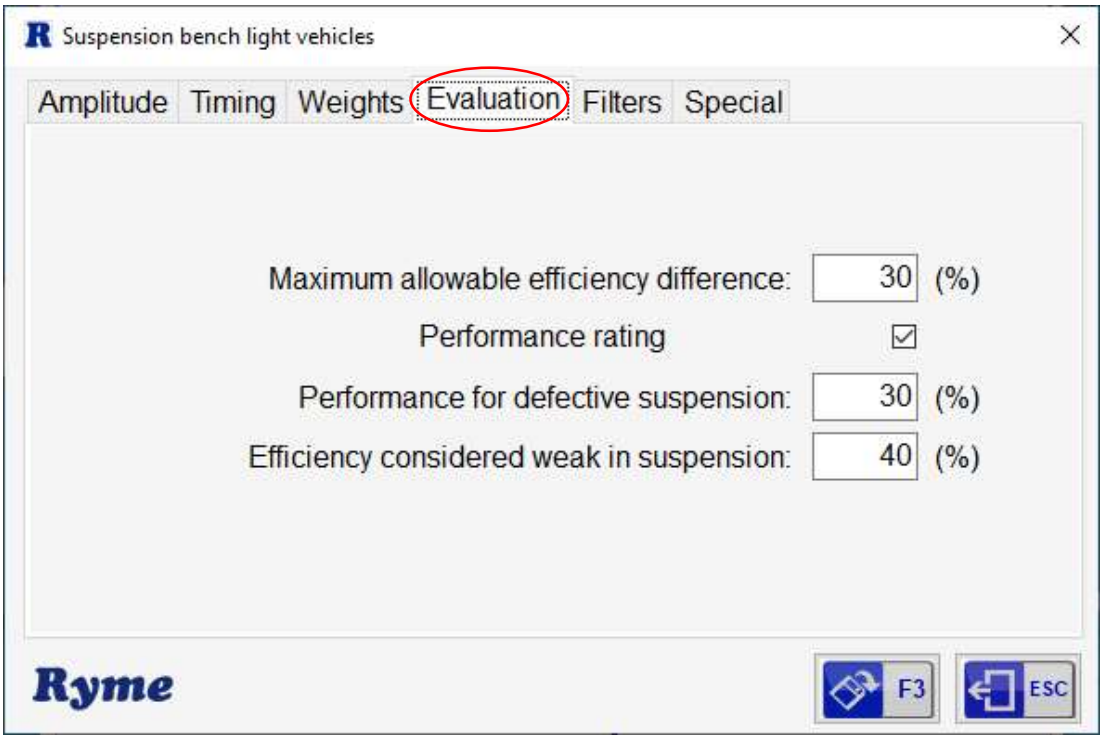
4.2.3 Weights



20 Suspension Bench Settings: Weights

- **Minimum weight to start the test (kg)**: Minimum weight from which the vehicle is detected on the suspension bench and the test starts.
- **Maximum weight per axle (kg)**: Maximum weight admitted. If a higher weight is detected, the test is aborted to avoid damaging the suspension bench.

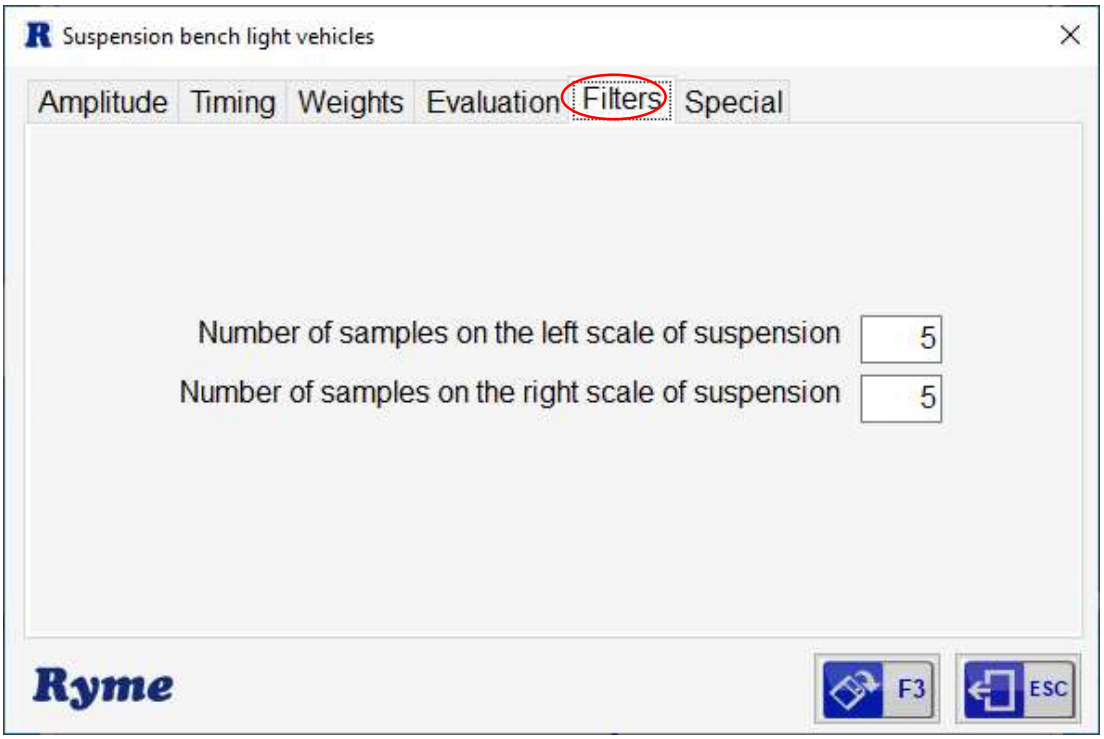
4.2.4 Evaluation



21 Suspension Bench Settings: Evaluation

- **Maximum allowable efficiency difference (percentage)**: A higher efficiency difference value between wheels than the one set here indicates that the efficiency is defective.
- **Performance rating**: If this box is checked, applications will rate the on-screen performance when testing, indicating whether it is correct, weak or defective.
- **Performance for defective suspension (percentage)**: Value from which the calculated performance value is considered to indicate a defective suspension.
- **Efficiency considered weak in suspension (percentage)**: Value from which the calculated efficiency value is considered to indicate a weak suspension.

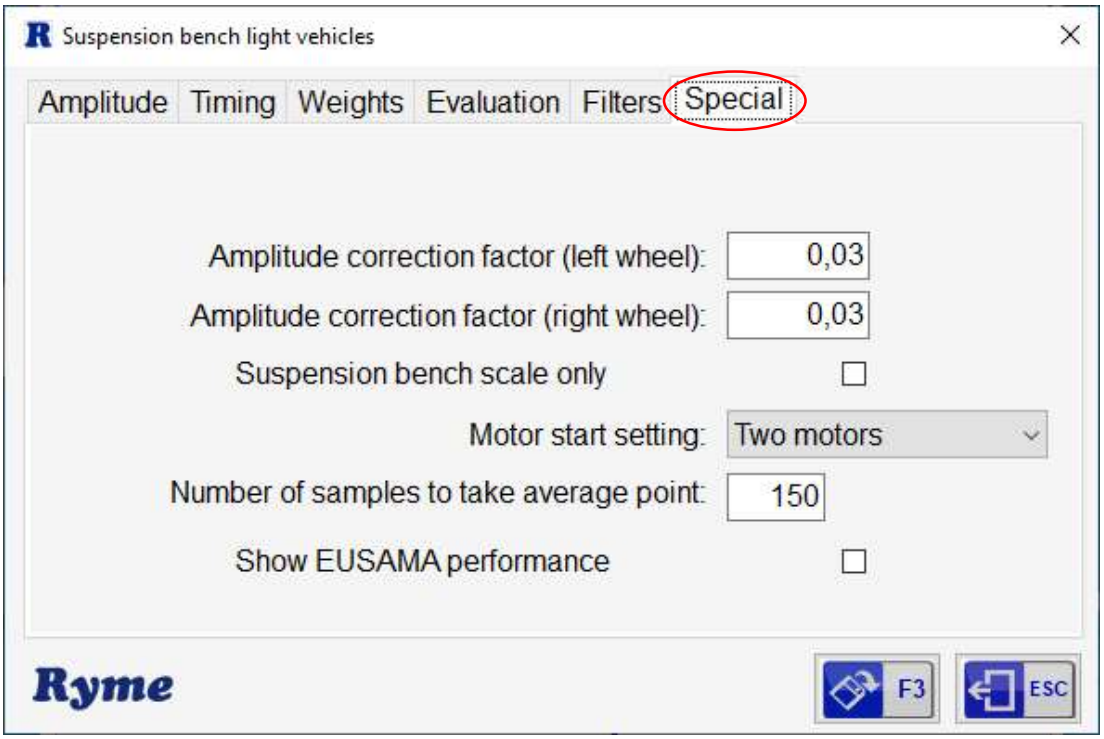
4.2.5 Filters



22 Suspension Bench Settings: Filters

- **Number of samples on the left scale of suspension bench**: Number of samples taken to filter the information obtained from the weight.
- **Number of samples on the right scale of suspension bench**: Number of samples taken to filter the information obtained from the weight.

4.2.6 Special



23 Suspension Bench Settings: Special

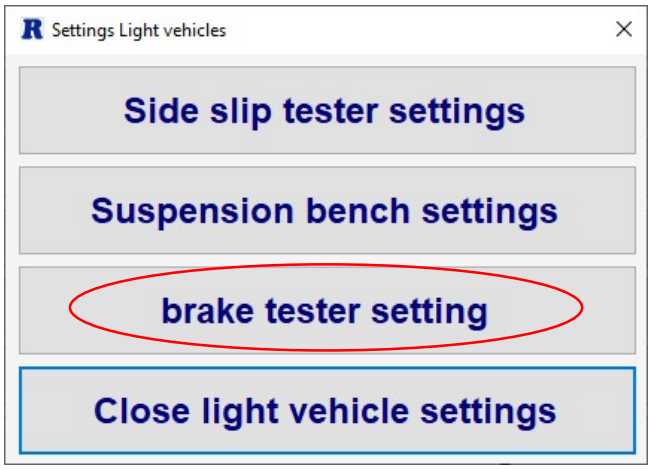
- **Amplitude correction factor (left wheel)**: This value allows you to correct the amplitude value calculated for the left wheel by applying a correction factor to it.
- **Amplitude correction factor (right wheel)**: This value allows you to correct the amplitude value calculated for the right wheel by applying a correction factor to it.
- **Suspension bench scale only**: If this option is checked, the amplitude/performance measurement is not performed and the vehicle will only be weighed, ending the measurement once the weight has been collected.
- **Motor start setting**: It is possible to indicate to the electronic board which motors must be started, depending on if it is a Suspension Bench or a Monobloc. The difference will be:
  - **Monobloc**: it has installed only one motor.
  - **Suspension bench**: it has two motors installed.
- **Number of samples to take average point**: Before starting the motor, the system will make sure for a perfect measurement to take the samples in the same point where the suspension system starts working.

- **Show EUSAMA performance**: By selecting this option, calculations will be made considering this measurement system.

4.3 Light Vehicles Brake Tester Settings

Settings of the different variables that can be used in the measurement with the brake tester. Click with the mouse on the 

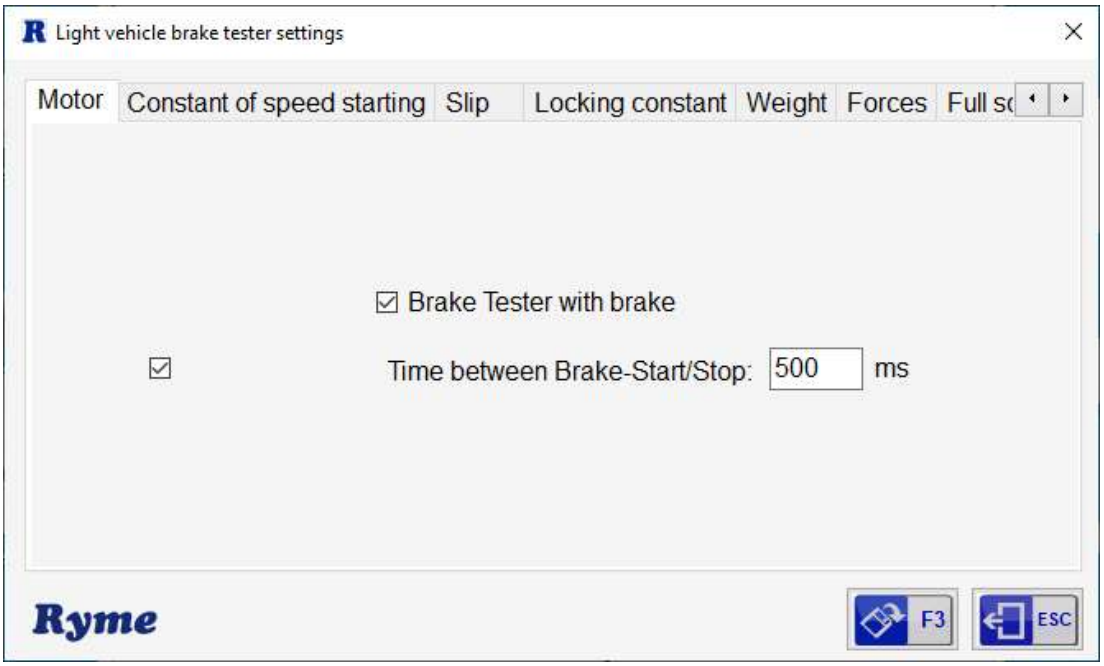
icon to access its menu.



24 Settings Menu: Light Vehicles Brake Tester

Click on the different tabs to configure the different parameters. To see the Settings that are not displayed at first sight, Click on the  icon. This way you will be able to move to the left and to the right to see the different settings and modify the parameters of the machine:

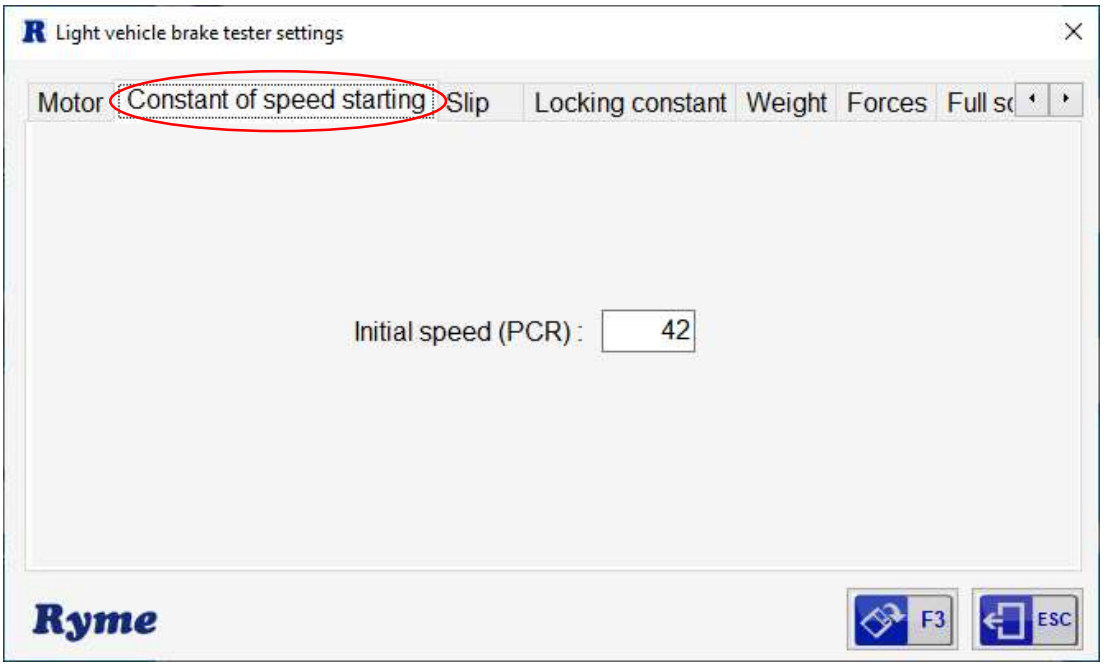
4.3.1 Motor



25 Light Vehicles Brake Tester Settings: Motor

- **Brake Tester with Brake**: Select this box if the brake tester has this option in the technical data sheet.
- **Time between Brake-Start/Stop**: Select this box in case the brake tester has soft starters and has a separate system installed for the motor start and brake command.

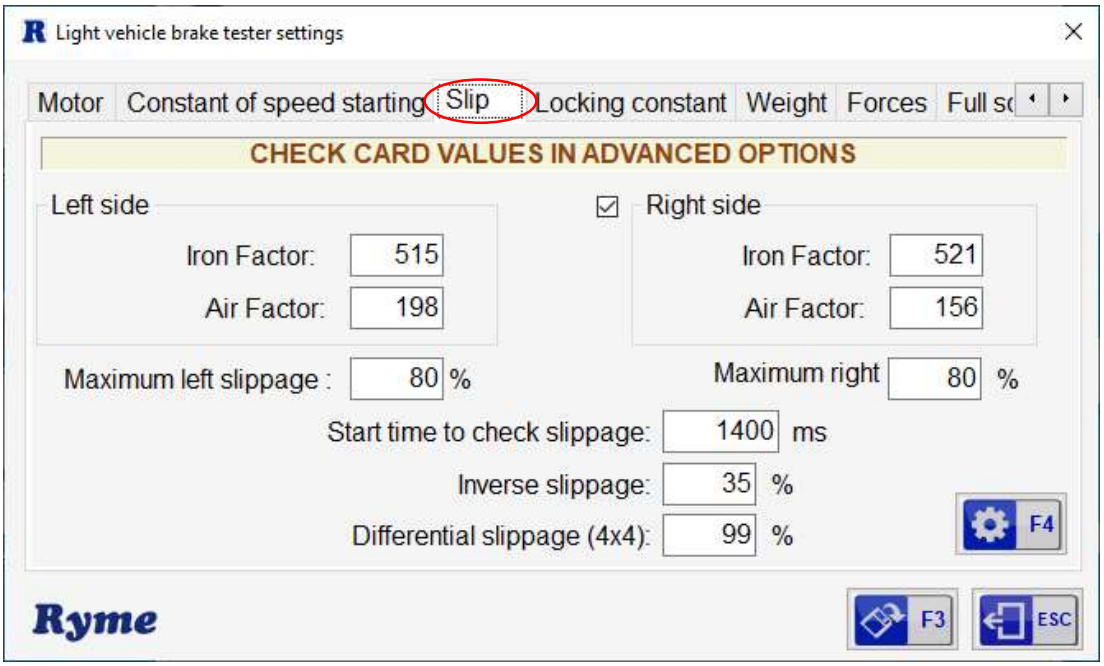
4.3.2 Initial speed constant



26 Light Vehicles Brake Tester Settings: Initial speed constant

- **Initial speed (PCR)**: numerical value used for calculating slippage when using PCR-type electronic boards.

4.3.3 Slippage

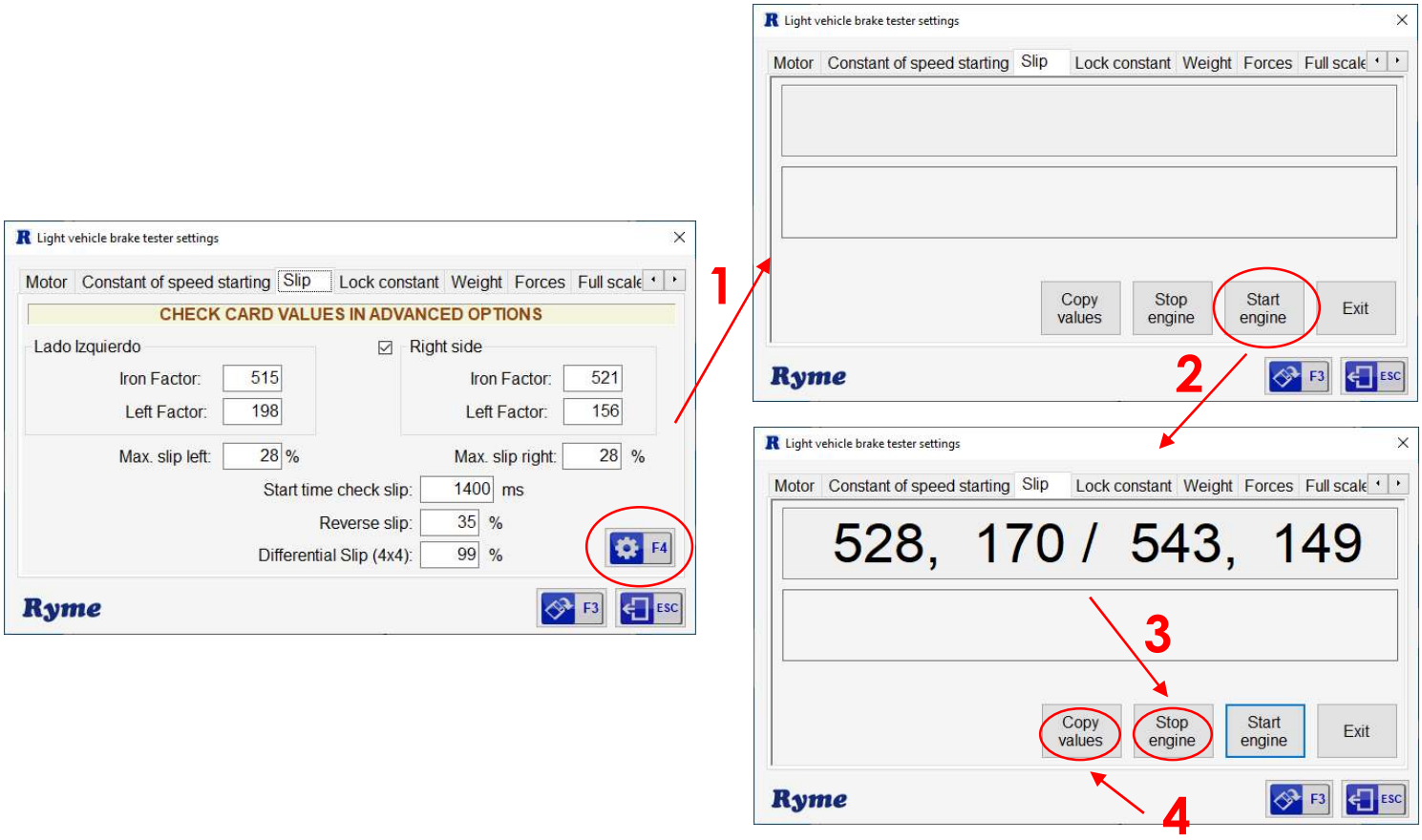


27 Light Vehicles Brake Tester Settings: Slippage

- **Left side:**
  - **Iron Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
  - **Air Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
- **Right side:**
  - **Iron Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
  - **Air Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
- **Maximum left slippage (percentage)**: Maximum percentage to be calculated which is admitted by the left side of the brake tester.
- **Maximum right slippage (percentage)**: Maximum percentage to be calculated which is admitted by the right side of the brake tester.
- **Start time to check slippage**: due to the time it takes for the slippage bar to match the nominal speed of the motor, during this time the electronic board will ignore the values obtained in the reading. Once this time is over, normal measurement will start.

- **Inverse slippage**: Maximum slippage value measured when each wheel is turned in one direction, if the difference is greater than the set value, the brake tester will stop for safety.
- **Differential slippage (4x4) (percentage)**: Maximum percentage difference of slippage between the left and right wheel to avoid possible breakage of the vehicle's differential box.
- **Setting the slippage values automatically:**

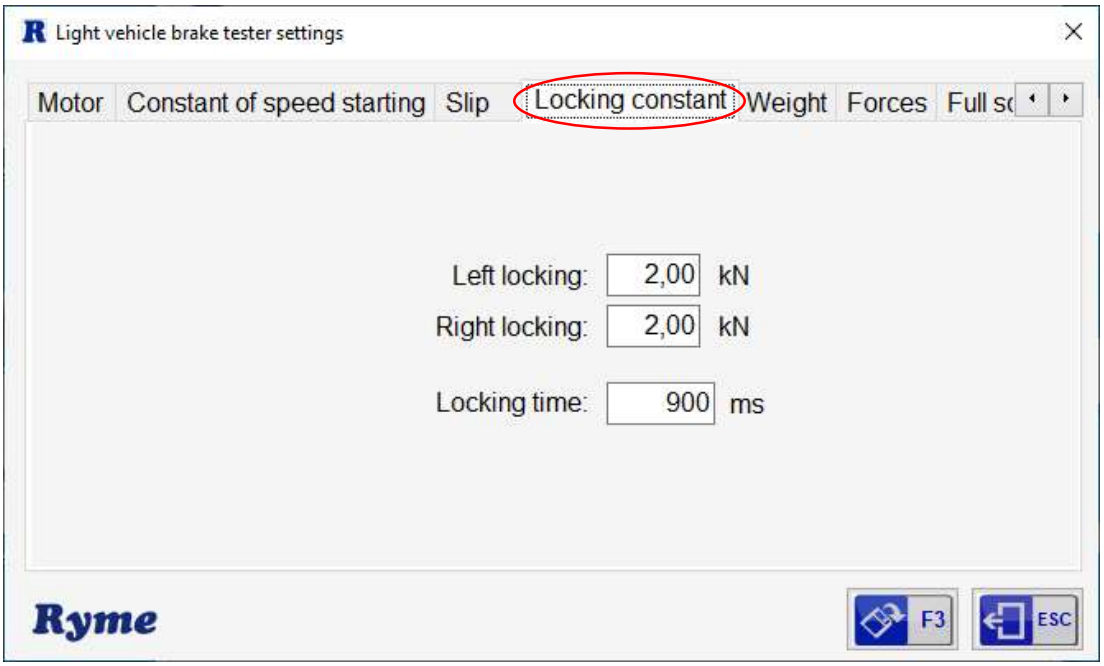
By pressing 'F4' on the keyboard or by clicking with the mouse on the icon marked below, a screen will appear for the live reading of the values that you must enter for the slippage settings. It is important to enter a vehicle in the brake tester and not to touch the brake pedal during the reading to carry out this operation:



Process:

- With a vehicle inserted in the brake tester, press the **'Start Motor'** button and allow a few seconds for the values to stabilize.
- Once the values have stabilized, press **'Stop Motor'** and then press **'Copy Values'** to transfer them directly to the settings.

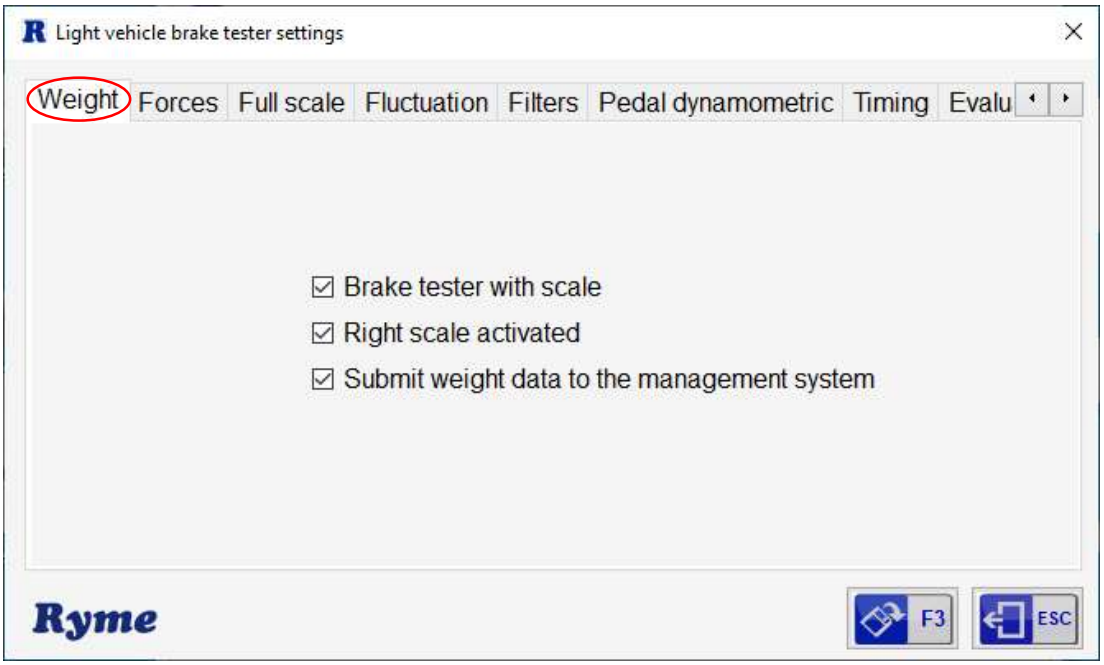
4.3.4 Locking Constant



28 Light Vehicles Brake Tester Settings: Locking Constant

- **Left locking (kN)**: Maximum numerical value in kN, to lock the left wheel if a value higher than this is detected when the left motor starts.
- **Right locking (kN)**: Maximum numerical value in kN, to lock the right wheel if a value higher than this is detected when the right motor starts.
- **Locking time (ms)**: Safety time during which the system will check if the initial value exceeds the one you set previously to avoid an erroneous manipulation of the vehicle/braking system.

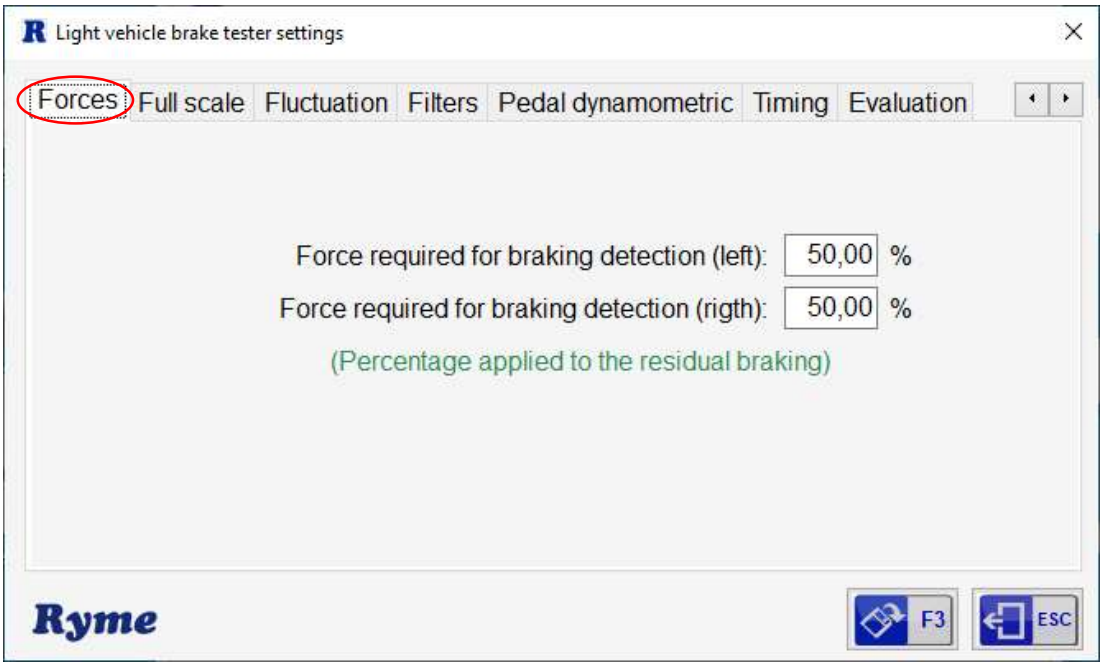
4.3.5 Weight



29 Light Vehicles Brake Tester Settings: Weight

- **Brake tester with scale**: Select this box in case the equipment has this option.
- **Right scale activated**: In case the brake tester has the scales option and is also FRQ type, the scales will be separated (left/right), so you will have to check this box for the correct reading of the data.
- **Submit weight data to the management system**: In case you want to see the weight data on the screen, but you do not want it to be sent to the management system, un-check this box.

4.3.6 Forces

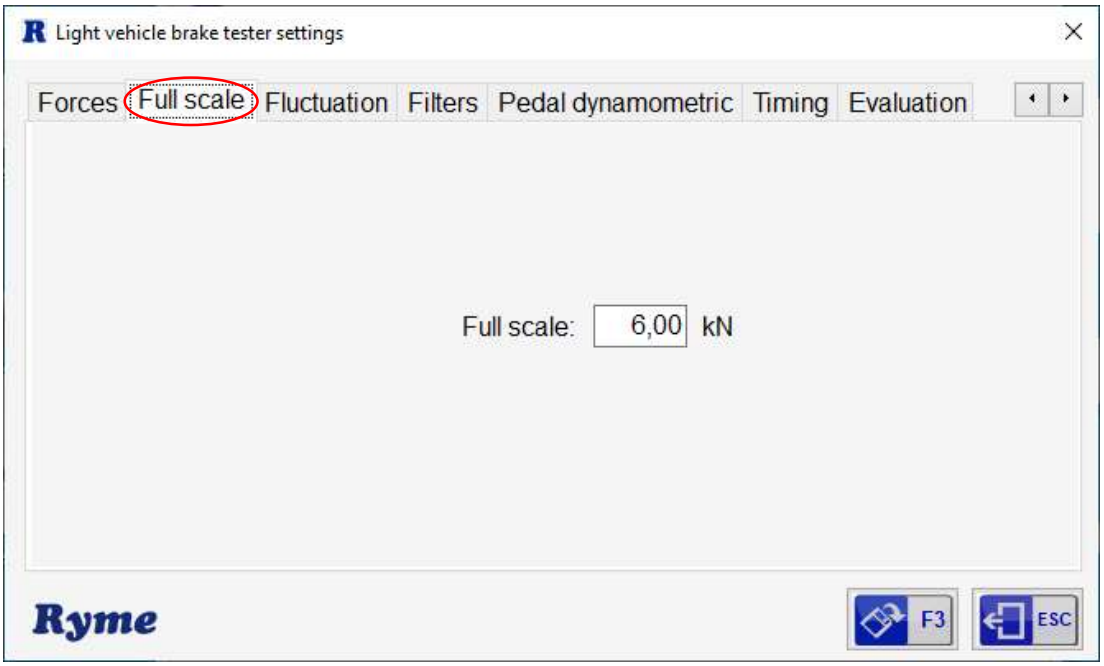


30 Light Vehicles Brake Tester Settings: Forces

- **Force required for braking detection (left) (percentage)**: Percentage value applied to residual braking, from which the system will consider braking and start collecting data on the left wheel.
- **Force required for braking detection (right) (percentage)**: Percentage value applied to residual braking, from which the system will consider braking and start collecting data on the right wheel.

(E.g.: 0.46kN+50%=0.69kN, from this value the system will consider it braked, saving the data for the maximum braking value).

4.3.7 Maximum scale range

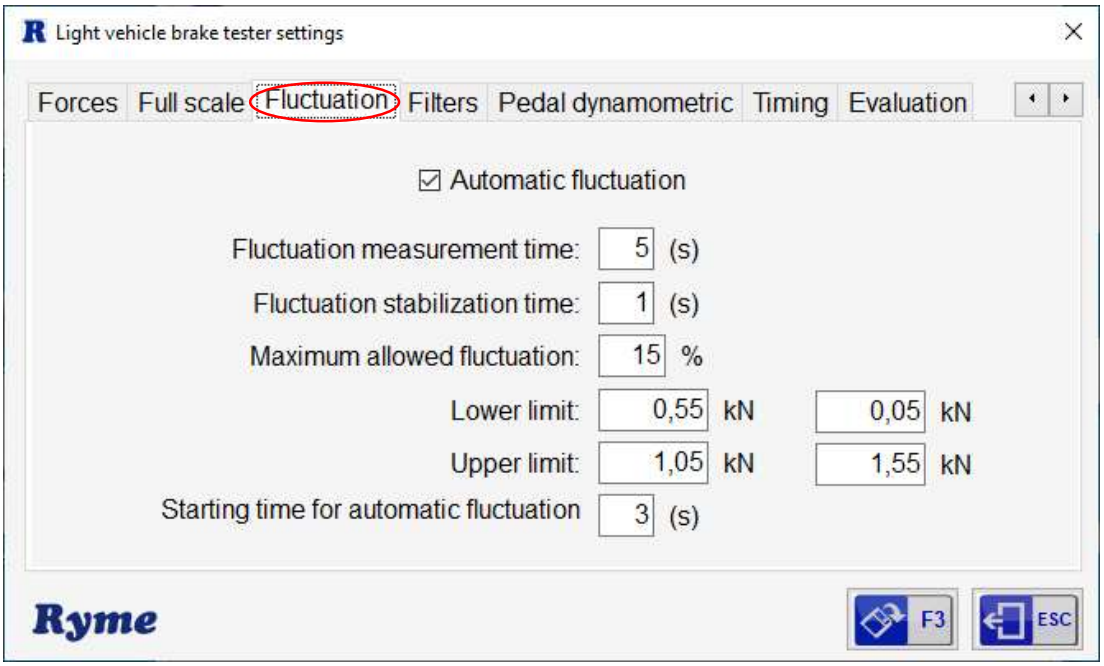


31 Light Vehicles Brake Tester Settings: Maximum scale range

- **Full scale (kN)**: Numerical value in kN of the maximum scale range that the brake tester's clocks will display during testing and calibration.

IMPORTANT: Set this value before calibrating, as the values on the electronic board will be adjusted accordingly.

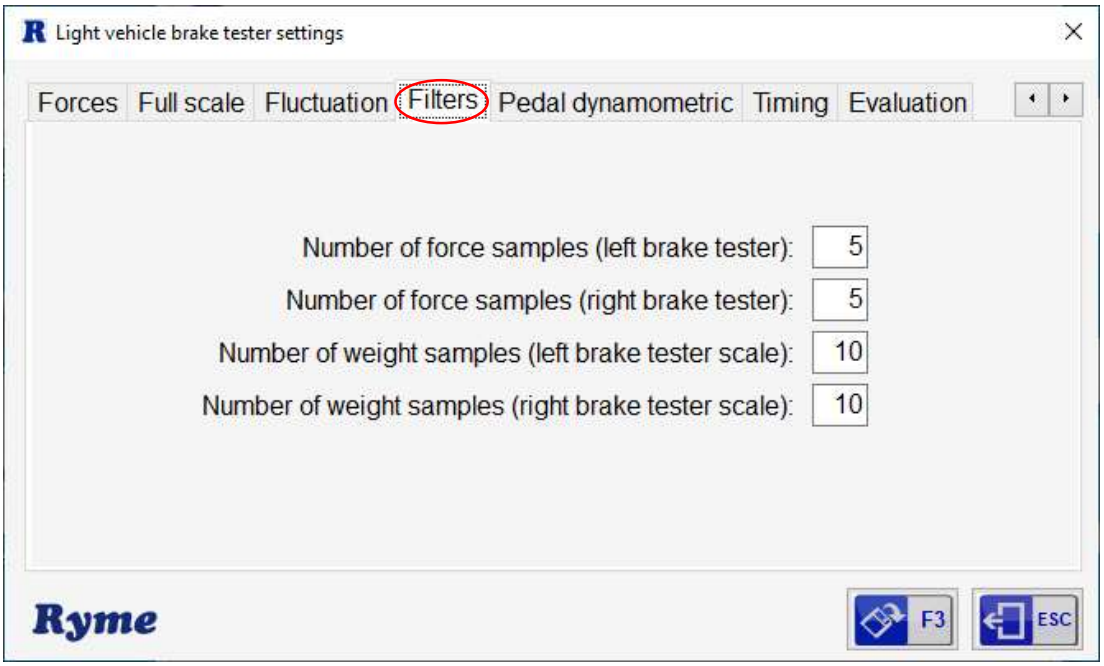
4.3.8 Fluctuation



32 Light Vehicles Brake Tester Settings: Fluctuation

- **Automatic fluctuation**: Select this option in case you want to perform the measurement of the fluctuation of the brakes always automatically. Otherwise, it will be activated manually for each axle measurement.
- **Fluctuation measurement time (seconds)**: Value in seconds to perform the fluctuation measurement.
- **Fluctuation stabilization time (seconds)**: time before starting with the fluctuation measurement, so that the technician can stabilize the force within the range of the gauge graph measuring fluctuation.
- **Maximum allowed fluctuation (percentage)**: maximum percentage value admitted, for the validation of the fluctuation test.
- **Lower limit (kN)**: kN value of the lower limit of the range for the fluctuation measurement.
- **Upper limit (kN)**: kN value of the upper limit of the range for fluctuation measurement.
- **Starting time for automatic fluctuation measurement (seconds):** waiting time after the measurement of the residual force value in the wheels that will take the gauge graphs measuring fluctuation to appear automatically.

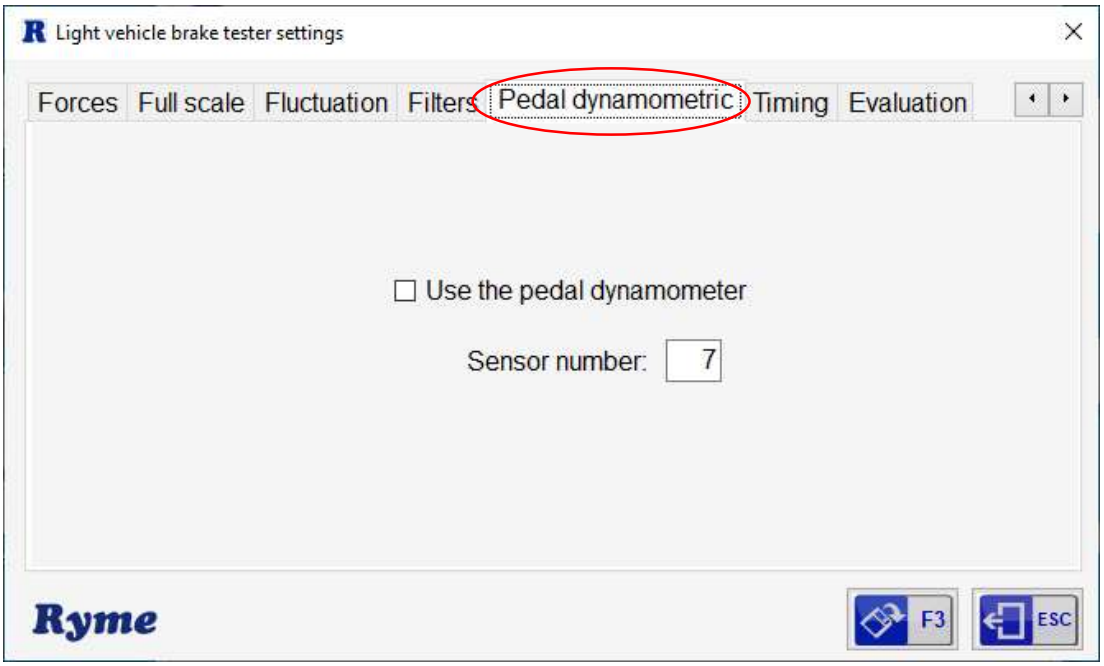
4.3.9 Filters



33 Light Vehicles Brake Tester Settings: Filters

- **Number of force samples (left brake tester)**: numerical value of the data to be taken for the smoothing of the data obtained from the left wheel force.
- **Number of force samples (right brake tester)**: numerical value of the data to be taken for the smoothing of the data obtained from the right wheel force.
- **Number of weight samples (left brake tester scale)**: numeric value of the data to be taken for the smoothing of the data obtained from the left wheel weight.
- **Number of weight samples (right brake tester scale)**: numeric value of the data to be taken for smoothing the data obtained from the right wheel weight.

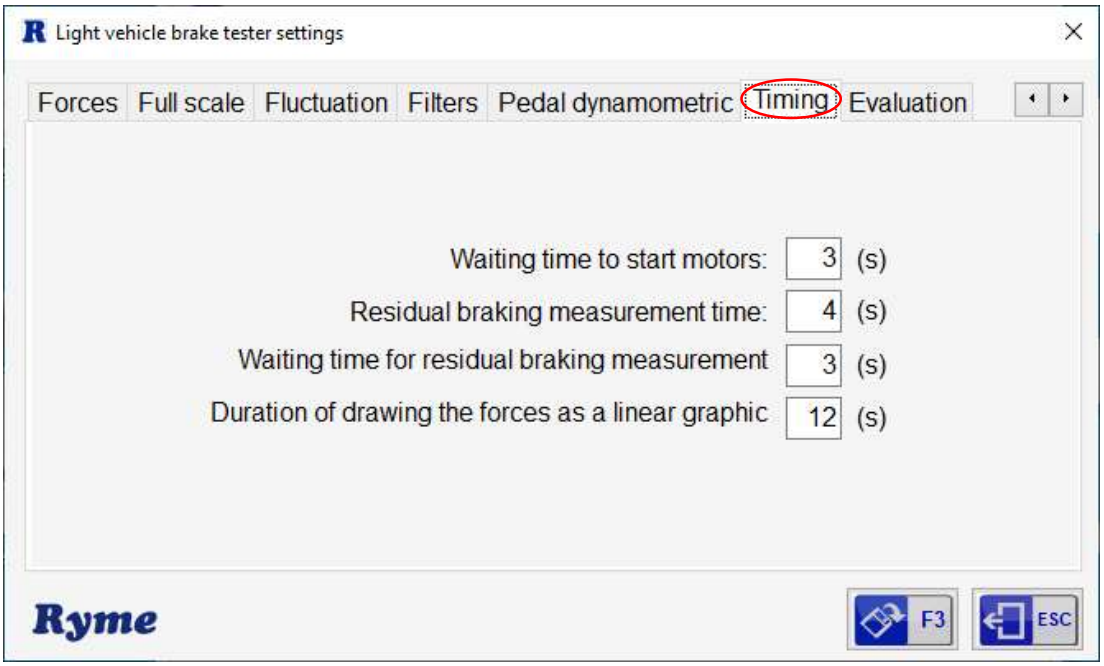
4.3.10 Pedal Dynamometer



34 Light Vehicles Brake Tester Settings: Pedal Dynamometer

- **Use the pedal dynamometer**: Select this box if the brake tester is accompanied by a pedal dynamometer to take the measurement during the test.
- **Sensor number**: address assigned in the physical settings of the sensor; it may vary depending on the number of sensors installed.

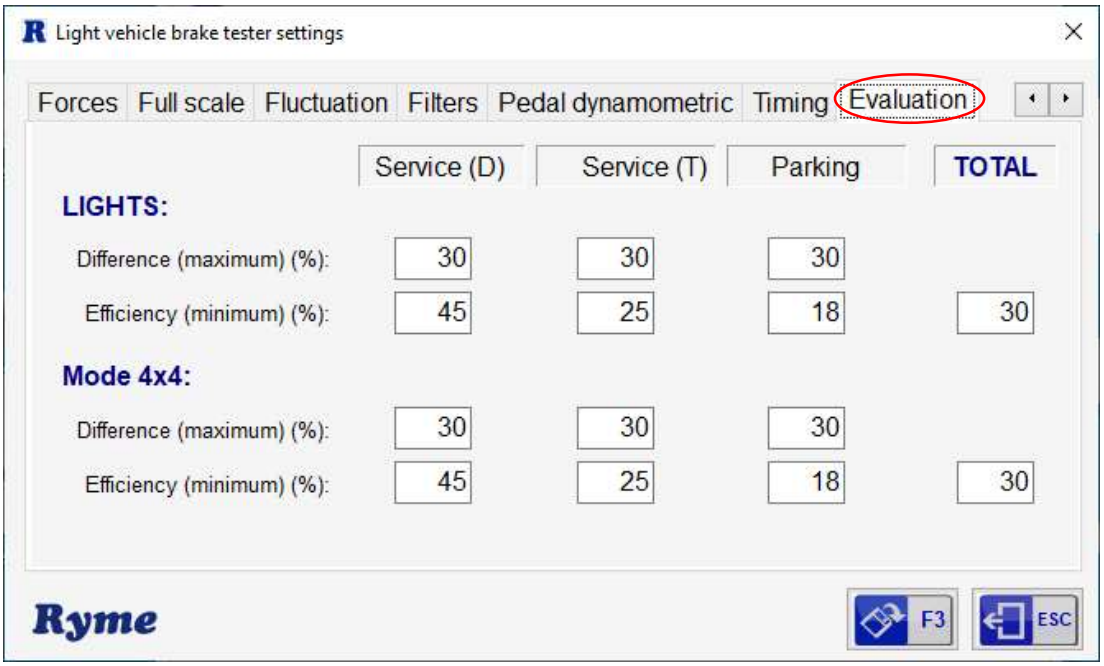
4.3.11 Timing



35 Light Vehicles Brake Tester Settings: Timing

- **Waiting time to start motors (seconds)**: value, in seconds, of the waiting time from the moment the vehicle is detected until the motors are started.
- **Residual braking measurement time (seconds)**: value, in seconds, of the time that the residual braking measurement will last.
- **Waiting time for residual braking measurement start (seconds)**: value, in seconds, of the waiting time for the residual braking measurement to start.
- **Duration of drawing the forces as a linear graphic model (seconds)**: value, in seconds, of the time for drawing the forces of the linear graphic model.

4.3.12 Evaluation



36 Light Vehicles Brake Tester Settings: Evaluation

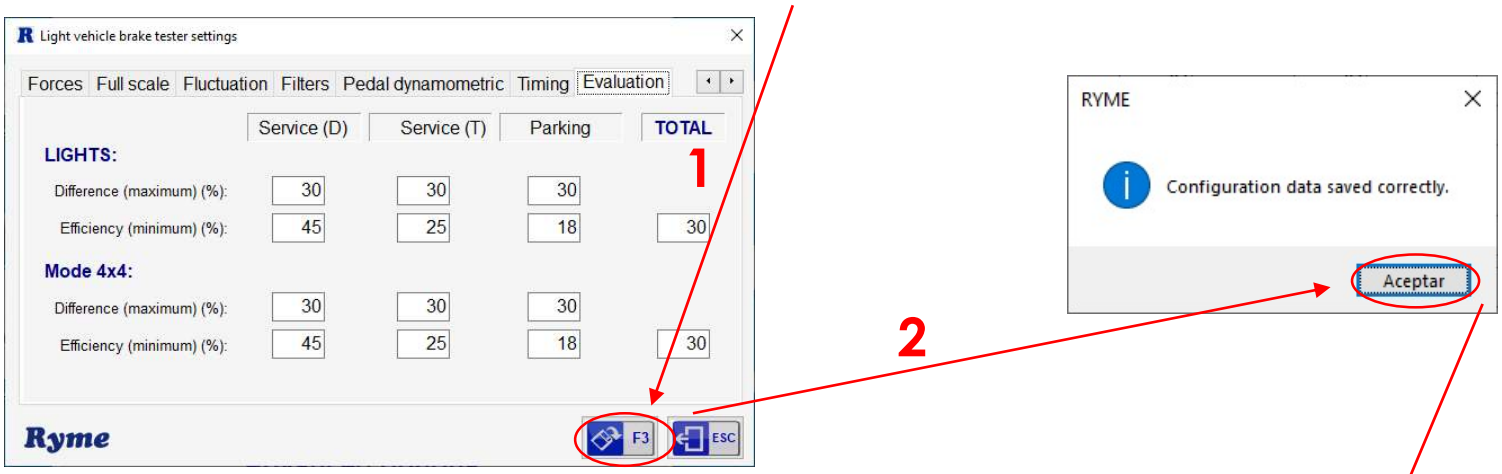
- **LIGHT VEHICLES:**
  - **Difference (maximum) (percentage)**: maximum configurable percentage value of admission for the tests on the different brakes: Service (D), Service (T) and Parking.
  - **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests in the different brakes: Service (D), Service (T), Parking, and a Total.

- **4x4 MODE:**
  - **Difference (maximum) (percentage)**: maximum configurable percentage value of admission for the tests on the different brakes: Service (D), Service (T) and Parking.
  - **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests in the different brakes: Service (D), Service (T), Parking, and a Total.

4.4 Save and Exit

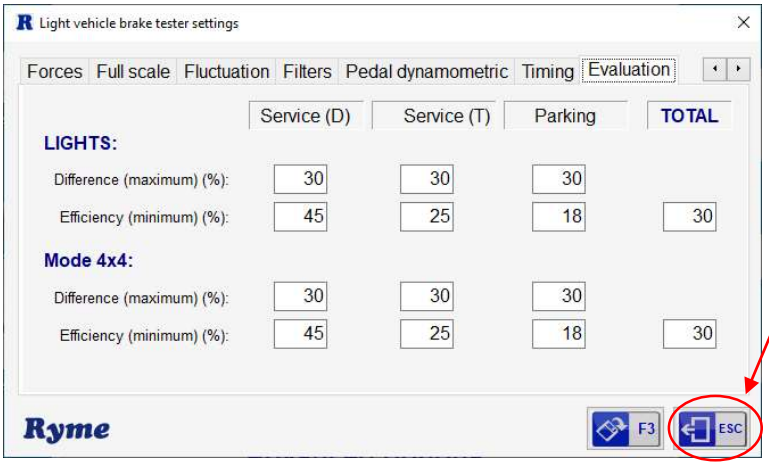
Before closing the settings window, either in a Side Slipe Tester, Suspension Bench or Brake Tester settings; if you want to save the modified parameters, click on the 

icon with the mouse or press 'F3' on the keyboard. You will then be informed with the message: 'Settings data successfully saved'.



Press accept and then click on the 

icon or press the 'Esc' key on the keyboard to exit to the main menu.

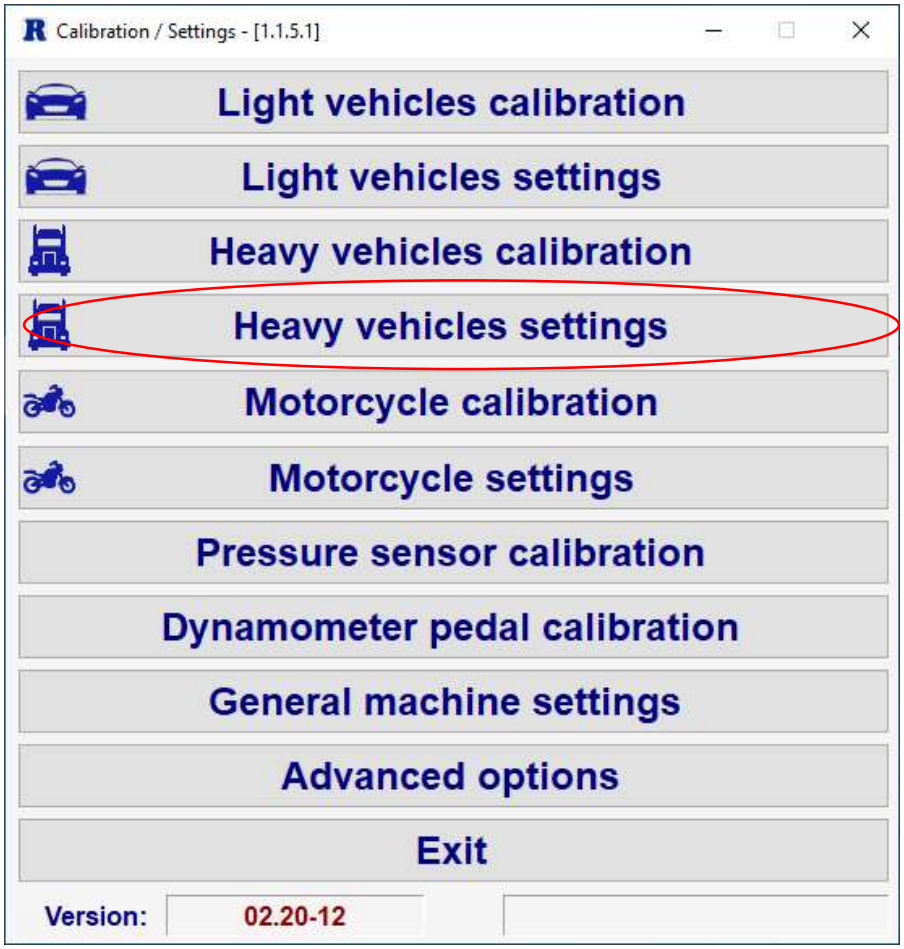


5 Heavy Vehicles Settings

In order to configure the line, open the application RYME_CalConf_PCE.exe:

37 RYME_CalConf_PCE.exe application

The settings window will open. You can select here the operation you want to perform. To configure the parameters, click with the mouse on the icon Heavy vehicle settings, located at the top of the menu:

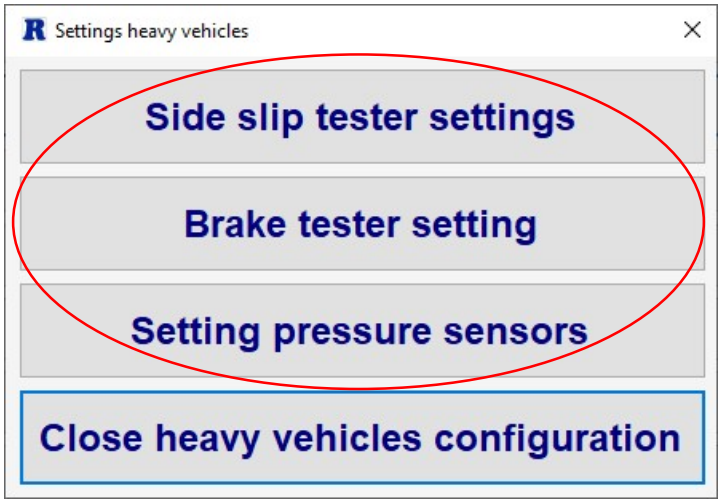


38 PCE Calibration/Setting Menu

From this menu you can configure the different parameters for the inspection of both light and heavy vehicles with the following machines:

- Side Slip Tester
- Brake Tester
- Pressure sensors

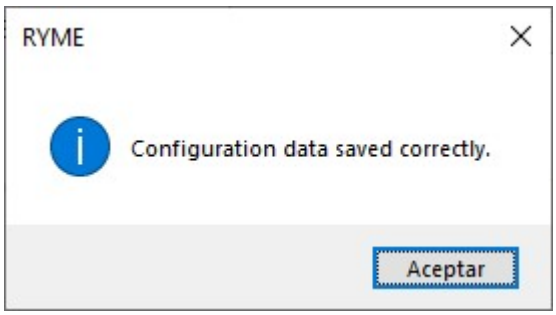
When you click on this option, a new menu will appear for you to select the device you want to configure.



39 Heavy Vehicles Settings Menu

Next, the Settings window will open. In it you will be able to see the different tabs to be able to configure the devices.

In all the windows, once the necessary changes have been made, you must click on the save icon  or the 'F3' key, so that the changes are saved (otherwise they will be lost).

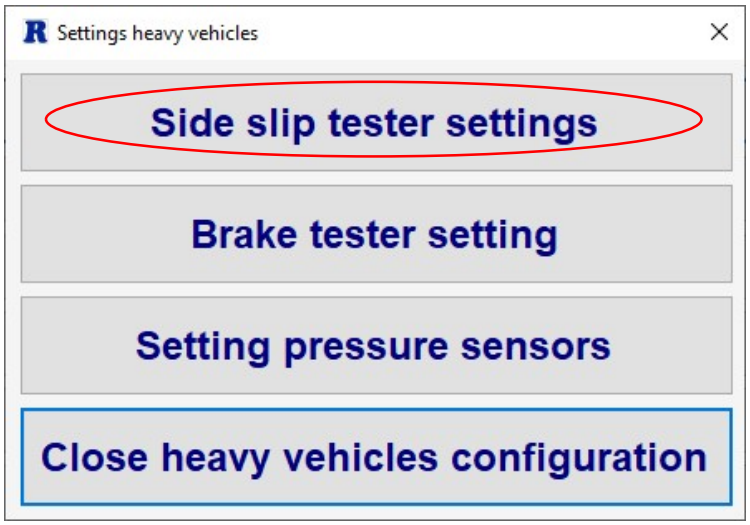


40 Settings saving confirmation

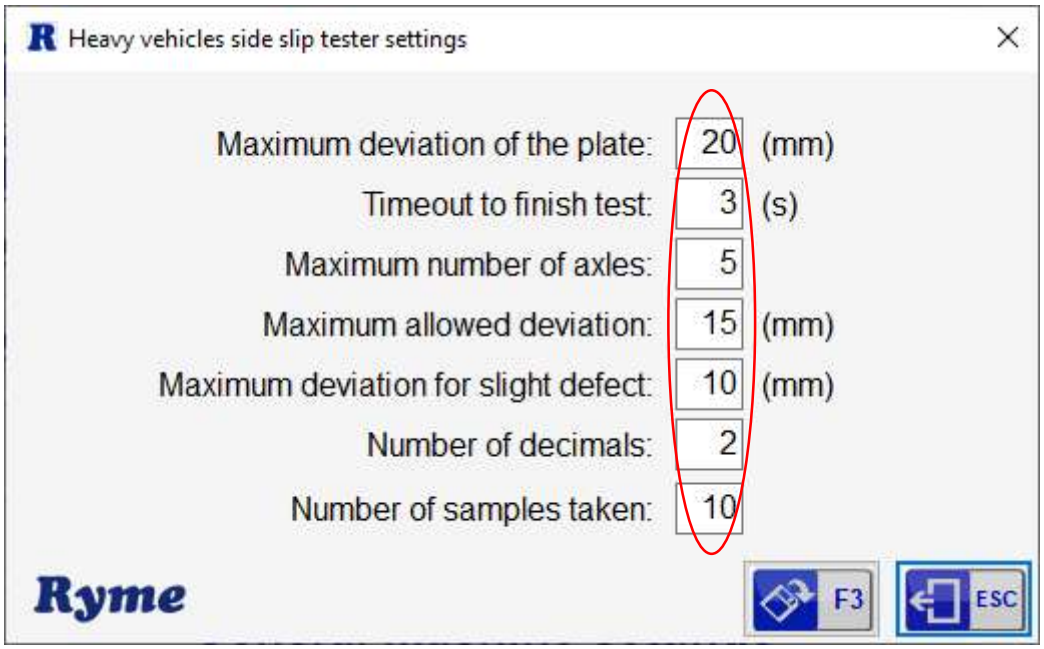
By pressing the 'Esc' key on the keyboard or the button on the remote control, you will leave this screen without saving the changes you have made.

5.1 Heavy Vehicles Side Slip Tester Settings

Settings of the different variables that can be used in the measurement with the side slip tester. Click with the mouse on the **Side slip tester settings** icon to access its menu.



By clicking on the different boxes you will be able to configure the different parameters:

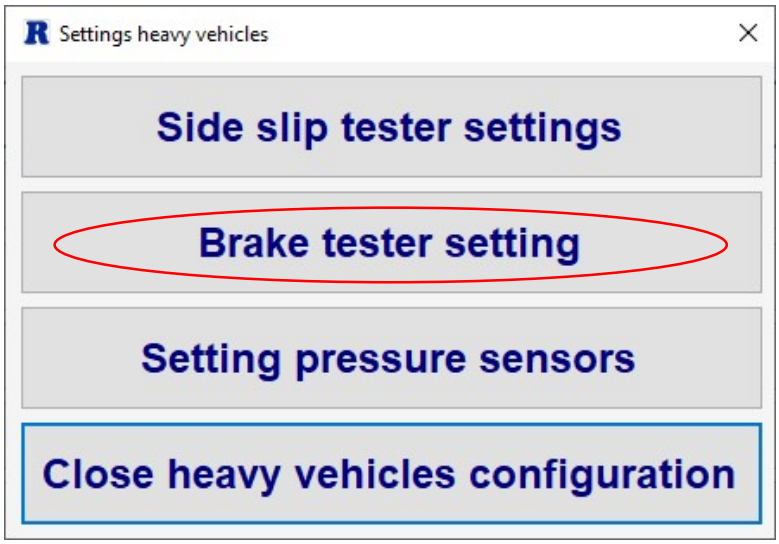


41 Side Slip Tester Settings Menu

- **Maximum deviation of the plate (millimeters)**: Maximum deviation that the slip tester plate can reach to the left and right.
- **Time to finish the test (seconds)**: Time the alignment is being measured until the value of the maximum deviation is taken.
- **Maximum number of axles**: Number of axles on which the alignment test will be performed.
- **Maximum allowed deviation (millimeters)**: Value from which the alignment is considered defective.
- **Maximum deviation for slight defect (millimeters)**: Value from which (and without reaching the maximum allowed deviation), the alignment value is considered to indicate slight defect.
- **Number of decimals**: Number of decimals shown (and stored), when taking the deviation value.
- **Number of samples taken**: Number of samples taken to filter the information obtained from the deviation.

5.2 Heavy Vehicles Brake Tester Settings

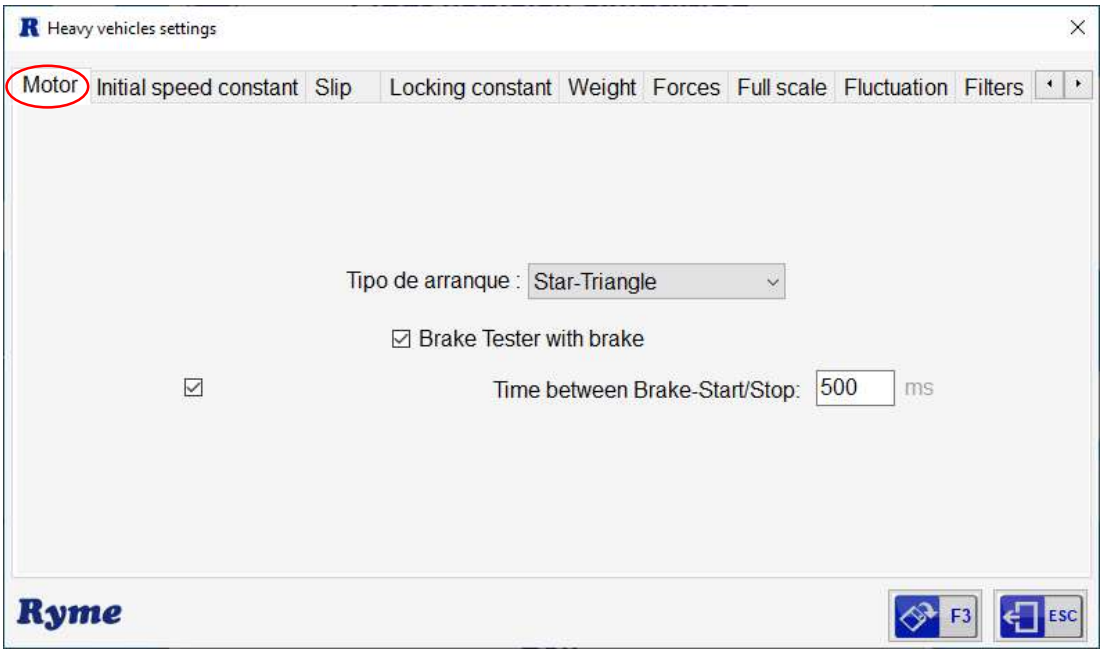
Settings of the different variables that can be used in the measurement with a brake tester. Click with the mouse on the Setting brake tester icon to access its menu.



42 Settings Menu: Heavy Vehicles Brake Tester

Click on the different tabs to configure the different parameters. To see the settings that are not displayed in the first plane, click on the  icon with the mouse, this way you will move to the left and to the right to see the different settings and modify the parameters of the device:

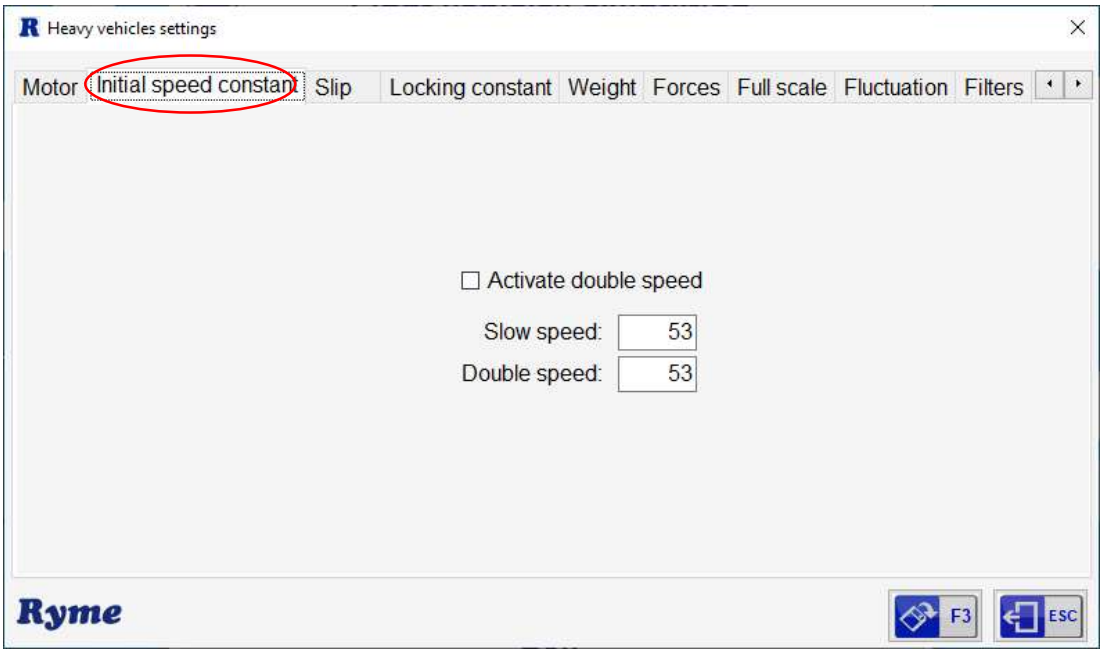
5.2.1 Motor



43 Heavy Vehicles Brake Tester Settings: Motor

- **Start mode**: Select the type of motor start (you will have to check the technical data sheet of the brake tester and the type of frame being mounted):
  - Star-Triangle
  - Soft Starters
- **Brake tester with brake**: Select this box if the brake tester has this option in the technical data sheet.
- **Time between Brake-Start/Stop**: Select this box in case the brake tester has soft starters and has a separate system for the motor start and brake command installed (only selectable for version with **starters**).

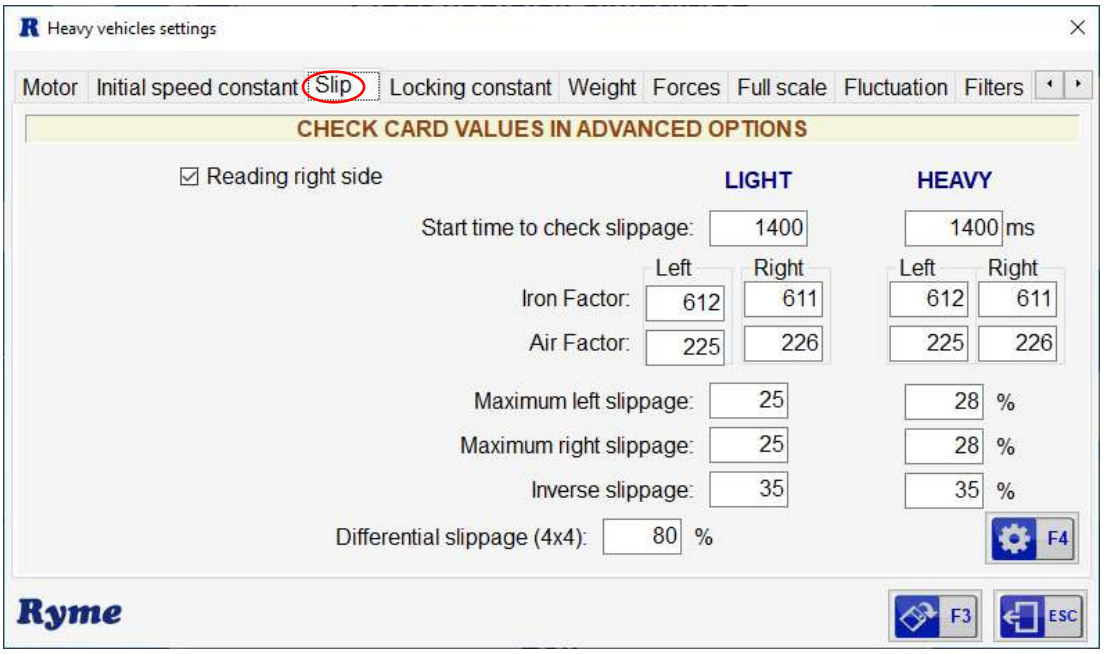
5.2.2 Initial speed constant



44 Heavy Vehicles Brake Tester Settings: Initial speed constant

- **Activate double speed**: click with the mouse on the tab in case the machine includes double speed motors (see brake tester data sheet).
- **Slow speed**: numerical value used for calculating slippage when using PCR-type electronic boards.
- **Double speed**: numerical value used for calculating slippage when using PCR-type electronic boards.

5.2.3 Slippage

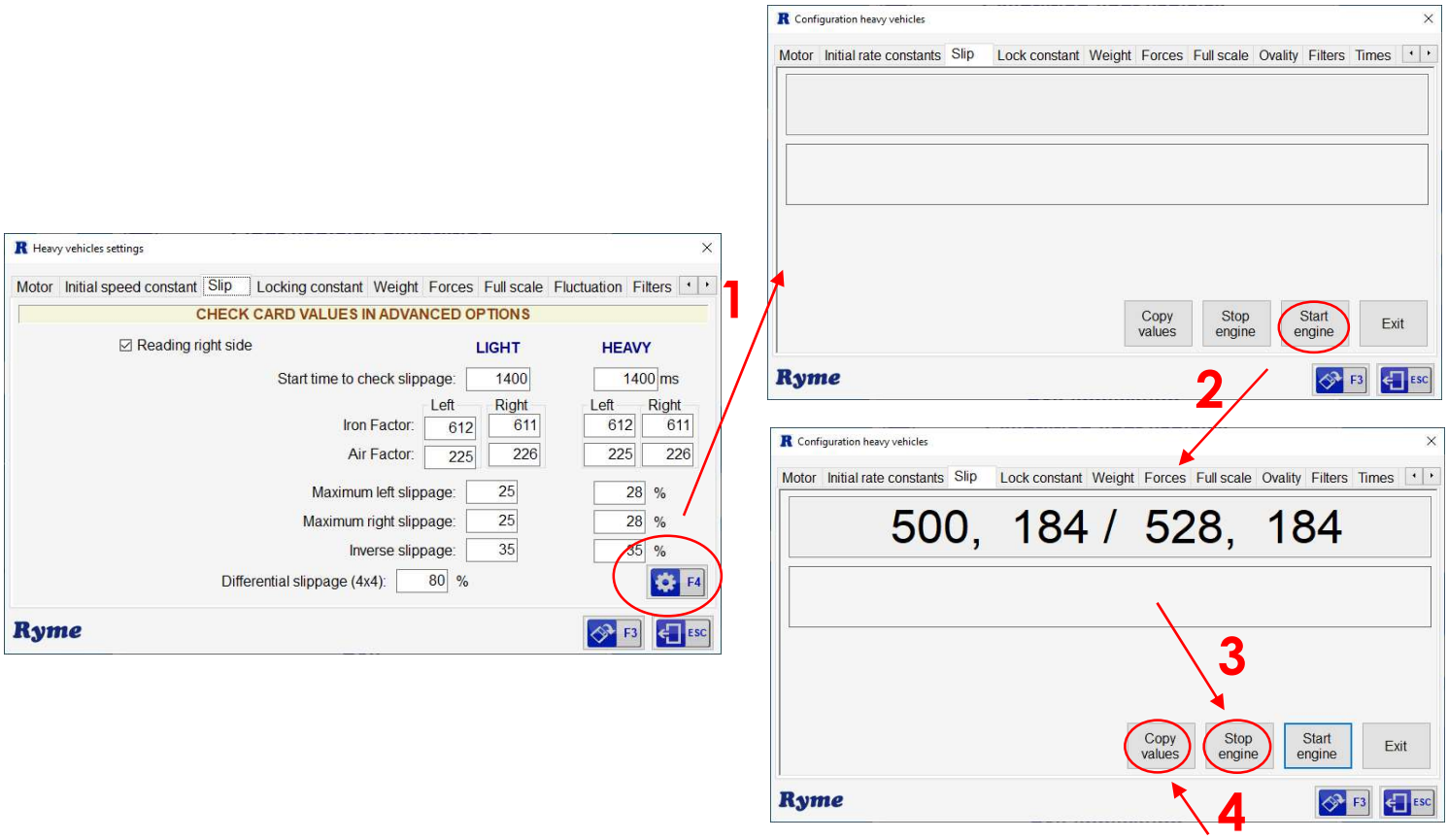


45 Heavy Vehicles Brake Tester Settings: Slippage

- **Start time for slippage testing**: due to the time it takes for the slippage bar to match the nominal motor speed, during this time, the electronic board will ignore the values obtained in the reading. Once this time is over, normal measurement will start. You can configure it individually for light and heavy vehicles.
- **Left side (Light/Heavy Vehicles):**
  - **Iron Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
  - **Air Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
- **Right side (Light/Heavy Vehicles):**
  - **Iron Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
  - **Air Factor**: time in board units that the sensor passes through the iron of the slippage bar when rolling at motor speed.
- **Maximum left slippage (percentage) (Light/Heavy Vehicles)**: Maximum percentage to be calculated which is allowed on the left side of the brake tester.

- **Maximum Right Slippage (percentage) (Light/Heavy Vehicles)**: Maximum percentage to be calculated which is allowed on the right side of the brake tester.
- **Inverse Slippage (Light/Heavy Vehicles)**: Maximum slippage value measured when each wheel is turned in one direction, if the difference is greater than the set value, the brake tester will stop for safety.
- **Differential slippage (4x4) (percentage) (Light/Heavy Vehicles):** Maximum percentage difference of slippage between the left and right wheel to avoid possible breakage of the vehicle's differential box.
- **Setting the slippage values automatically:**

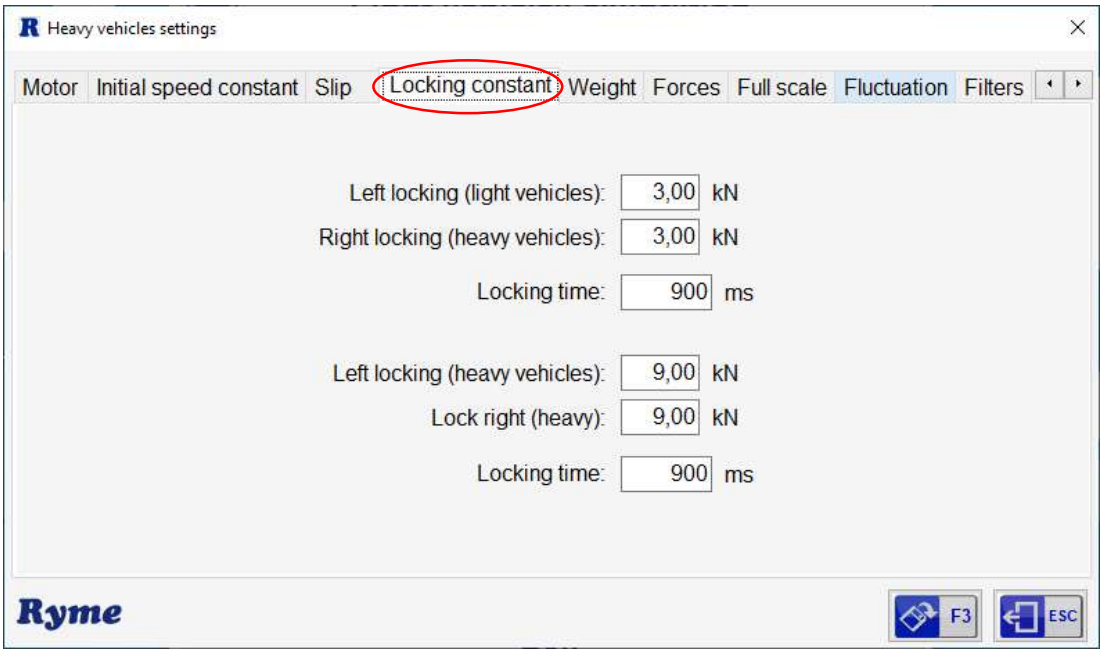
By pressing 'F4' on the keyboard or by clicking with the mouse on the icon below marked, a screen will appear for the live reading of the values that you have to enter for the slippage settings. It is important to enter a vehicle in the brake tester and not to touch the brake pedal during the reading to carry out this operation:



Process:

- With a vehicle inserted in the brake tester, press the **'Start Motor'** button, and allow a few seconds for the values to stabilize.
- Once the values have stabilized, press **'Stop Motor'** and then press **'Copy Values'** to transfer them directly to the settings.

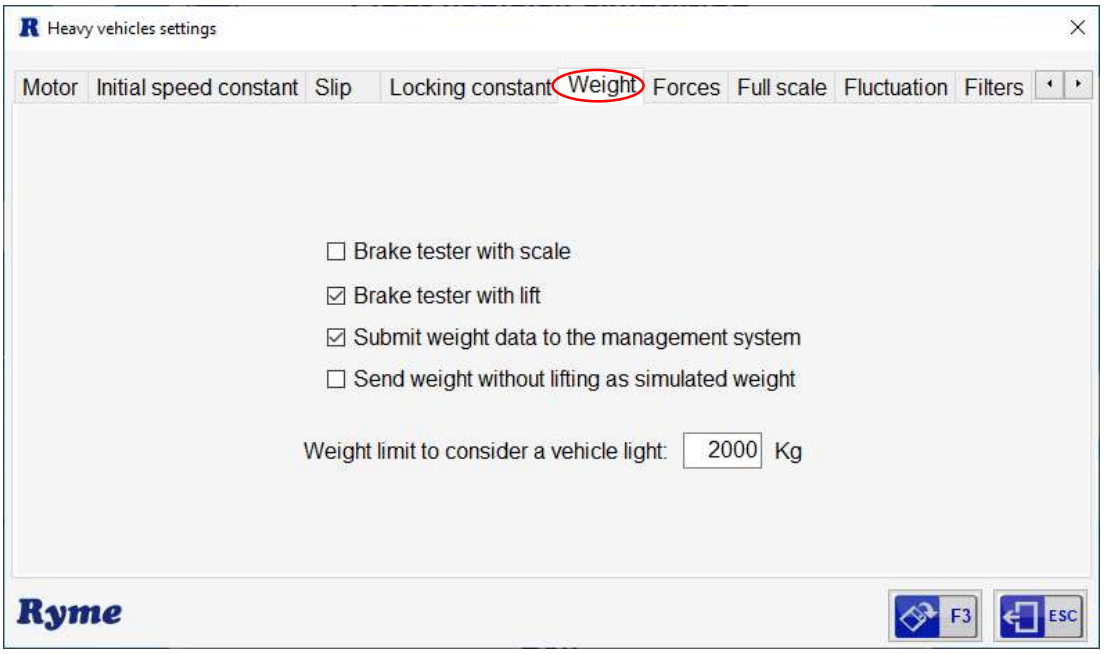
5.2.4 Locking Constant



46 Heavy Vehicles Brake Tester Settings: Locking Constant

- **Left locking (light vehicles) (kN)**: maximum numerical value in kN, to lock the left wheel in case a value higher than this is detected at left motor start on the light vehicle display.
- **Right locking (light vehicles) (kN)**: maximum numerical value in kN, to lock the left wheel in case a value higher than this is detected at the right motor start on the light vehicles display.
- **Left locking (heavy vehicles) (kN)**: Maximum numerical value in kN, to lock the left wheel in case of a value higher than this is detected at the left motor start on the heavy vehicles display.
- **Right locking (heavy vehicles) (kN)**: Maximum numerical value in kN, to lock the left wheel in case a value higher than this is detected at the right motor start on the heavy vehicles display.
- **Blocking time**: Time since the motor starts in which the card is controlling that the force of the gauge is not higher than the set one. If it is higher, the card stops automatically.

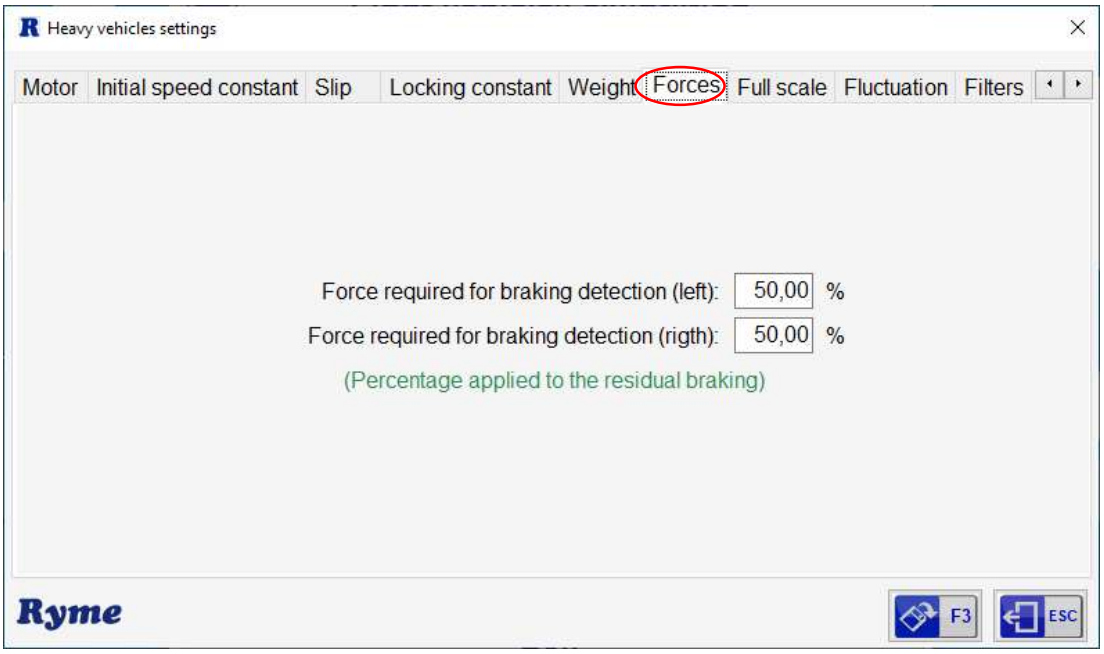
5.2.5 Weight



47 Heavy Vehicles Brake Tester Settings: Weight

- **Brake tester with scale**: Select this box in case the equipment includes this option in the technical data sheet.
- **Brake tester with lift**: Select this box in case the equipment includes this option in the technical data sheet.
- **Send weight data to the management system**: In case you want to see the weight data on the screen, but you do not want it to be sent to the management system, un-check this box.
- **Send weight without lifting as simulated weight**: For certain management systems or MOT groups, this option is activated to send the weight taken before lifting as a lifted weight since they have an external scale and do not require it. This value will be sent to the management system in the corresponding code.
- **Weight limit to consider a vehicle light (kg)**: value in Kg to discriminate a light vehicle from a heavy vehicle, so that automatically the software will open the screen according to the vehicle entered in the brake tester.

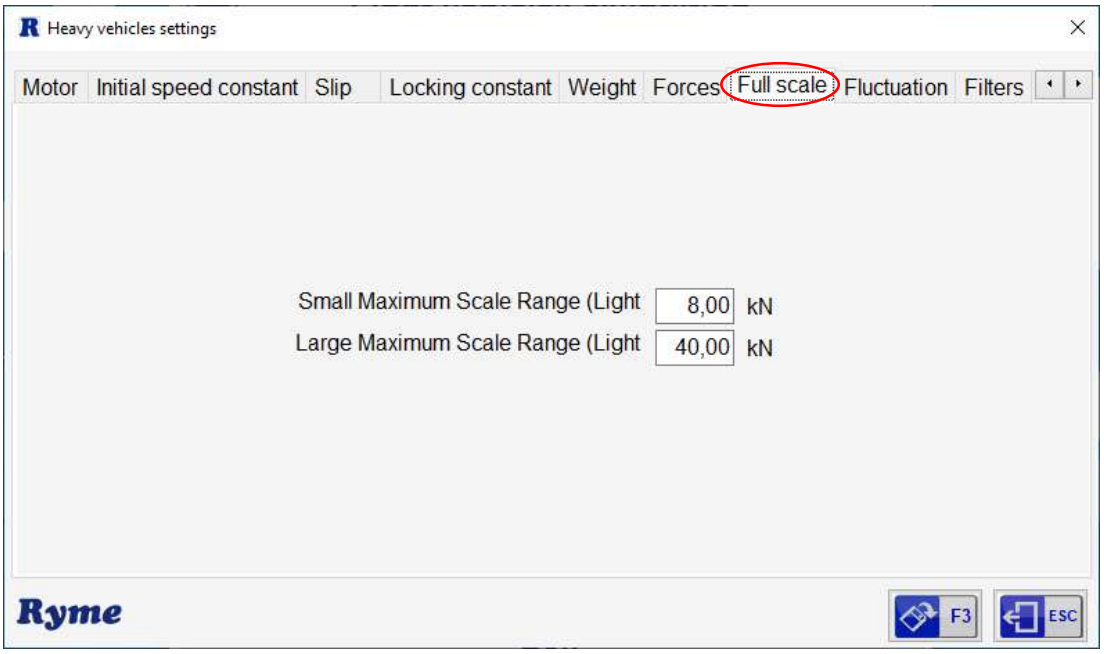
5.2.6 Forces



48 Heavy Vehicles Brake Tester Settings: Forces

- **Force required for braking detection (left) (percentage)**: Percentage value applied to residual braking, from which the system will consider braking and start collecting data on the left wheel.
- **Force required for braking detection (right) (percentage)**: Percentage value applied to residual braking, from which the system will consider braking and start collecting data on the right wheel.

5.2.7 Maximum Scale Range

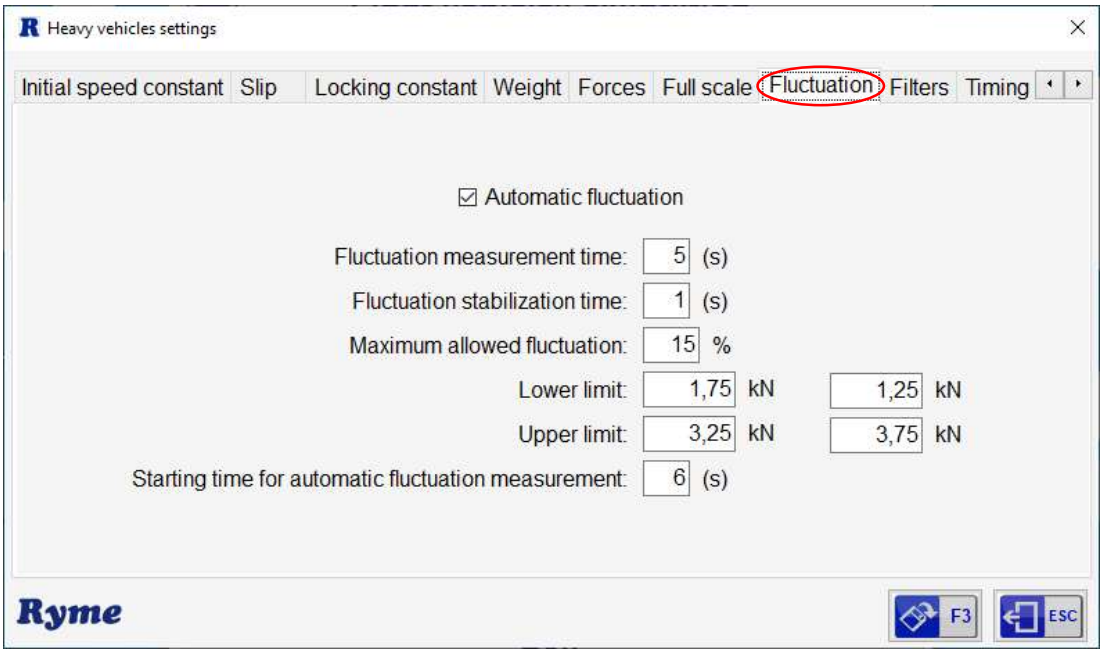


49 Heavy Vehicles Brake Tester Settings: Maximum Scale Range

- **Small Maximum Scale Range (Light Vehicles) (kN)**: Numerical value in kN of the scale range that you will see on the measuring clocks of the brake tester during the test and calibration.
- **Large Maximum Scale Range (Heavy Vehicles) (kN)**: Numerical value in kN of the scale range that you will see on the measuring clocks of the brake tester during the test and calibration.

IMPORTANT: Set this value before performing the calibration, as the values on the electronic board will be adjusted accordingly.

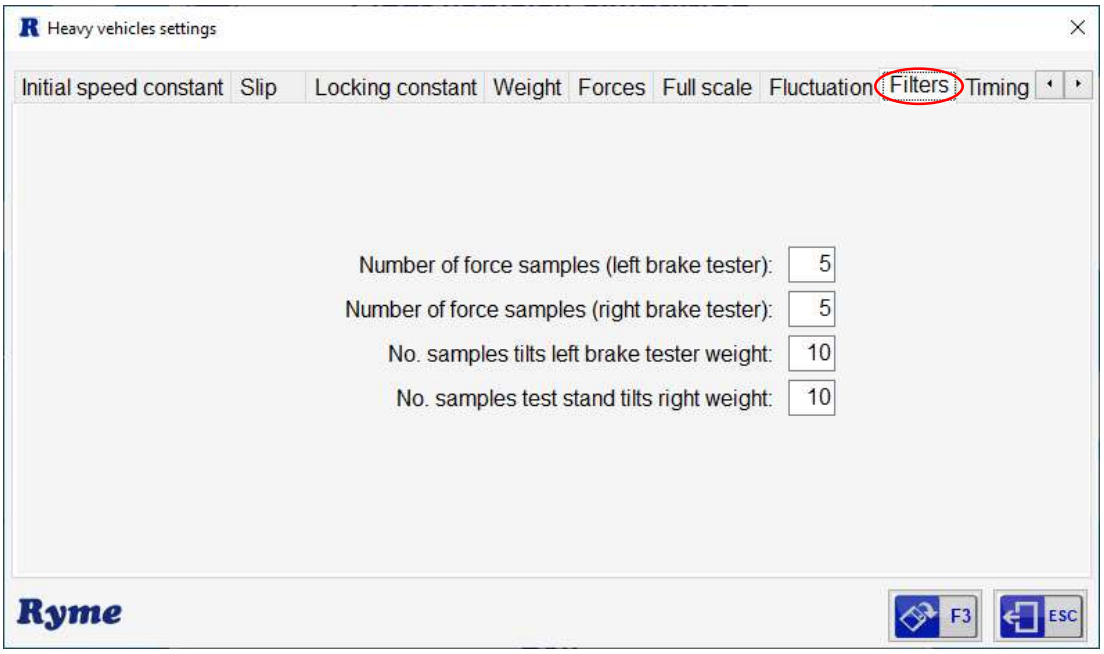
5.2.8 Fluctuation



50 Heavy Vehicles Brake Tester Settings: Fluctuation

- **Automatic fluctuation**: Select this option in case you want to perform in the test the fluctuation of the brakes always automatically. Otherwise, it will be activated manually for each axle measurement.
- **Fluctuation measurement time (seconds)**: Value in seconds to perform the fluctuation measurement.
- **Fluctuation stabilization time (seconds)**: time before starting with the fluctuation measurement, so that the technician can stabilize the force within the range of the gauge graph measuring fluctuation.
- **Maximum allowed fluctuation (percentage)**: maximum percentage value admitted, for the validation of the fluctuation test.
- **Lower limit (kN)**: kN value of the lower limit of the range for the fluctuation measurement.
- **Upper limit (kN)**: kN value of the upper limit of the range for fluctuation measurement.
- **Starting time for automatic fluctuation measurement (seconds):** waiting time after the measurement of the residual force value in the wheels that will take the gauge graphs measuring fluctuation to appear automatically.

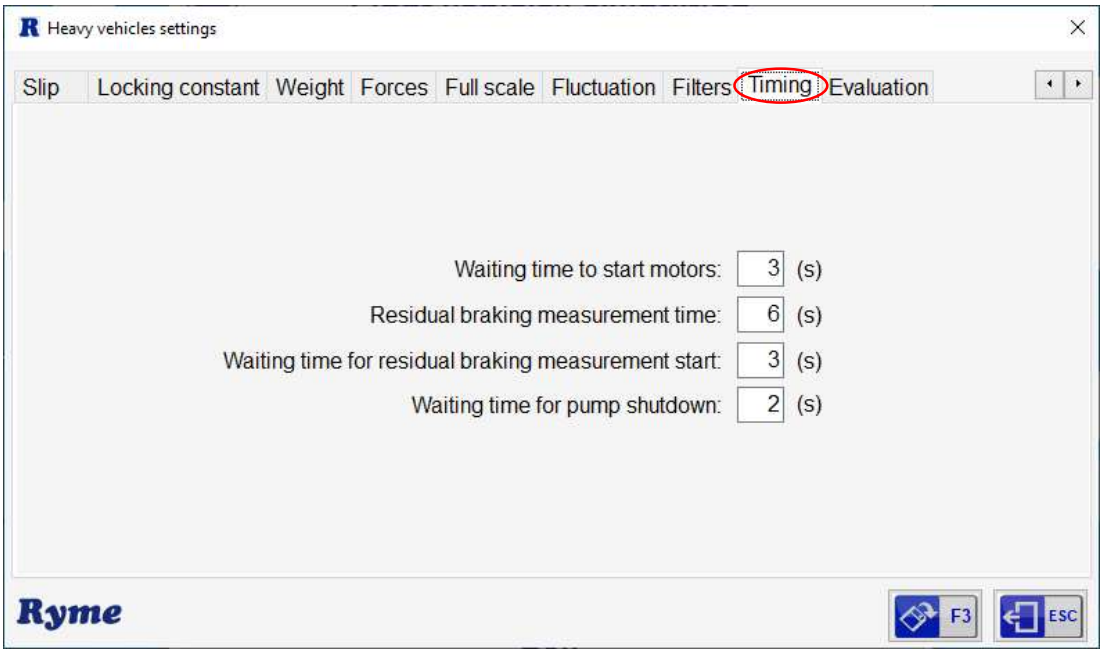
5.2.9 Filters



51 Heavy Vehicles Brake Tester Settings: Filters

- **Number of force samples (left brake tester)**: numerical value of the data to be taken for the smoothing of the data obtained from the left wheel force.
- **Number of force samples (right brake tester)**: numerical value of the data to be taken for the smoothing of the data obtained from the right wheel force.
- **Number of weight samples (left brake tester scale)**: numeric value of the data to be taken for the smoothing of the data obtained from the left wheel weight.
- **Number of weight samples (right brake tester scale)**: numeric value of the data to be taken for smoothing the data obtained from the right wheel weight.

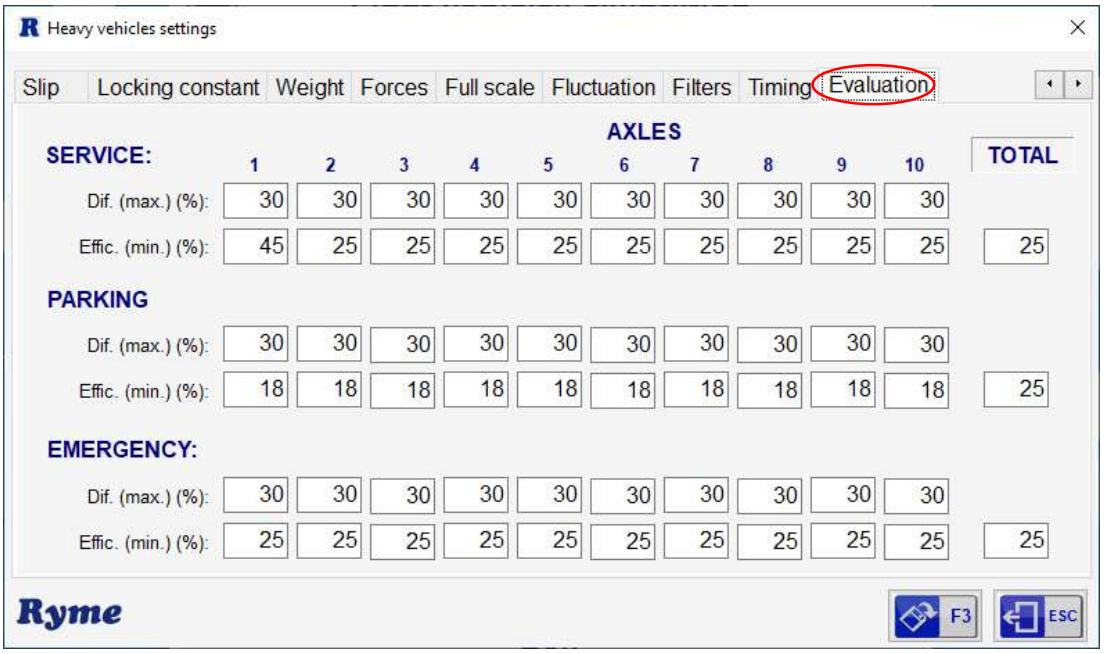
5.2.10 Timing



52 Heavy Vehicles Brake Tester Settings: Timing

- **Timeout to start motors (seconds)**: value, in seconds, of the waiting time from the moment the vehicle is detected until the motors are started.
- **Residual braking measurement time (seconds)**: value, in seconds, of the time that the residual braking measurement will last.
- **Waiting time for residual braking measurement start (seconds)**: value, in seconds, of the waiting time for the residual braking measurement to start.
- **Waiting time for pump shutdown**: Time set for automatic pump shutdown after starting up.

5.2.11 Evaluation



53 Heavy Vehicles Brake Tester Settings: Evaluation

SERVICE:

- **Difference (maximum) (percentage)**: maximum configurable percentage value of admission for the tests in the different brakes: axle 1, axle 2, axle 3... axle 10.
- **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests in the different brakes: axle 1, axle 2, axle 3... axle 10 and a Total.

PARKING:

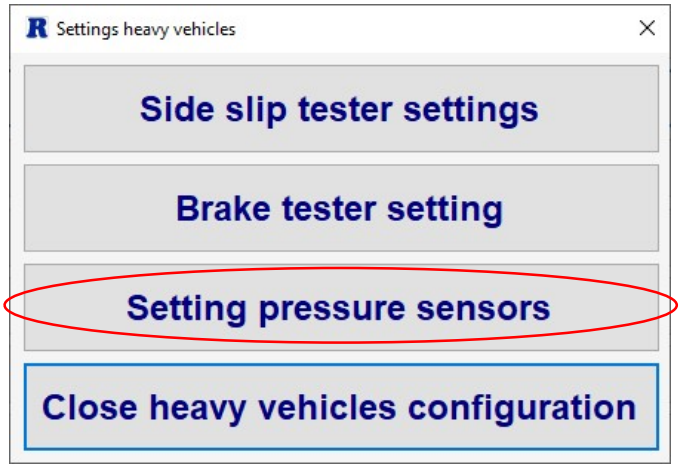
- **Difference (maximum) (percentage)**: maximum configurable percentage value of admission for the tests on the different brakes: axle 1, axle 2, axle 3... axle 10.
- **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests on the different brakes: axle 1, axle 2, axle 3... axle 10 and a Total.

EMERGENCY:

- **Difference (maximum) (percentage)**: maximum configurable percentage value of admission for the tests in the different brakes: axle 1, axle 2, axle 3... axle 10.
- **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests in the different brakes: axle 1, axle 2, axle 3... axle 10 and a Total.

5.3 Pressure Sensor Settings

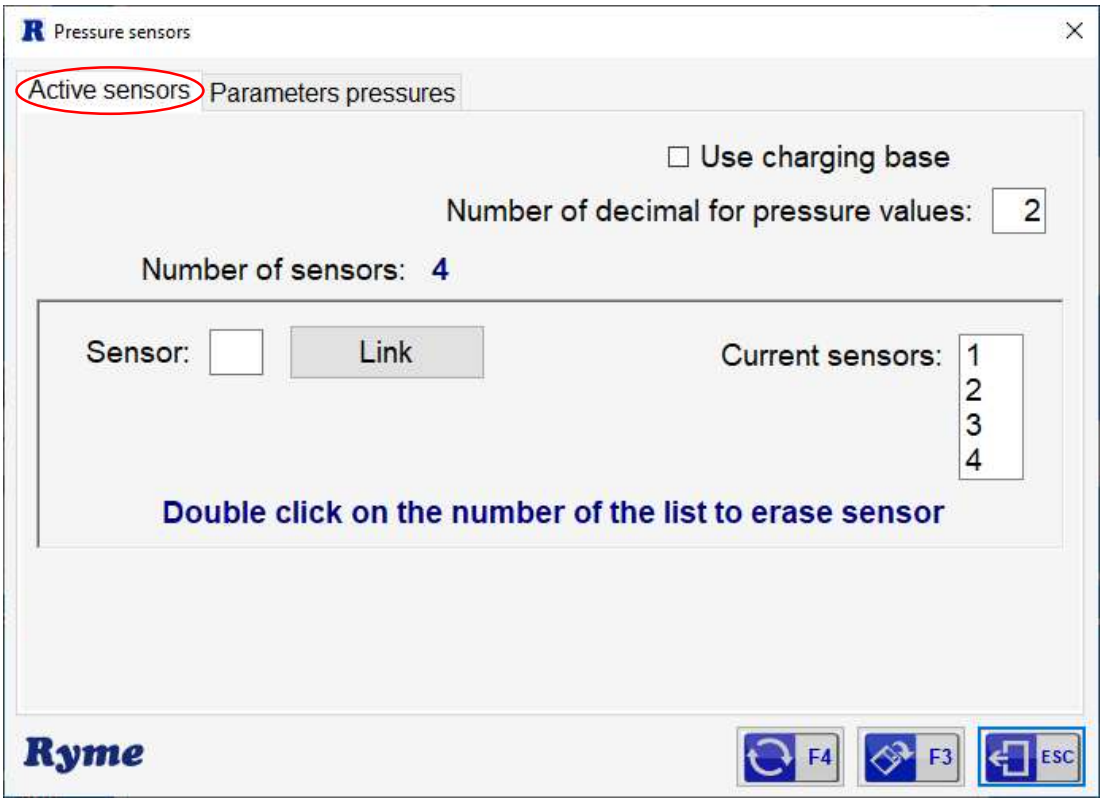
Settings of the different variables that can be used in the measurement with Pressure Sensors installed in the machine. Click with the mouse on the Setting pressure sensors icon to access the menu.



54 Settings Menu: Heavy Vehicles Brake Tester

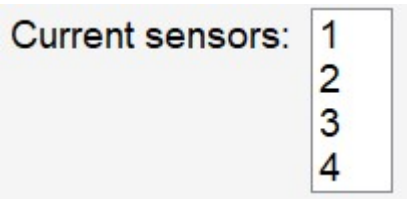
Click on the different tabs to configure the different parameters:

5.3.1 Active sensors



55 Pressure Sensors Settings: Active sensors

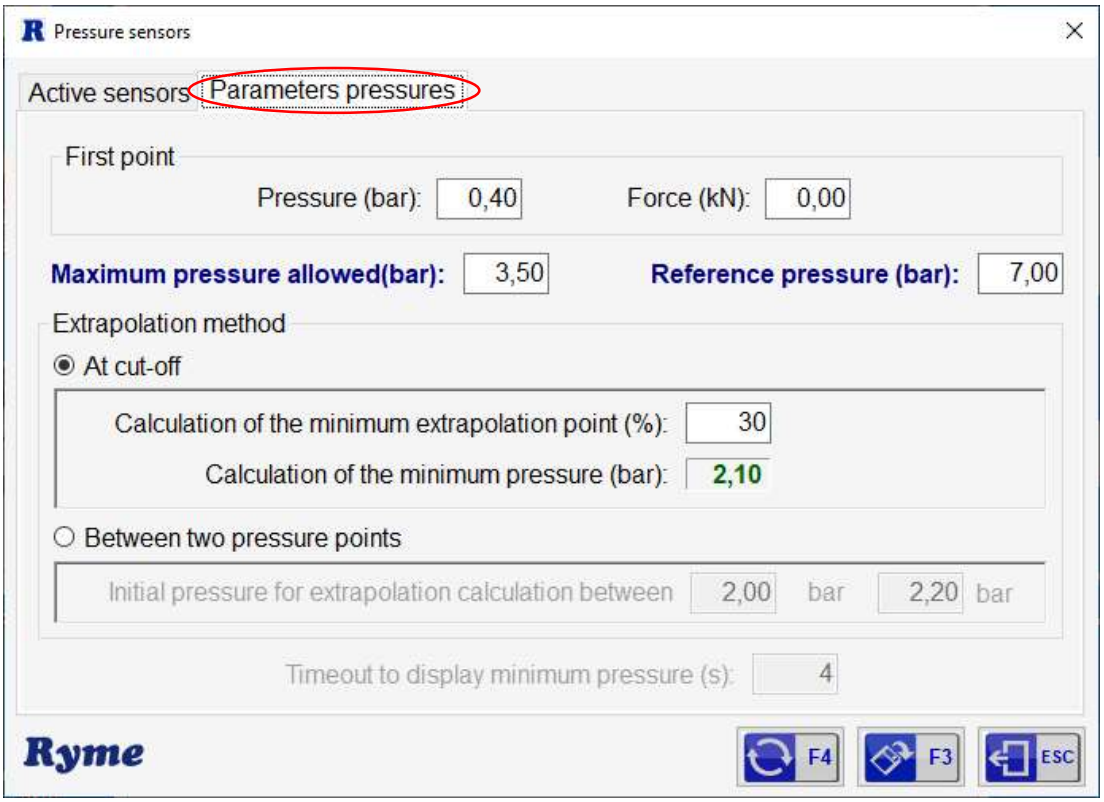
- **Use charging base**: Select this option in case you want to use a charging base for the control of the devices. This way if all the sensors of the line are not placed in the base, it will not let you see and save the results of the test.
- **Number of decimals for pressure values**: number of decimals you want to see in the test results.
- **Number of sensors**: indicates the number of sensors connected to the application.
- **Sensor**: Enter the number of the direction assigned to the sensor and then click on the Link icon. It will indicate in the right part of the window the current sensors connected to the installation.



56 Pressure Sensors Settings: Current sensors

Double-click on the current sensor 'X' number to remove it from the list.

5.3.2 Pressure Parameters



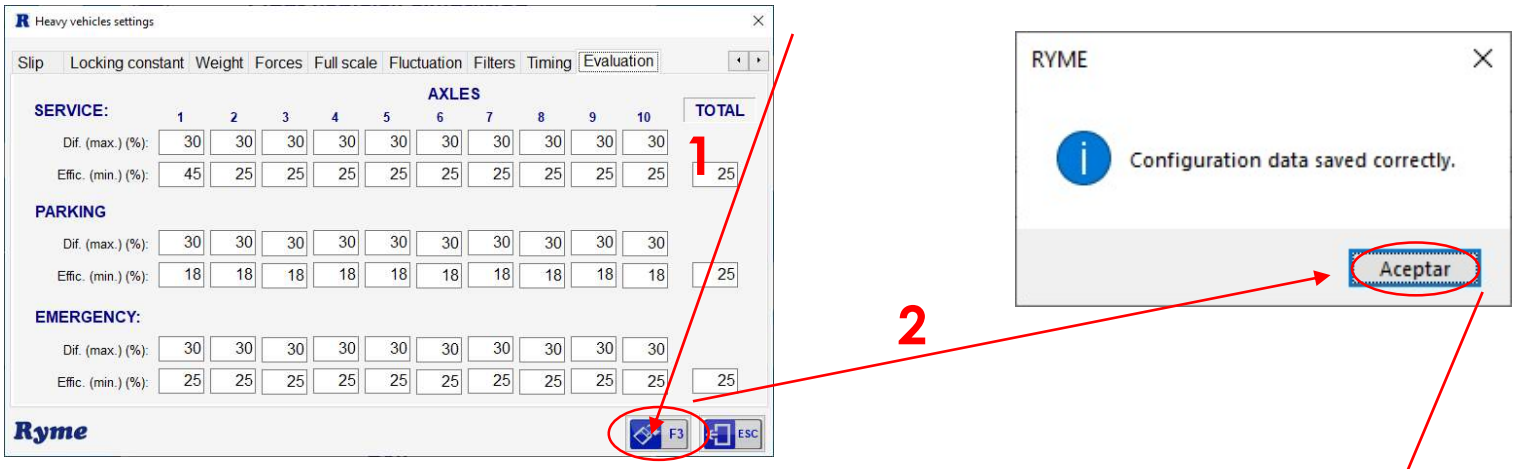
57 Pressure Sensors Settings: Pressure Parameters

- **First point**: This will be the first point in taking measurements to make the extrapolation of the data of the curve, for this you must configure:
  - **Pressure (bar)**: Value from which the graph will take the first point.
  - **Force (kN)**: Value from which the graph will take the first point.
  - **Maximum pressure allowed**: Maximum value allowed to the system when performing a test (this will avoid uncontrolled errors related to the braking system of the vehicles: drops of the pneumatic system to 0 bar at its maximum point).
  - **Reference pressure (bar)**: Default value of the reference pressure for the calculation of the extrapolation curve at its maximum point. This graph will be calculated individually per axle during the test, as this value can be modified manually by entering the data from the vehicle data sheet).
- **Extrapolation method**: With these parameters you will determine the creation of the curve. Click with the mouse to select the type of extrapolation that will be used in the tests according to the implemented system:

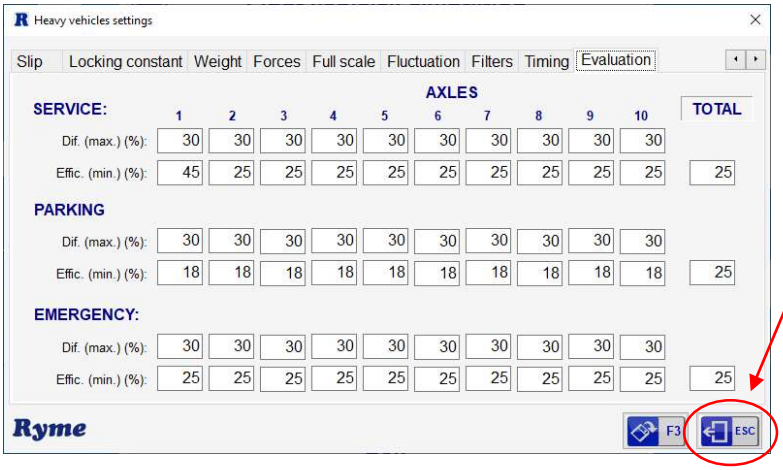
- **At cut-off**: selecting this option it will extrapolate as follows:
  - **Calculation of the minimum extrapolation point (percentage)**: For the application to be able to carry out the calculation of extrapolation, the pneumatic braking system of the vehicle must exceed this minimum percentage of pressure during the test. This value will be applied to the axle reference pressure.
  - **Calculation of the minimum pressure (bar)**: numerical value expressed in bar, of the minimum pressure calculated to create the extrapolation curve. This value will be, by definition, a maximum of 2.00 bar.
- **Between two points:** selecting this option it will extrapolate as follows:
  - **Initial pressure for extrapolation calculation between two points**: numerical value in bars between which the measurements necessary for the calculation of the extrapolation curve will be taken. This value will depend on the regulations of each country.
  - **Timeout to display minimum pressure (seconds)**: numeric value in seconds that takes to read the pressure of the sensors before making the calculations of extrapolation.

5.4 Save and Exit

Before closing the settings window, either in a Side Slip Tester, Suspension Bench or Brake Tester settings; if you wish to save the modified parameters, click on the  icon with the mouse or press 'F3' on the keyboard. You will then be informed with the message: 'Settings data successfully saved'.



Press 'Accept' and then click on the  icon or press the 'Esc' key on the keyboard to exit to the main menu.

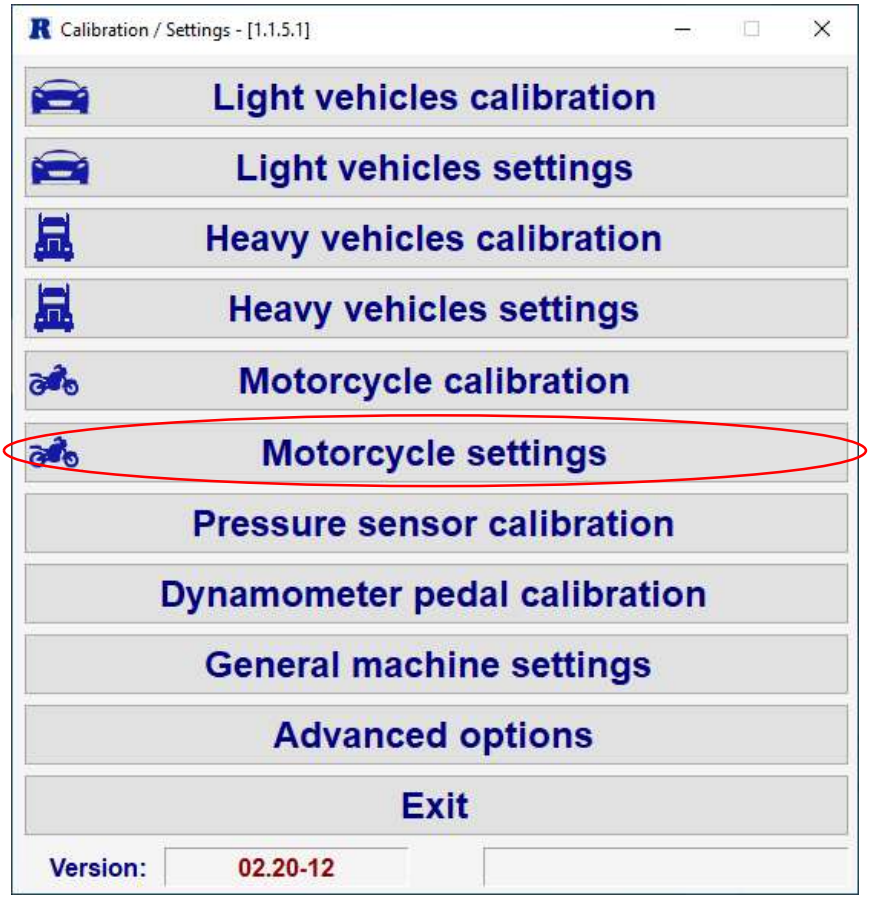


6 Motorcycle Settings

In order to configure the line, open the application RYME_CalConf_PCE.exe:

58 RYME_CalConf_PCE.exe application

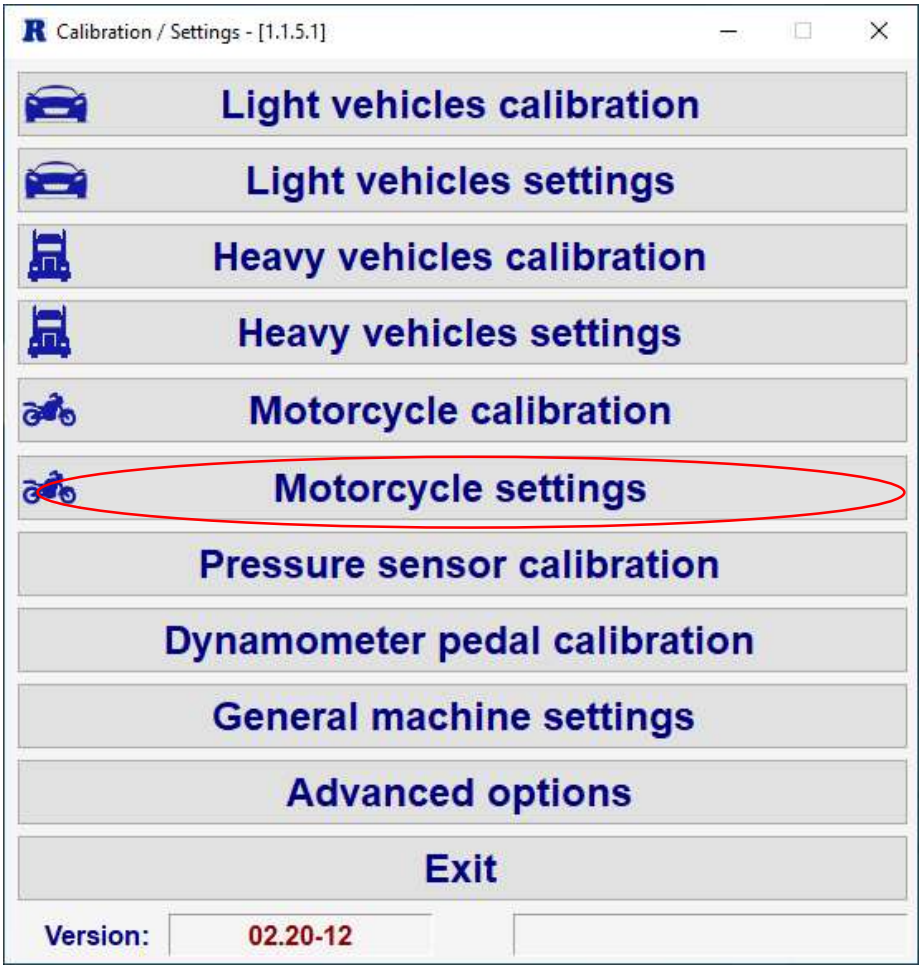
The settings window will open. You can select here the operation you want to perform. To configure the parameters, click with the mouse on the icon 'Motorcycle settings', located at the top of the menu:



59 PCE Calibration/Settings Menu

6.1 Motorcycle Brake Tester Settings

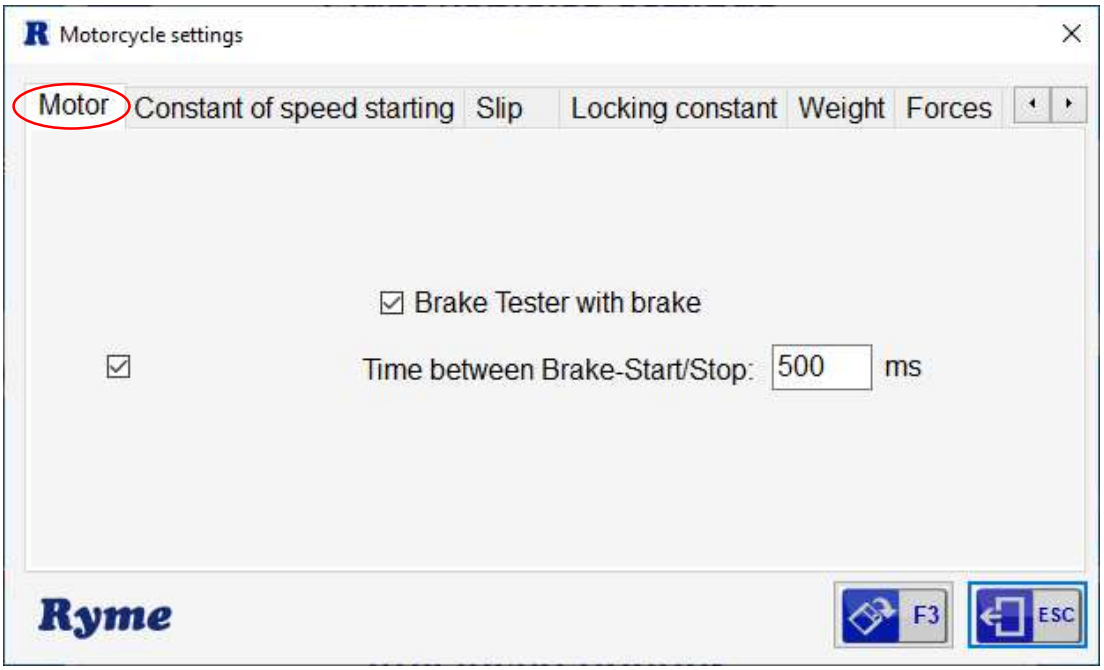
Settings of the different variables that can be used in the measurement with a brake tester. Click on the **Motorcycle settings** icon to access the Settings menu.



60 Motorcycle Brake Tester Settings Menu

Click on the different tabs to configure the different parameters. In order to see the Settings that are not visualized in a first plane, click with the mouse in the  icon, this way you will be able to move to the left and to the right to see the different Settings and to modify the parameters of the machine:

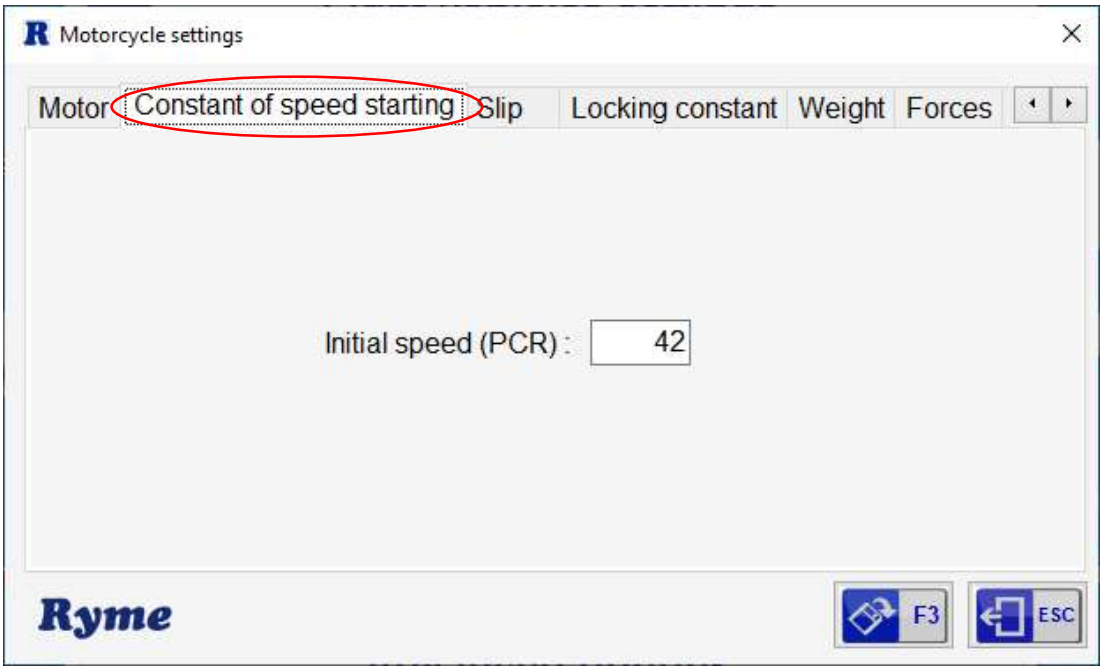
6.1.1 Motor



61 Motorcycle Brake Tester Settings: Motor

- **Brake Tester with Brake**: Select this box if the brake tester has this option in the technical data sheet.
- **Time between Brake-Start/Stop**: Select this box in case the brake tester has soft starters and has a separate system installed for the motor start and brake command.

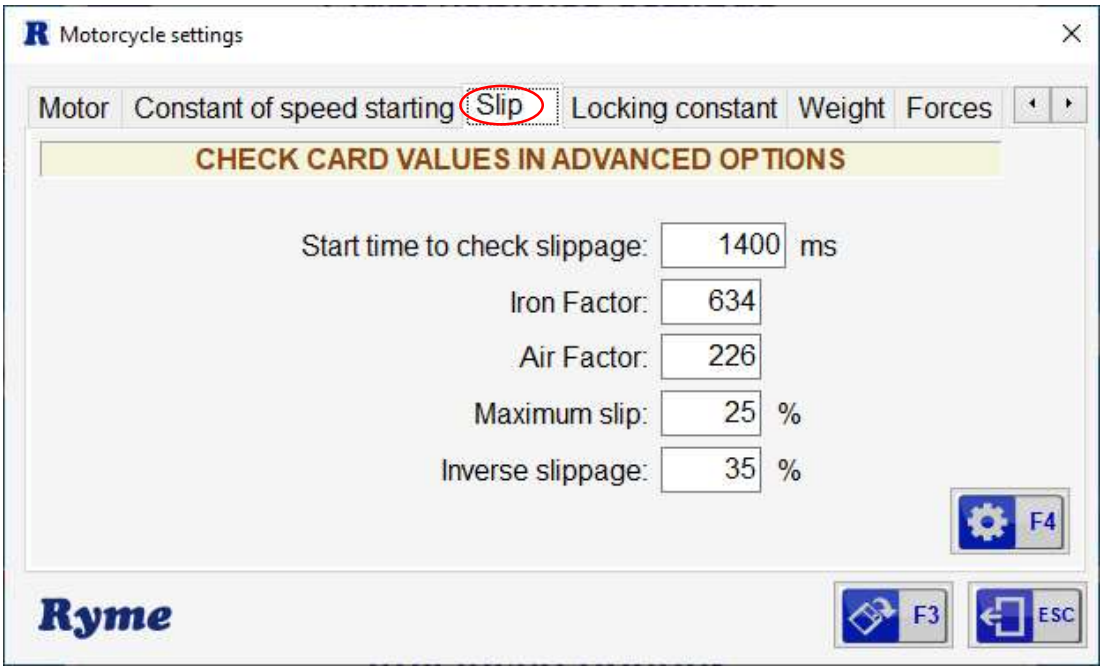
6.1.2 Initial speed constant



62 Motorcycle Brake Tester Settings: Initial Speed Constant

- **Initial speed (PCR)**: numerical value used for calculating slippage when using PCR-type electronic boards.

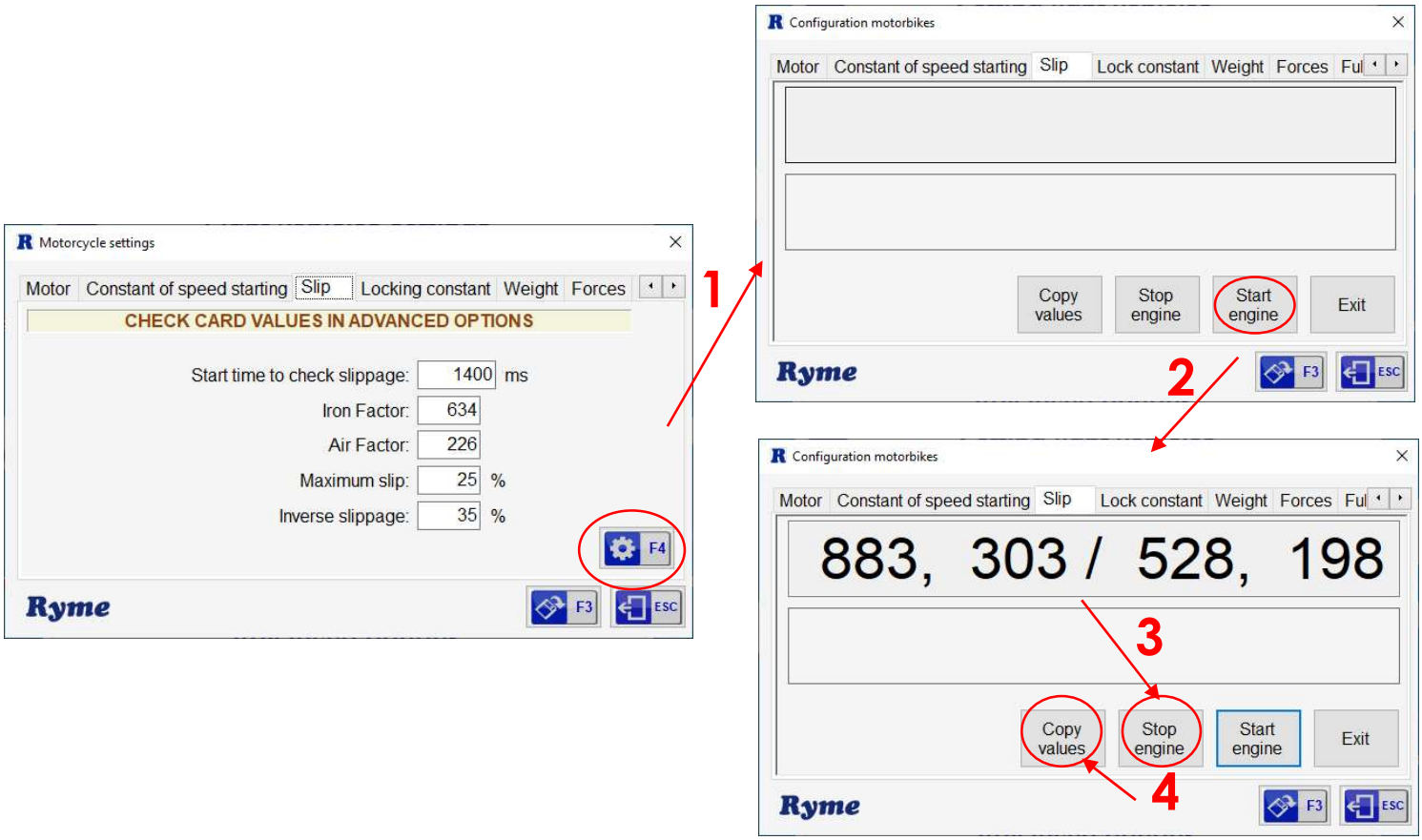
6.1.3 Slippage



63 Motorcycle Brake Tester Settings: Slippage

- **Time to start the slippage check**: due to the time it takes for the slippage bar to equalize to the nominal speed of the motor, during this time, the electronic board will ignore the values obtained in the reading. Once this time is over, normal measurement will start.
- **Iron Factor**: time in board units that the sensor passes through the iron of the slider bar when rolling at motor speed.
- **Air Factor**: time in board units that the sensor passes through the slider iron when rolling at motor speed.
- **Maximum Slippage (Percentage)**: Maximum percentage to be calculated that the measuring side of the brake tester allows.
- **Inverse Slippage**: Maximum slippage value measured when each wheel is turned in one direction. If the difference is greater than the set value, the brake tester will stop for safety.
- **Setting slippage values automatically:**

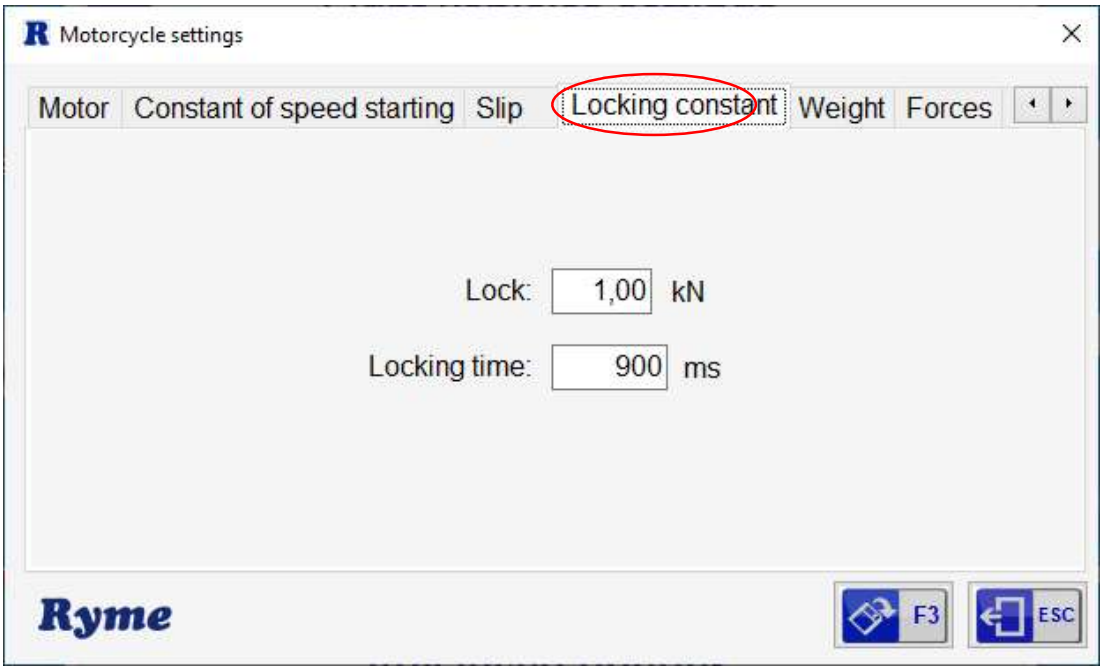
By pressing 'F4' on the keyboard or by clicking with the mouse on the icon below marked, a screen will appear for the live reading of the values that you have to enter for the slippage settings. It is important to enter a vehicle in the brake tester and not to touch the brake pedal during the reading in order to carry out this operation:



Process:

- With a vehicle inserted in the brake tester, press the **'Start Motor'** button and allow a few seconds for the values to stabilize.
- Once the values have stabilized, press **'Stop Motor'** and then press **'Copy Values'** to transfer them directly to the settings.

6.1.4 Locking constant

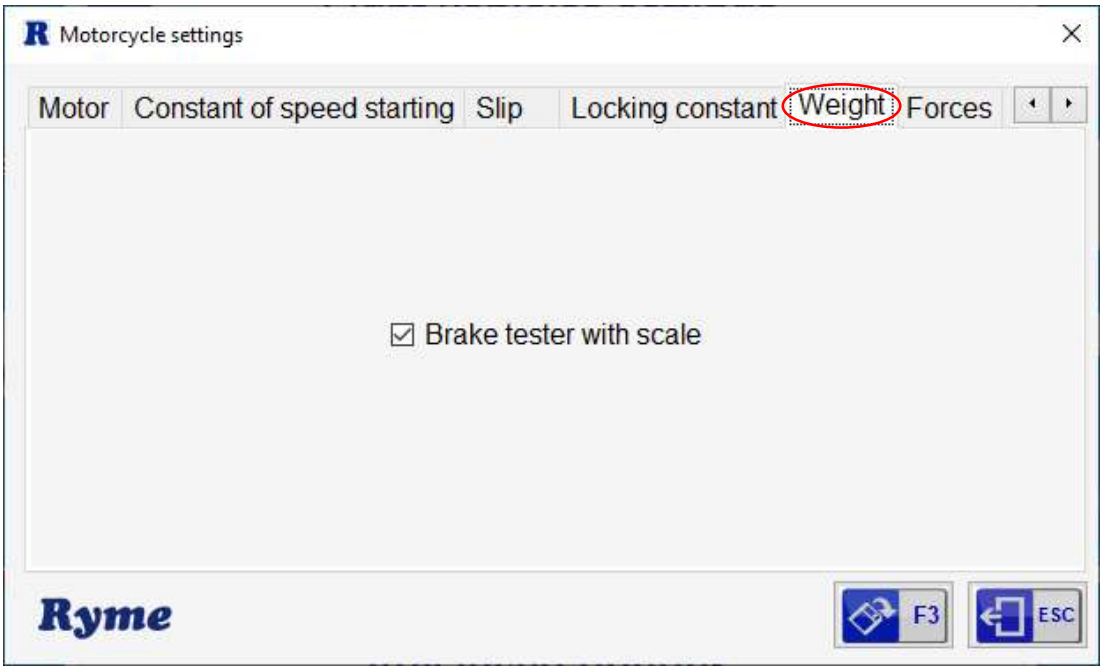


pri

64 Motorcycle Brake Tester Settings: Locking Constant

- **Locking (kN)**: maximum numerical value in kN, to lock the wheel in case a value higher than this is detected at motor start.
- **Locking time**: safety time during which the system will check if the initial value exceeds the one you set previously to avoid an erroneous manipulation of the vehicle/braking system.

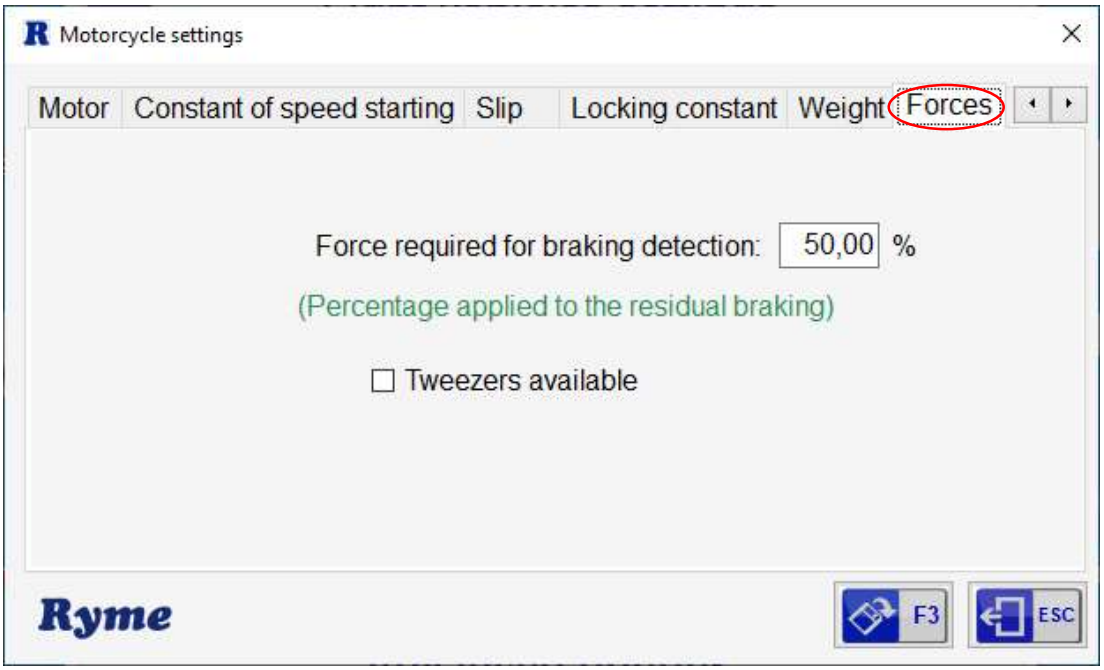
6.1.5 Weight



65 Motorcycle Brake Tester Settings: Weight

- **Brake tester with scale**: Select this box in case the equipment has this option.

6.1.6 Forces

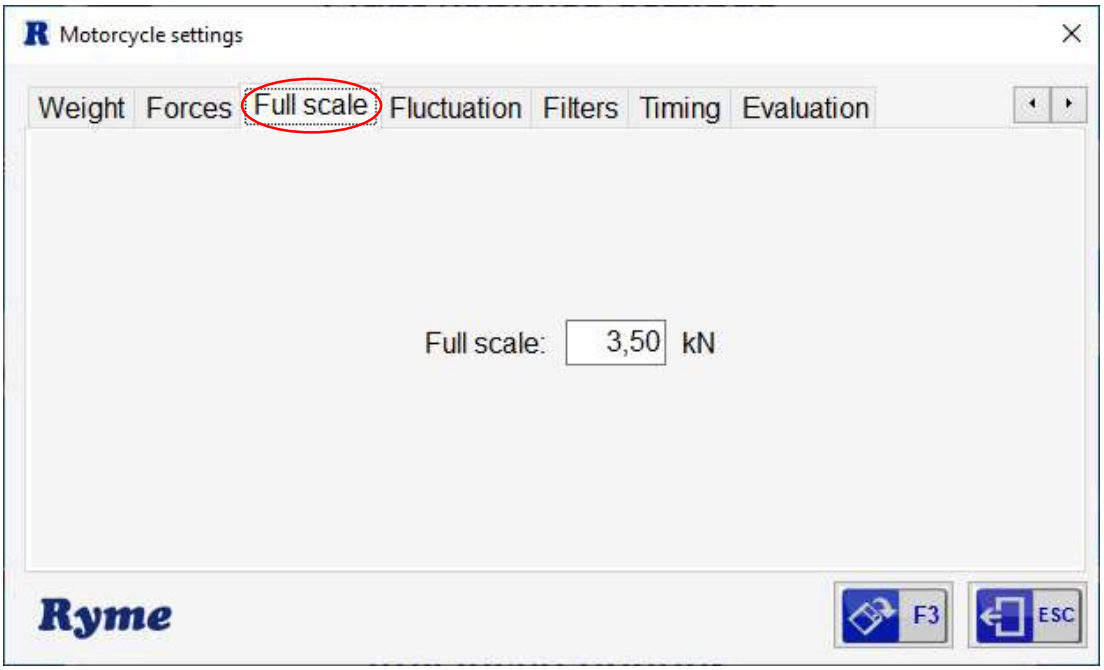


66 Motorcycle Brake Tester Setting: Forces

- **Force required for braking detection (percentage)**: Percentage value applied to residual braking, from which the system will consider braking and start collecting data on the wheel.

(E.g.: 0.10kN+50%=0.15kN, from this value the system will consider it braked, saving the data for the maximum braking value).

6.1.7 Maximum Scale Range

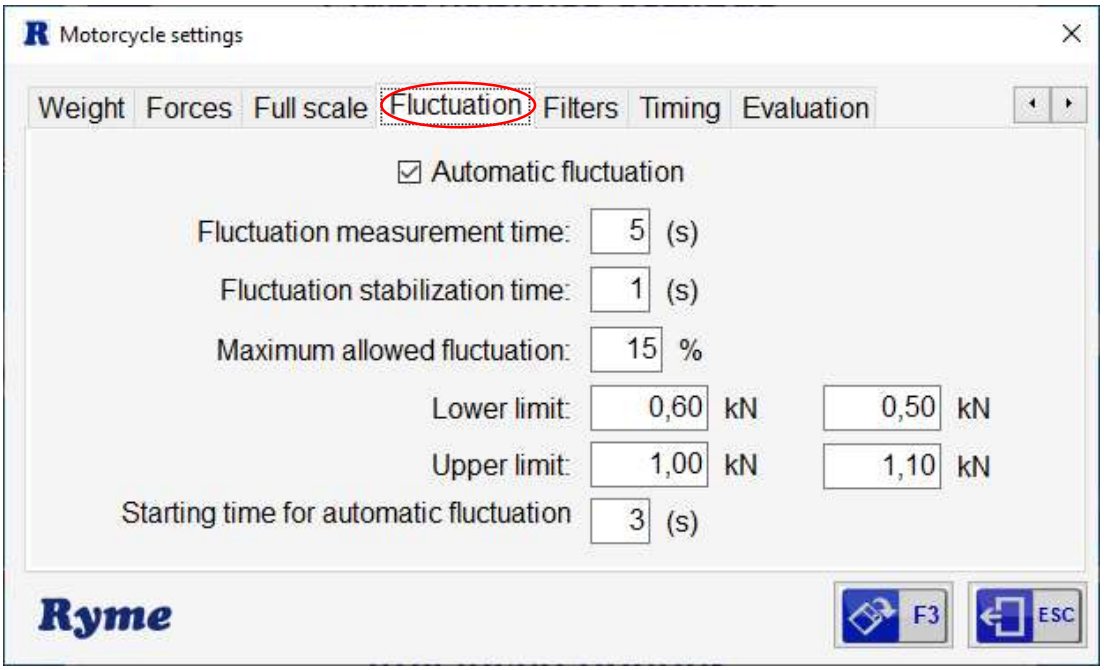


67 Motorcycle Brake Tester Settings: Maximum Scale Range

- **Maximum Scale Range (kN)**: Numerical value in kN of the maximum scale range that you will see on the measurement clocks of the brake tester during the test and calibration.

IMPORTANT: Set this value before calibrating, as the values on the electronic board will be adjusted accordingly.

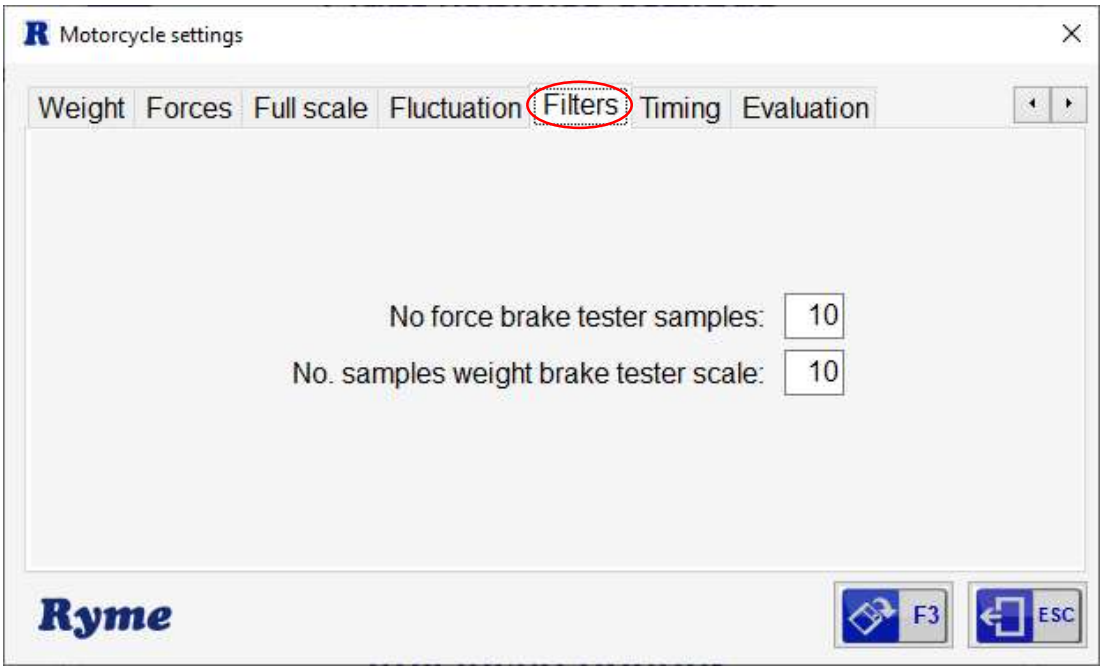
6.1.8 Fluctuation



68 Motorcycle Brake Tester Setting: Fluctuation

- **Automatic fluctuation**: Select this option in case you want to perform the measurement of the fluctuation of the brakes always automatically. Otherwise, it will be activated manually for each axle measurement.
- **Fluctuation measurement time (seconds)**: Value in seconds to perform the fluctuation measurement.
- **Fluctuation stabilization time (seconds)**: time before starting with the fluctuation measurement, so that the technician can stabilize the force within the range of the gauge graph measuring fluctuation.
- **Maximum allowed fluctuation (percentage)**: maximum percentage value admitted, for the validation of the fluctuation test.
- **Lower limit (kN)**: kN value of the lower limit of the range for the fluctuation measurement.
- **Upper limit (kN)**: kN value of the upper limit of the range for fluctuation measurement.
- **Starting time for automatic fluctuation measurement (seconds):** waiting time after the measurement of the residual force value in the wheels that will take the gauge graphs measuring fluctuation to appear automatically.

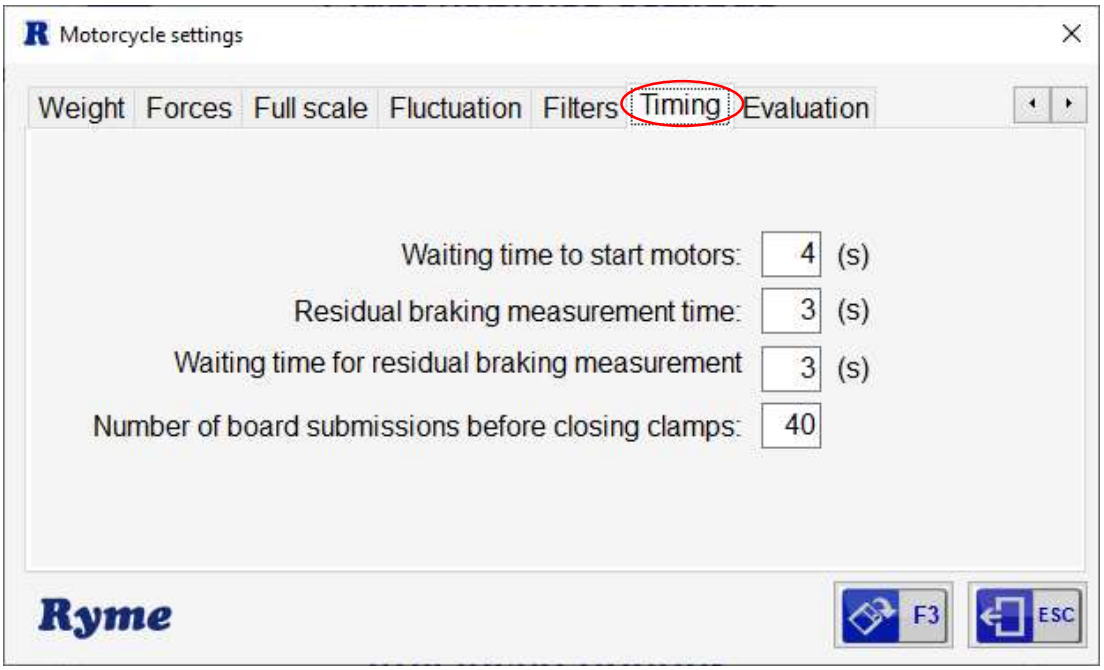
6.1.9 Filters



69 Motorcycle Brake Tester Settings: Filters

- **Number of brake tester force samples**: numerical value of the data to be taken for the smoothing of the data obtained from the left wheel force.
- **Number of brake tester weight samples**: numerical value of the points to be taken for smoothing the data obtained from the wheel weight

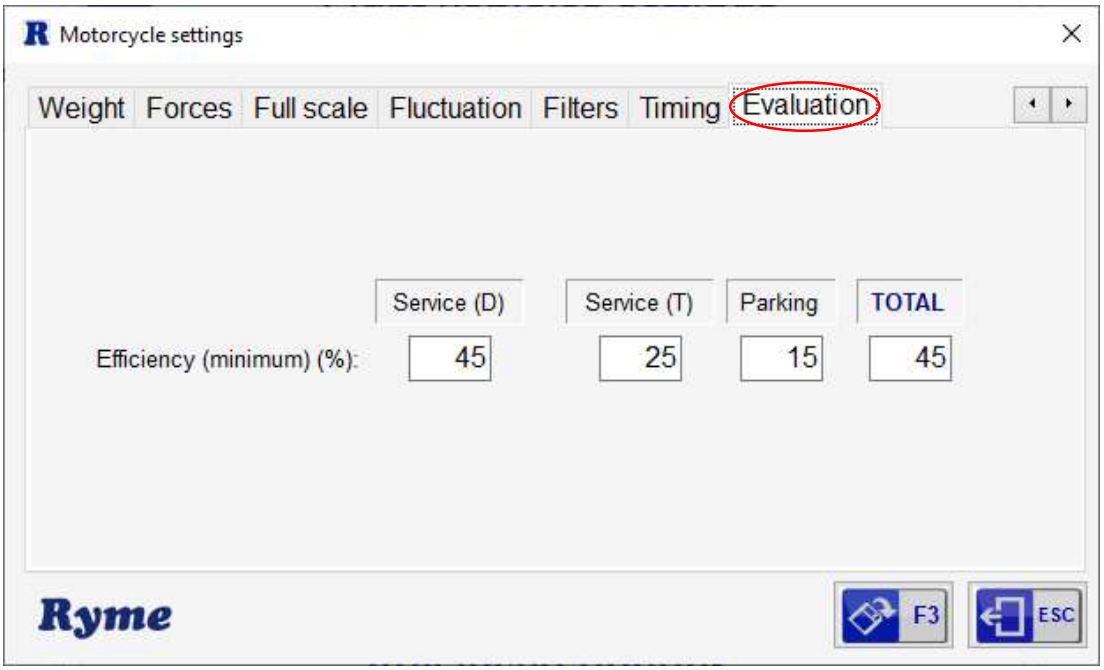
6.1.10 Timing



70 Motorcycle Brake Tester Settings: Timing

- **Timeout to start motors (seconds)**: value, in seconds, of the waiting time from the moment the vehicle is detected until the motors are started.
- **Residual braking measurement time (seconds)**: value, in seconds, of the time that the residual braking measurement will last.
- **Waiting time for residual braking measurement start (seconds)**: value, in seconds, of the waiting time for the residual braking measurement to start.
- **Number of board submissions before closing clamps**: Number of samples that will be counted before the system, once it detects presence, closes the clamps. This delay system will be configurable for security reasons, depending on who is doing the test, a technician or the owner of the vehicle

6.1.11 Evaluation



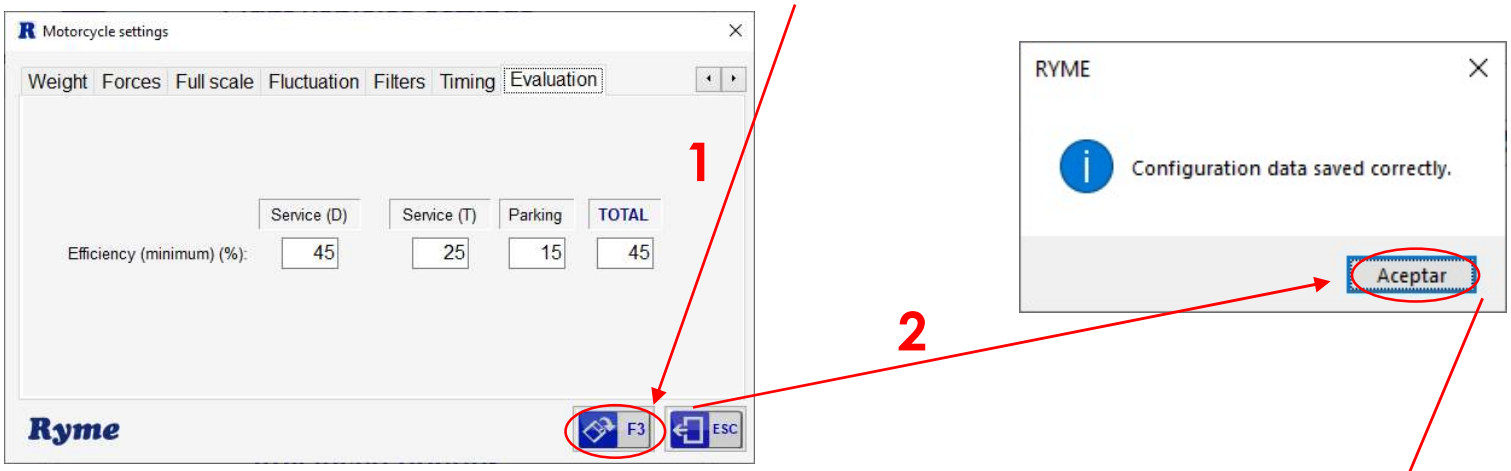
71 Motorcycle Brake Tester Settings: Evaluation

- **Efficiency (minimum) (percentage)**: configurable minimum percentage value of admission for the tests in the different brakes: Service (Front), Service (Rear), Parking and Total.

6.2 Save and Exit

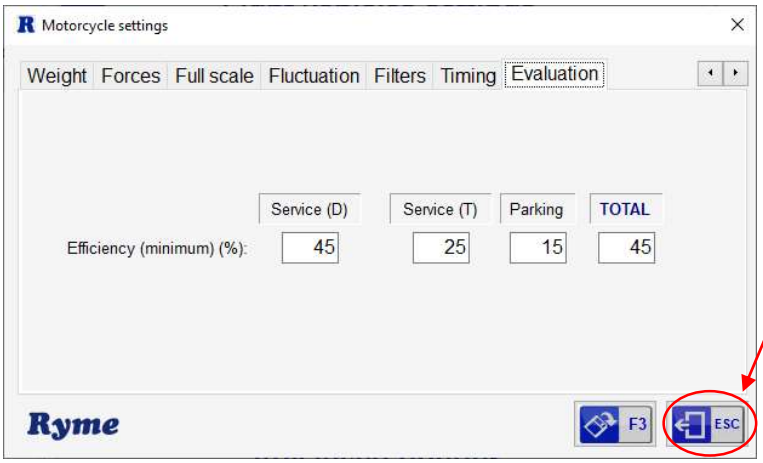
Before closing the settings window, either in a Side Slip Tester, Suspension Bench or Brake Tester settings; if you wish to save the modified parameters, click on the 

icon with the mouse or press 'F3' on the keyboard. You will then be notified with the message: 'Settings data successfully saved'.



Press accept and then click on the 

icon or press the 'Esc' key on the keyboard to exit to the main menu.



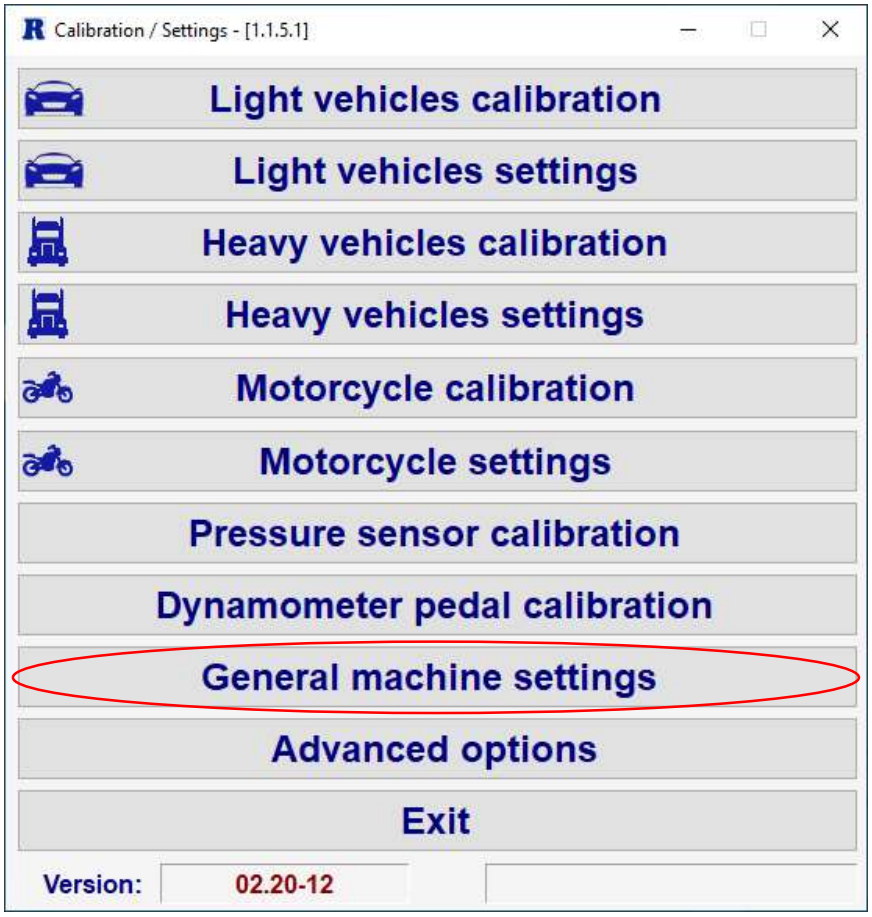
7 Calibration

7.1 Calibration for Light Vehicles Equipment

In order to configure the line, open the application RYME_CalConf_PCE.exe:

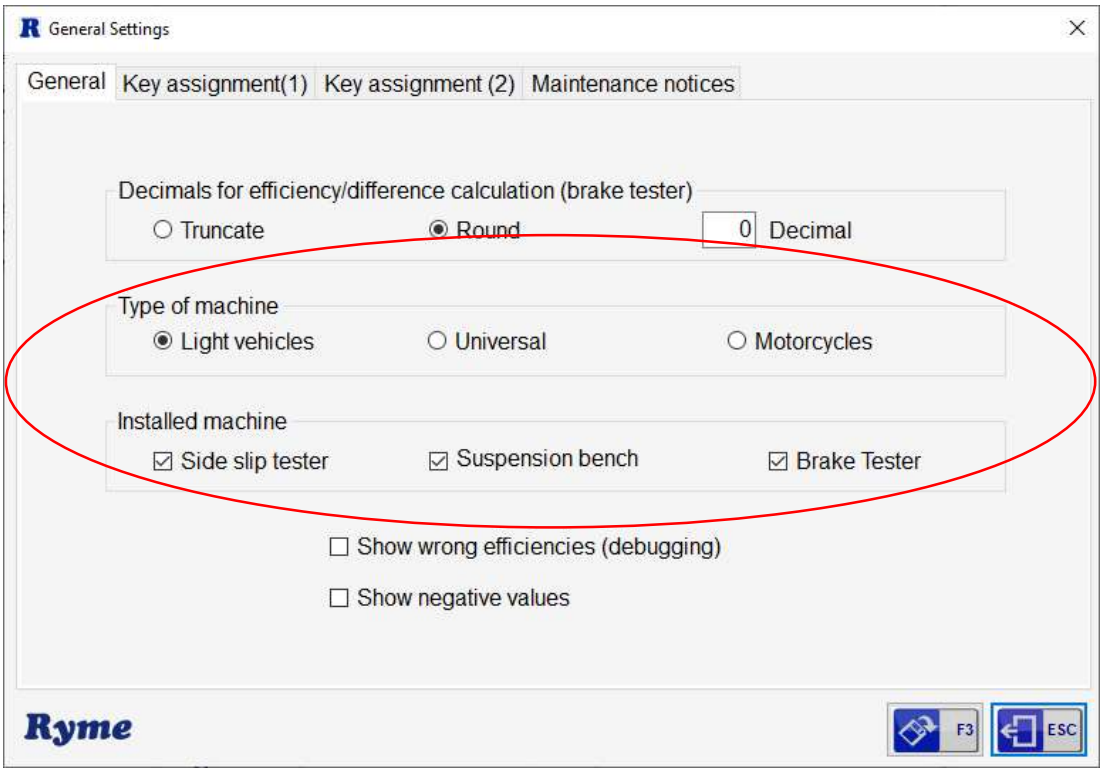
72 RYME_CalConf_PCE.exe application

To correctly calibrate the light vehicles brake tester, it is mandatory to configure the installed machine in the Main Menu option. **General machine settings**



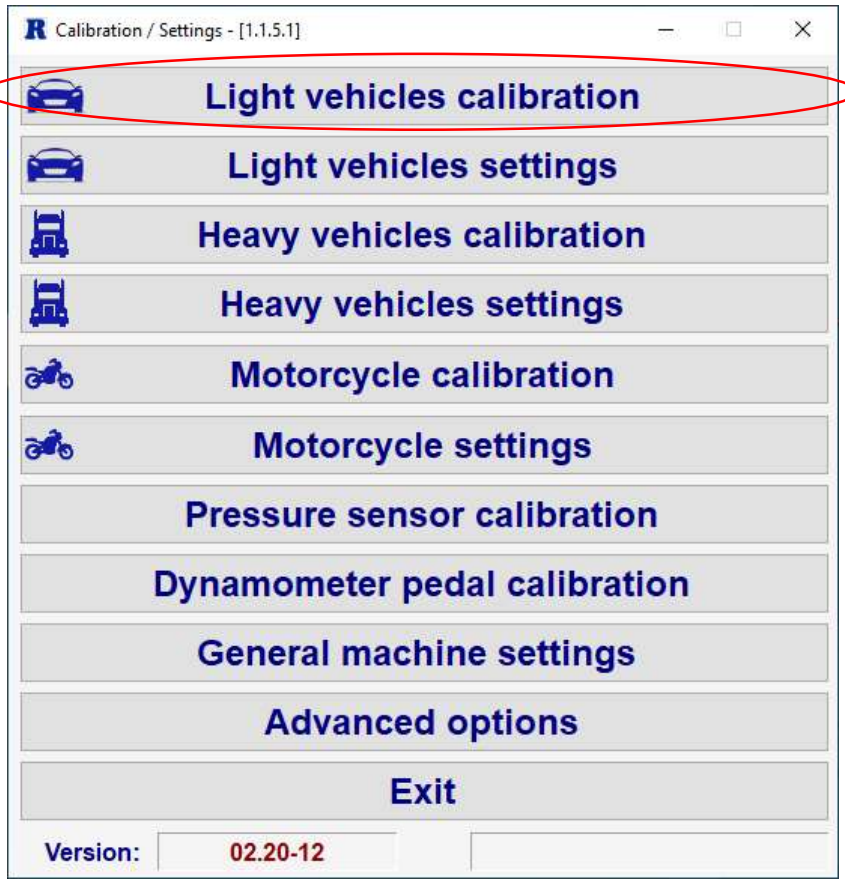
73 PCE Calibration/Settings Menu

By clicking on this icon, a window will appear in which you will be able to select the type of brake tester to be used and the machines installed in the line.



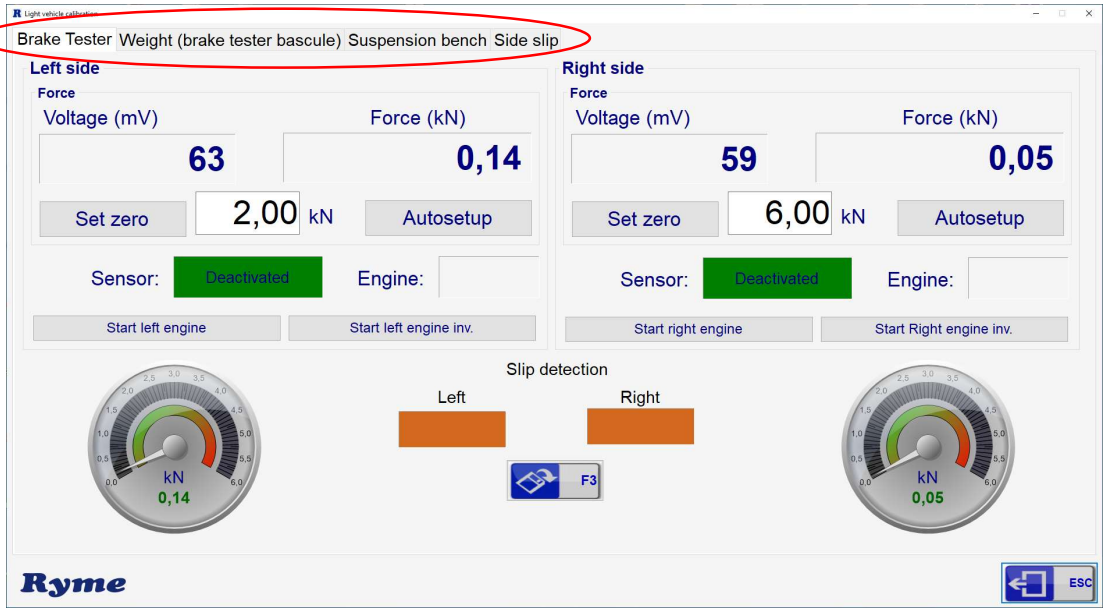
After this step, save the changes by pressing the 'F3' key on the keyboard or by clicking with the mouse on the  icon and exit this window by pressing the 'Esc' key on the keyboard or by clicking with the mouse on the  icon to start the calibration.

Open the Settings window, from which you will be able to select the operation you want to perform. To adjust the parameters, click with the mouse on the **Light vehicles calibration** icon, located at the top of the menu:



74 Settings Menu: Light Vehicles Calibration

By clicking on the different tabs with the mouse, you will be able to calibrate the machine:



75 Light Vehicles Calibration Window: Brake Tester

To make the necessary adjustments to the machines in the line, follow the this order:

- Side Slip Tester
- Suspension Bench
- Brake Tester/Weight

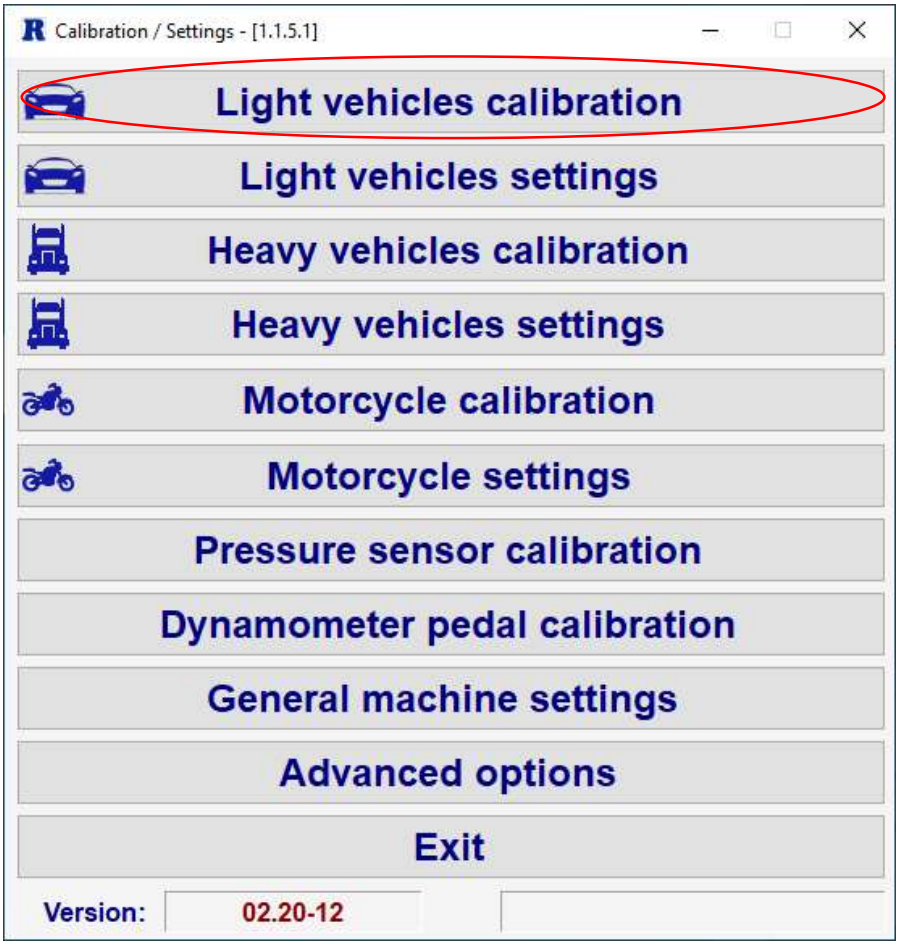
7.1.1 Light Vehicles Side Slip Tester Calibration

1.) Turn on the main switch on the console of the Light Vehicles Brake Tester

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe.**

3.) Click with the mouse on the 

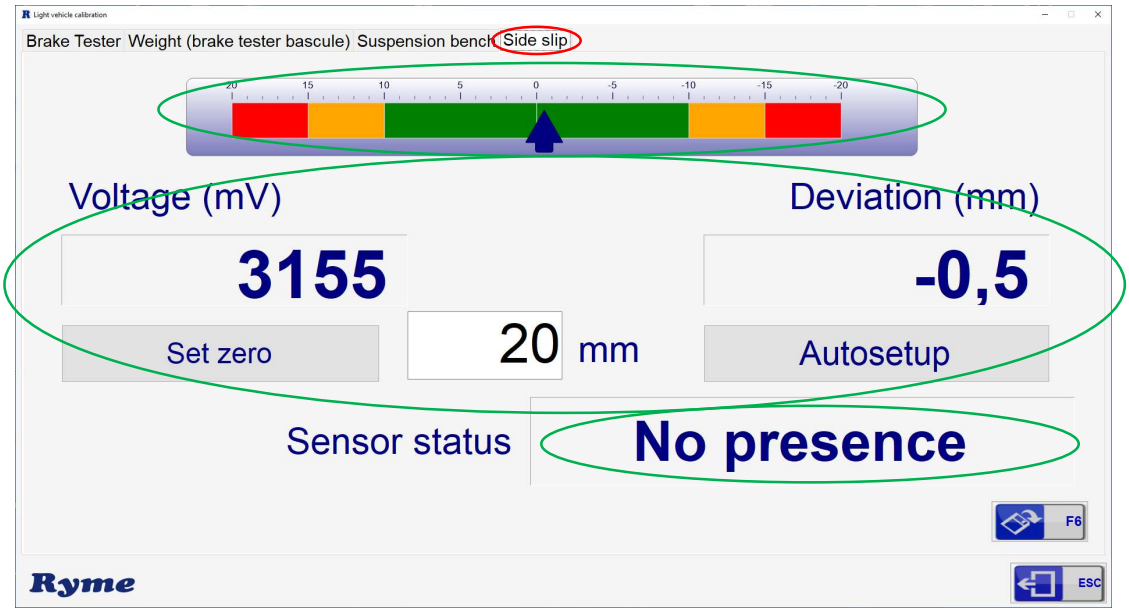
icon.



76 Settings Menu: Light Vehicles Calibration

a window will appear where you will calibrate/adjust the machine:

In the Side Slip Tester tab you will start with making the necessary calibration and adjustments:



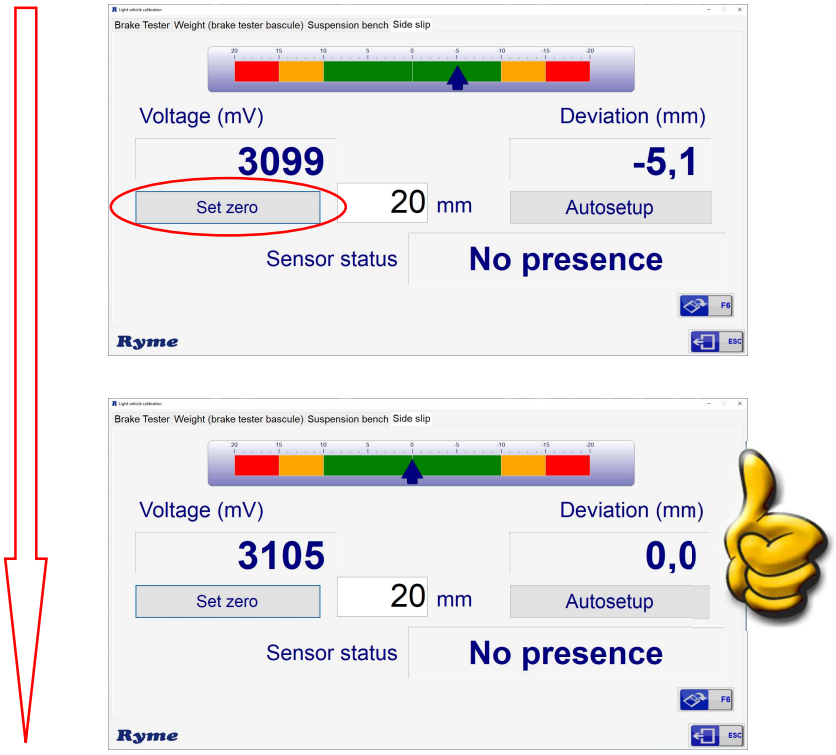
77 Light Vehicles Calibration Menu: Side Slip Tester

In this screen of calibration/adjustment you are shown: in the upper part, a bar where you can observe the immediate value in a graphic way, and in the lower part, the taking of the measurements that informs you about:

- The voltage in millivolts of the measurement potentiometer.
- The deviation in millimetres measured by the potentiometer, calculated with the input voltage and the calibration values.
- The sensor condition: you can check the condition of the side slip tester's input sensor by changing from non-presence to presence when detecting or not the vehicle on the slip tester. (As it is an inductive sensor, you can check its correct operation by placing a metal element on it).

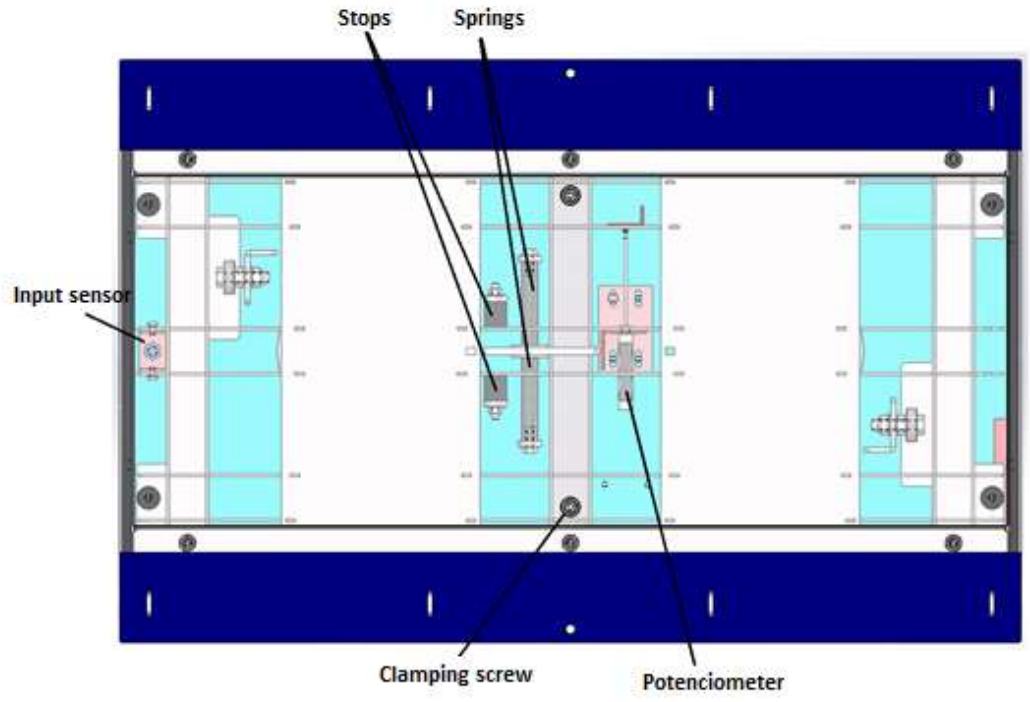
78 Side Slip Tester Calibration Menu: Sensor condition

5.) To perform the calibration or adjustment leave the side slip tester centered (dead point), click on the icon Set zero.



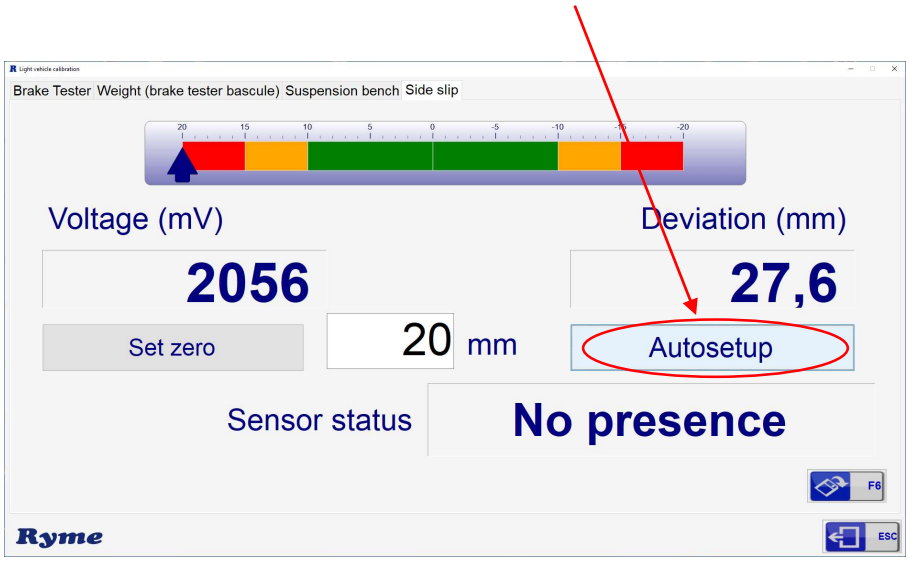
and then set the maximum deviation of the side slip tester, which by default will be 20mm.

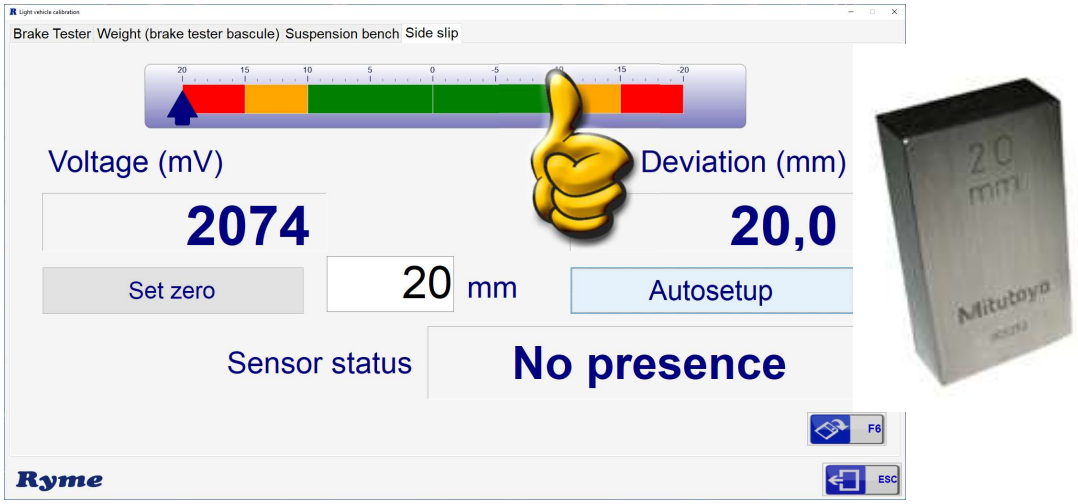
6.) Place the side slip tester at the right end and insert the 20mm gauge between the dolly and the fixed platform.



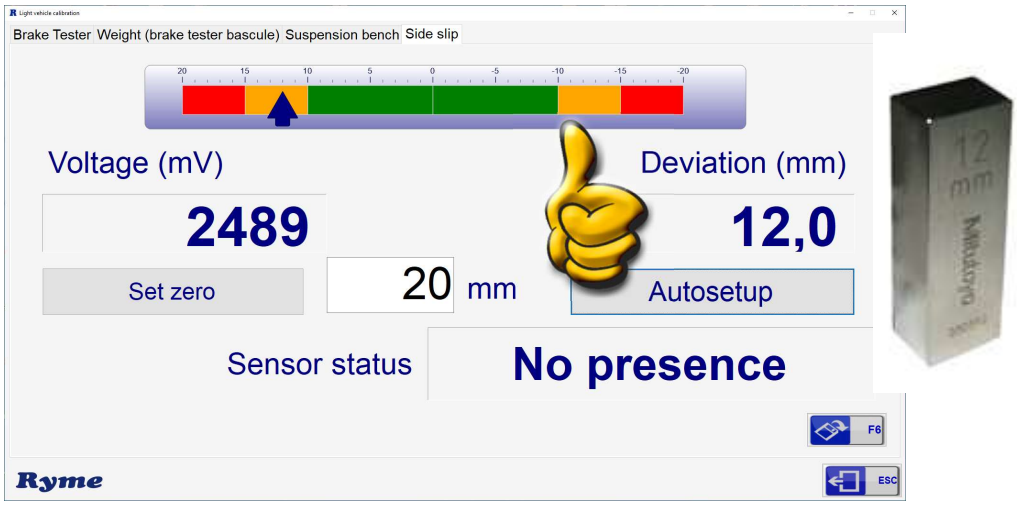
7.) Release the side slip tester, making this stop with the gauge and the device itself.

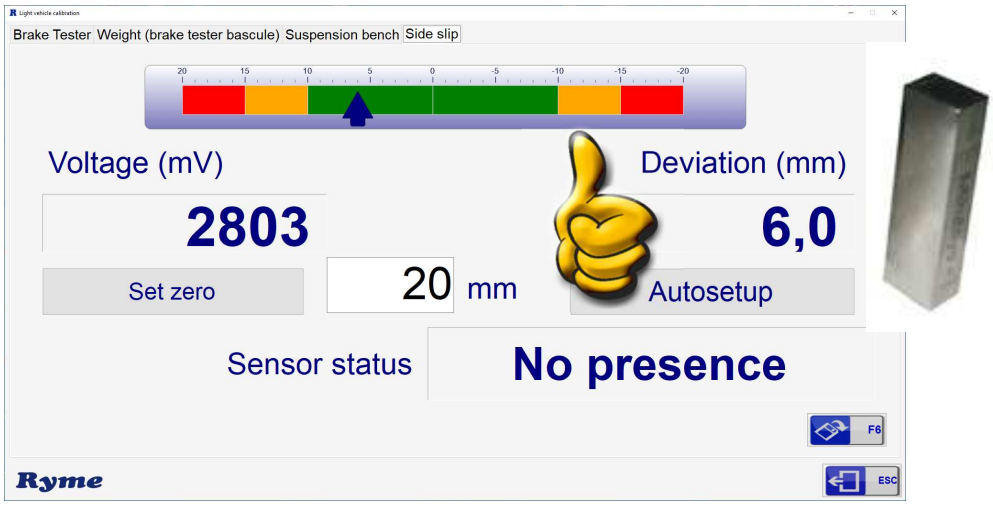
8.) Click on the icon Autosetup.





9.) Next, remove the gauge and check with the other ones (of different size) that the value on the screen corresponds to the chosen gauge.

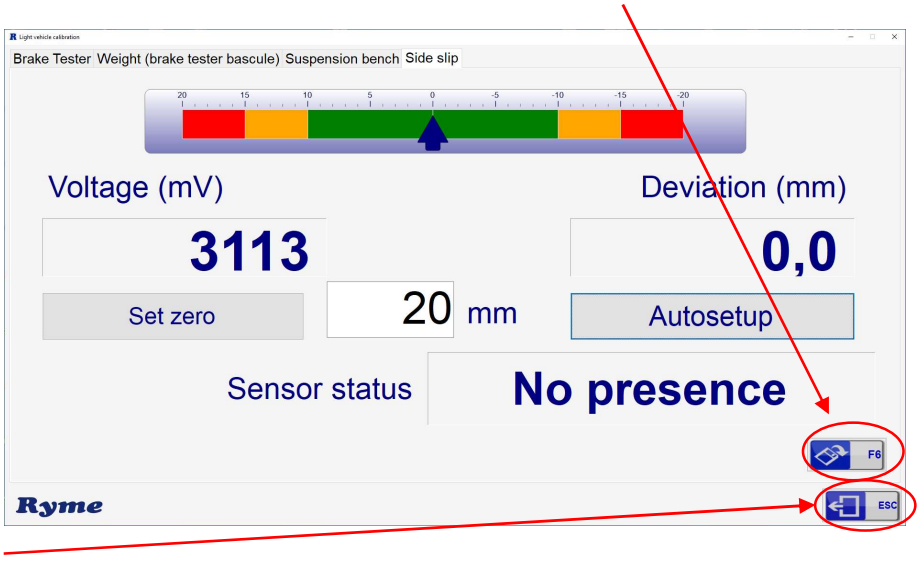




10.) Following these steps you will calibrate the side slip tester.

11.) Check towards the opposite side, with the same gauges and following the same process in an inverse way that the measurements are the same, but with a negative sign.

12.) To save the settings it is important to make sure you press the 'F6' key on the keyboard or click with the mouse on the  icon.



To exit the screen, press the 'Esc' key on the keyboard or click on the  icon.

7.1.2 Suspension Bench Calibration

- Objective

This procedure establishes the guidelines for the calibration of the scale in the Ryme® FRL line suspension bench.

- Scope

This procedure is applicable to Ryme® Suspension Bench models:

  - PCE (BSL/BSU)

- Personnel requirements

The personnel who will carry out the calibration must have the technical knowledge and appropriate training.

- Equipment and material

The list of material required to carry out the brake tester calibration is

  - Known weight

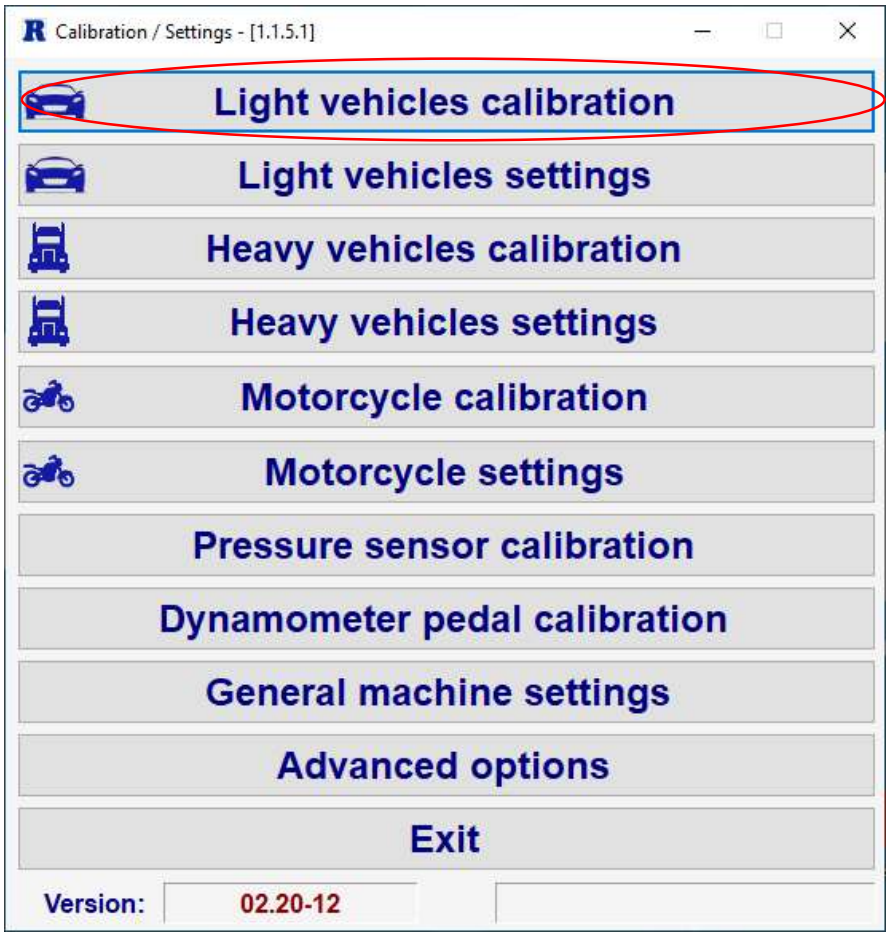
- Description of the process

1.) Turn on the main switch on the console of the Light Vehicles Brake Tester

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe**.

3.) Click with the mouse on the icon 

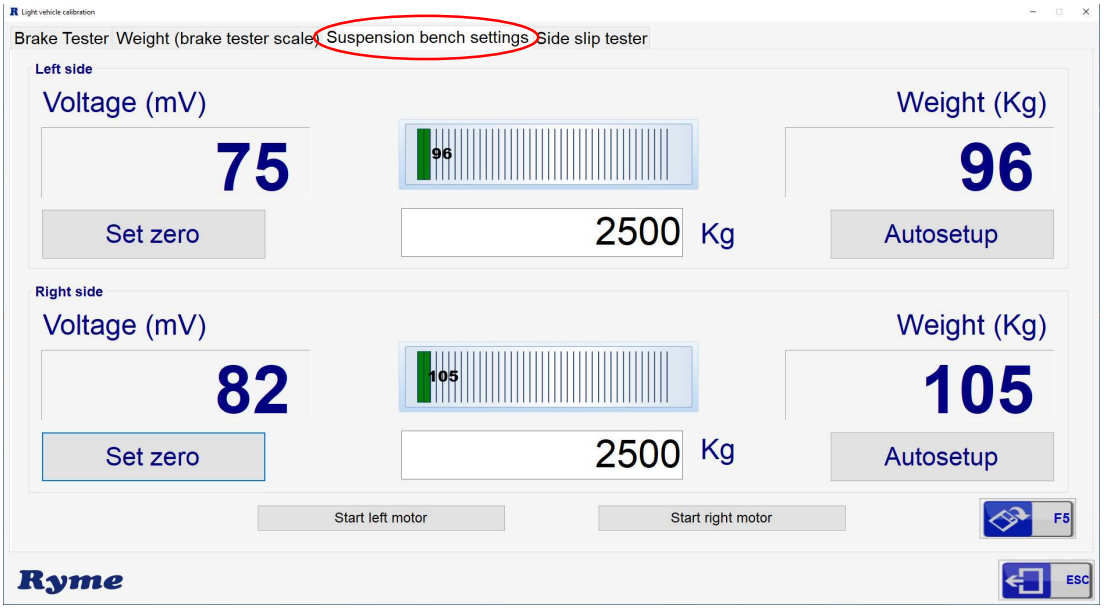
,



79 Settings Menu: Light Vehicles Calibration

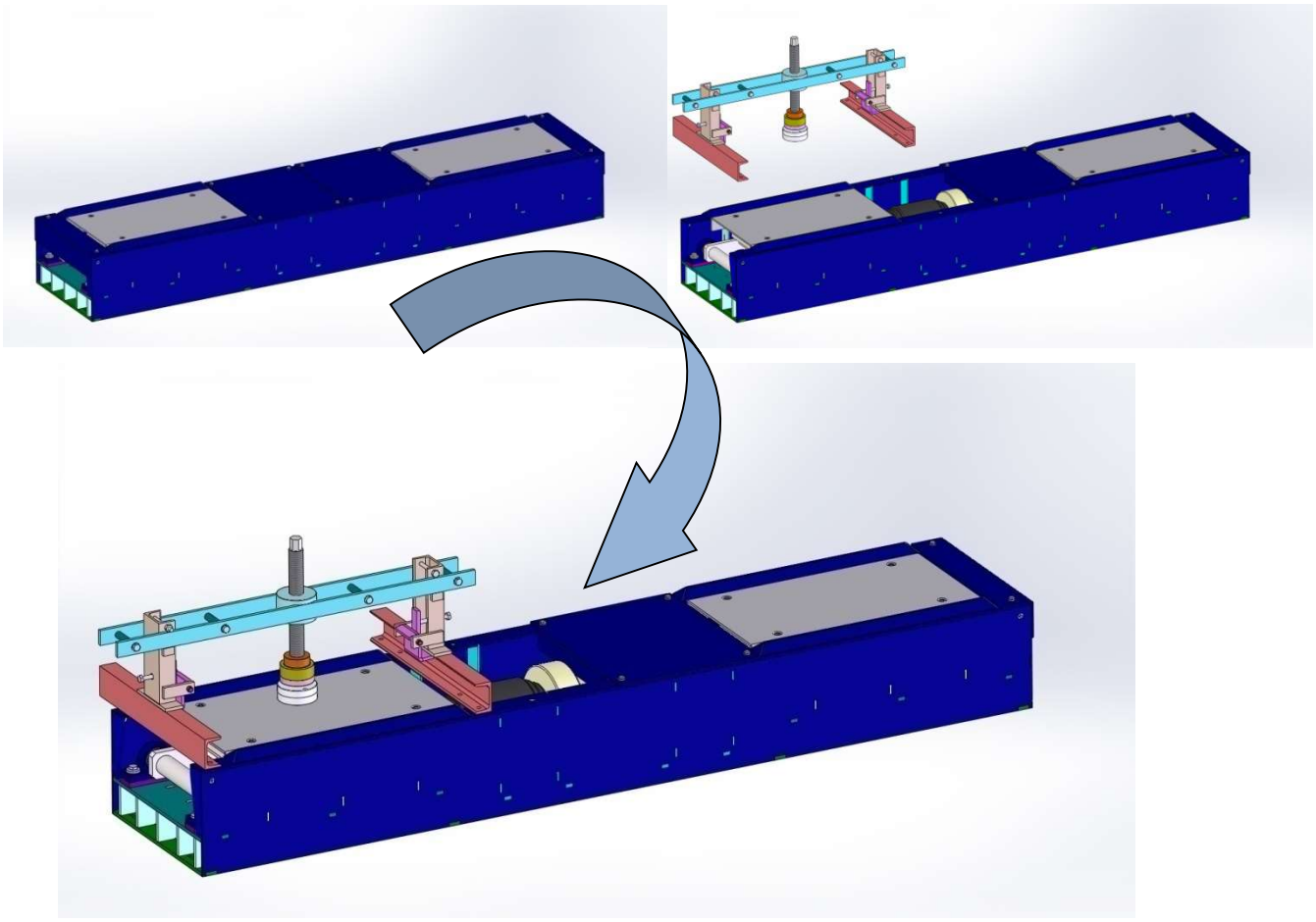
a window will appear where you can calibrate/adjust the device:

In the Suspension Bench tab, you will start performing the calibration/adjustment:

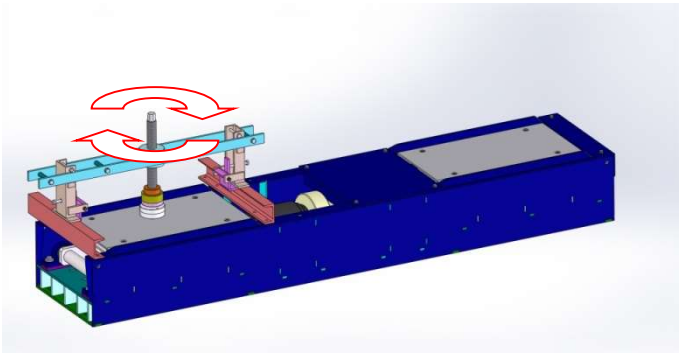


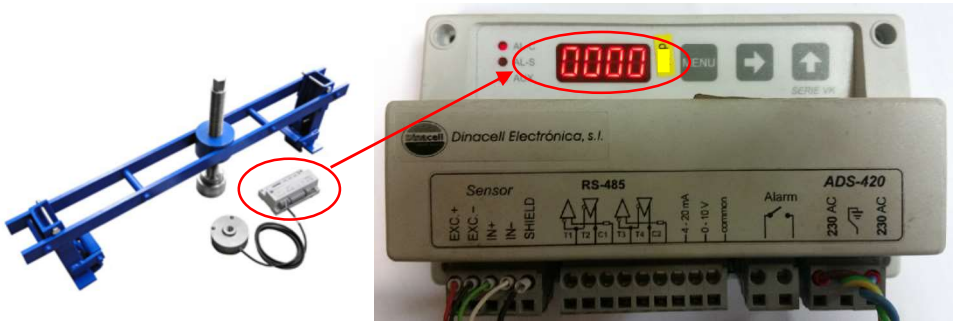
80 Light Vehicles Calibration Menu: Suspension Bench

4.) Place the calibration tool on the left side of the suspension bench.

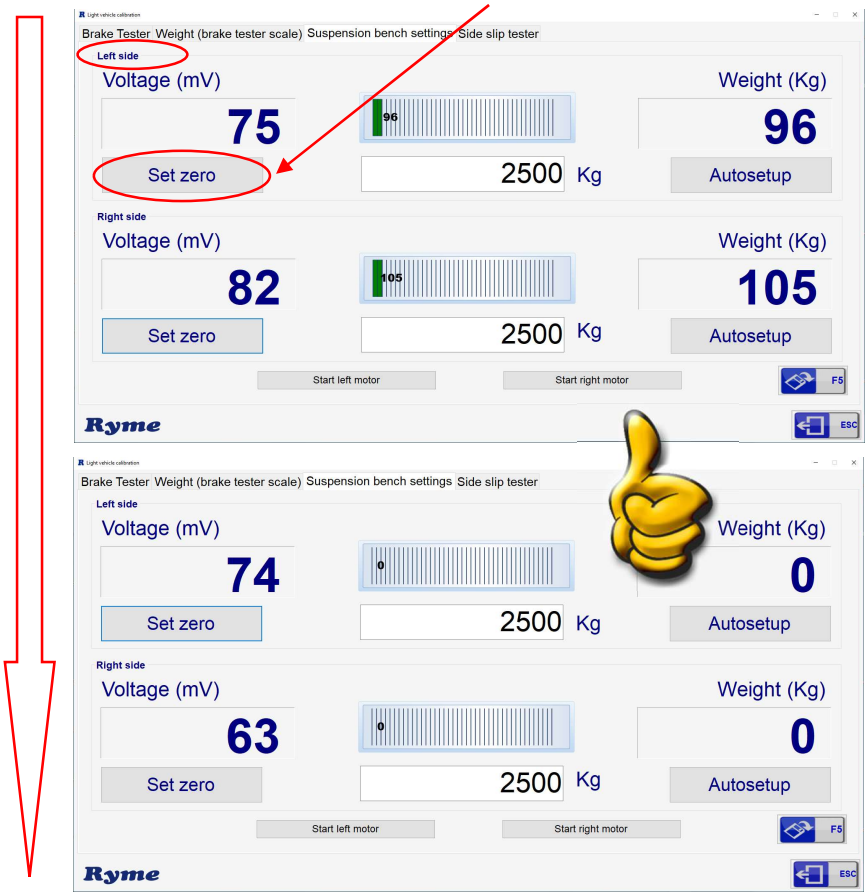


5.) Adjust the thread of the tool screw to the suspension bench tile, without touching it.

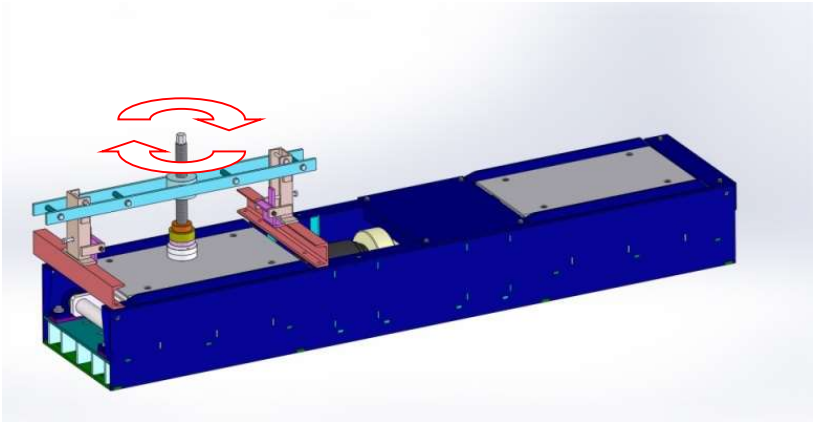


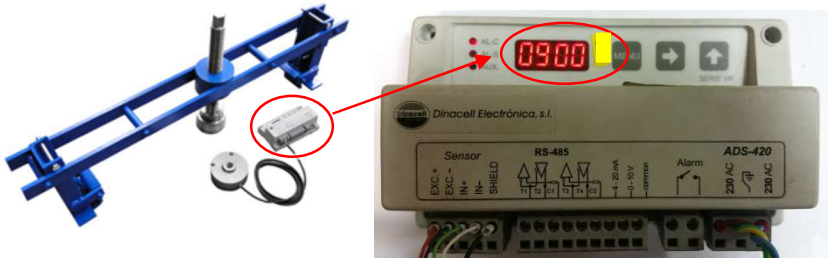


6.) Set by software the value zero. To do this, on the Suspension Bench calibration screen (left side), click on the Set zero icon with the mouse, without any weight on it.

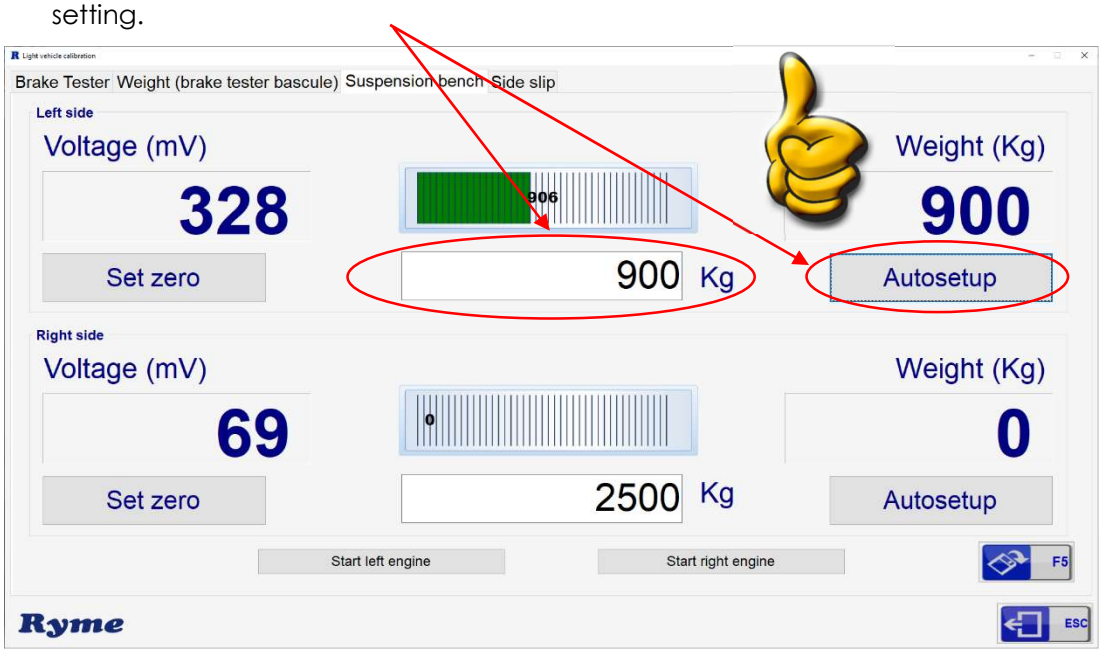


7.) Turn the screw of the tool until it marks a reference measurement, (left side in case you have enabled the weight per wheel and not per axle).

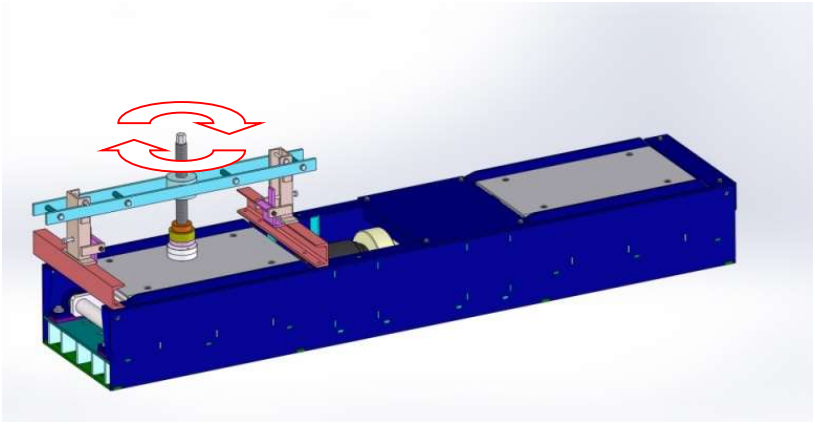


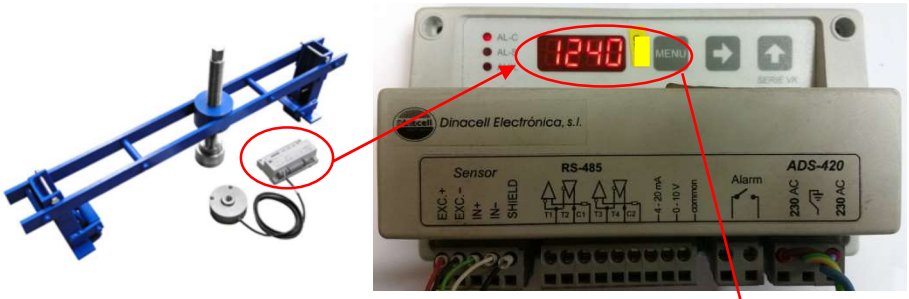


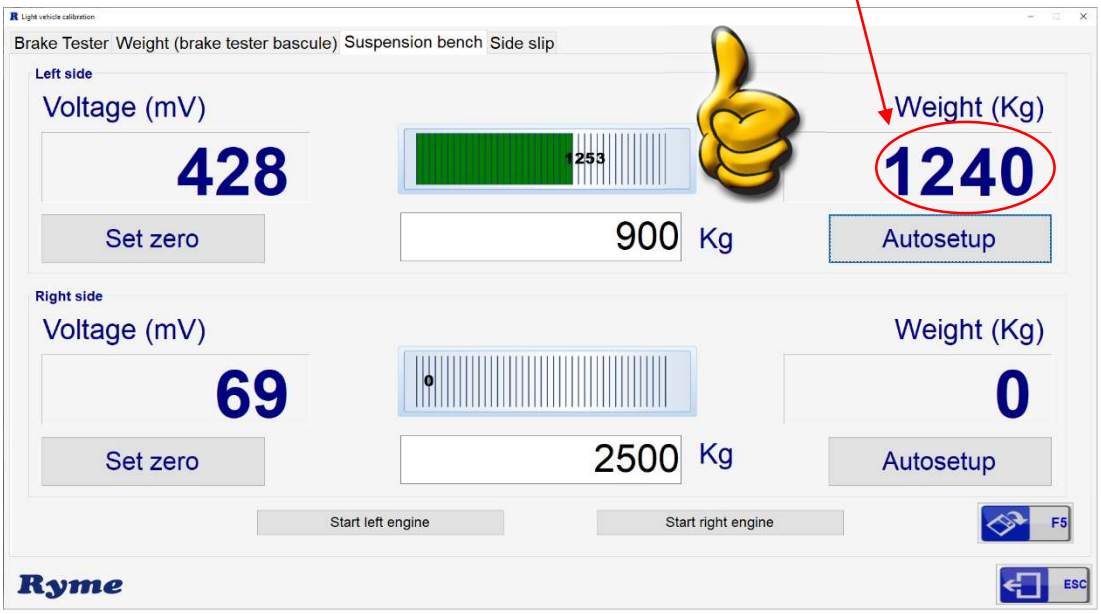
8.) Type in the known weight in the auto-adjustment window using the keyboard and click with the mouse Autosetup. A window appears to confirm the setting.



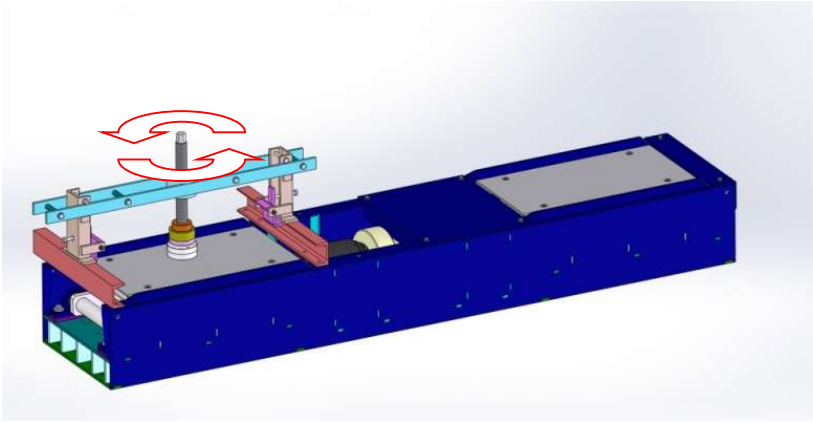
9.) Check with another weight (by turning the screw) that it shows the correct measurement:

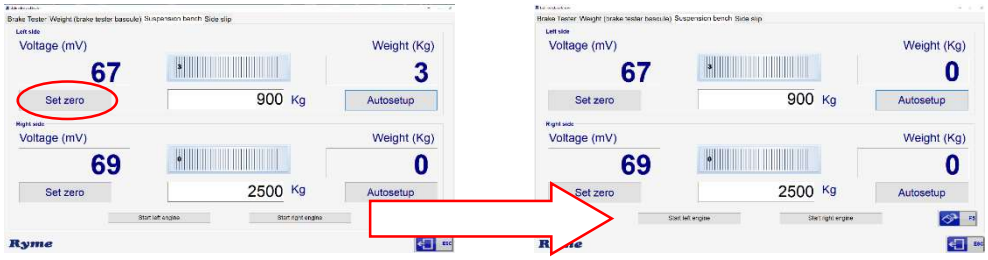






10.) After calibration, remove the tool and with nothing on the suspension bench click on the icon Set zero.





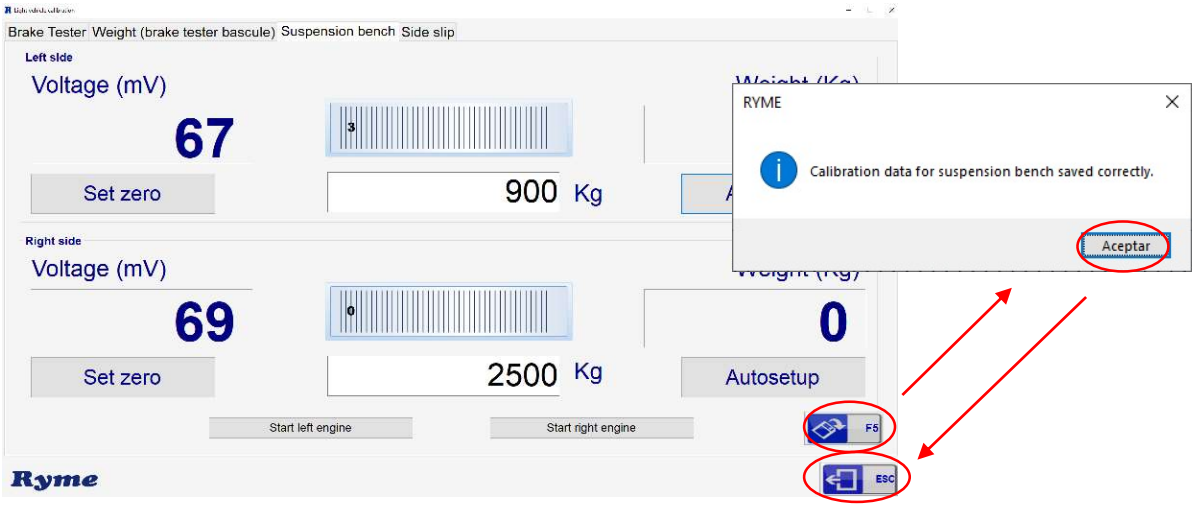
11.) Once the left side is calibrated, the right side has to be calibrated. For this purpose, steps 4 to 10 will be repeated, both inclusive, with the right side.

To save the calibration correctly it is important to make sure to press 'F5' on the keyboard or click with the mouse on the 

icon.

To exit, press the 'Esc' key on the keyboard or click on the 

icon.



7.1.3 Light Vehicles Brake Tester Calibration

- Objective

This procedure establishes the guidelines for the calibration of Ryme® roller brake testers.

- Scope

This procedure is applied by the Ryme® brake testers of the following models:

  - PCE (FRL)

- Reference documentation

  - Expression of the uncertainty of measurement in the calibrations. CEA-ENAC-LC/02 Guide.

- Personnel requirements

The personnel who will carry out the calibration must have the technical knowledge and appropriate training.

- Equipment and material

The list of material required to carry out the brake tester calibration is

  - FRL brake tester bar
  - 30 kg weight
  - Leveler tool

- Description of the process

  - **Prequisites**

  - To perform the calibration, the torque (moment) of forces measured with the gauge will be simulated, giving it a known value (calculated by elementary physical principles) and compared with the values read by the brake tester indicator.

The moment of a force is given by the expression:

$$\vec{M} = \vec{r} \times \vec{F} = |\vec{r}| \cdot |\vec{F}| \cdot \operatorname{sen}(\alpha)$$

Where the moment ($\vec{M}$) is the cross product of the position vector ($\vec{r}$) (distance from the point of the application of force to the axis of rotation) by the applied ($\vec{F}$) force (which in this case will be a weight), in other words, the product of the modules of said vectors by the sine of the angle ($\alpha=\pi/2$) they form between them.

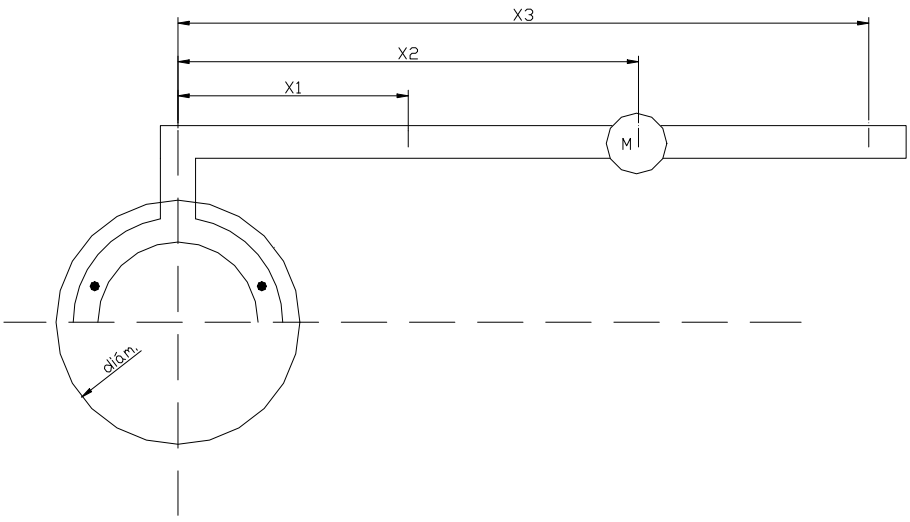
During the calibration, a bar is adjusted to the motor, which produces a moment over the brake tester. If on top of that a mass is placed in different points, different moment values can be applied to the brake tester.

As it is a vectorial magnitude, the resulting moment is the vectorial sum of both moments, which because the applied force is that of gravity and the position vector is always perpendicular to it, its sum is Scalar.

- Identify the brake tester by its serial number or any other manufacturing mark and take the data on the corresponding data collection sheet.
- Remove the brake tester covers, both the outer and central ones.
- Carry out a preliminary visual inspection of the interior, noting any anomalies observed on the data collection sheet.

Placement of the calibration bar

The bracket calibration bar for light vehicle and motorcycle brake testers should be placed on the engine mount on one side in the holes provided for this purpose. This will serve as a support for the calibration, securing it tightly with screws and nuts. Check with the leveler tool its horizontality.



81 Light Vehicles Calibration Lever

- **Calibration process**

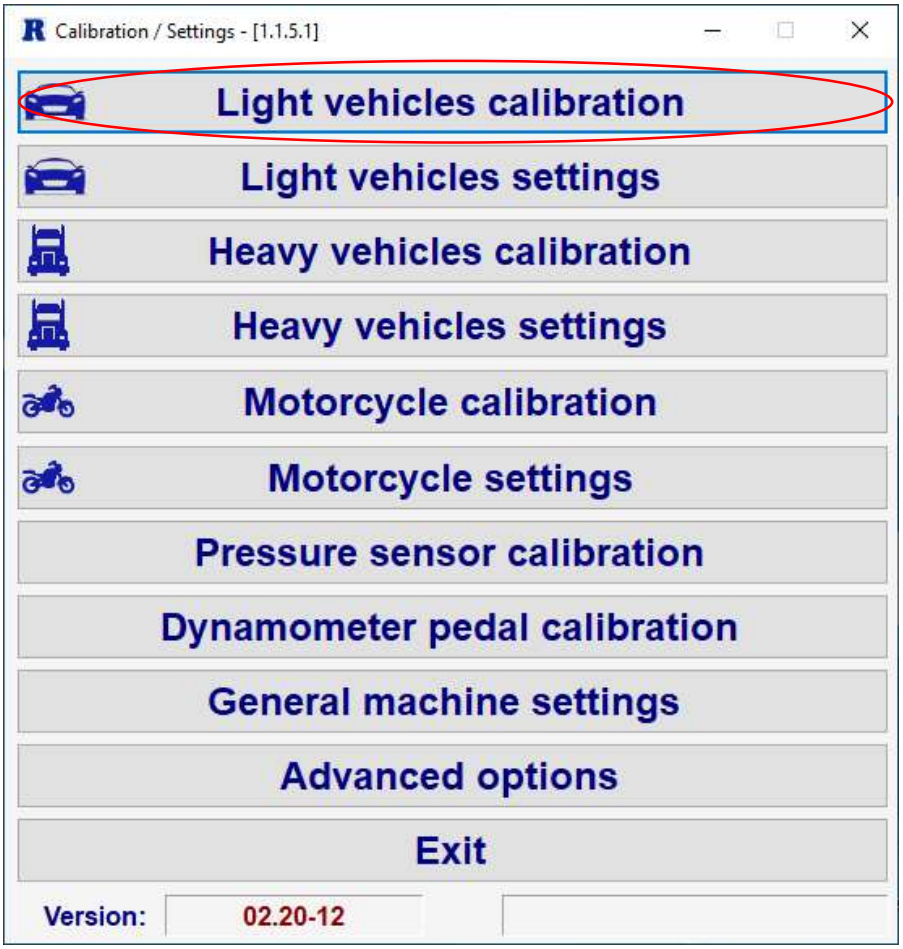
BRAKE TESTER:

1.) Turn on the main switch on the console of the Light Vehicles Brake Tester.

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe**.

3.) Click with the mouse on the icon 

,

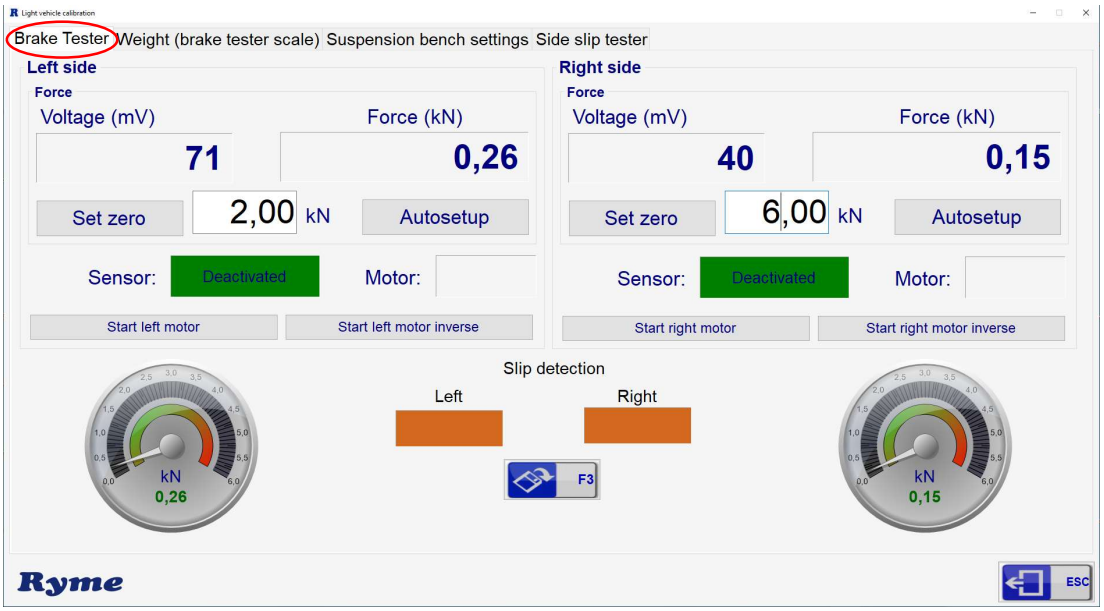


82 Settings Menu: Light Vehicles Calibration

a window will appear where you will calibrate/adjust the machine:

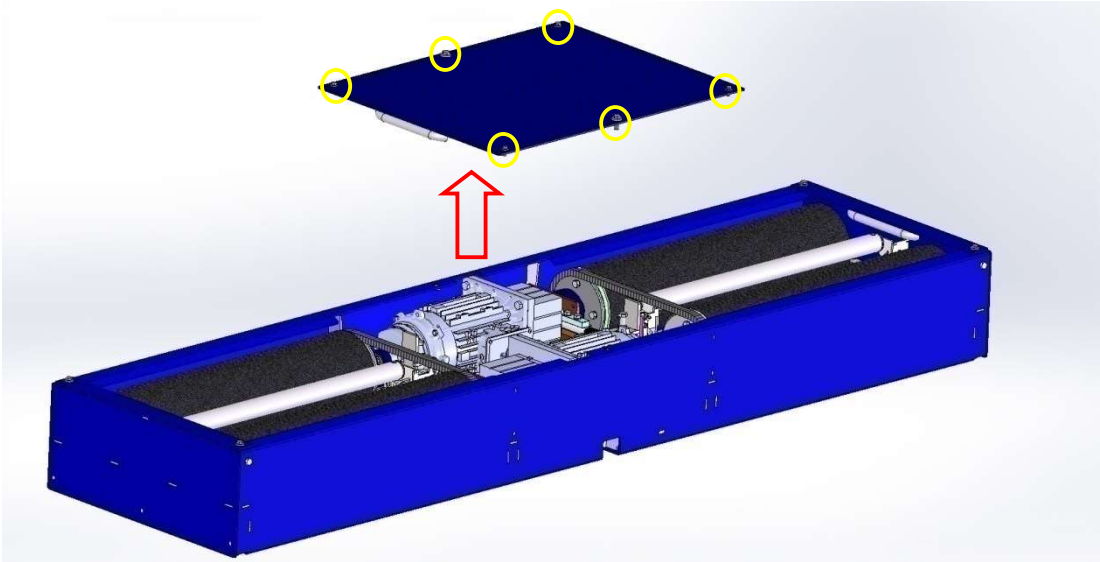
CAUTION: Turn off all protections before performing any operations.

In the Brake Tester tab, you will begin to perform the calibration/adjustment:

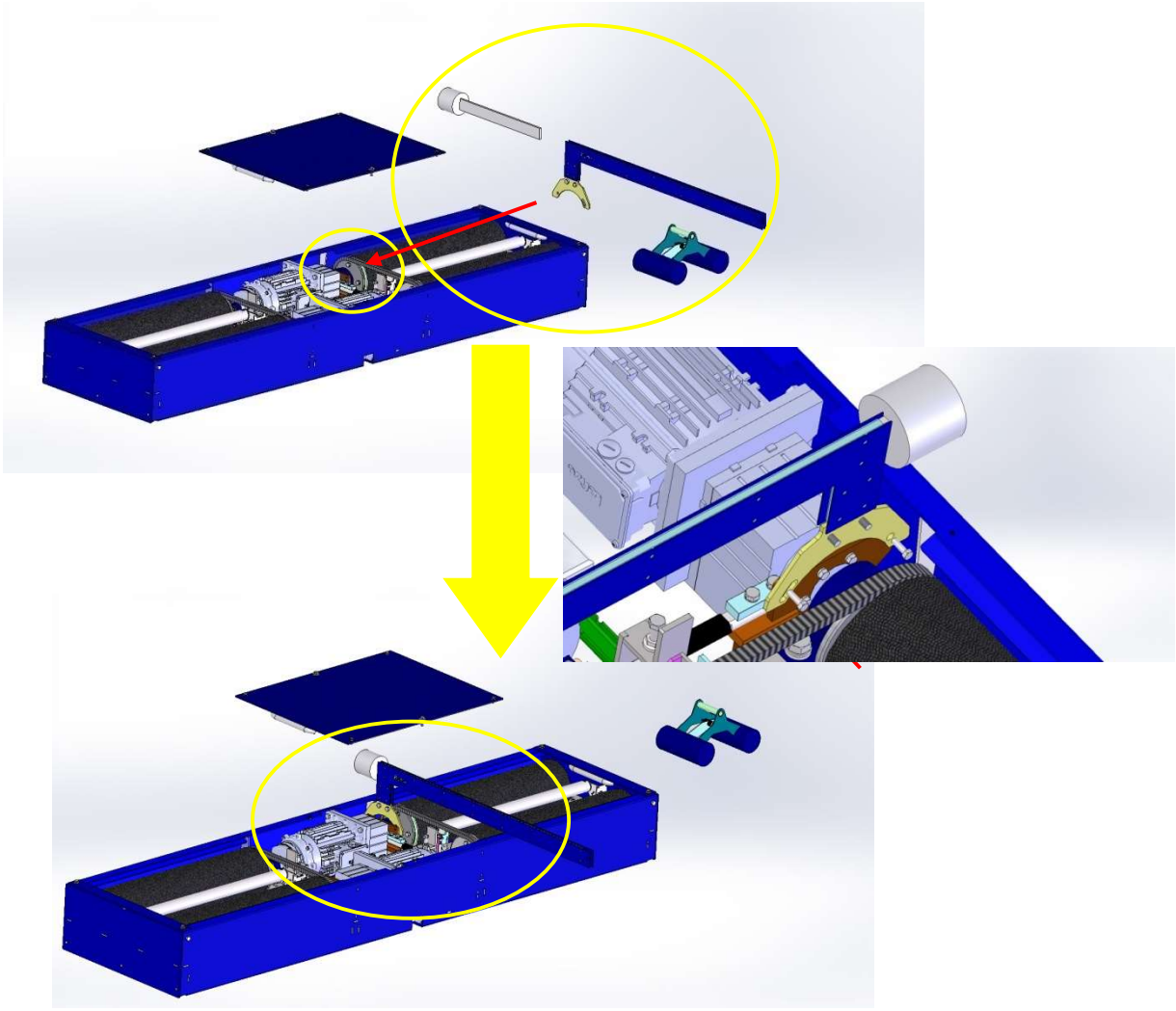


83 Calibration/adjustment tab for light vehicles

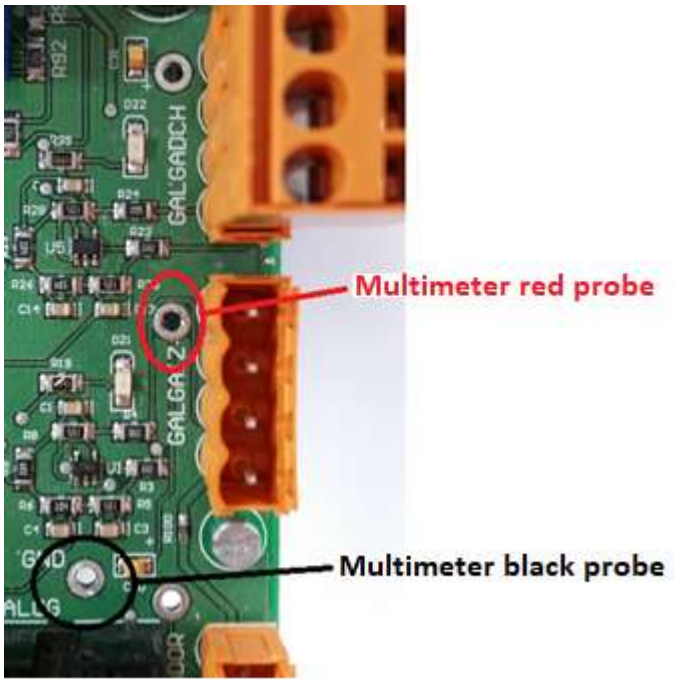
4.) Remove the screws and remove the center cover.



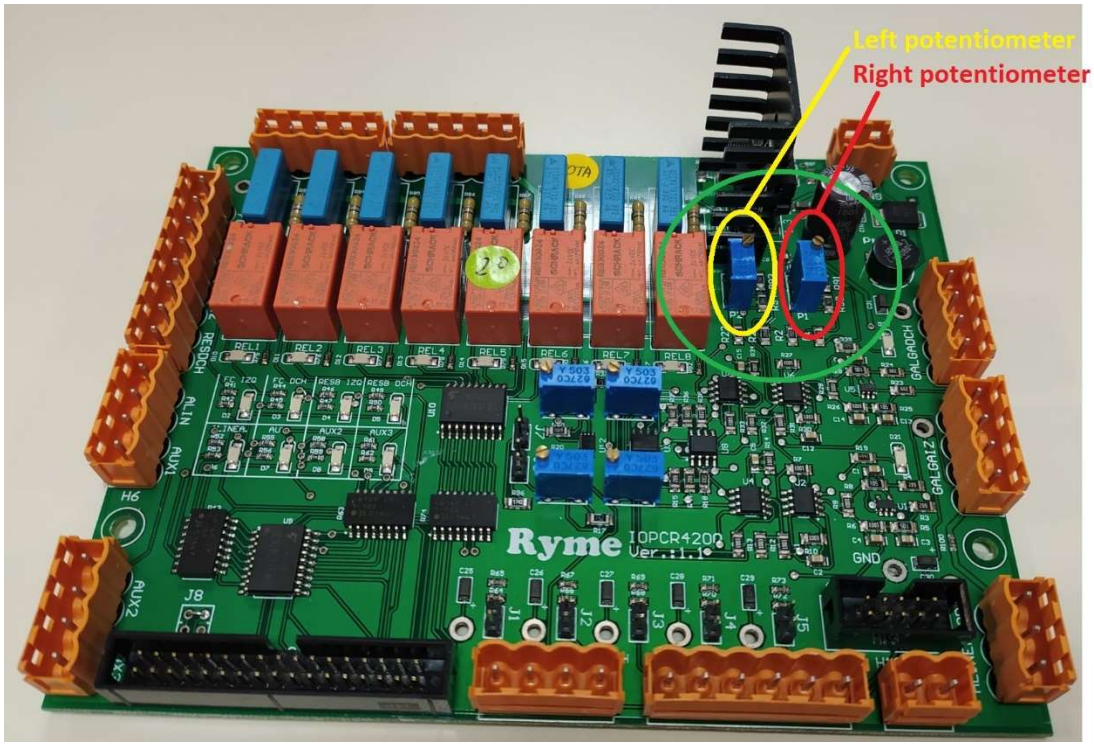
5.) Place the calibration bar on the left side using the two fastening screws, it is important that it is levelled.



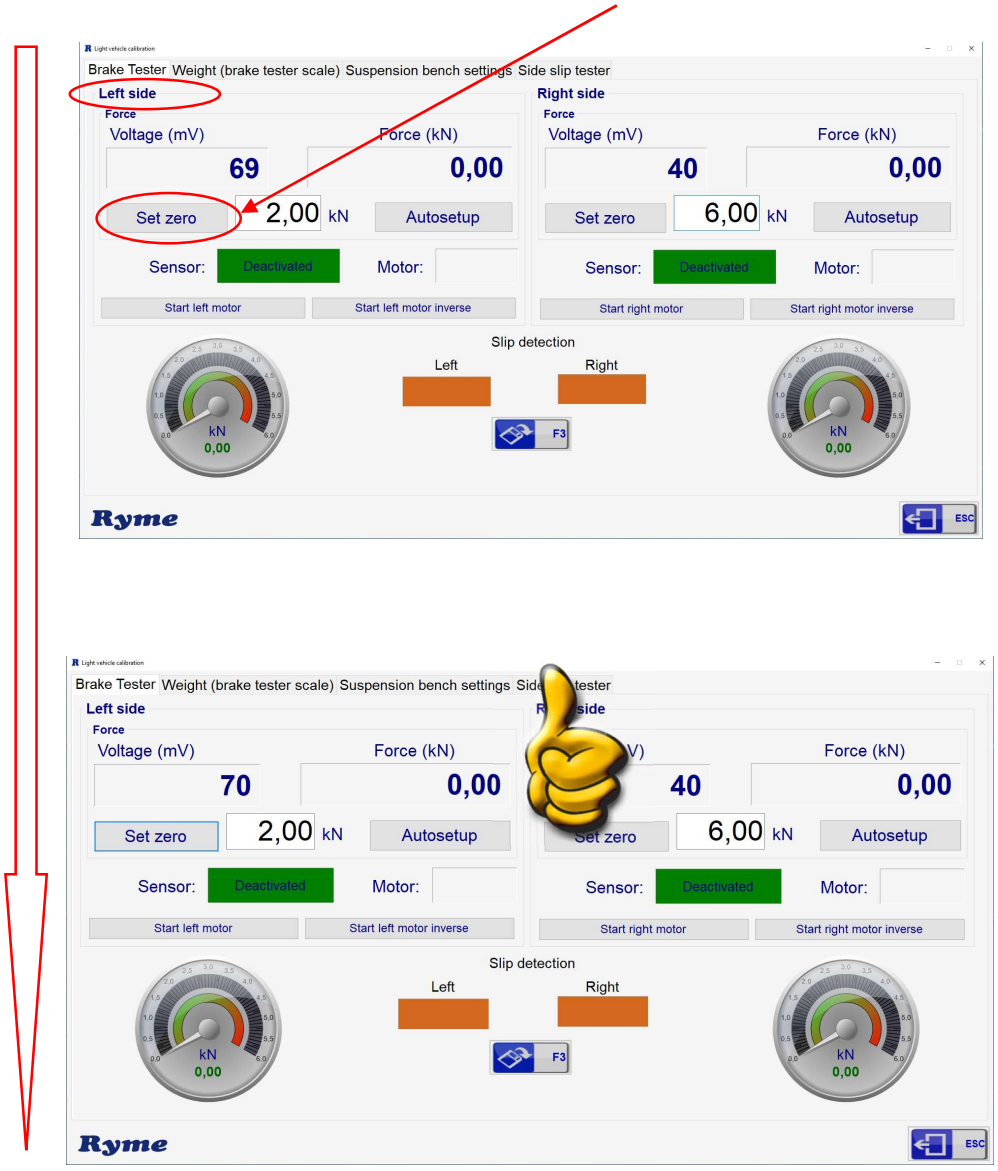
6.) With the help of a multimeter, measure the voltage (in mV) to regulate the 'zero' of the line. To do this, place the multimeter in direct current measurement mode, introduce the black tip in the hole of the plate with name 'GND' and the red tip in the hole of the plate with name 'GALGAIZ', as you can see it in the following image:



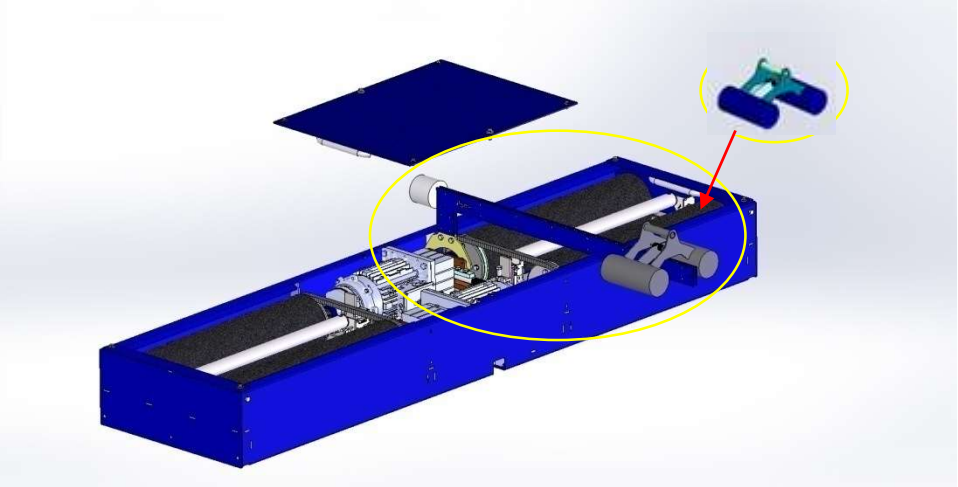
7.) Then, with the help of a screwdriver, rotate the potentiometer on the right side (which corresponds to the left gauge) until a voltage of ±100mV is obtained on the multimeter.



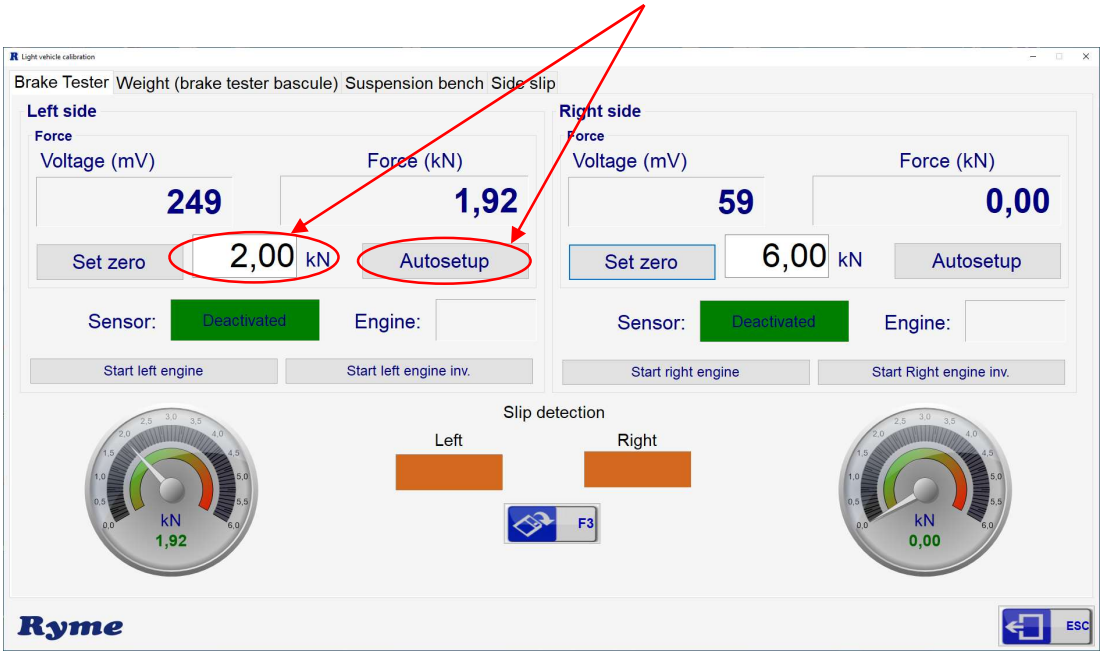
8.) Once the required voltage is achieved, you must set by software the value zero on the left side. To do this, on the calibration screen, click with the mouse on the icon Set zero.



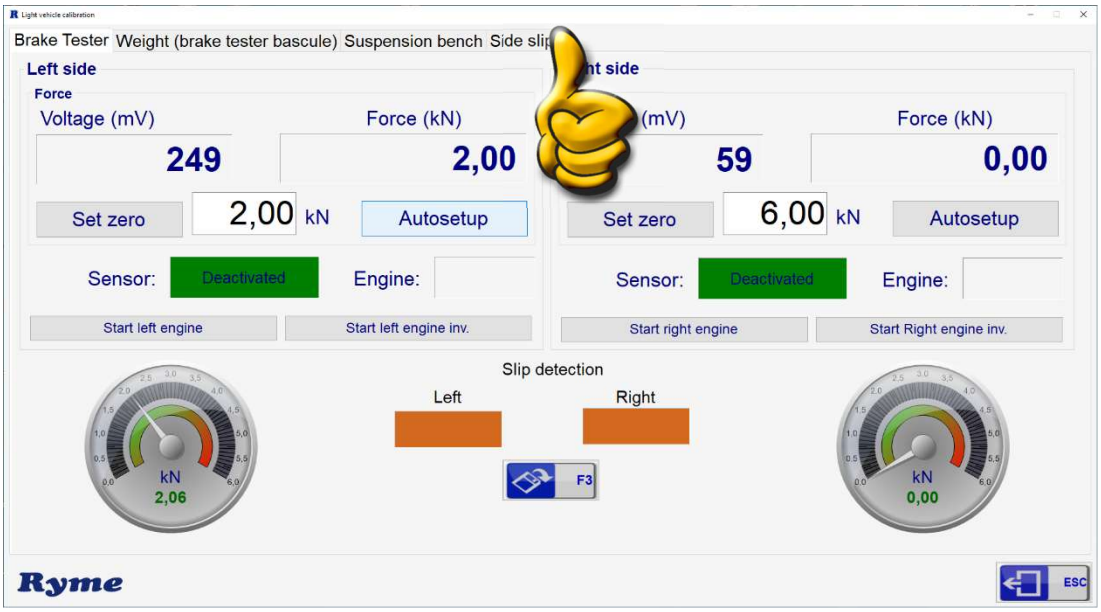
9.) Place the 30 kg weight in the lever notch corresponding to 2kN.



10.) Type using the keyboard in the auto-adjustment window 2 kN and click with the mouse on the Autosetup .



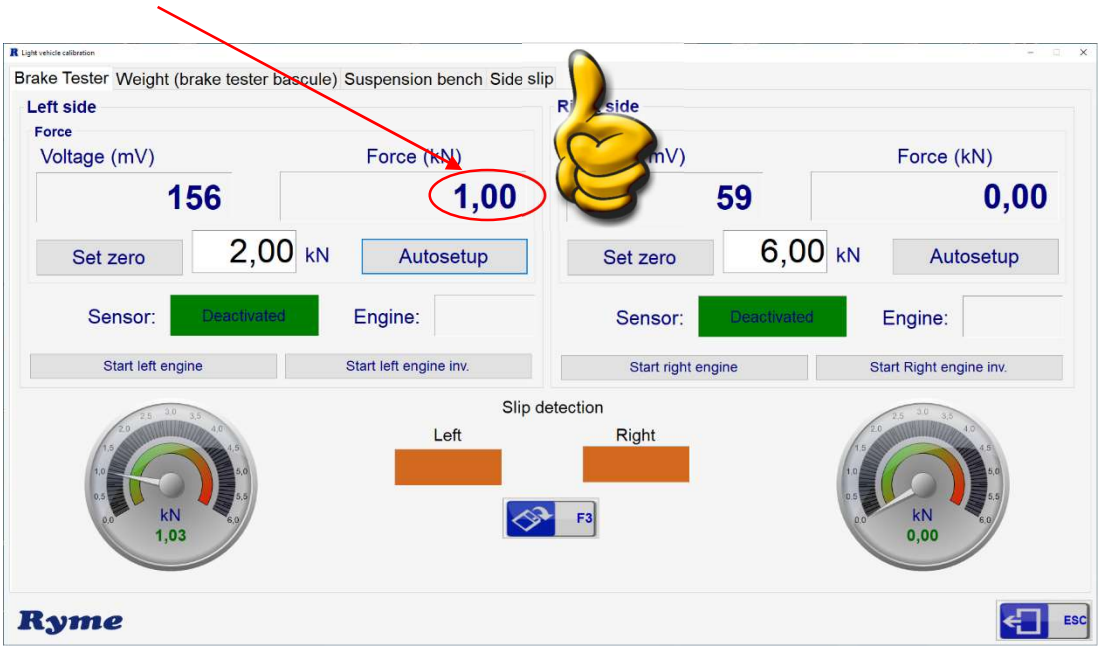
A setting confirmation window will be displayed.



11.) Place the weight in the notch of the bar corresponding to 1kN.

12.) Check on the monitor that the reading of the left force is 1kN.

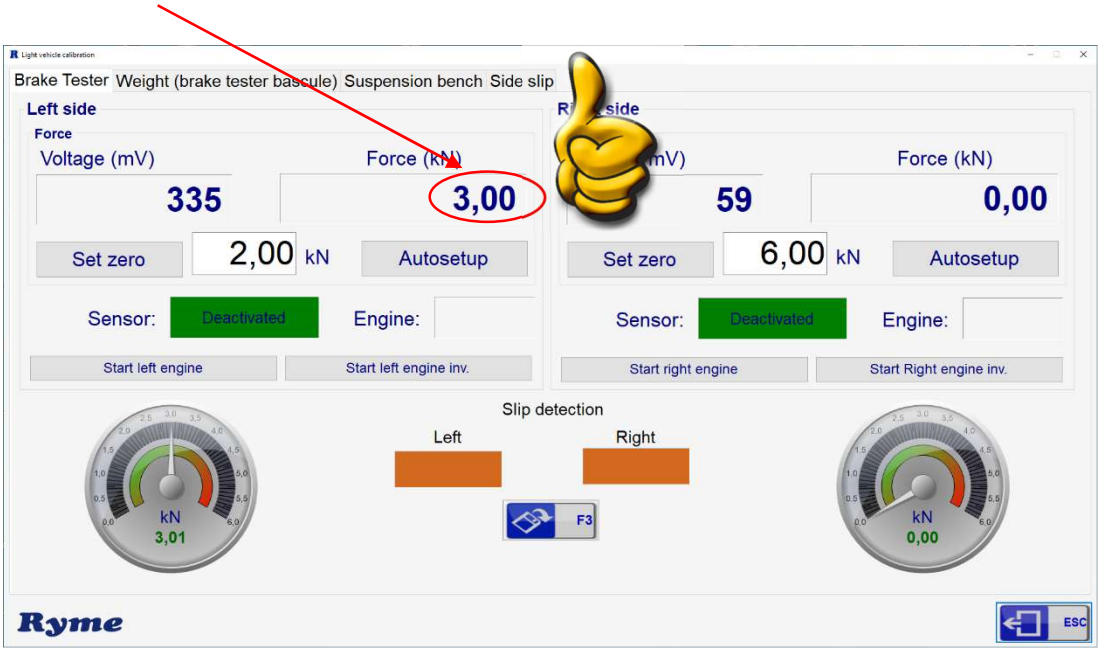
This measurement can be between 0.99 and 1.01kN.



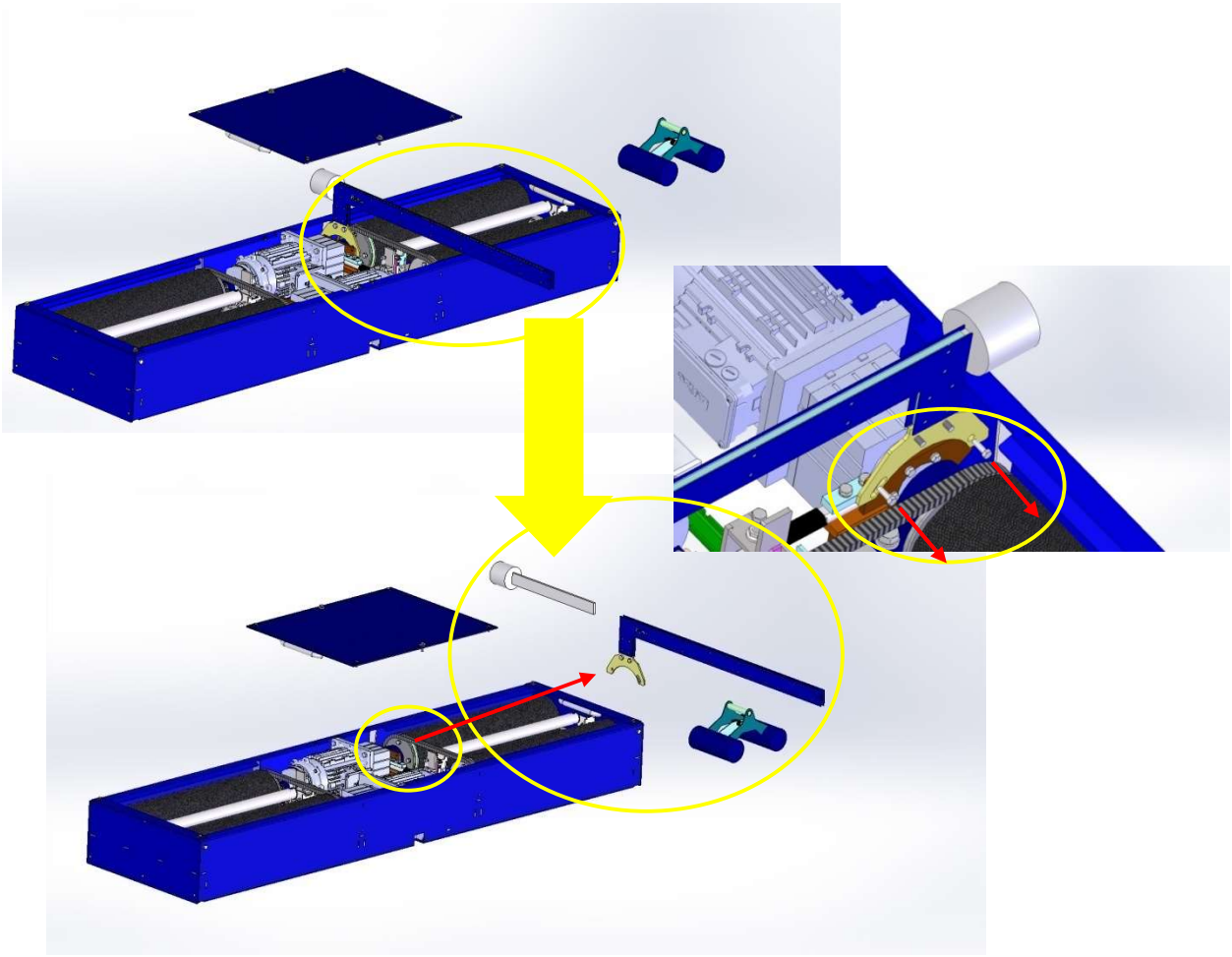
13.) Place the weight in the notch of the bar corresponding to 3kN.

14.) Check on the monitor that the reading of the left force is 3kN.

This measure can be between 2.99 - 3.01kN.

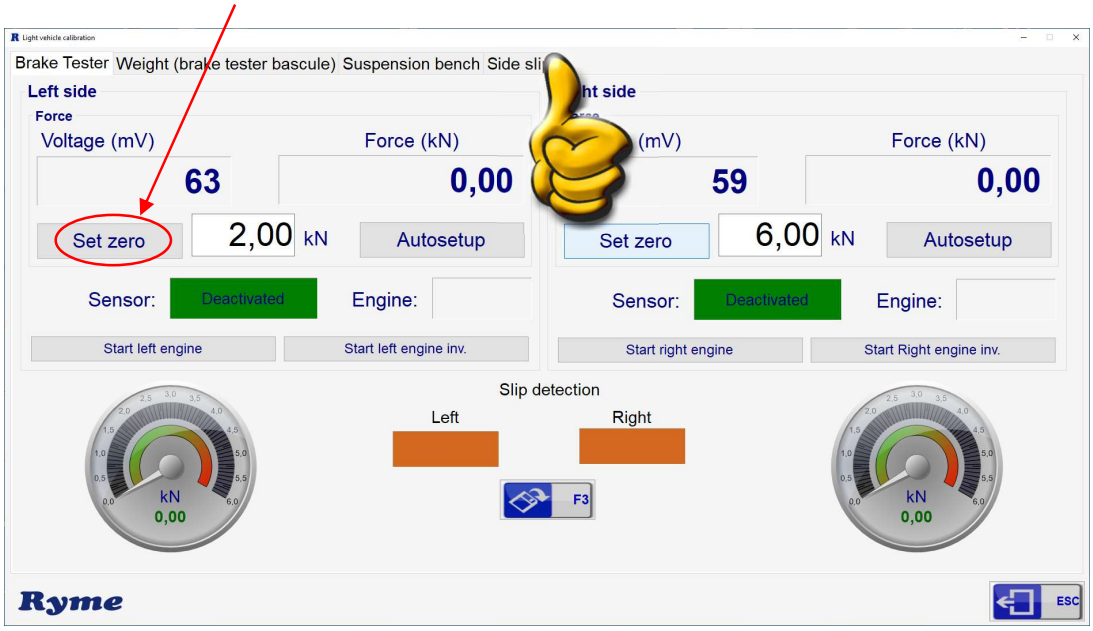


15.) After these actions, the calibration bar is removed.



16.) Remove the calibration bar, measure again with the multimeter to obtain an offset voltage of +-100mV by turning the corresponding potentiometer.

17.) The value zero of the left side is set again. To do this, in the calibration screen (and without the calibration bar), click with the mouse on the icon Set zero.



Once the left side is calibrated, the right side is calibrated/adjusted. To do this, repeat steps 4 to 16, both inclusive, with the right side.

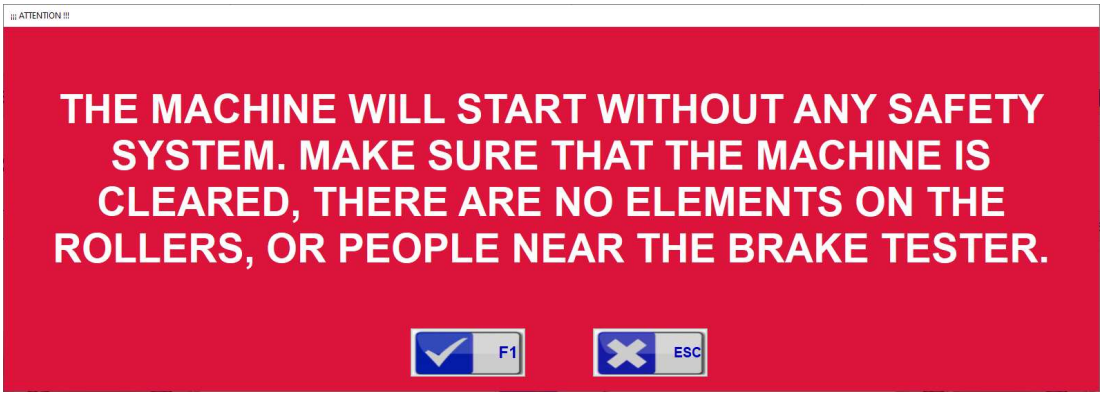
Note: from this screen you will be able to test the correct operation of the presence sensors, in green it will be disabled and in yellow it will be enabled:

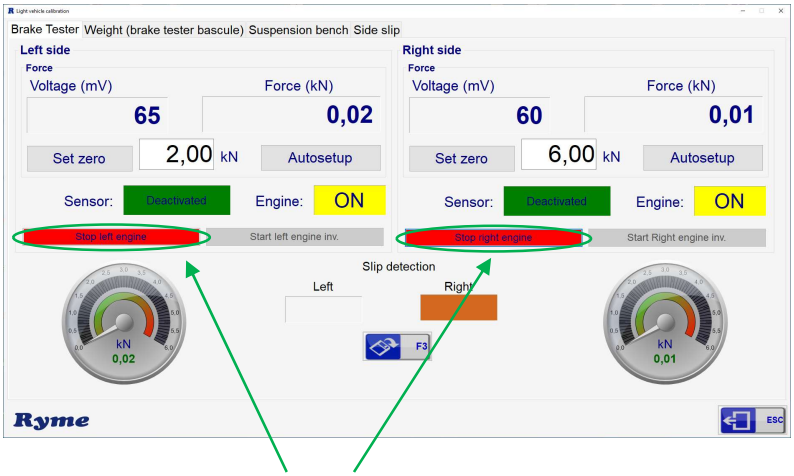
84 Brake Tester Calibration Menu: Sensor Condition


Brake Tester
Weight (brake tester bascule)
Suspension bench
Side slip
Left side
Force
Voltage (mV)
Force (kN)
65
0,02
Set zero
2,00 kN
Autosetup
Sensor:
Deactivated
Engine:
Start left engine
Start left engine inv.
Right side
Force
Voltage (mV)
Force (kN)
60
0,01
Set zero
6,00 kN
Autosetup
Sensor:
Deactivated
Engine:
Start right engine
Start Right engine inv.
Slip detection
Left
Right
F3
kN
0,02
kN
0,01
Ryme
ESC
Brake Tester
Weight (brake tester bascule)
Suspension bench
Side slip
Left side
Force
Voltage (mV)
Force (kN)
66
0,03
Set zero
2,00 kN
Autosetup
Sensor:
Activated
Engine:
Start left engine
Start left engine inv.
Right side
Force
Voltage (mV)
Force (kN)
59
0,00
Set zero
6,00 kN
Autosetup
Sensor:
Activated
Engine:
Start right engine
Start Right engine inv.
Slip detection
Left
Right
F3
kN
0,03
kN
0,00
Ryme
ESC

And of the motors, being able to start and stop them manually by clicking on the corresponding icon: left motor/left motor inverse and right motor/right motor inverse.

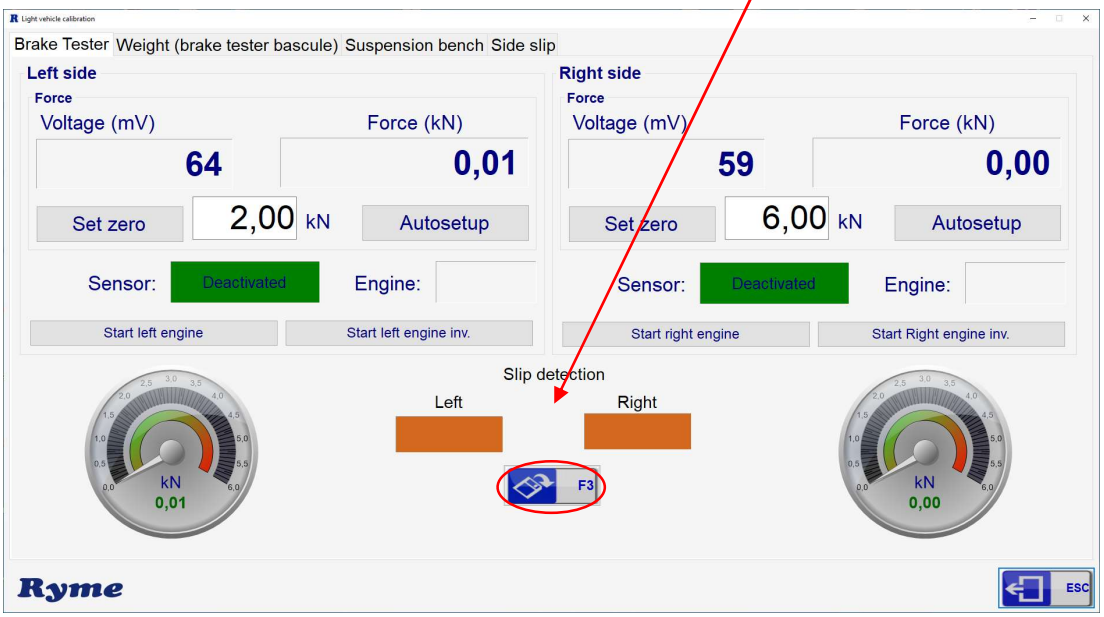
An alert message will warn you before starting:



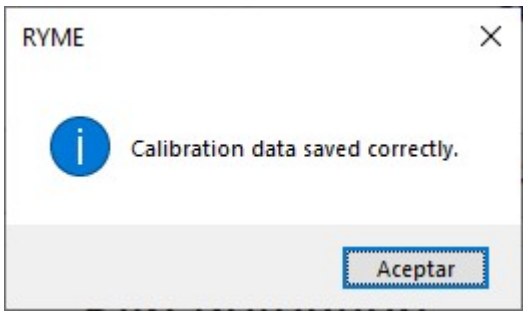


By clicking on the icons 'Stop left motor' and 'Stop right motor' the motors will stop.

It is important to make sure that you save the calibration/adjustment correctly by clicking on the  icon with the mouse or by pressing the 'F3' key on the keyboard.



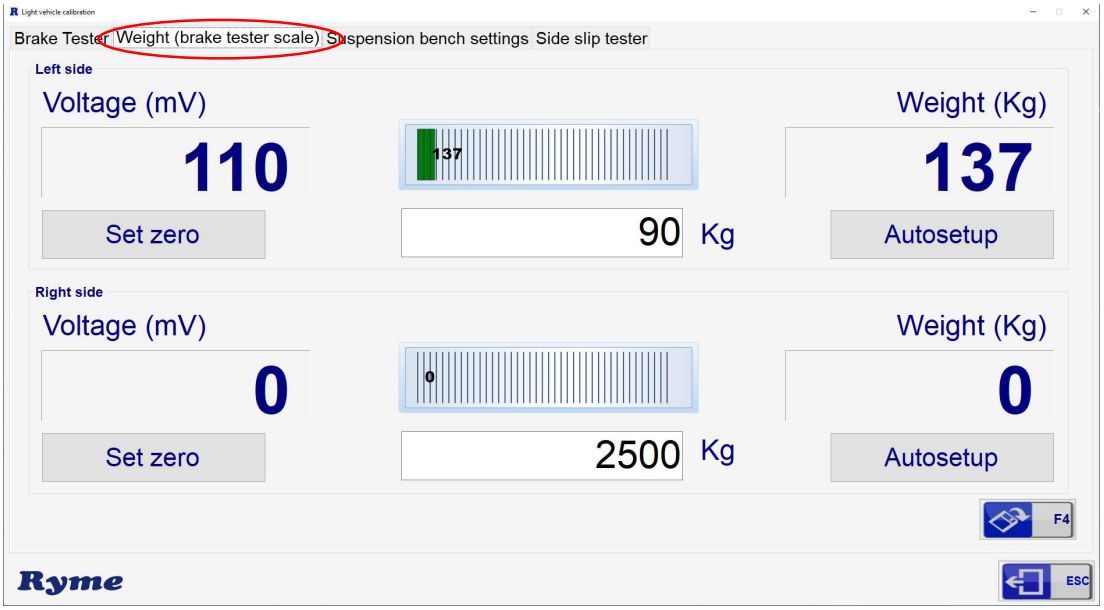
It will inform you through a message if it has been correctly saved.



7.1.4 Weight calibration (brake tester scale):

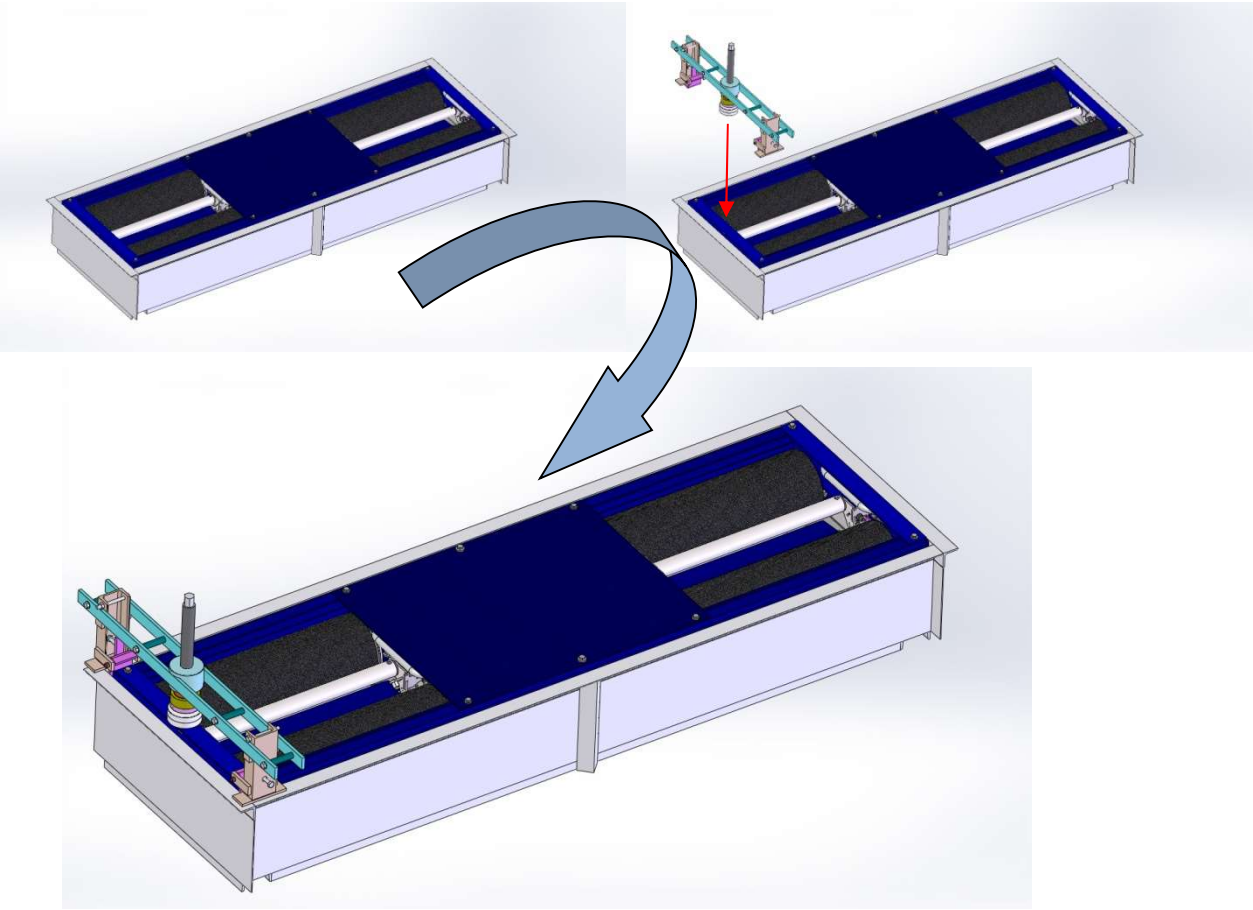
From the tab Weight (brake tester scale), you will proceed to calibrate the equipment:

Note: For this, make sure that the brake tester has a scale.

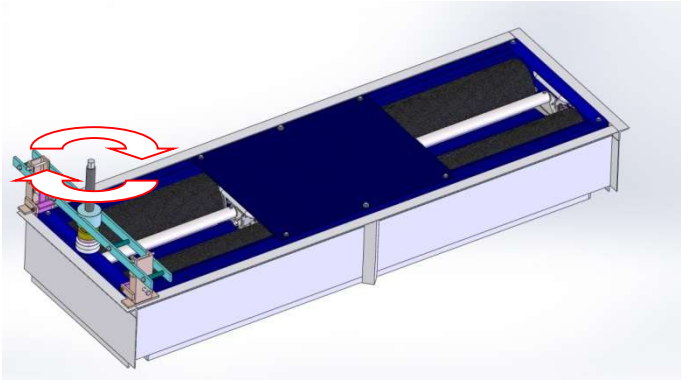


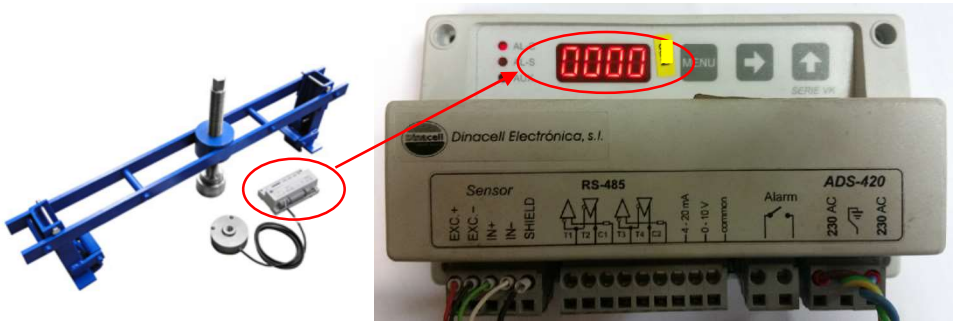
85 Light Vehicles Brake Tester Calibration/Adjustment Tab: Brake Tester Scale Weight

1.) Place the calibration/adjustment tool on the left side of the brake tester (where the scale is located).

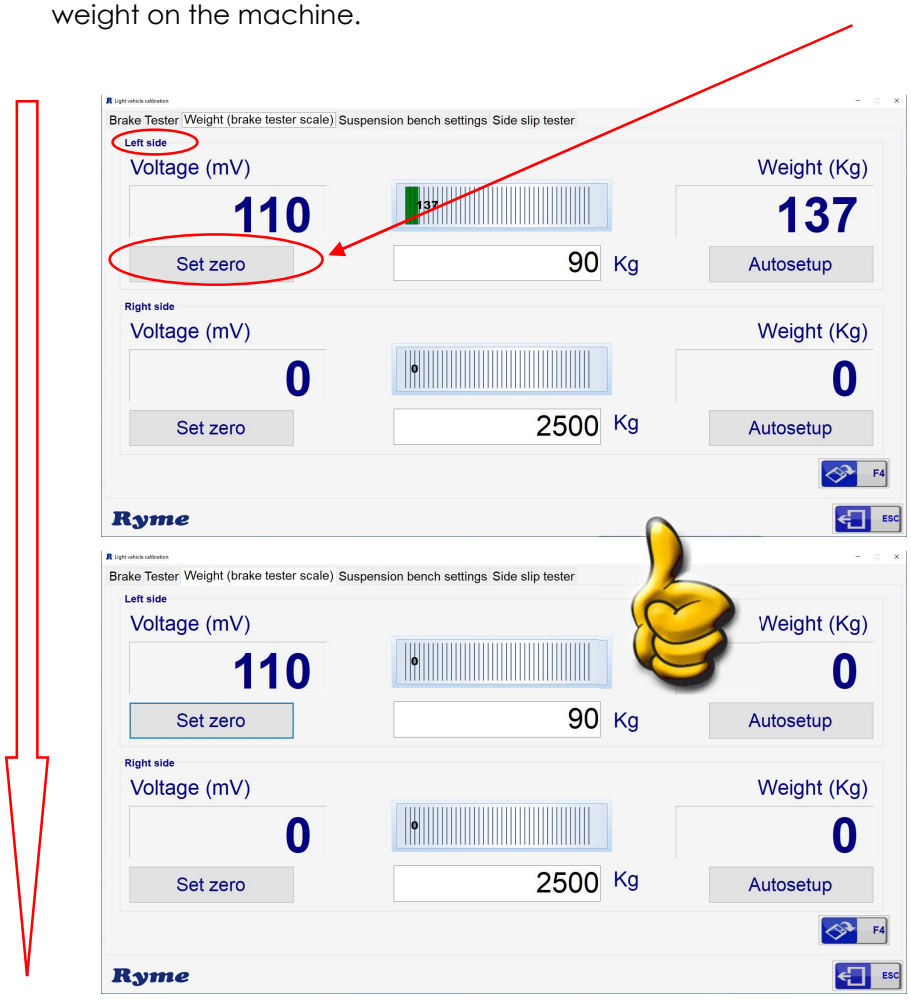


2.) Turn the screw to adjust the tool to the tile without applying excessive force.

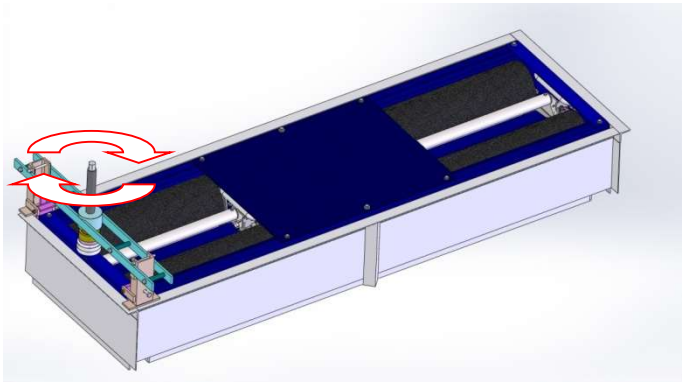


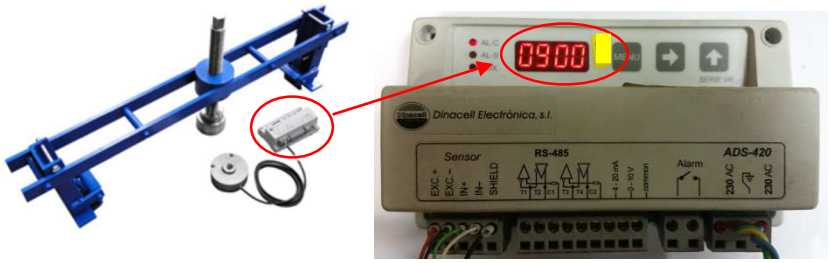


3.) Set by software the value zero. To do this, on the calibration screen of the Axle Weight (left side), click with the mouse on the Set zero icon, all this without any weight on the machine.

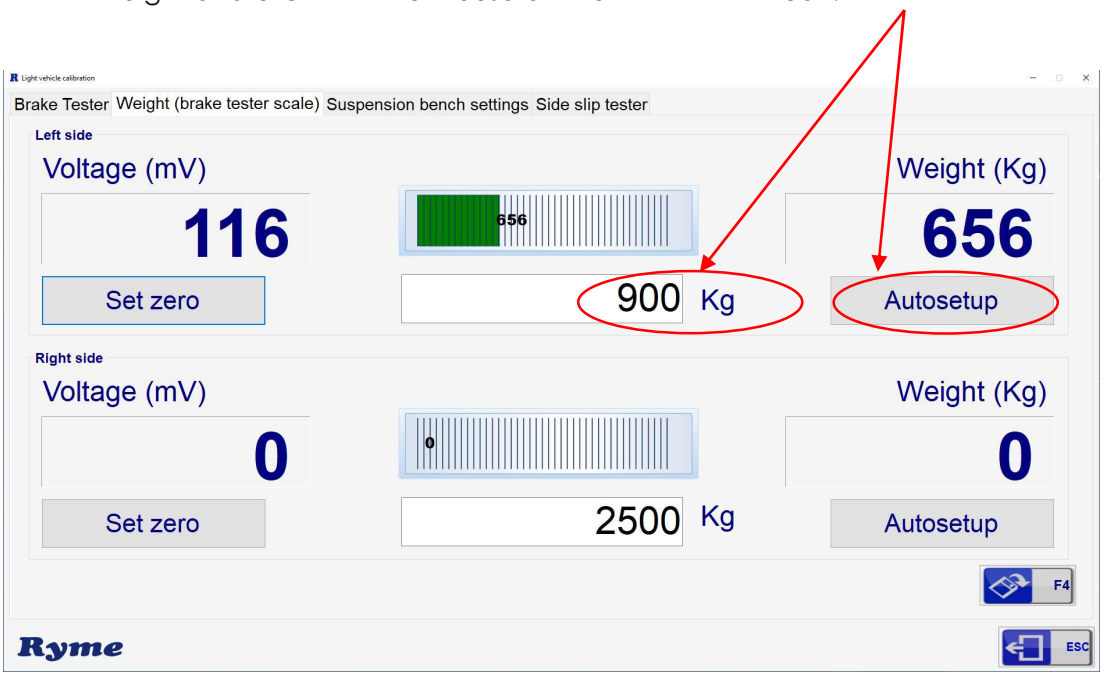


4.) Turn the screw of the calibration tool until it marks a reference measurement.

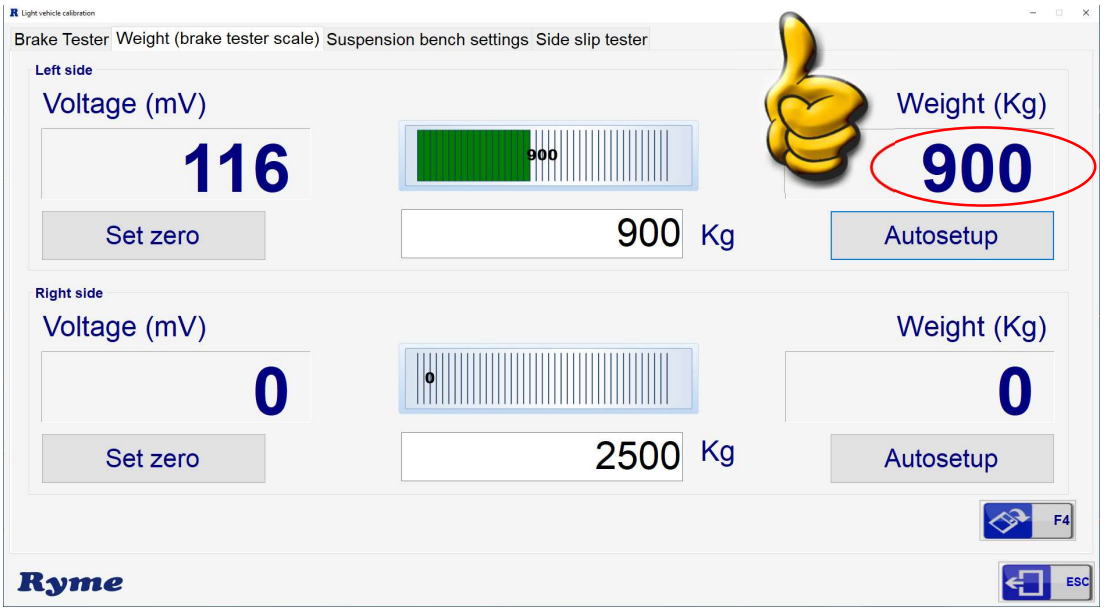




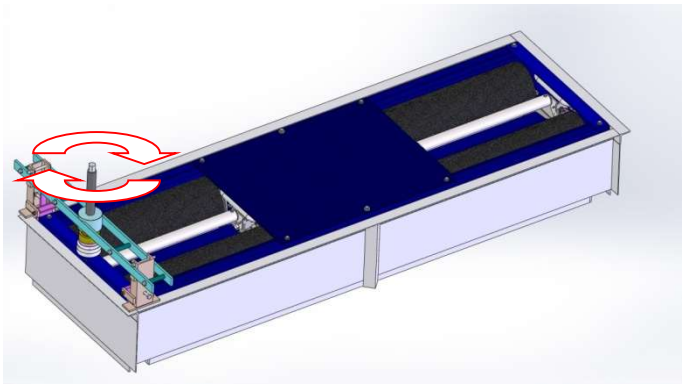
5.) Type using the keyboard in the auto-adjustment window the kg of the known weight and click with the mouse on the Autosetup icon.



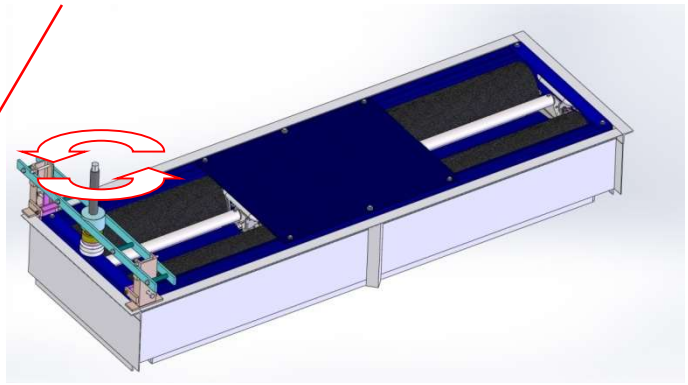
6.) A setting confirmation window will then be displayed.

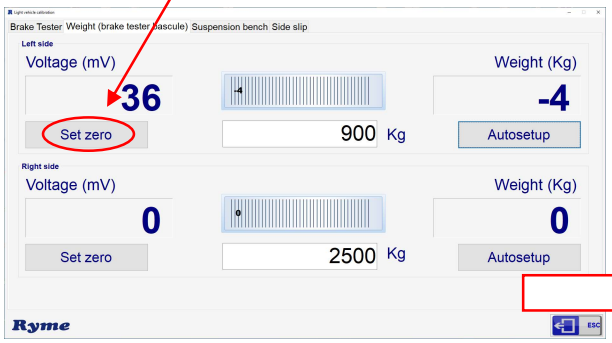


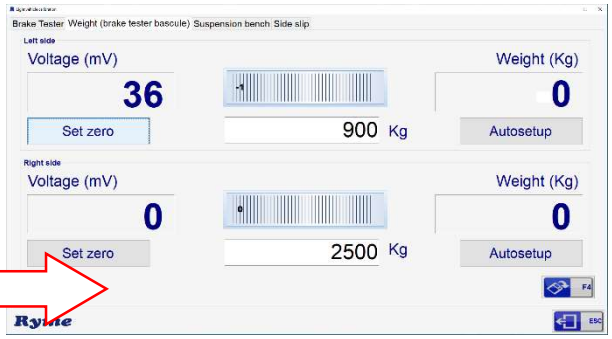
7.) Check with another weight (by turning the screw) that it shows the correct measurement:



8.) After calibration, remove the tool and with nothing in the brake tester click on the Set zero icon.

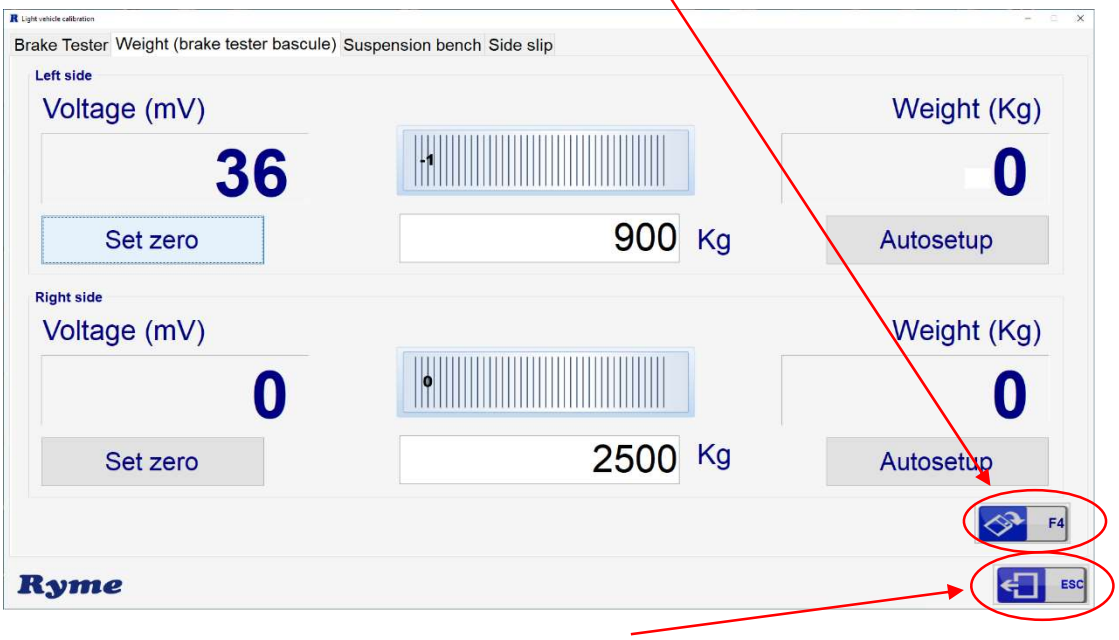






To save the calibration/adjustment correctly it is important to make sure to press the 'F4' key on the keyboard or click with the mouse on the 

icon.



To exit, press the 'Esc' key on the keyboard or click on the 

icon.

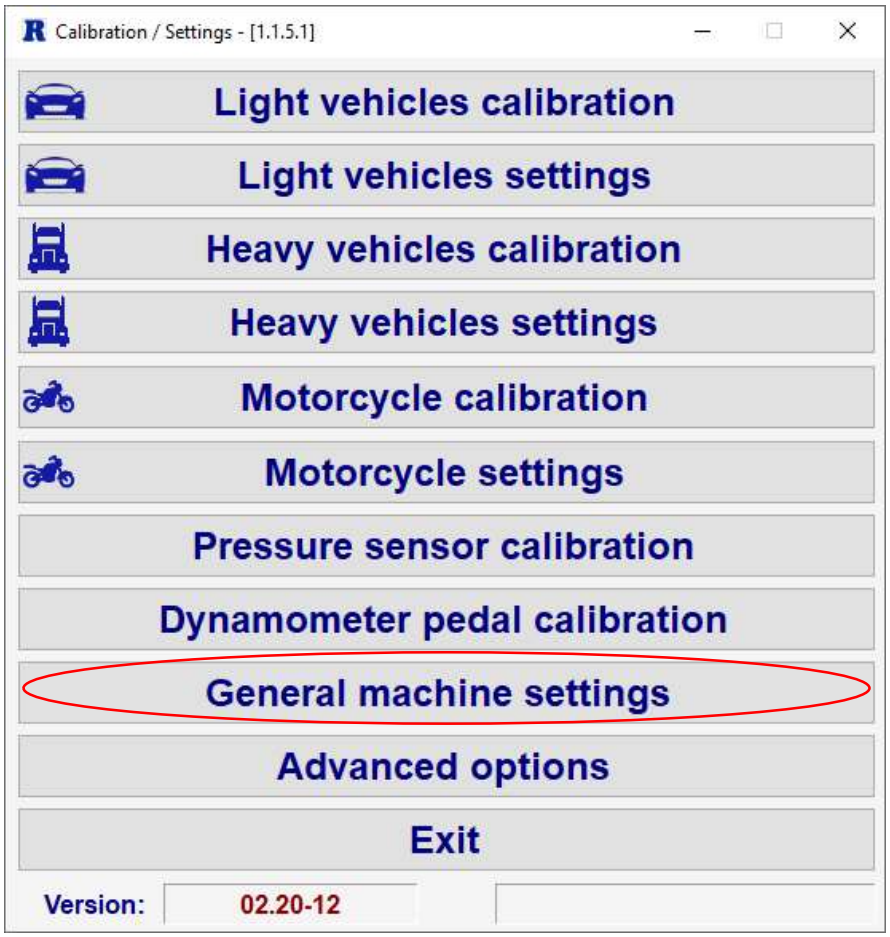
Note: if the model of the machine to be calibrated/adjusted is FRQ, you must enable the right side first: see section 4.3.5 Weight. After configuring this side, repeat the same process as before for the left side, but now on the right side with the corresponding frame.

7.2 Calibration for Heavy Vehicles Equipment

In order to configure the line, open the application RYME_CalConf_PCE.exe:

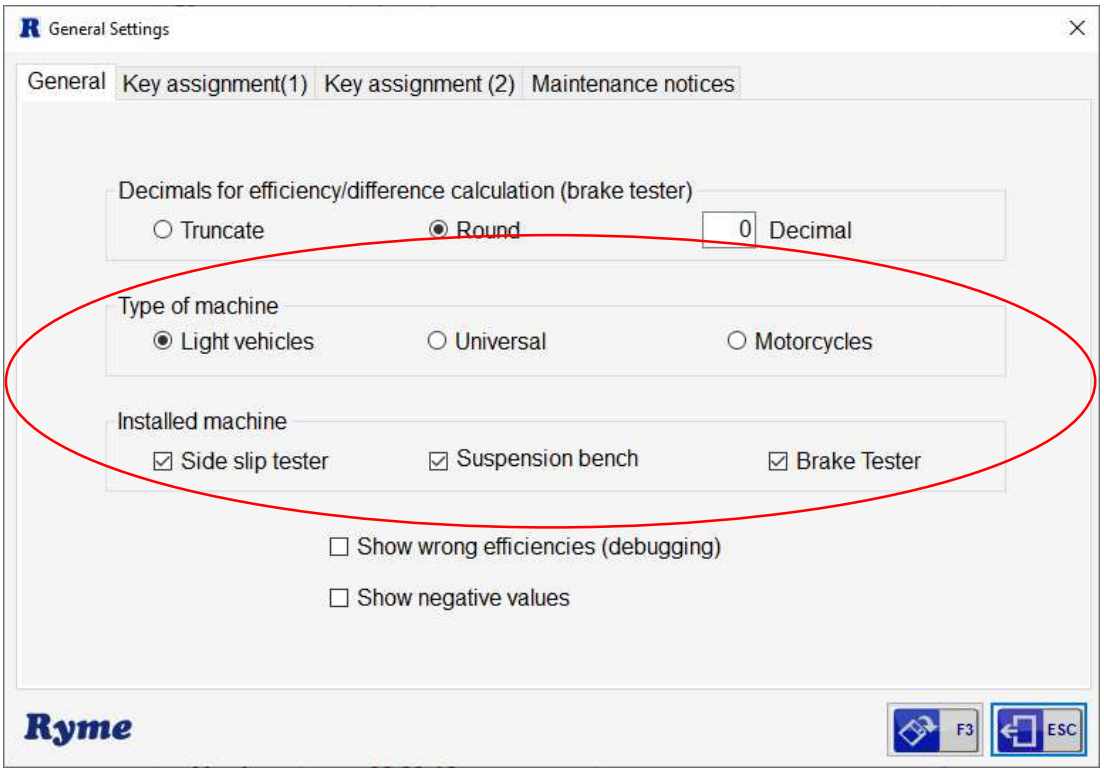
86 RYME_CalCong_PCE.exe application

To correctly calibrate the heavy vehicles brake tester, it is mandatory to configure the installed machine in the Main Menu **General machine settings** option.



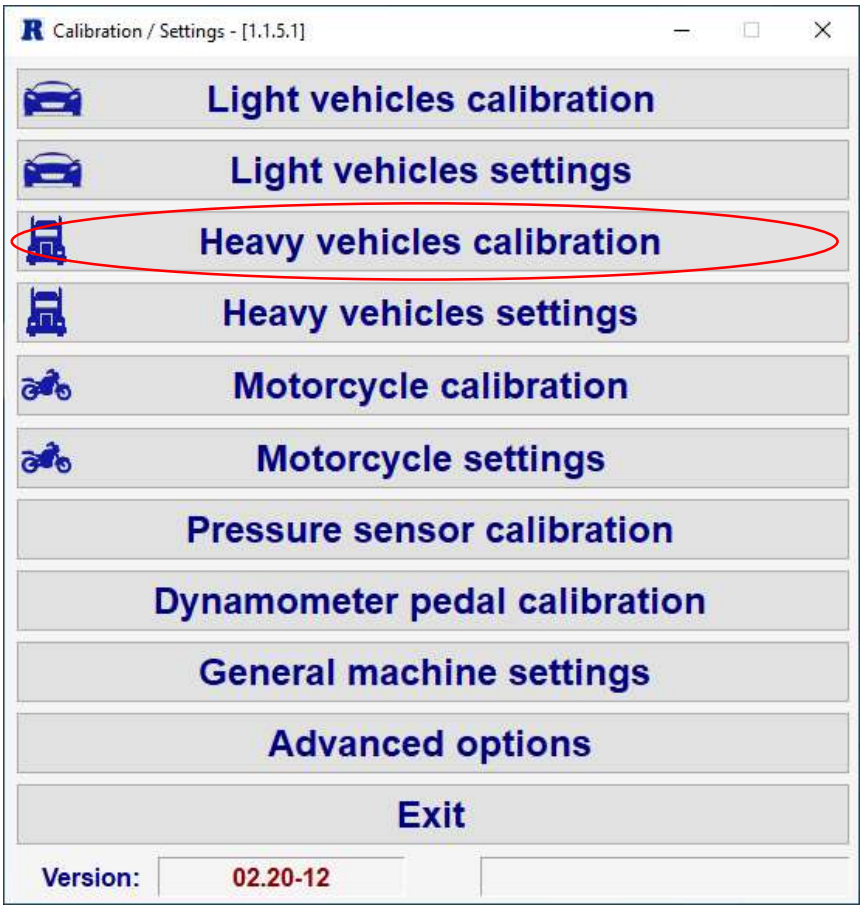
87 PCE Calibration/Settings Menu

By clicking on this icon, a window on which you will select the type of brake tester to be used and the machines installed on the line will appear.



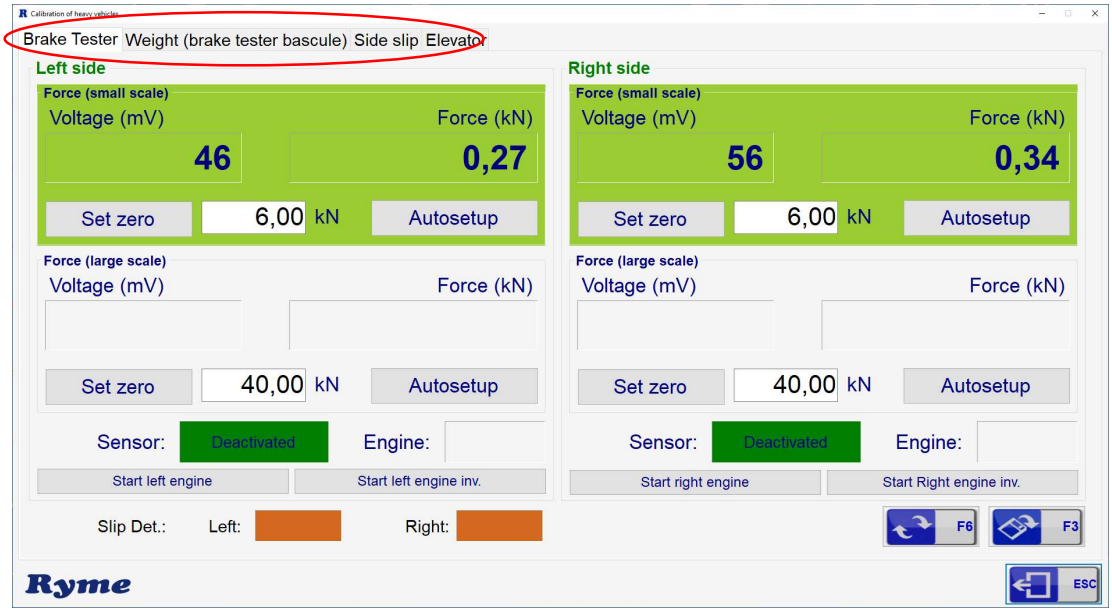
After this step, save the changes by pressing the 'F3' key on the keyboard or by clicking with the mouse on the  icon and exit this window by pressing the 'Esc' key on the keyboard or by clicking with the mouse on the  icon to start the calibration.

Open the Settings window, from which you will select the operation you want to perform. Here you will configure the parameters by clicking on the  icon, located in the central part of the menu:



88 Settings Menu: Heavy Vehicles Calibration

By clicking on the different tabs with the mouse, you will be able to carry out the calibration/adjustment of the machine:



89 Heavy Vehicles Calibration Window: Brake Tester

To make the necessary adjustments to the machines in the line, follow this order:

- Lift
- Side Slip Tester
- Brake Tester/Weight

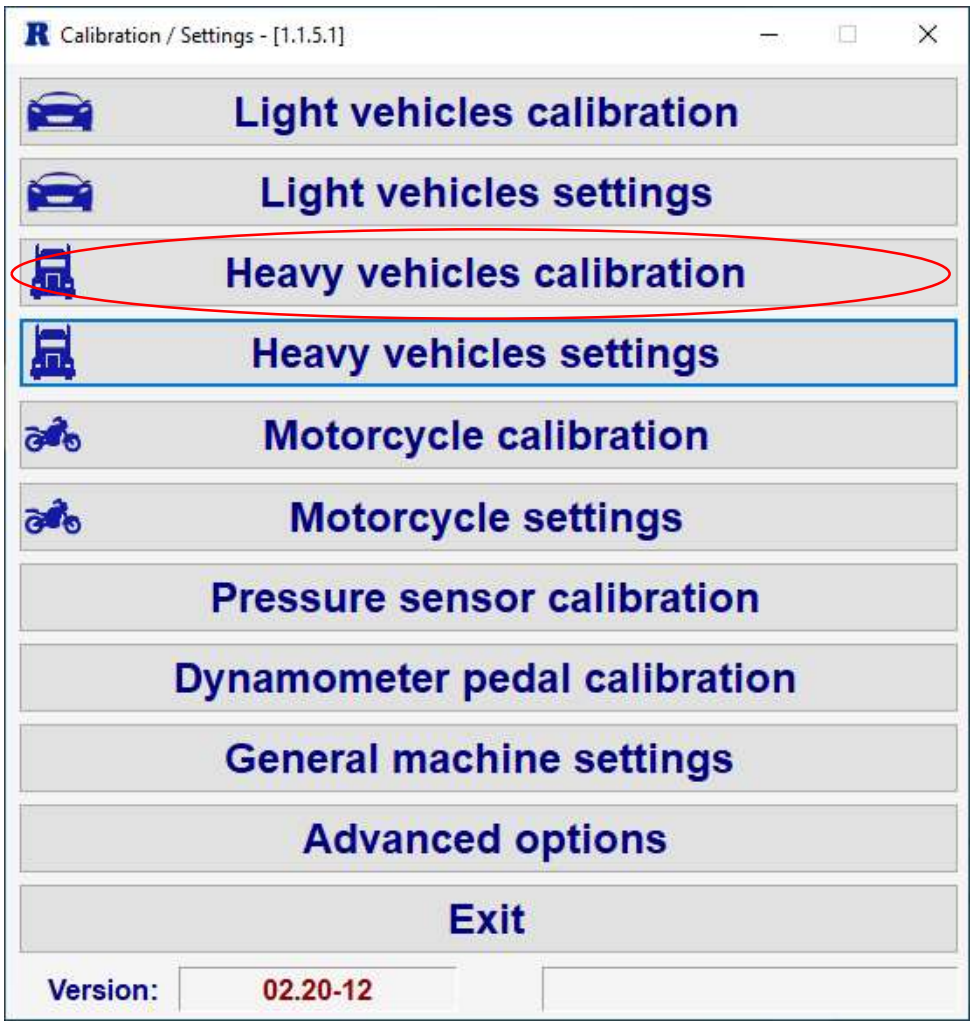
7.2.1 Lift Calibration

1.) Turn on the main switch on the console of the Heavy vehicles brake tester.

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe**.

3.) Click with the mouse on the icon 

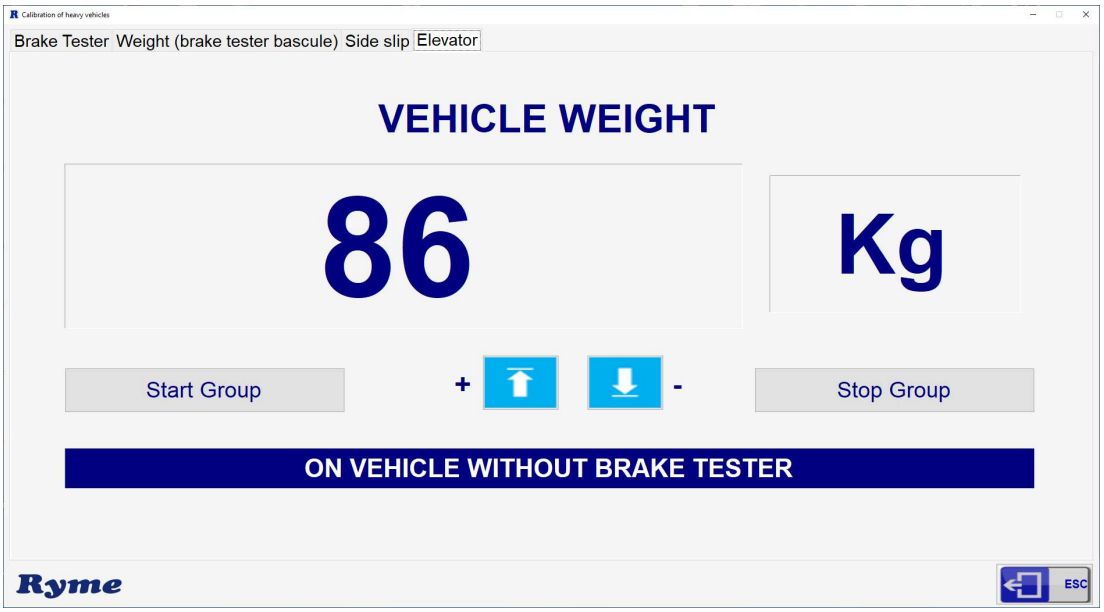
,



90 Setting Menu: Heavy Vehicles Calibration

a window will appear where you will calibrate the machine:

Click with the mouse on the 'Lift' tab in order to start the testing:



91 Lift Calibration Tab

From the Lift tab you can check its performance, with the peculiarity that you will not need to introduce a vehicle on the line (without detecting presence or weight).

Note: The Lift scale will be calibrated/adjusted at the same time as you calibrate/adjust the brake tester scale.

To test the scale, follow these steps:

- Start the hydraulic group before giving any command, by clicking with the mouse on the icon 'Start Group'.
- Check that the brake tester lifts correctly; to do this the operator must press the 'UP' icon with the mouse .
- Check that the brake tester lowers correctly; to do this the operator must press the 'UP' icon with the mouse .
- Finally, stop the hydraulic group by clicking with the mouse on the icon 'Stop Group'.

Check visually the absence of leaks, adequate greasing, and possible signs of wear.

7.2.2 Heavy Vehicles Side Slip Tester Calibration

1.) Turn on the main switch on the console of the Heavy vehicles brake tester.

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe.**

3.) Click with the mouse on the icon 

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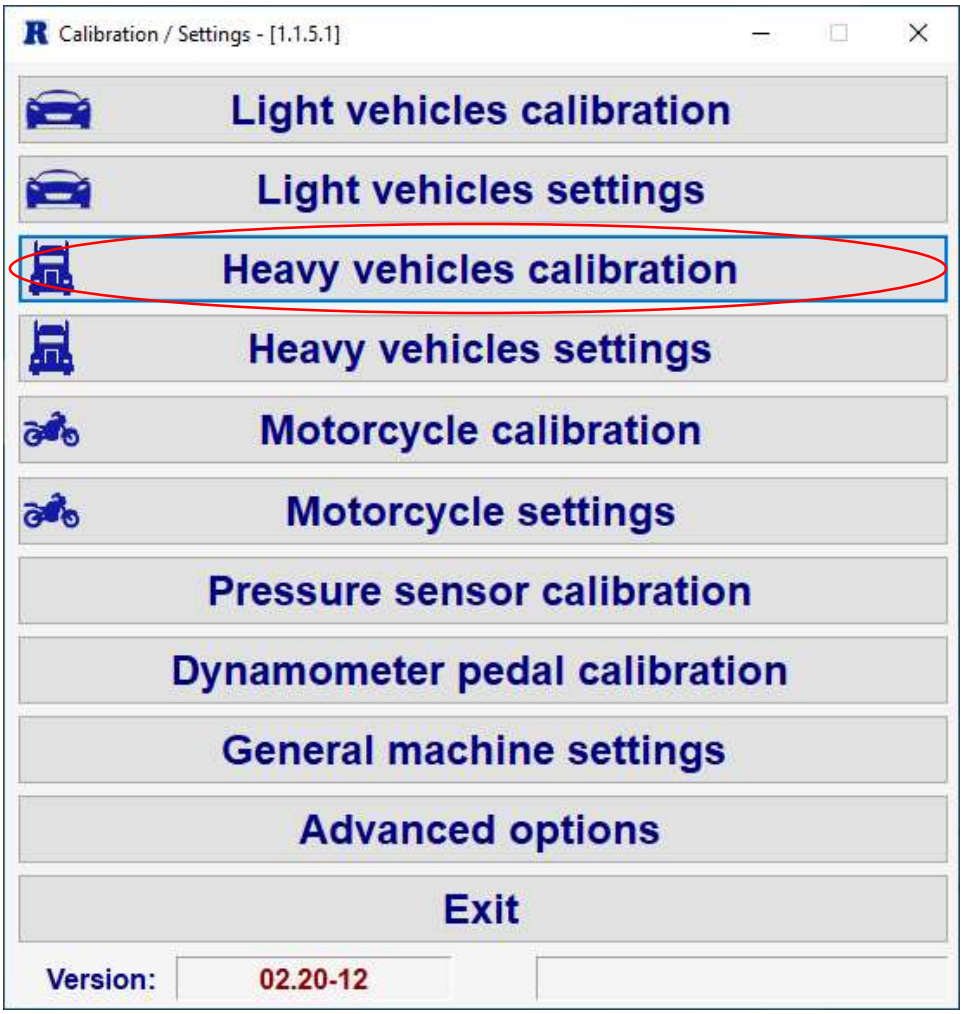
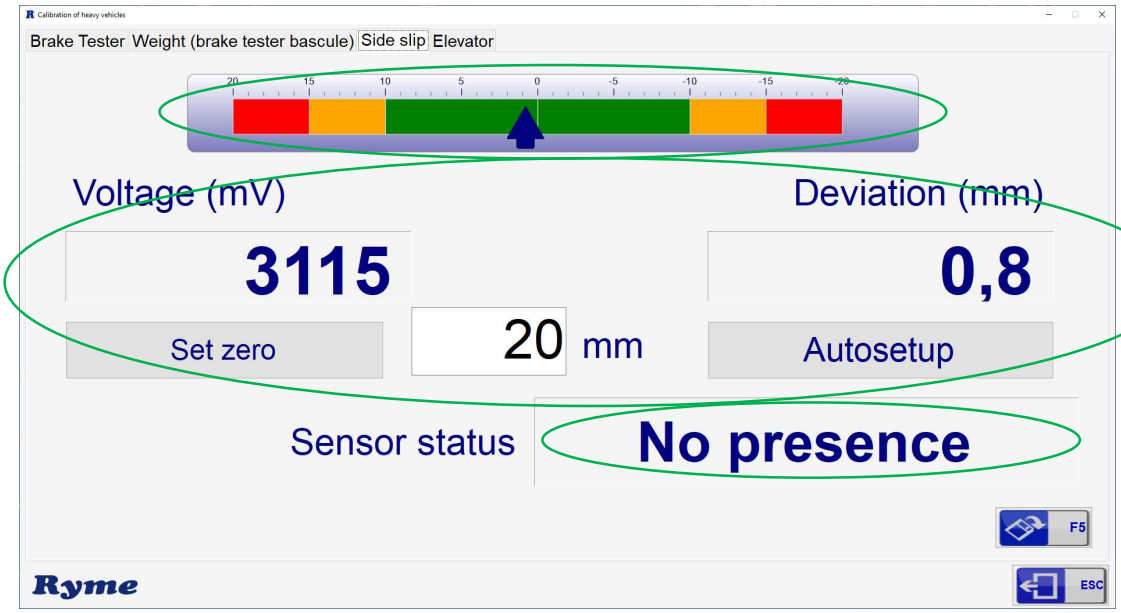


92 Setting Menu: Heavy Vehicles Calibration

a window will be displayed, from which you will calibrate the machine:

In the Side Slip Tester tab you will start with performing the calibration/adjustment:



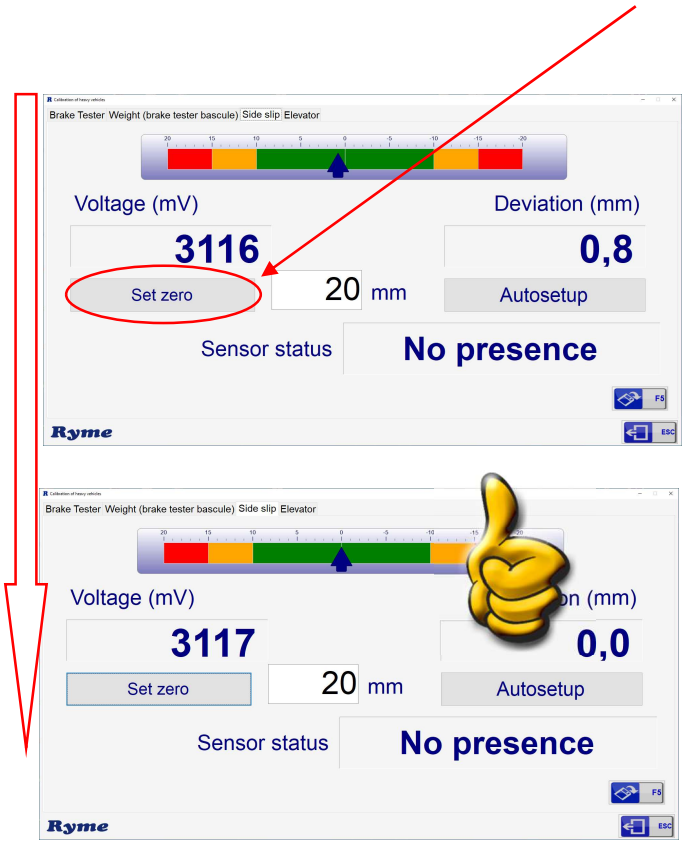
93 Heavy Vehicles Calibration Menu: Side Slip Tester

In this calibration screen you are shown: in the upper part, a bar where you can observe the immediate value in a graphic way, and in the lower part, the measurement taking that informs you of:

- The voltage, in millivolts.
- The deviation in millimeters.
- The sensor condition: you can check the side slip tester condition by changing from non-presence to presence when detecting or not the vehicle on the side slip tester.

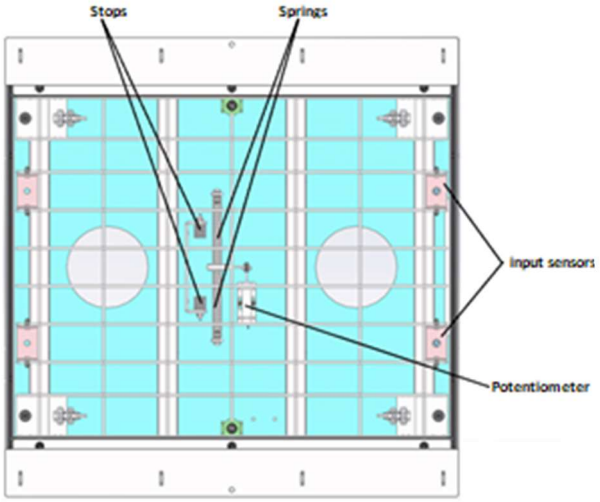
94 Side Slip Tester Calibration Menu: Sensor Condition

1. To perform the calibration, leave the side slip tester centred (dead point), and click with the mouse on the icon Set zero,



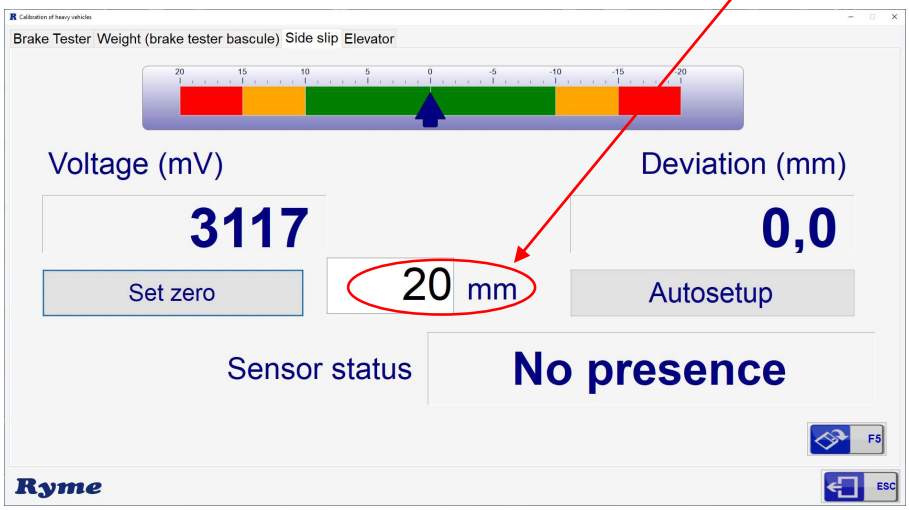
Next, set the maximum deviation of the side slip tester, which by default will be 20mm.

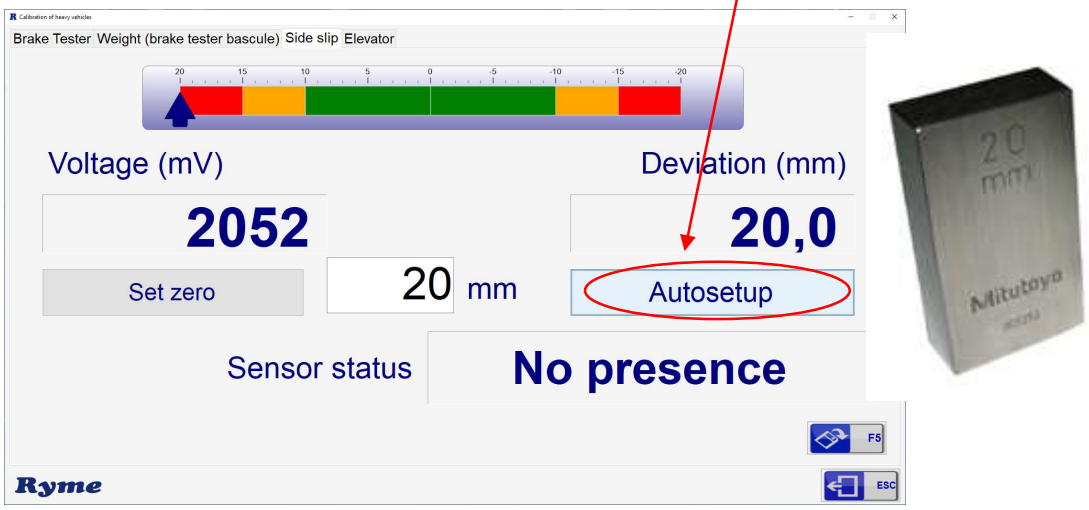
2. Place the side slip tester at the right end and insert the 20mm gauge between the moving platform and the fixed platform.



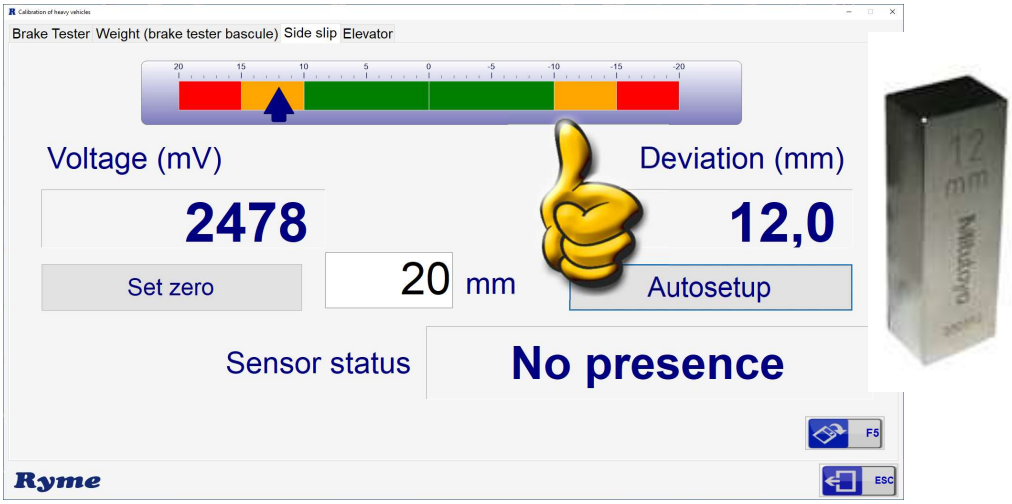
3. Release the side slip tester, making this stop with the gauge and the machine itself.

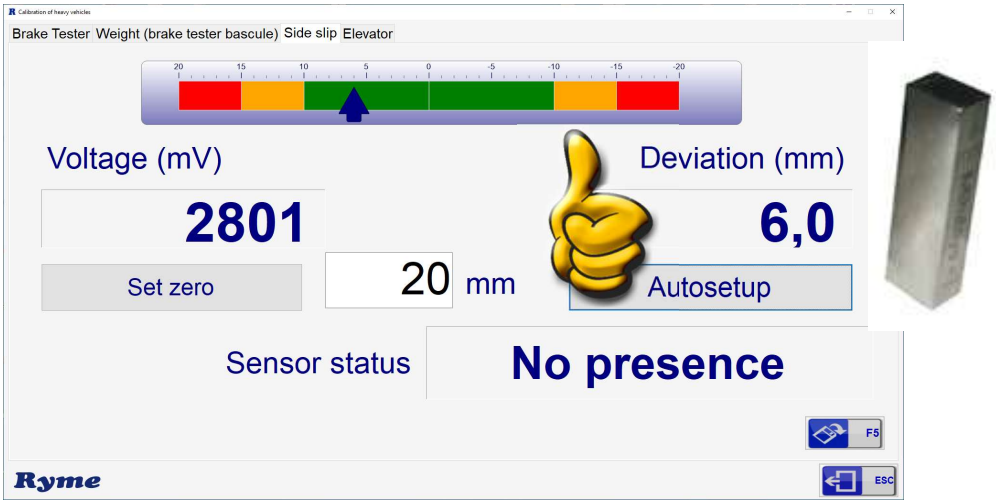
4. Write in the box the measure of the gauge that you are going to use to adjust the side slip tester and click with the mouse on the icon Autosetup.





5. Next, remove the gauge and check with the other ones (of different size) that the value on the screen corresponds to the chosen gauge.





6. Following these steps you will perform the calibration of the side slip tester.

7. Check the opposite side; by using the same gauge and following the same process on the opposite side, you should obtain the same value but with a negative sign.
8. To save the calibration correctly it is important to make sure to press 'F6' on the keyboard or click with the mouse on the icon 

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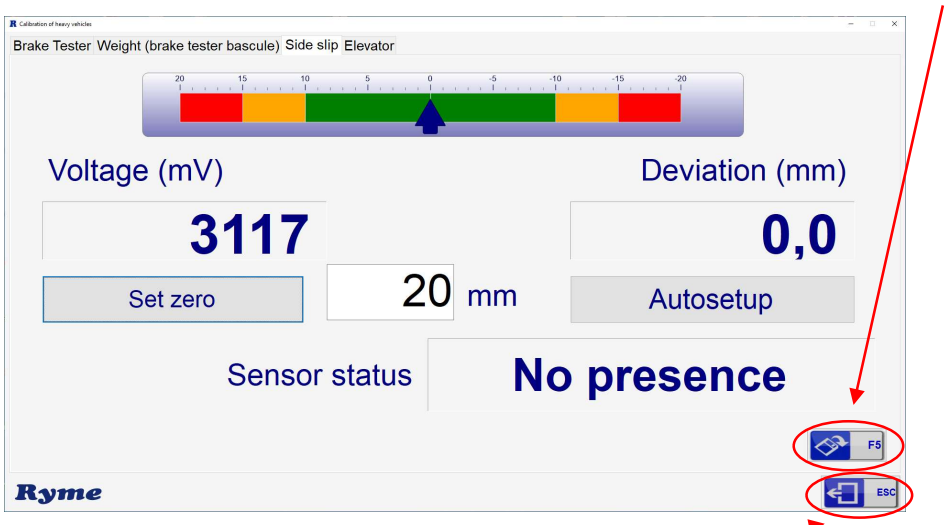


To exit, press the 'Esc' key on the keyboard or click on the 

icon.

7.2.3 Heavy Vehicles Brake Tester Calibration

- Objective

This procedure describes the guidelines for the calibration of Ryme® roller brake testers.

- Scope

This procedure is applied to the following models of Ryme® brake testers:

- FRU 1
- FRU 2
- FRU 3
- FRU 4
- FRU 7
- FRU lift

- Reference documentation
  - Expression of the uncertainty of measurement in the calibrations. CEA-ENAC-LC/02 Guide.
- Personnel requirements
  - The personnel who will carry out the calibration must have the technical knowledge and appropriate training.
- Equipment and material
  - The list of materials required to carry out the brake tester calibration is
    - FRU brake tester bar
    - 30 kg weight
    - Leveler tool
- Description of the process
  - **Previous considerations**

To perform the calibration, the torque (moment) of forces measured with the gauge will be simulated, giving it a known value (calculated by elementary physical principles) and compared with the values read by the brake tester indicator.

The moment of a force is given by the expression:

$$\vec{M} = \vec{r} \times \vec{F} = |\vec{r}| \cdot |\vec{F}| \cdot \operatorname{sen}(\alpha)$$

Where the moment ($\vec{M}$) is the cross product of the position vector ($\vec{r}$) (distance from the point of the application of force to the axis of rotation) by the applied ($\vec{F}$) force (which in this case will be a weight), in other words, the product of the modules of said vectors by the sine of the angle ($\alpha=\pi/2$) they form between them.

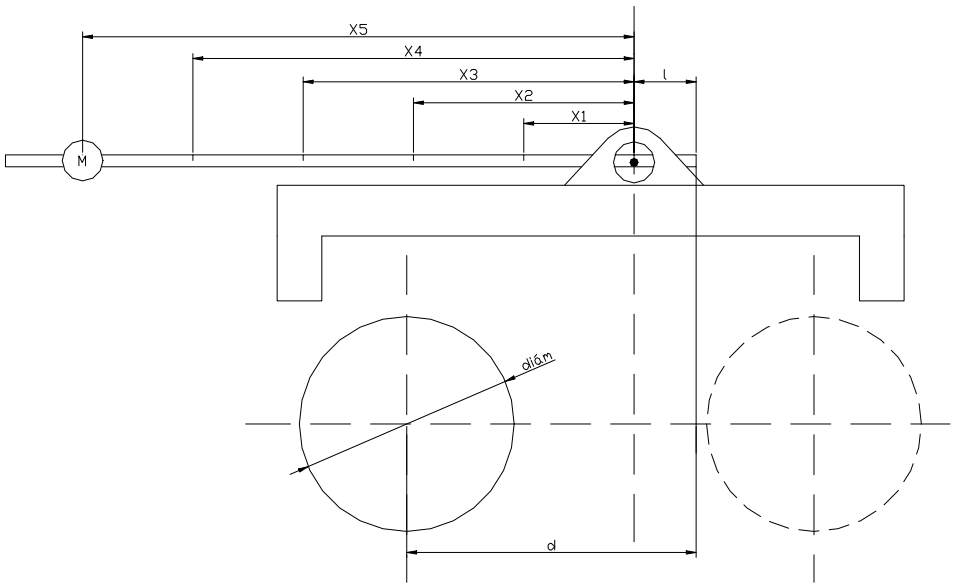
During the calibration, a bar is adjusted to the motor, which produces a moment over the brake tester. If on top of that a mass is placed in different points, different moment values can be applied to the brake tester.

As it is a vectorial magnitude, the resulting moment is the vectorial sum of both moments, which because the applied force is that of gravity and the position vector is always perpendicular to it, its sum is Scalar.

- Identify the brake tester by its serial number or any other manufacturing mark and take the data on the corresponding data collection sheet.
- Remove the brake tester covers, both the outer and central ones.
- Carry out a preliminary visual inspection of the interior, noting any anomalies observed on the data collection sheet.

- **Placement of the calibration bar**

Place the bar on one of the calibration supports of the motors, then insert the bolt in the hole that the bar has for this purpose, placing the rest of the tools along with it. Verify the horizontality of the calibration bar with the leveler tool.



95 Heavy Vehicles Calibration Lever

- **Calibration process**

BRAKE TESTER:

1.) Turn on the main switch on the console of the Heavy vehicles brake tester.

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe**.

3.) Click with the mouse on the icon 

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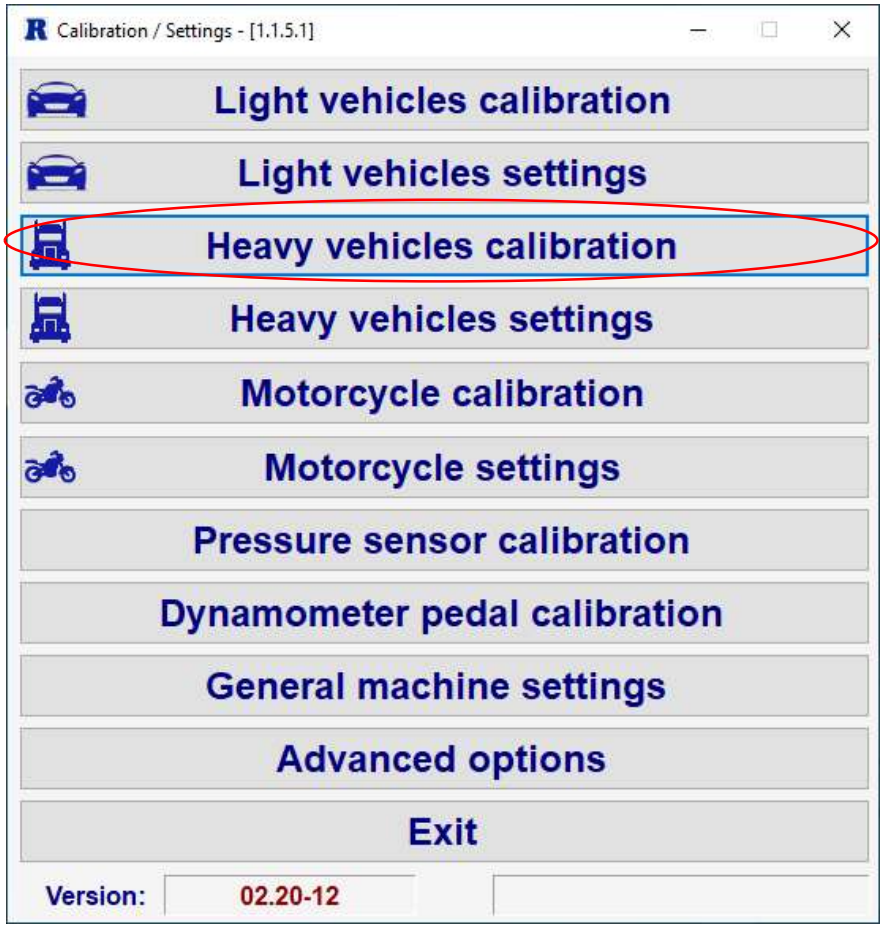
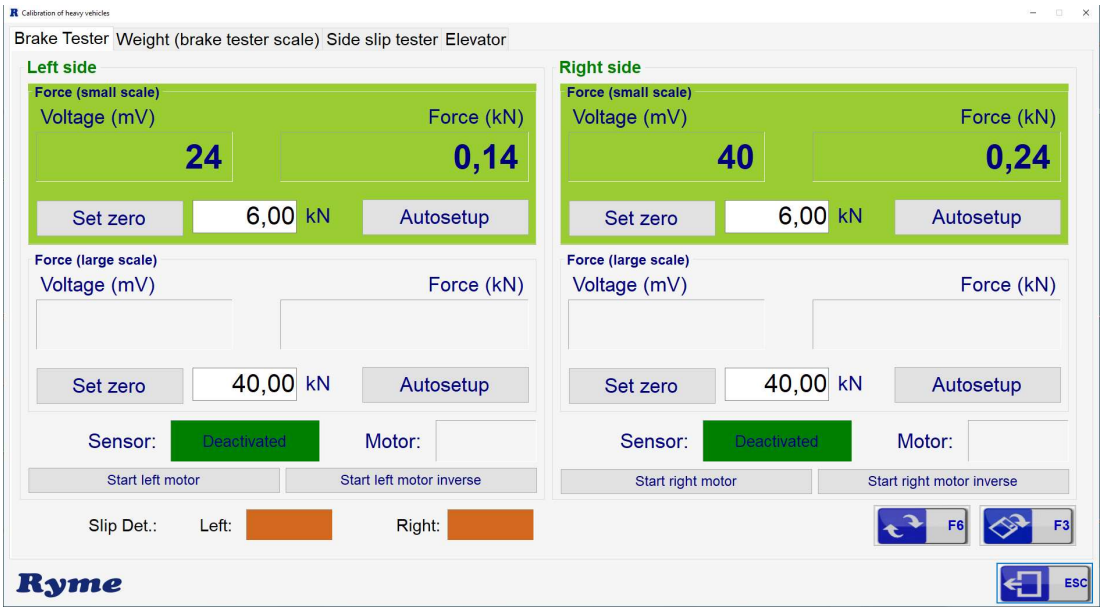


96 Settings Menu: Heavy Vehicles Calibration

a window will then open, from which you will calibrate/adjust the machine.

In the 'Brake Tester' tab you will start to perform the calibration/adjustment:

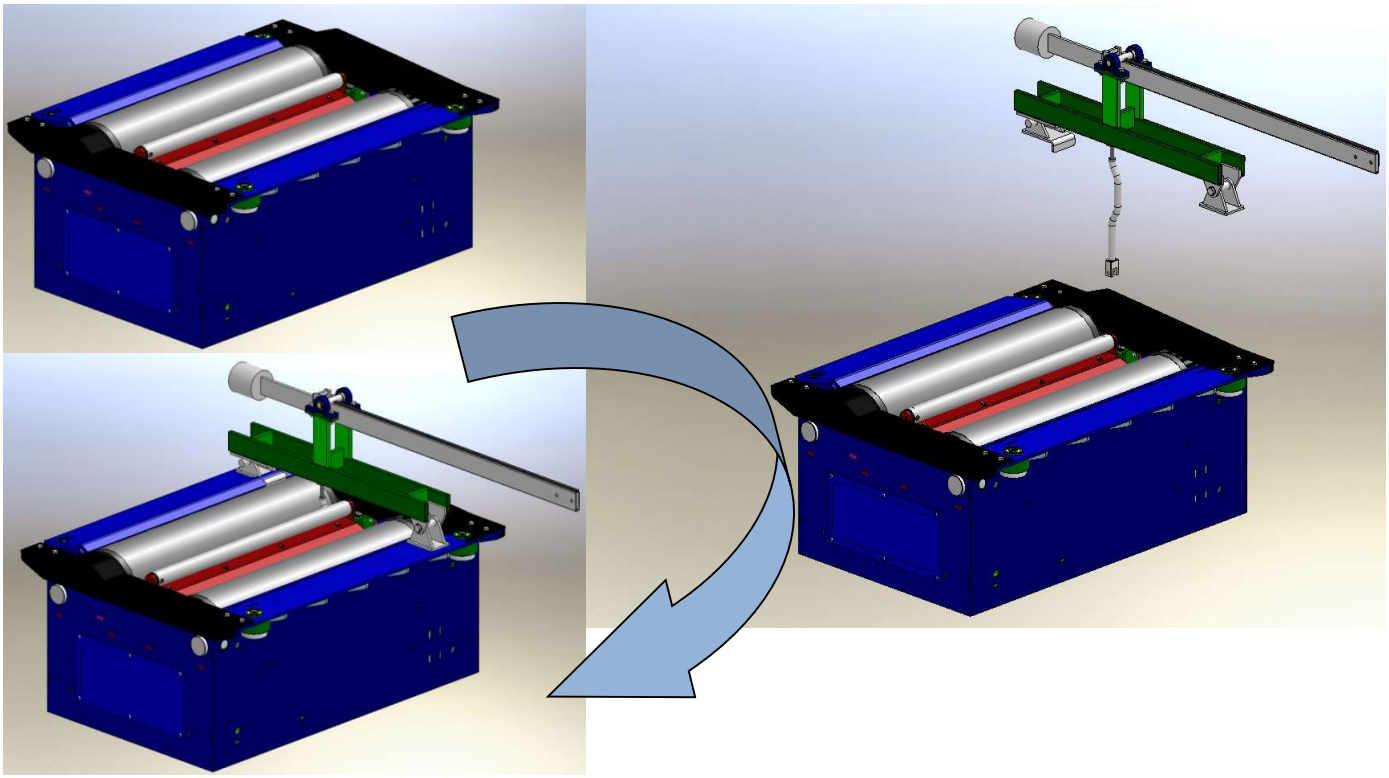


97 Heavy Vehicles Brake Tester Calibration/Adjustment Tab

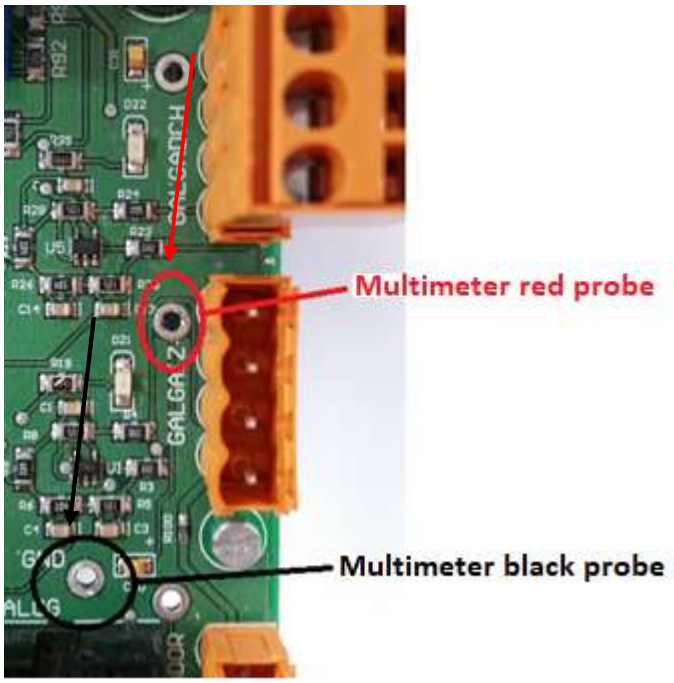
CAUTION: Turn off all protections before performing any operations.

You will start by calibrating the small scale:

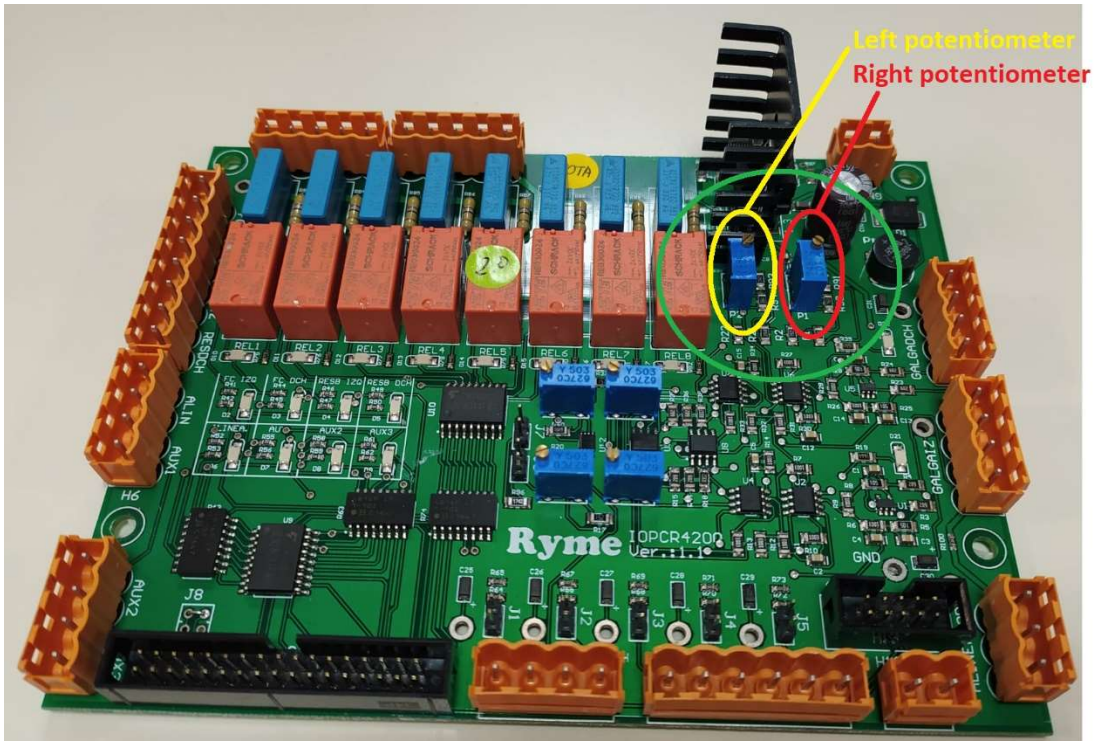
4.) Place the calibration bar on the left brake tester.



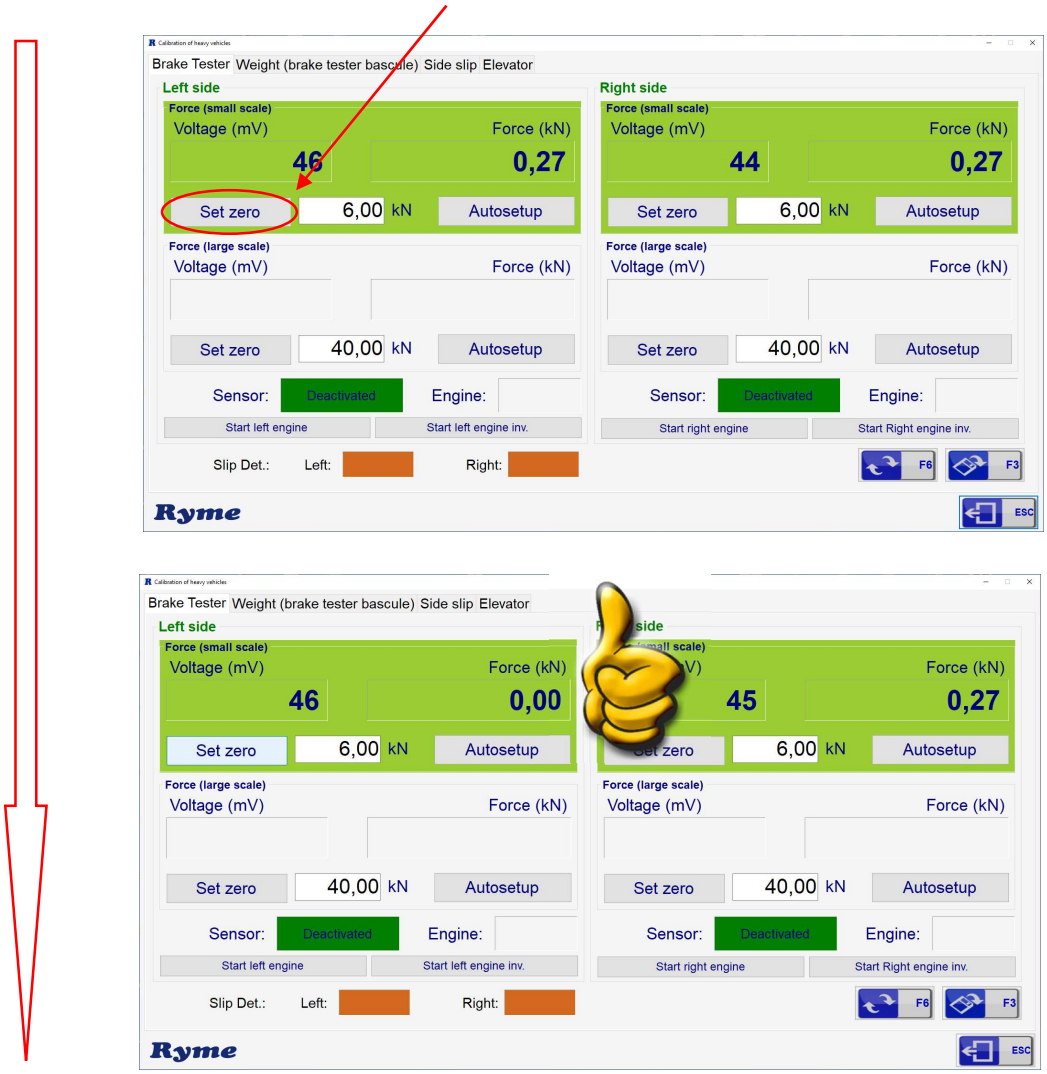
5.) With the help of a multimeter, measure the voltage (in mV) to regulate the 'zero' of the line. To do this, place the multimeter in direct current measurement mode, introduce the black tip in the hole of the plate with name 'GND' and the red tip in the hole of the plate with name 'GALGAIZ', as you can see it in the image:



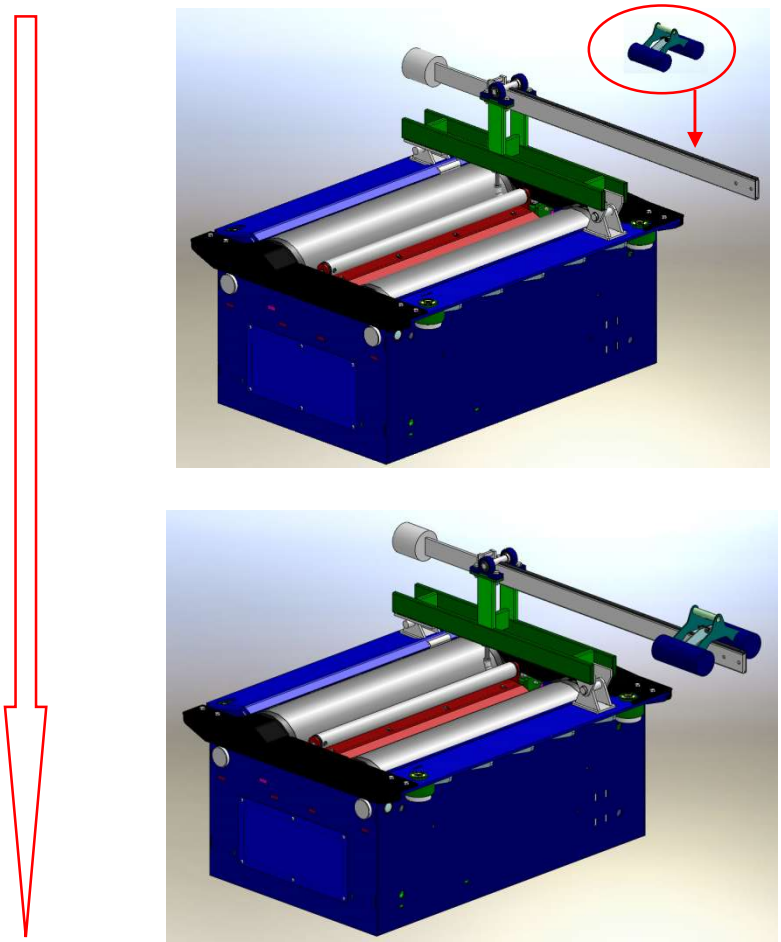
6.) Then, with the help of a screwdriver, turn the potentiometer on the left side (which corresponds to the left gauge) until a voltage of ±100mV is obtained on the multimeter.



7.) Once the required voltage is achieved, you must set by software the zero on the left side. To do this, on the calibration screen, click with the mouse on the icon Set zero.



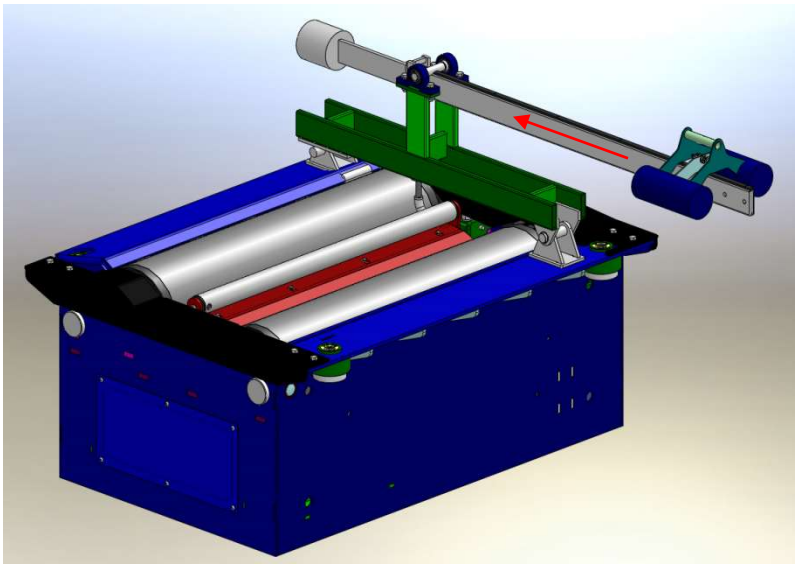
8.) Place the 30 kg weight in the lever notch corresponding to 6kN.



9.) Type with the keyboard in the auto-adjustment window 6 kN and click with the mouse on the Autosetup icon.

A setting confirmation window will appear.

10.) Place the weight in the notch of the bar corresponding to 3kN.



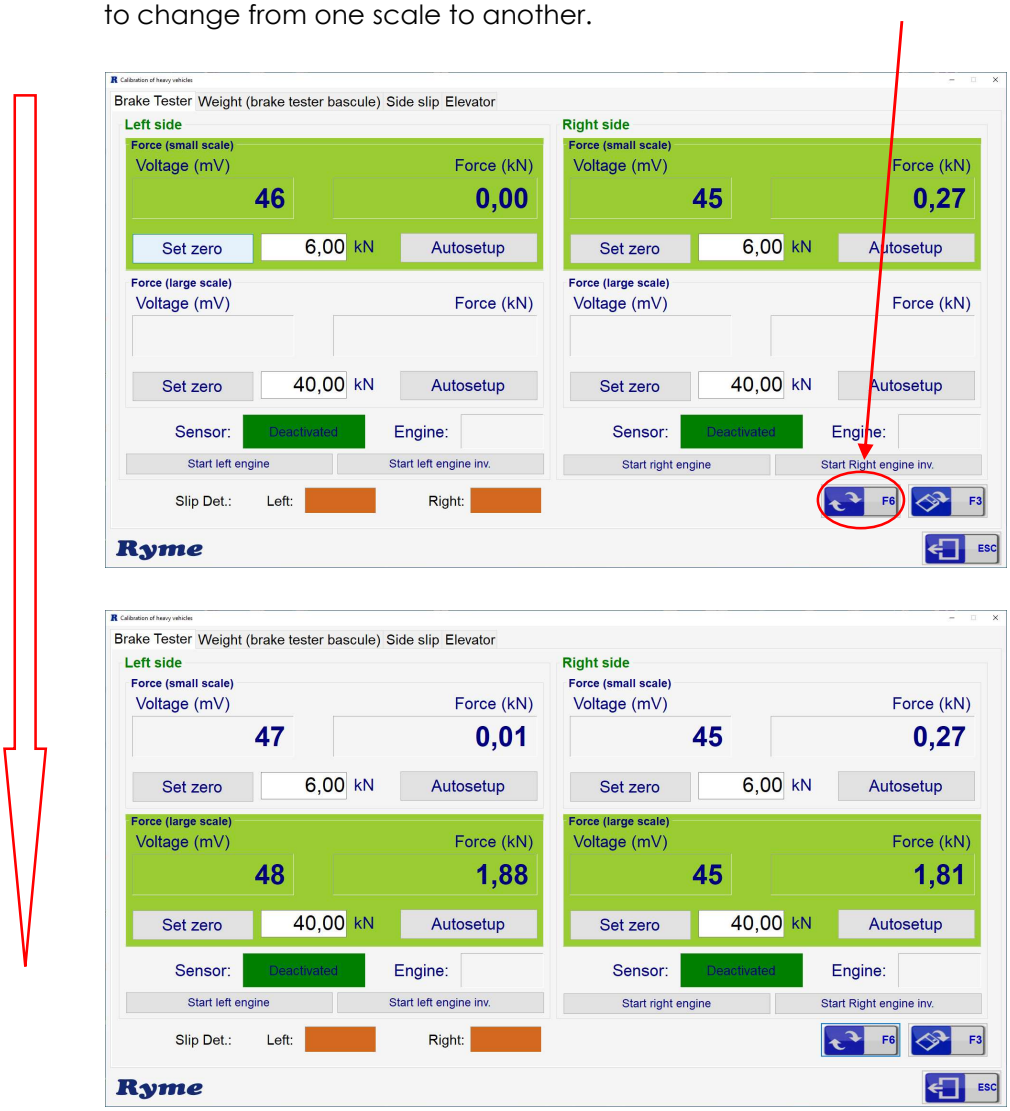
11.) Check on the monitor that the reading of the left force is 3kN.

It can be between 2.99 and 3.01kN.

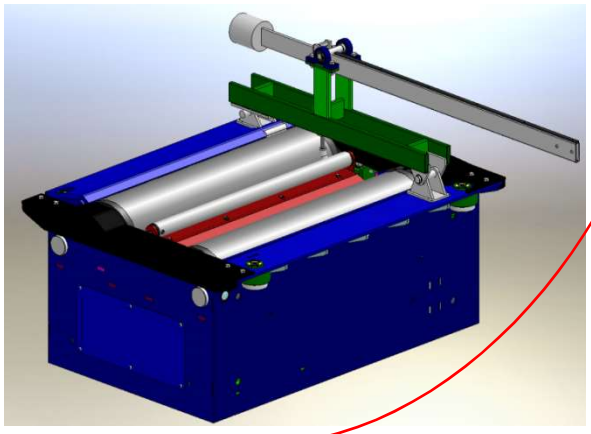
You will continue to calibrate the large scale:

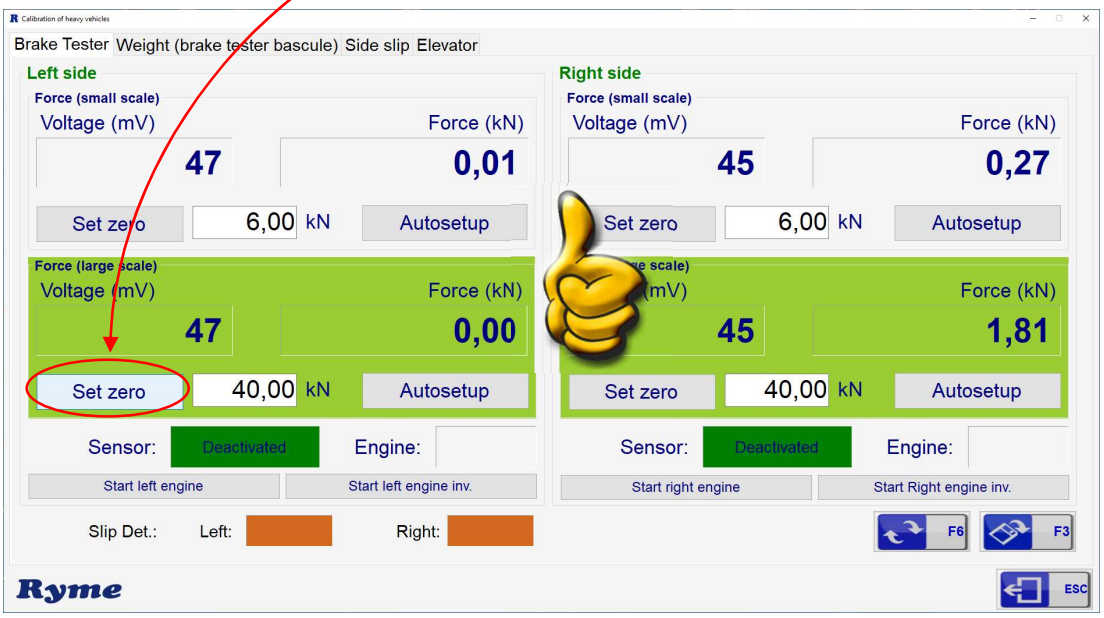
12.) Press the 'F6' key on the keyboard or click on the 

icon with the mouse to change from one scale to another.

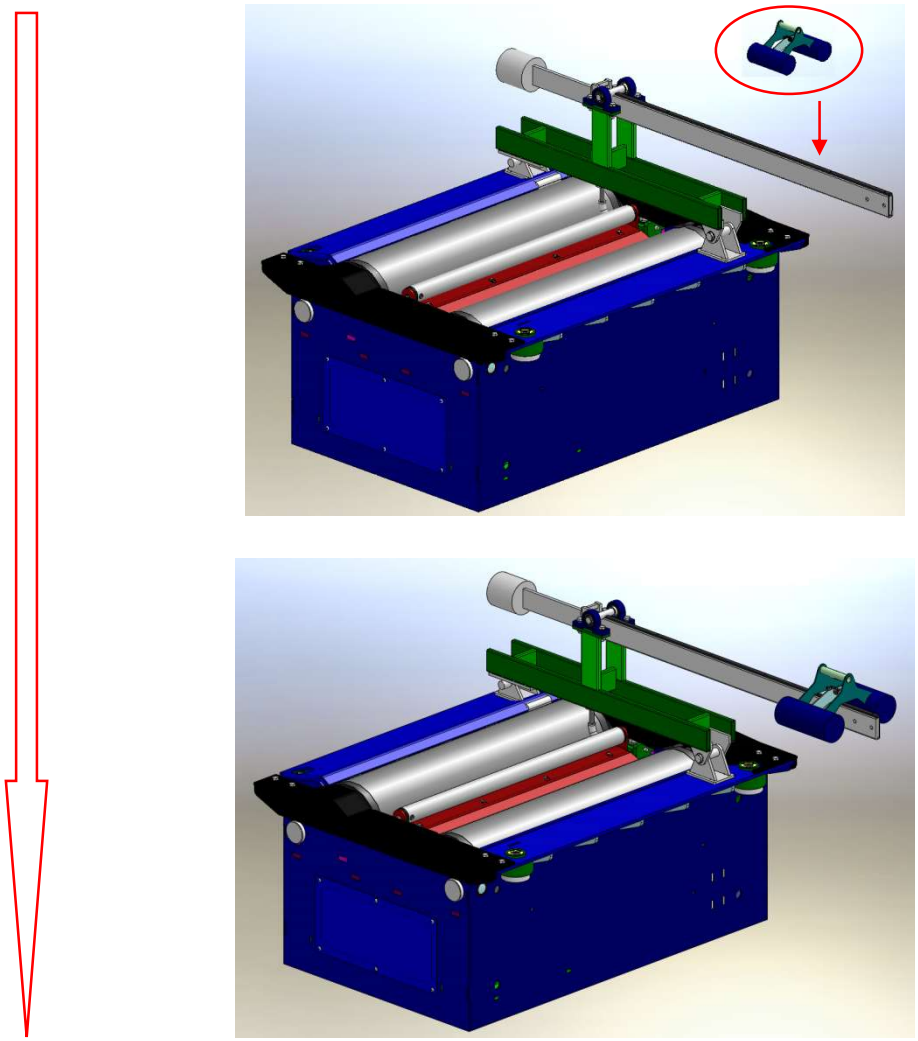


13.) Set by software the zero on the left side. To do this, on the calibration screen, click with the mouse Set zero.





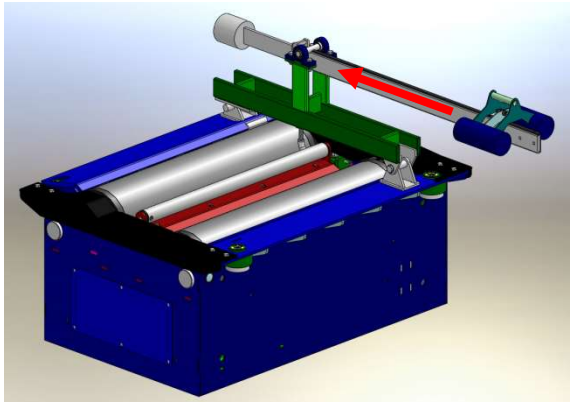
14.) Place the 30kg weight in the 12kN lever notch.



15.) Type with the keyboard in the auto-adjustment window 12 kN and click with the mouse on the Autosetup icon.

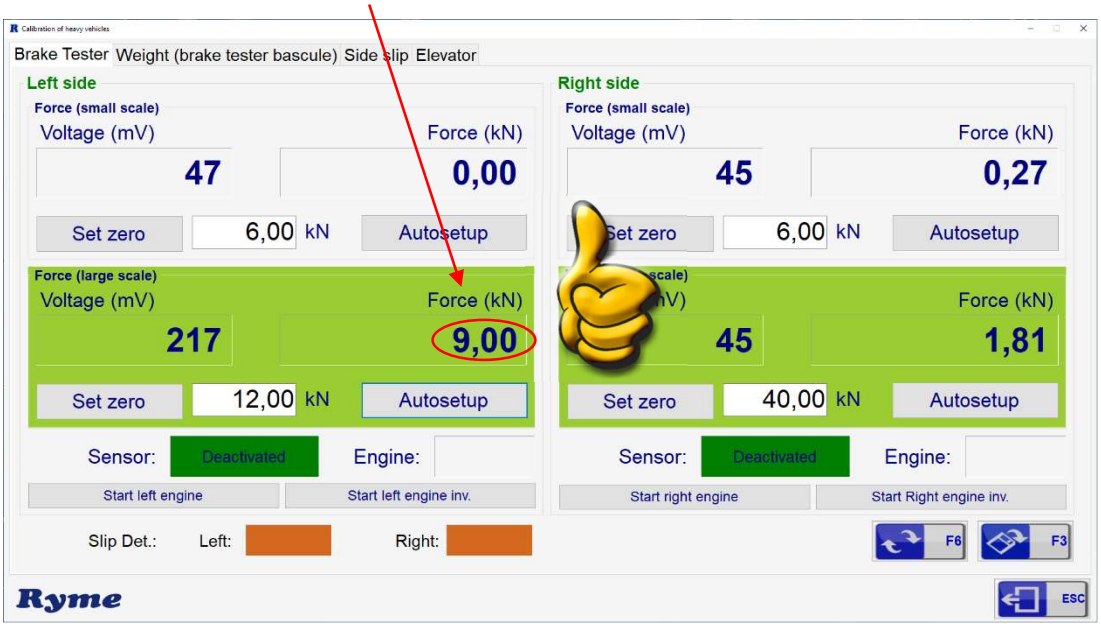
A setting confirmation window will appear.

16.) Place the weight in the notch of the bar corresponding to 9kN.

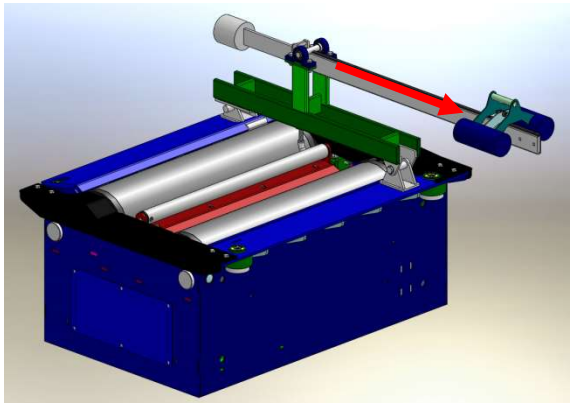


17.) Check on the monitor that the reading of the left force is 9kN.

It can be between 8.99 and 9.01kN.

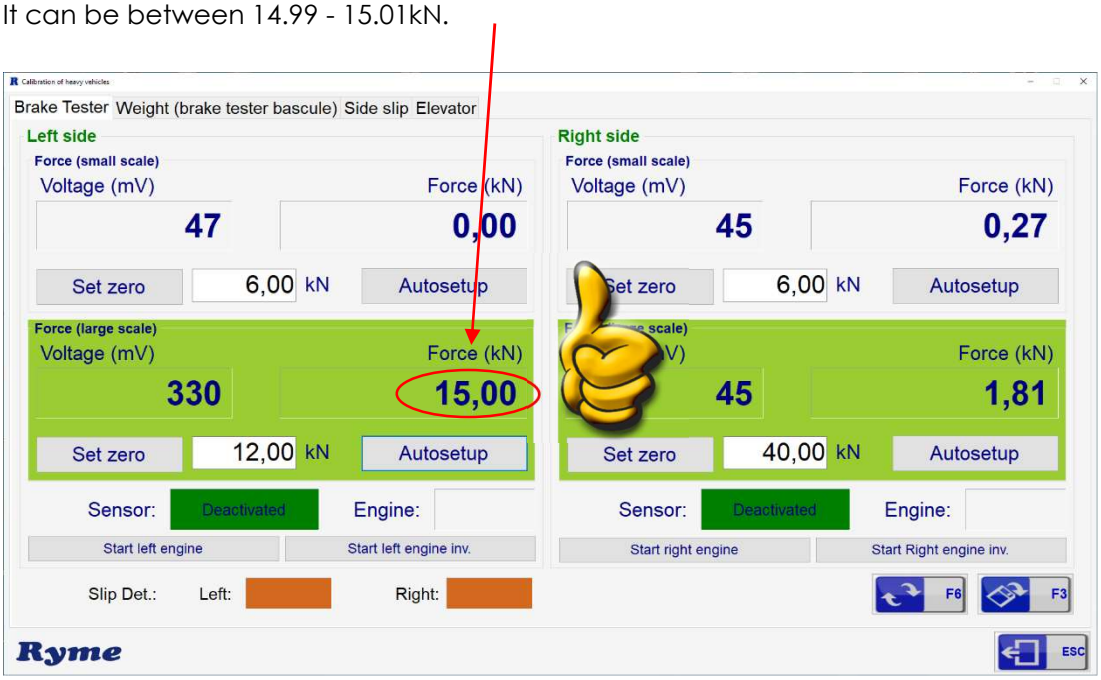


18.) Place the weight in the notch of the bar corresponding to 15kN.



19.) Check on the monitor that the reading of the left force is 15kN.

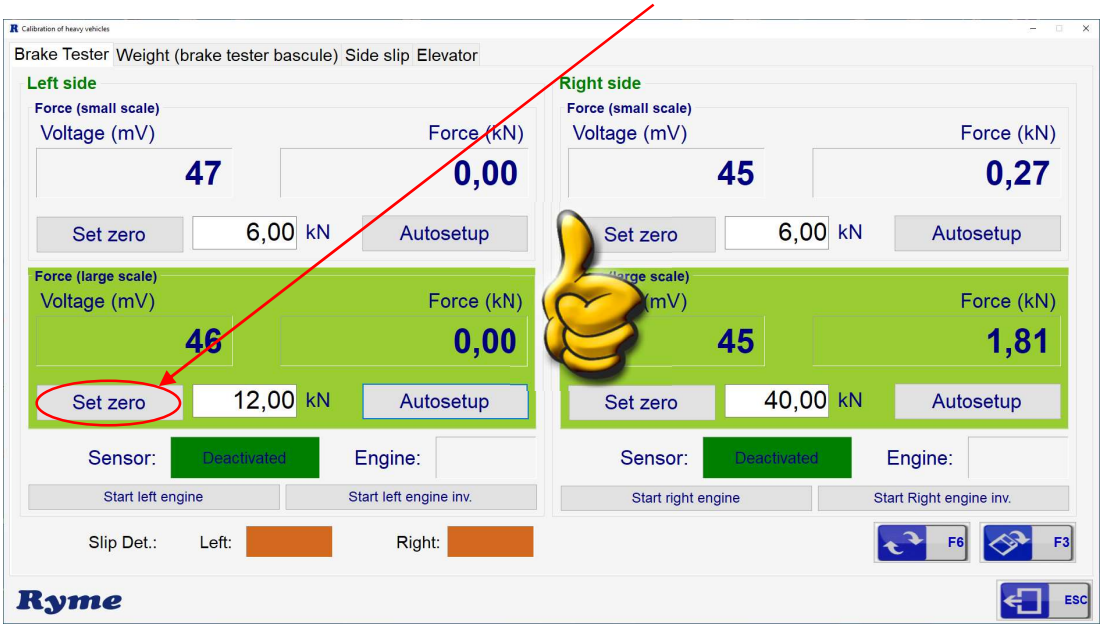
It can be between 14.99 - 15.01kN.



20.) After these actions, the calibration bar is removed and the left side zero is set again.

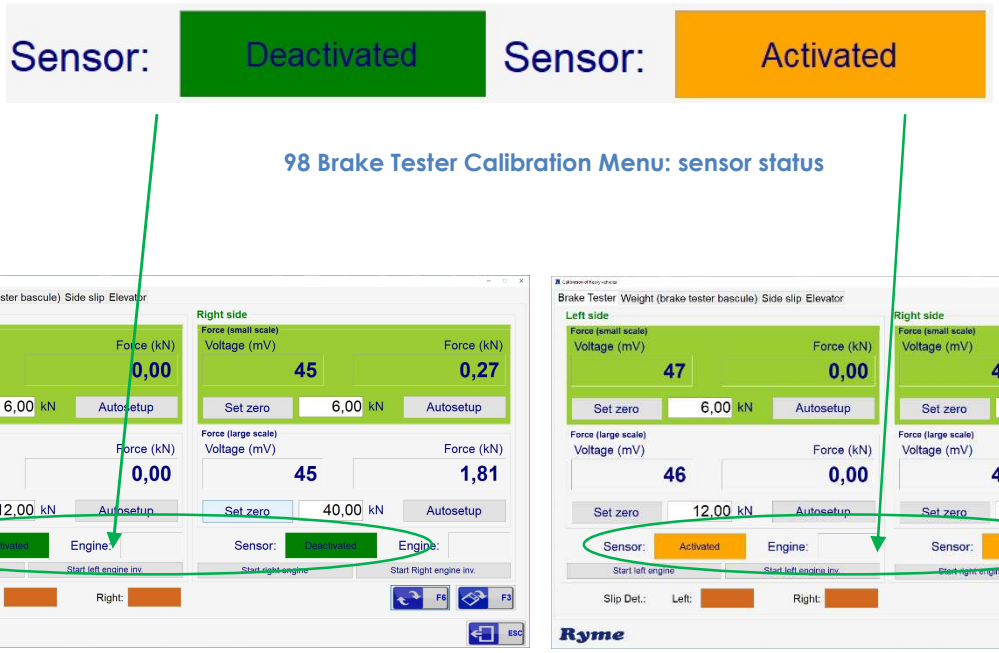
21.) Once the calibration bar is removed, measure again with the multimeter, obtaining an offset voltage of +-100mV by rotating the corresponding potentiometer.

22.) Then, in the calibration screen and without the calibration bar, click with the mouse on the Set zero icon.



Once the left side is calibrated, proceed to the calibration of the right side. To do this, repeat steps 4 to 20, both inclusive, on the right side.

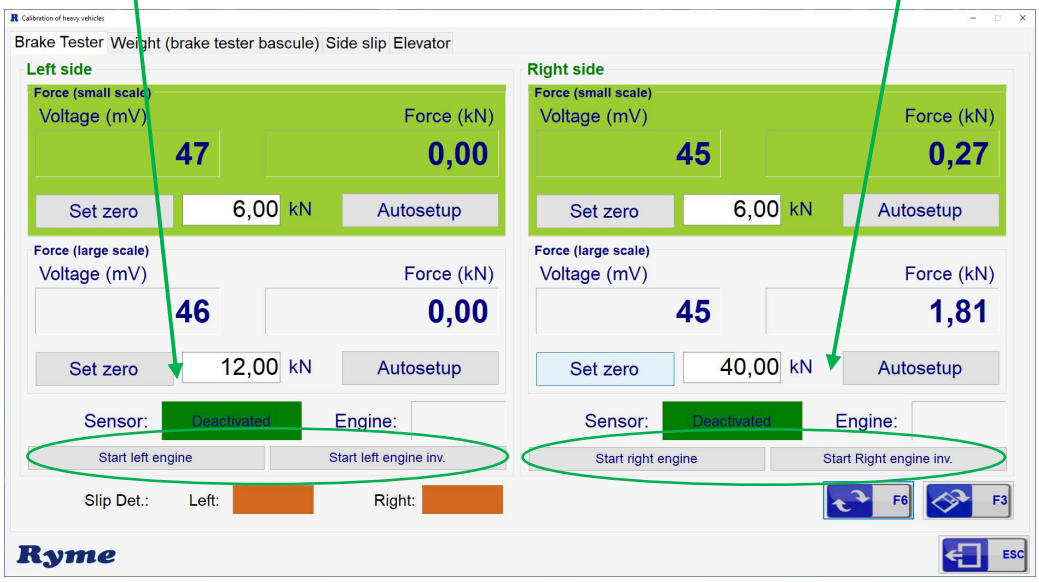
Note: from this screen you can test the correct operation of the presence sensors, in green it will be disabled and in yellow it will be enabled:



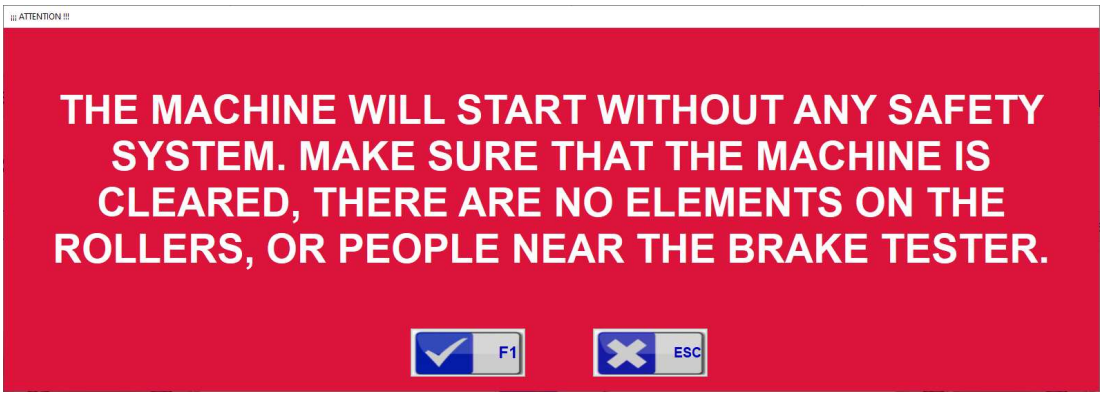
98 Brake Tester Calibration Menu: sensor status

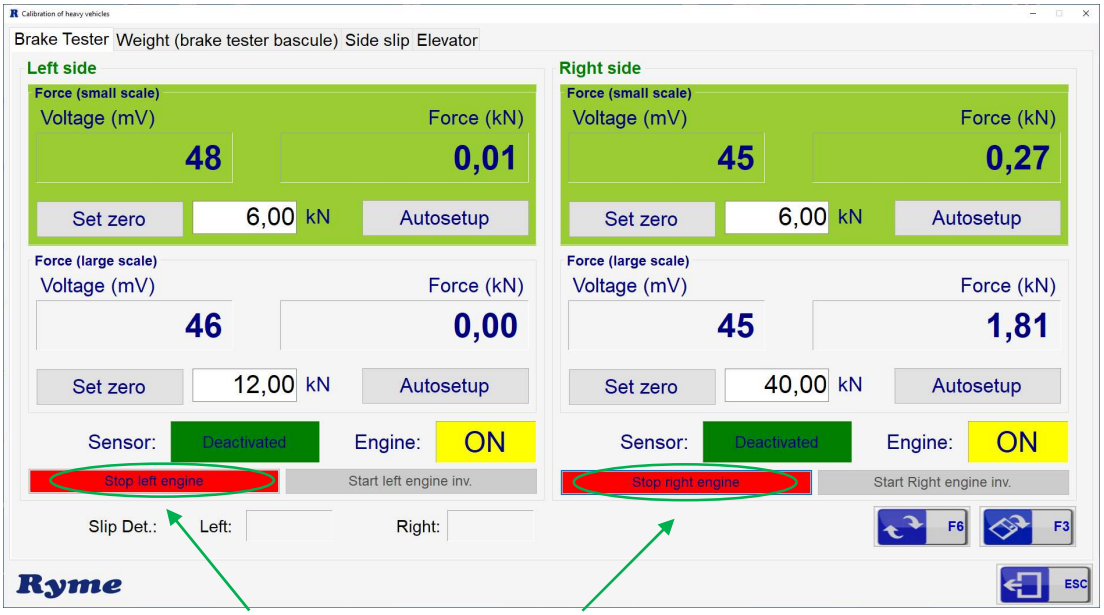
And of the motors, being able to start and stop them manually by clicking on the corresponding icon: left motor/left motor inverse and right motor/right motor inverse.

99 Brake Tester Calibration Menu: Motor Start



An alert message will warn you before starting the motors (Note: if you have a vehicle inserted in the brake tester, this message will not be shown):

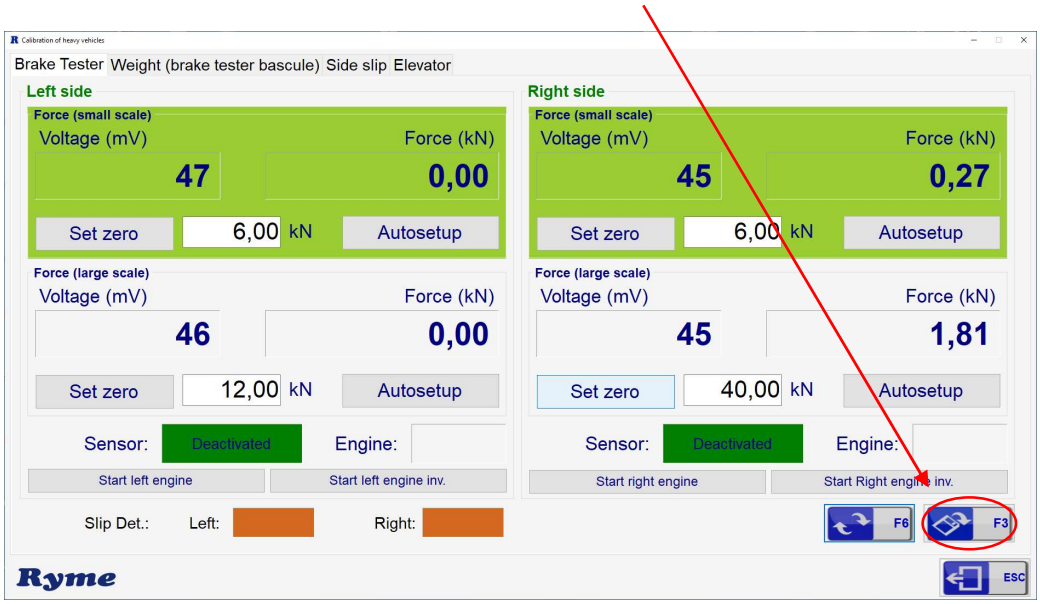




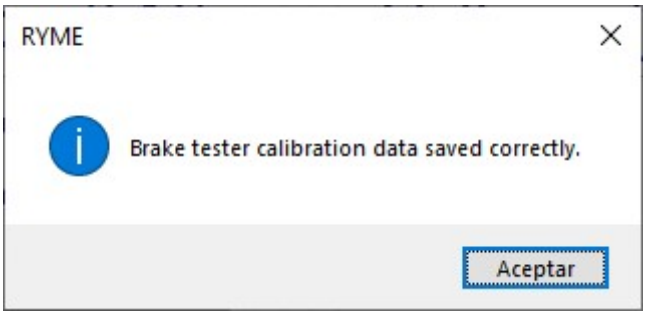
By clicking on the icons 'Stop left motor' and 'Stop right motor' the motors will stop.

You can save the calibration by clicking on the 

icon with the mouse or by pressing the 'F3' key on the keyboard.

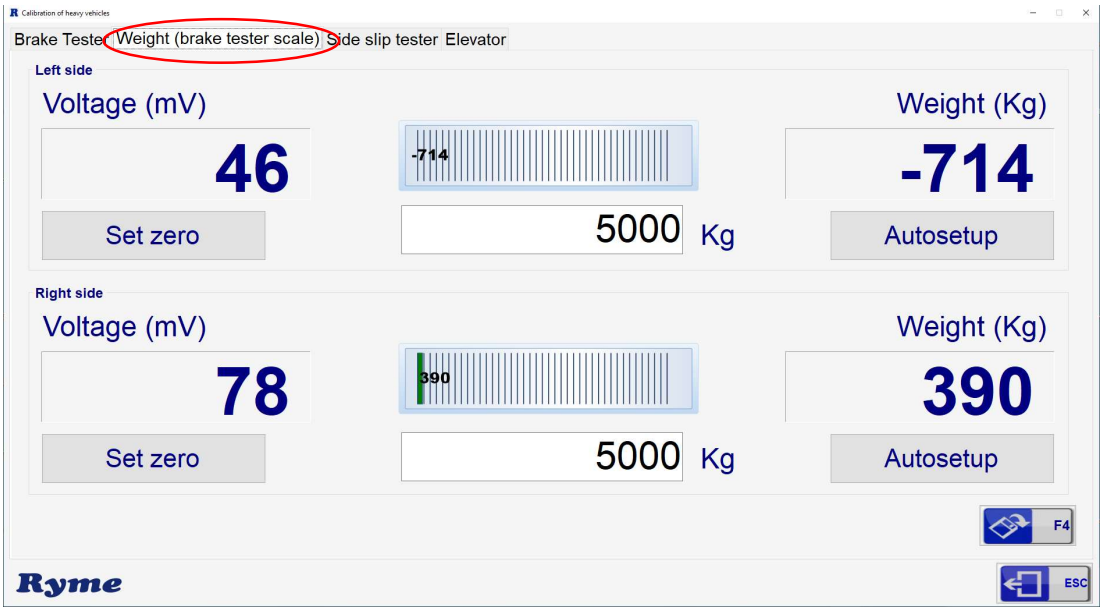


It will inform you through a message that it has been correctly saved.



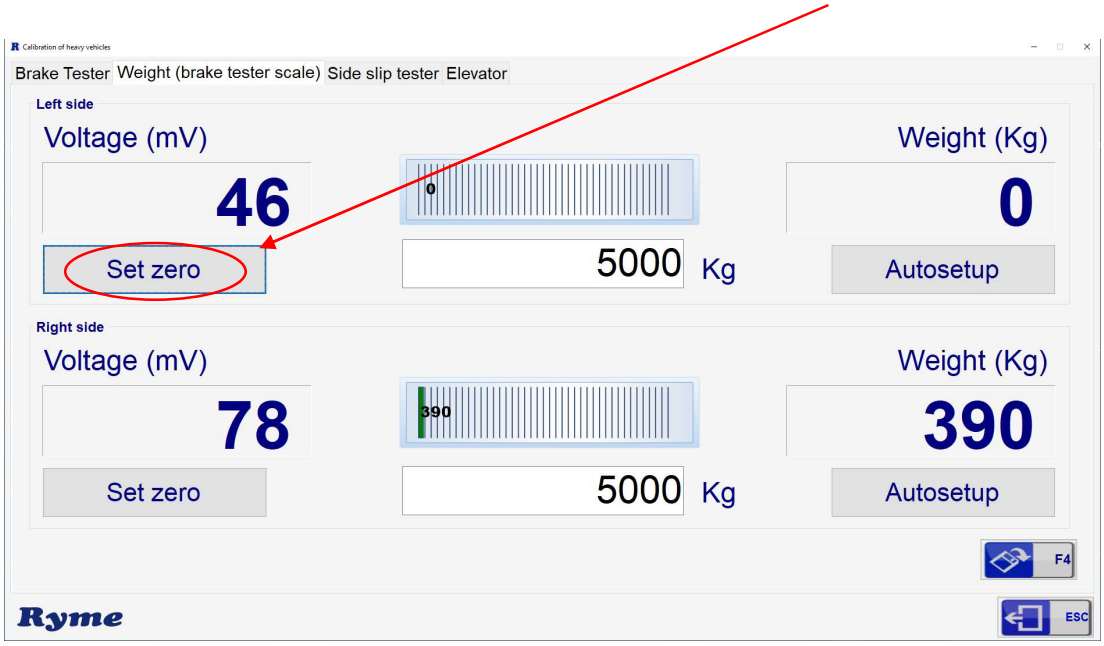
7.2.4 Weight calibration (brake tester scale):

In the Weight tab (brake tester scale), you will start to perform the calibration:

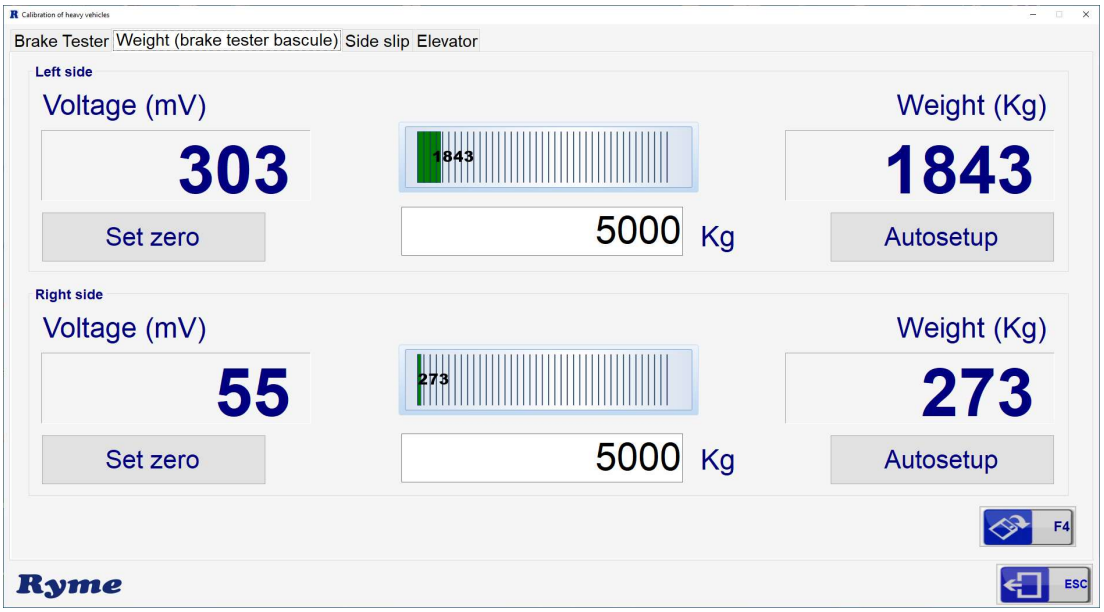


100 Heavy Vehicles Scale Calibration Screen

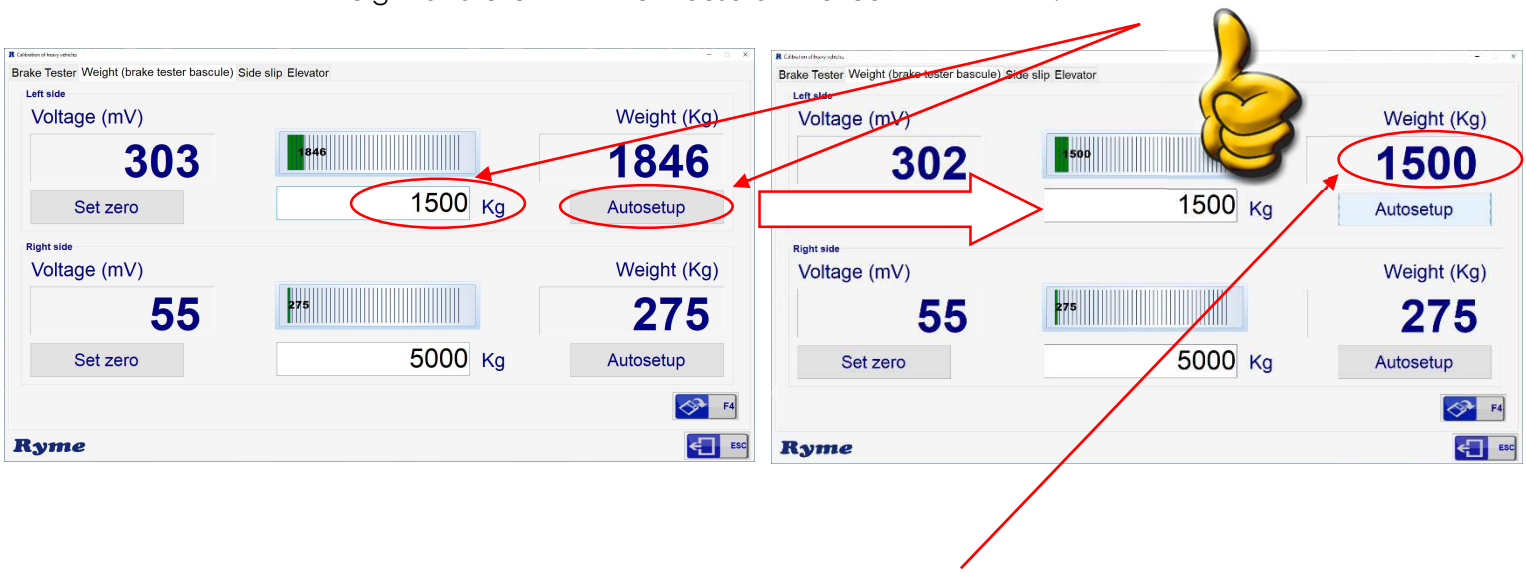
1.) Set by software the zero. To do this, on the Axle weight calibration screen (left side), click with the mouse on the Set zero icon.



2.) Place the known weight on the brake tester (left side).



3.) Type with the keyboard in the auto-adjustment window the kg of the known weight and click with the mouse on the icon Autosetup.



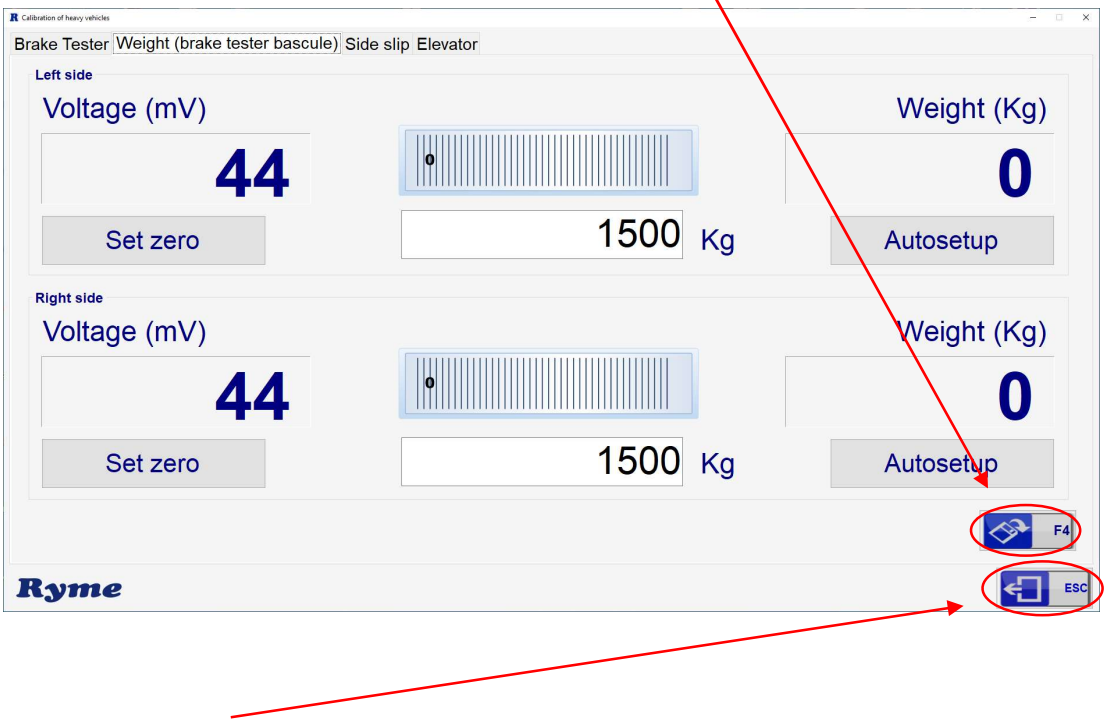
A setting confirmation window will appear.

4.) After these actions, the known weight can be removed, and you have to make sure that the scales return to the original value before the weight adjustment.

5.) Once the left side is calibrated, proceed to perform the calibration/adjustment of the right side. To do this, repeat steps 1 to 4 inclusive.

To save the calibration correctly it is important to make sure to press the 'F4' key on the keyboard or click with the mouse on the 

icon.



To exit this screen, press the 'Esc' key on the keyboard or click on the 

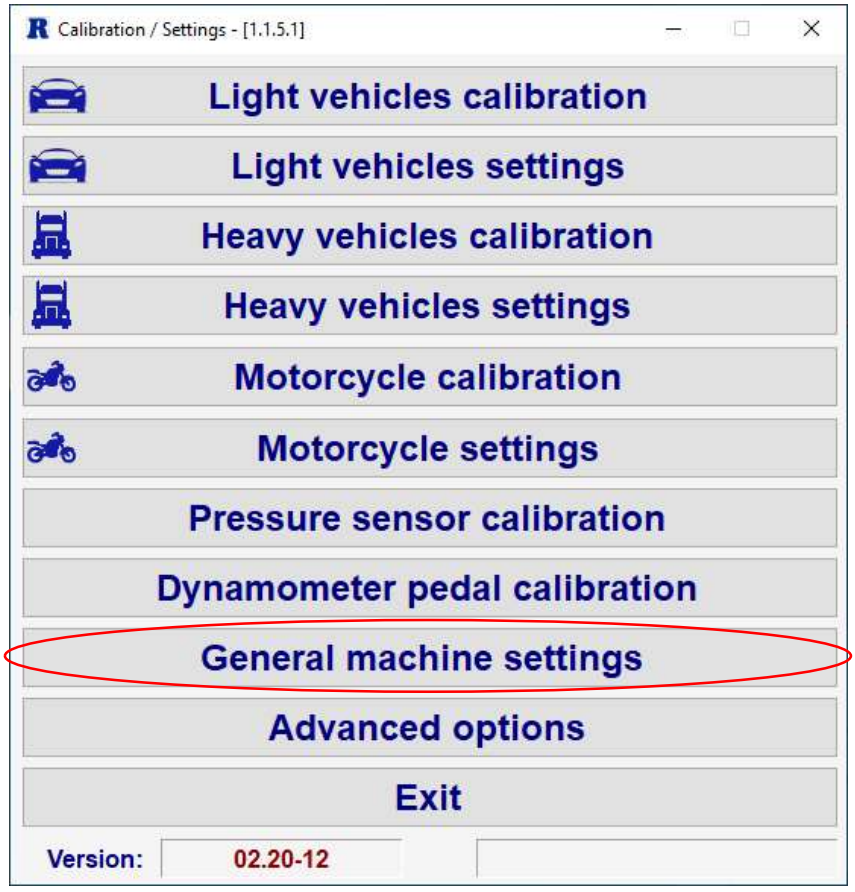
icon.

7.3 Motorcycle Calibration

In order to configure the line, open the application RYME_CalConf_PCE.exe:

101 RYME_CalConf_PCE.exe application

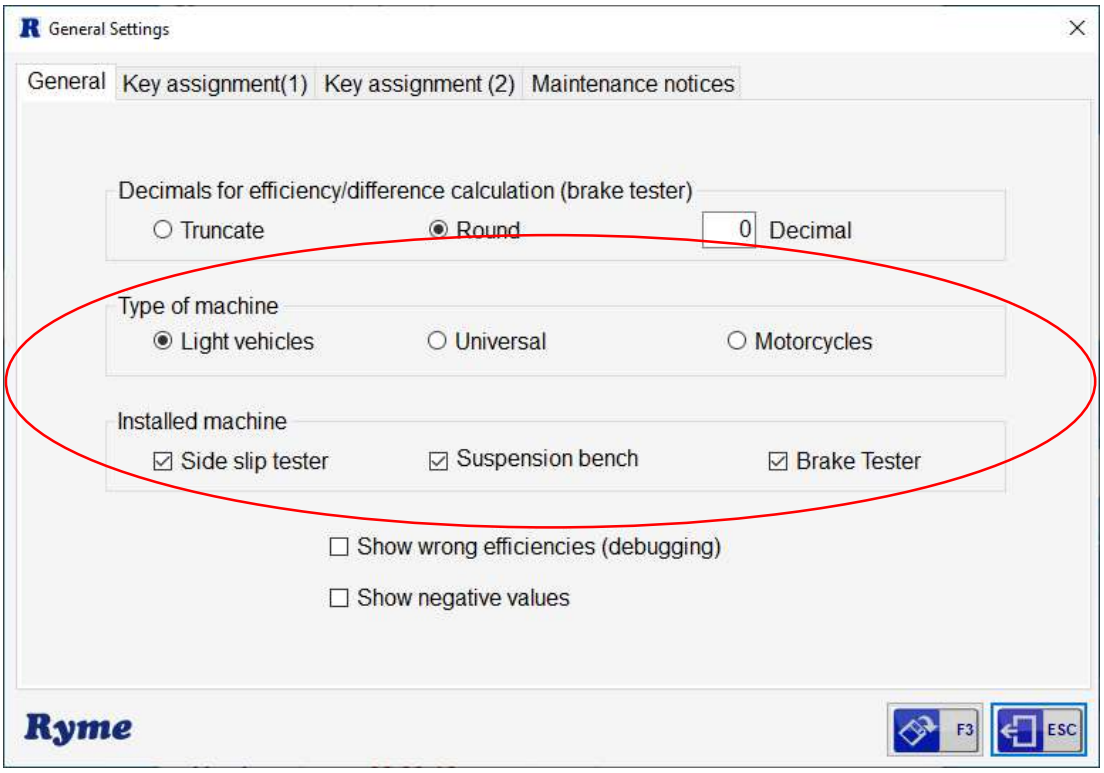
To correctly calibrate the motorcycle brake tester, it is mandatory to configure the installed machine in the Main Menu option **General machine settings**.



102 PCE Calibration/Settings Menu

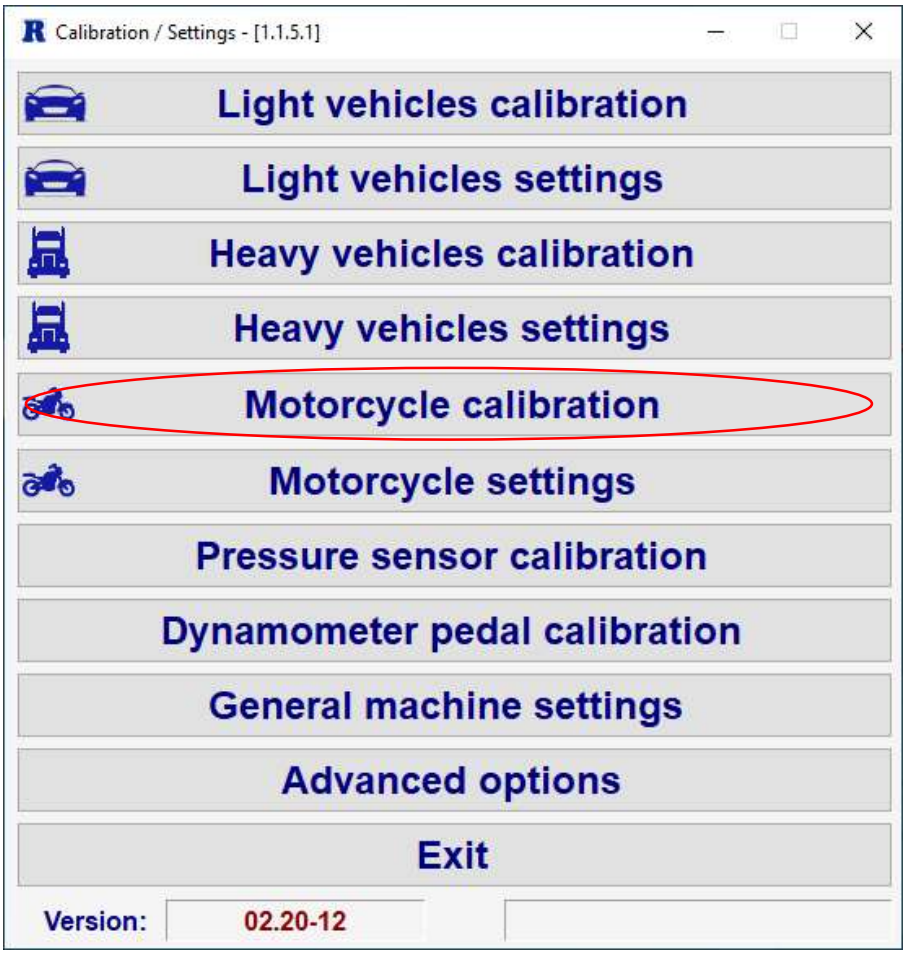
Note: in case the machine model to be adjusted/calibrated is: FRL/FRQ, it will not be necessary to change the configuration to 'Motorcycles'. Proceed directly to calibrate leaving the previously saved configuration: 'Light Vehicles'.

When you click on this icon, a window will appear in which you can select the type of brake tester to be used and the machines installed in the line.



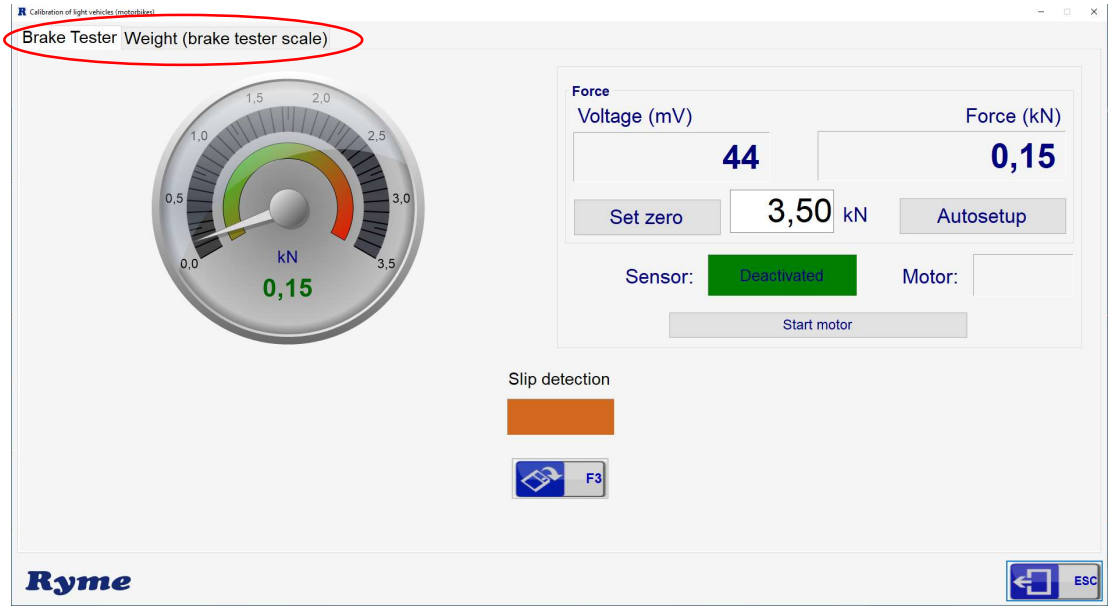
After this step, save the changes by pressing the 'F3' key on the keyboard or by clicking with the mouse on the  icon and exit this window by pressing the 'Esc' key on the keyboard or by clicking with the mouse on the  icon to start the calibration.

Open the Settings window, from which you will be able to select the operation you want to perform. To adjust the parameters, click with the mouse on the  icon, located in the central part of the menu:



103 Settings Menu: Motorcycle calibration/adjustment

By clicking on the different tabs with the mouse, you will be able to calibrate the machine:



104 Motorcycle calibration/adjustment window: Brake tester

To make the necessary adjustments to the machines in the line, follow this order:

- Brake tester
- Weight

7.3.1 Motorcycle Brake Tester Calibration

- Objective

This procedure describes the steps necessary for the calibration of Ryme® roller brake testers.

- Scope

This procedure is applied to the following models of Ryme® brake testers:

  - PCE (FRM)

- Reference documentation

  - Expression of the uncertainty of measurement in the calibrations. CEA-ENAC-LC/02 Guide.

- Personnel requirements

  - The personnel who will carry out the calibration must have the technical knowledge and appropriate training.

- Equipment and material

  - The list of material required to carry out the brake tester calibration is

    - FRM brake tester bar
    - 30 kg weight
    - Leveler tool

- Description of the process

  - **Previous considerations**

To perform the calibration, the torque (moment) of forces measured with the gauge will be simulated, giving it a known value (calculated by elementary physical principles) and compared with the values read by the brake tester indicator.

The moment of a force is given by the expression:

$$\vec{M} = \vec{r} \times \vec{F} = |\vec{r}| \cdot |\vec{F}| \cdot \text{sen}(\alpha)$$

Where the moment ($\vec{M}$) is the cross product of the position vector ($\vec{r}$) (distance from the point of the application of force to the axis of rotation) by the applied ($\vec{F}$) force (which in this case will be a weight), in other words, the product of the modules of said vectors by the sine of the angle ($\alpha=\pi/2$) they form between them.

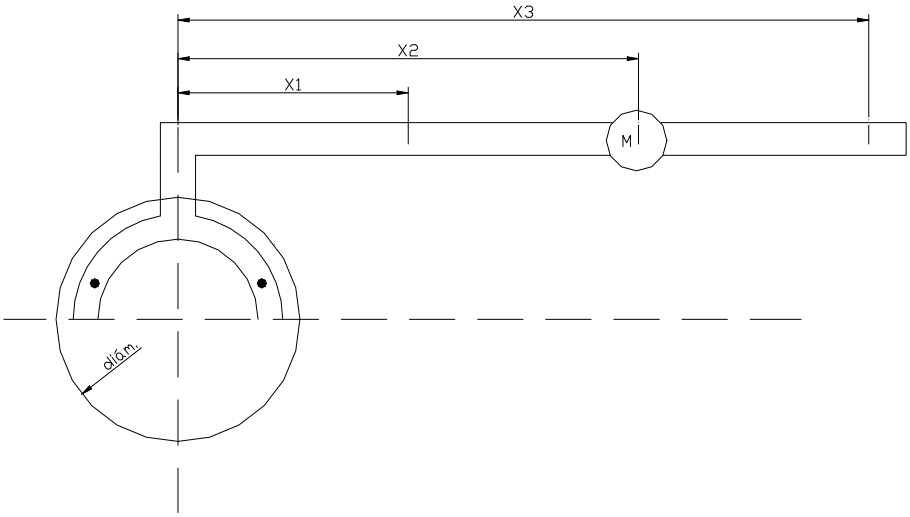
During the calibration, a bar is adjusted to the motor, which produces a moment over the brake tester. If on top of that a mass is placed in different points, different moment values can be applied to the brake tester.

As it is a vectorial magnitude, the resulting moment is the vectorial sum of both moments, which because the applied force is that of gravity and the position vector is always perpendicular to it, its sum is Scalar.

- Identify the brake tester by its serial number or any other manufacturing mark and take the data on the corresponding data collection sheet.
- Remove the brake tester covers, both the outer and central ones.
- Carry out a preliminary visual inspection of the interior, noting any anomalies observed on the data collection sheet.

- **Placement of the calibration bar**

The calibration bar for light vehicle and motorcycle brake testers should be placed on the engine mount on one side in the holes provided for this purpose. This will serve as a support for the calibration, securing it tightly with screws and nuts. Check with the level its horizontality.



105 Motorcycle Calibration Lever

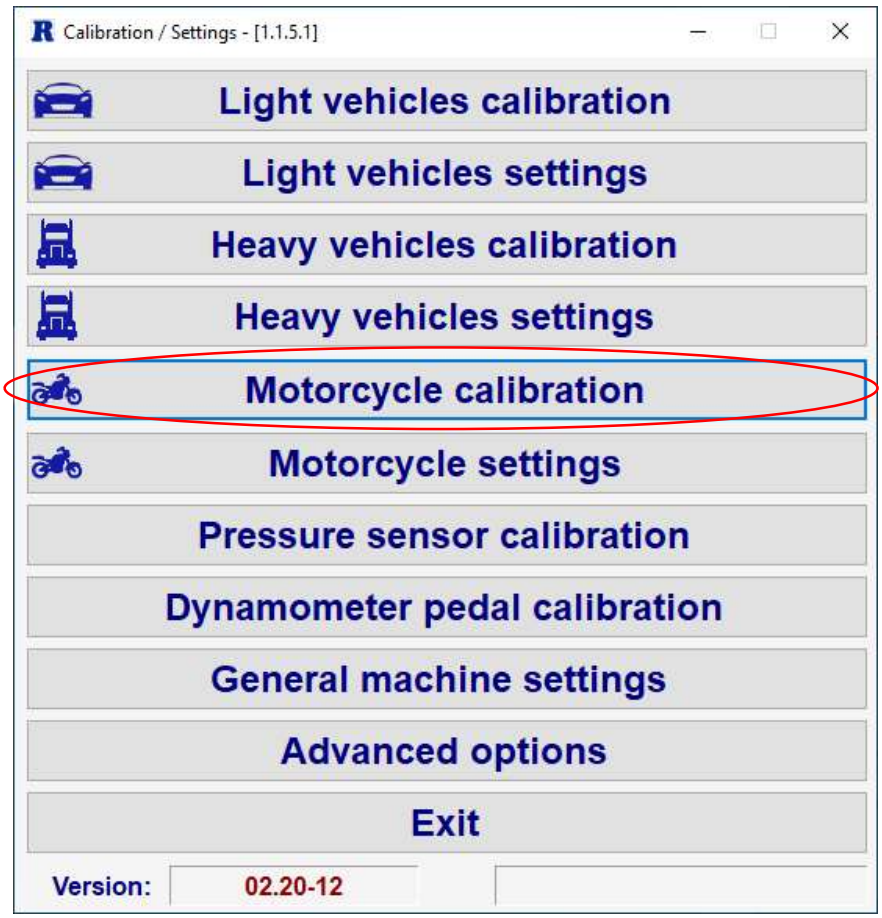
- **Calibration process**

BRAKE TESTER:

1.) Turn on the main switch on the console of the Motorcycle brake tester.

2.) Turn on the PC and load the program **RYME_CalConf_PCE.exe**.

3.) Click with the mouse on the icon Motorcycle calibration,

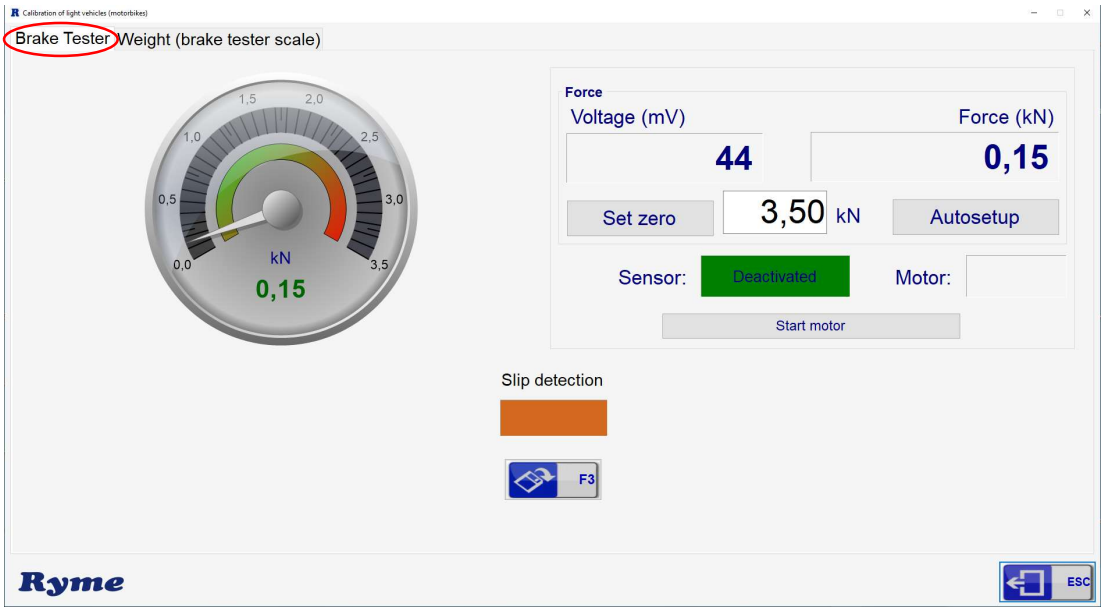


106 Settings Menu: Motorcycle calibration/adjustment

a window will appear where you will calibrate/adjust the machine:

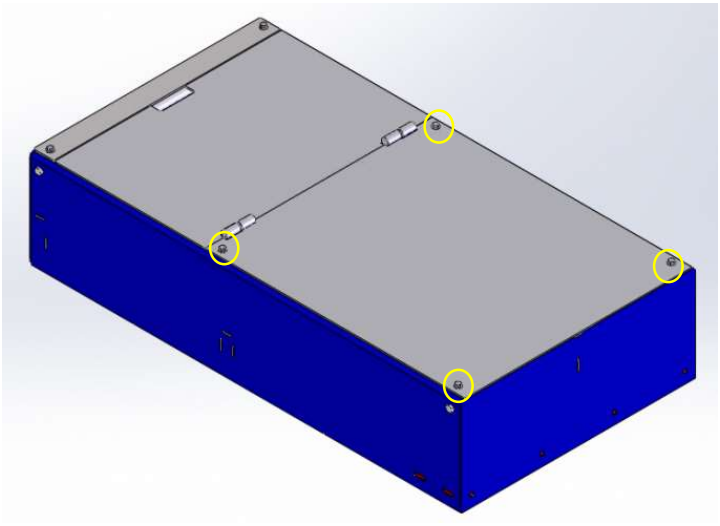
CAUTION: Turn off all protections before performing any operations.

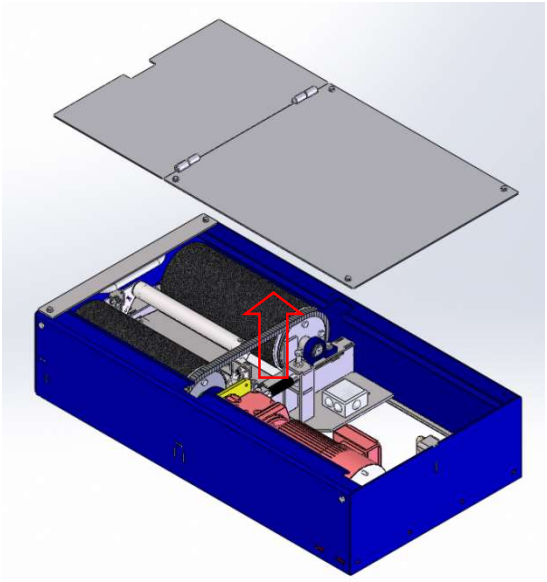
In the brake tester tab you will start with the performance of the calibration/adjustment:



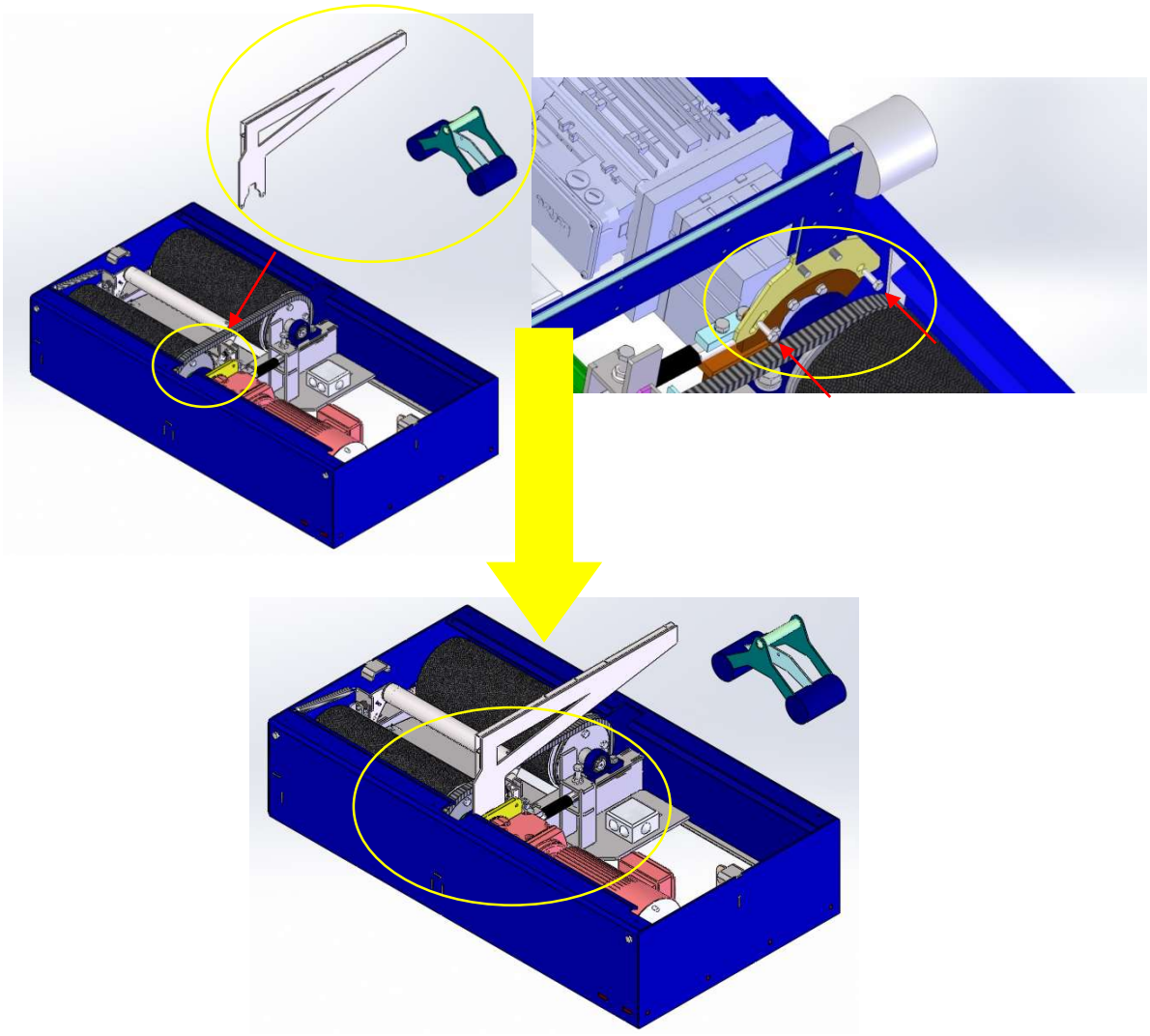
107 Brake Tester Calibration/Adjustment display

4.) Remove the screws and remove the cover.

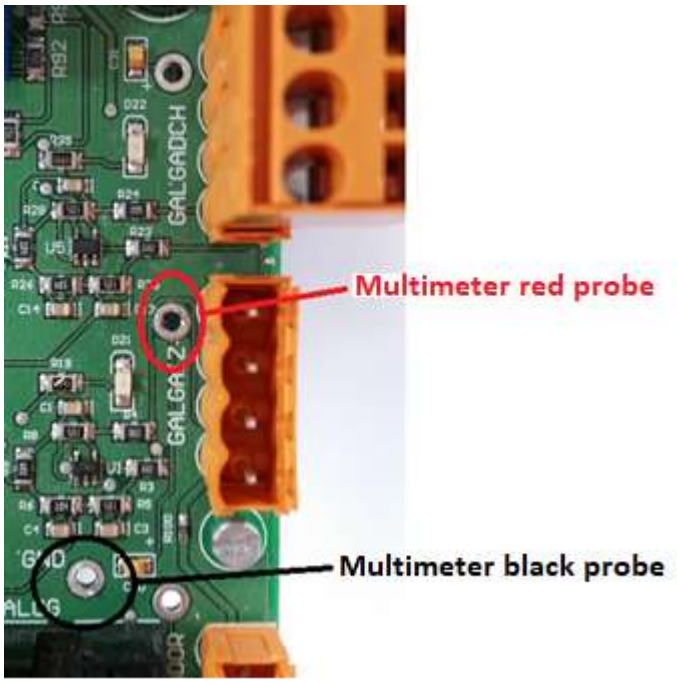




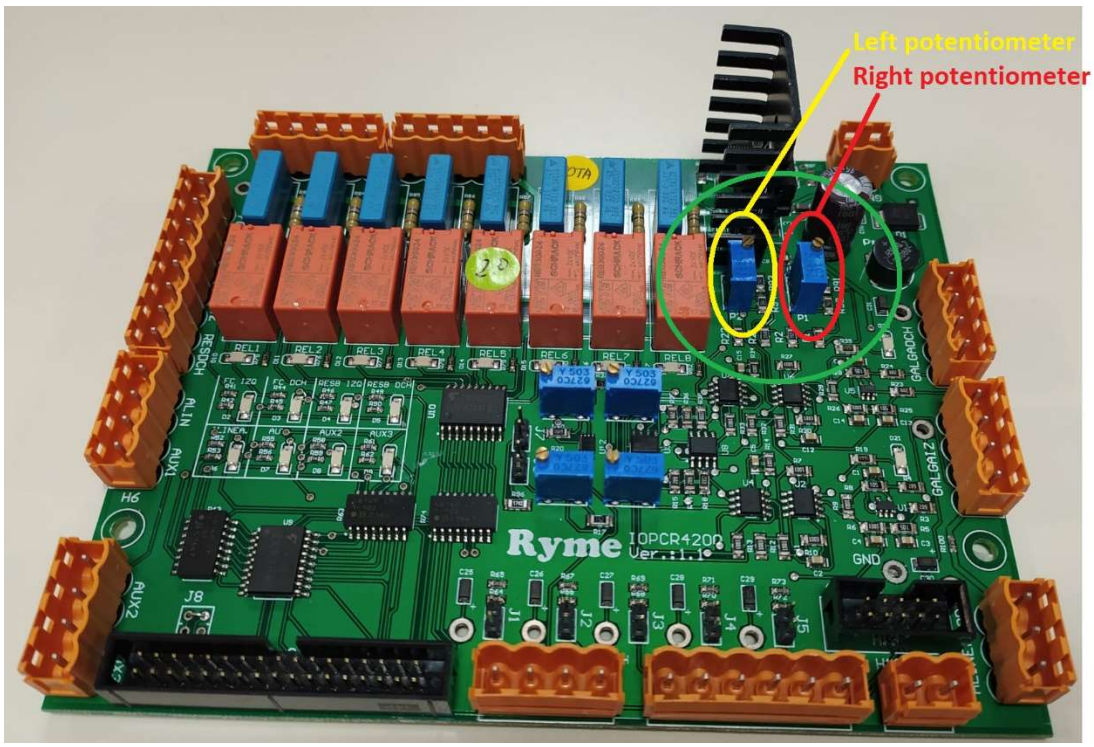
5.) Place the calibration bar with the help of the two fastening screws, it is important that it is properly levelled.



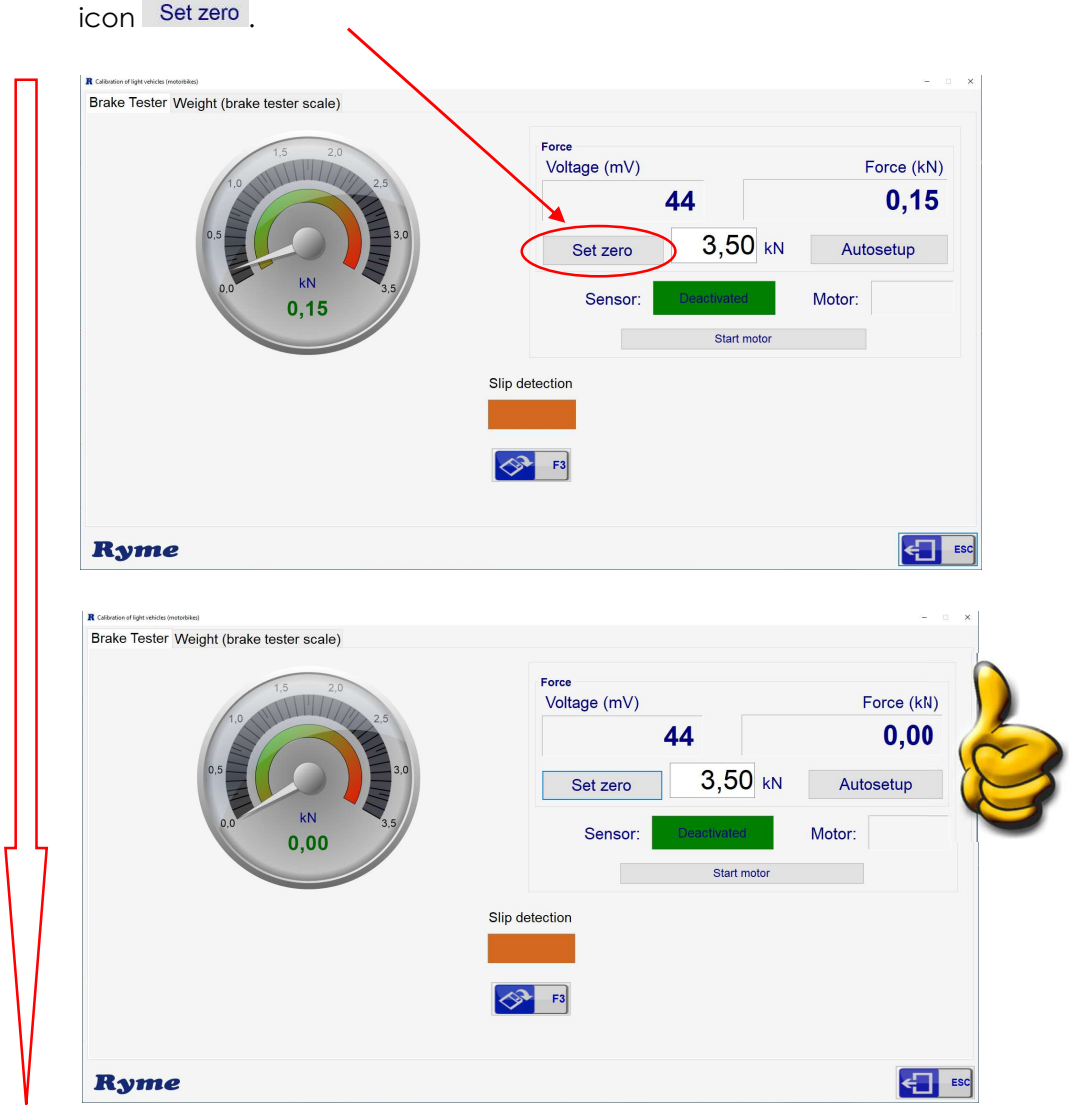
6.) With the help of a multimeter, measure the voltage (in mV) to regulate the 'zero' of the line. To do this, place the multimeter in direct voltage measurement mode, introduce the black tip in the hole of the plate with name 'GND' and the red tip in the hole of the plate with name 'GALGAIZ', as you can see on the image:



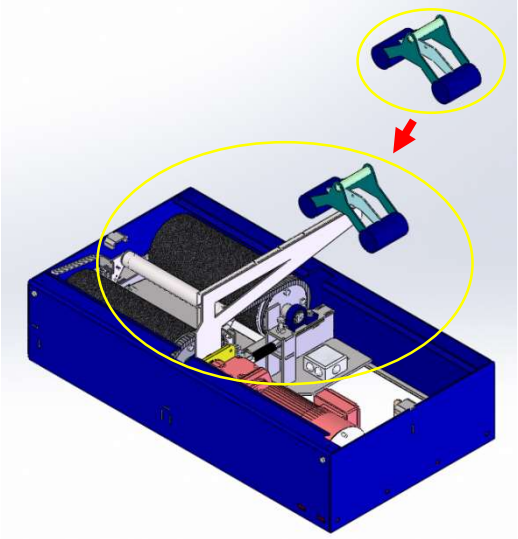
7.) Then, with the help of a screwdriver, turn the potentiometer on the right side (which corresponds to the left gauge) until a voltage of ±100mV is obtained on the multimeter.



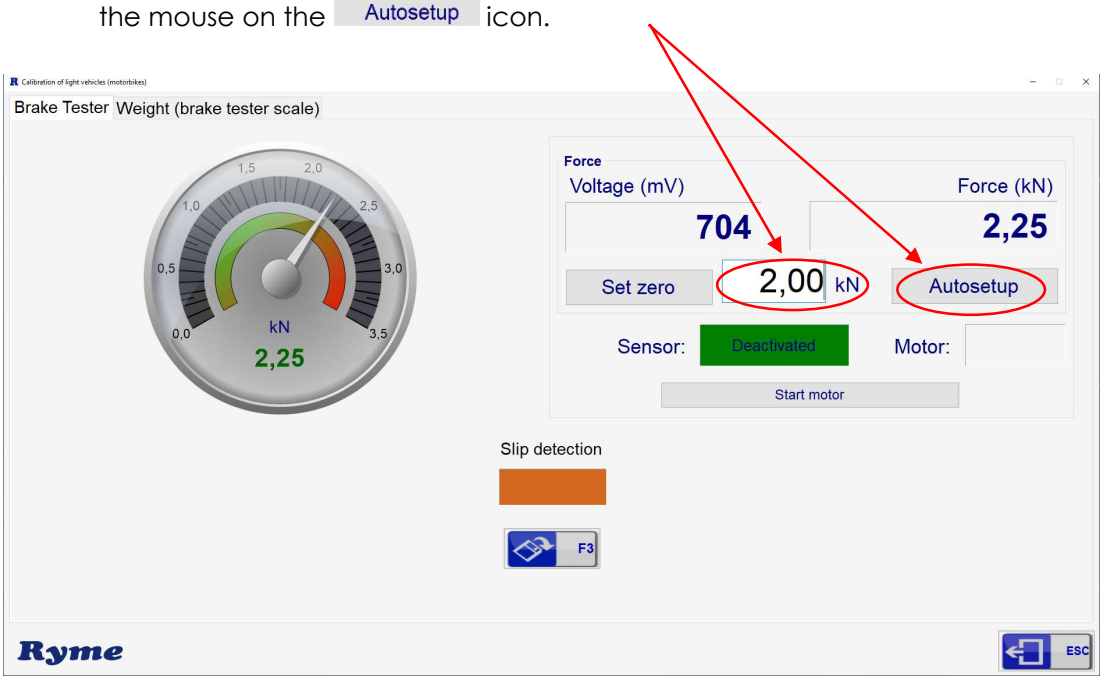
8.) Once the required voltage has been achieved, you must set by software the value zero. To do this, on the calibration screen, click with the mouse on the icon Set zero.



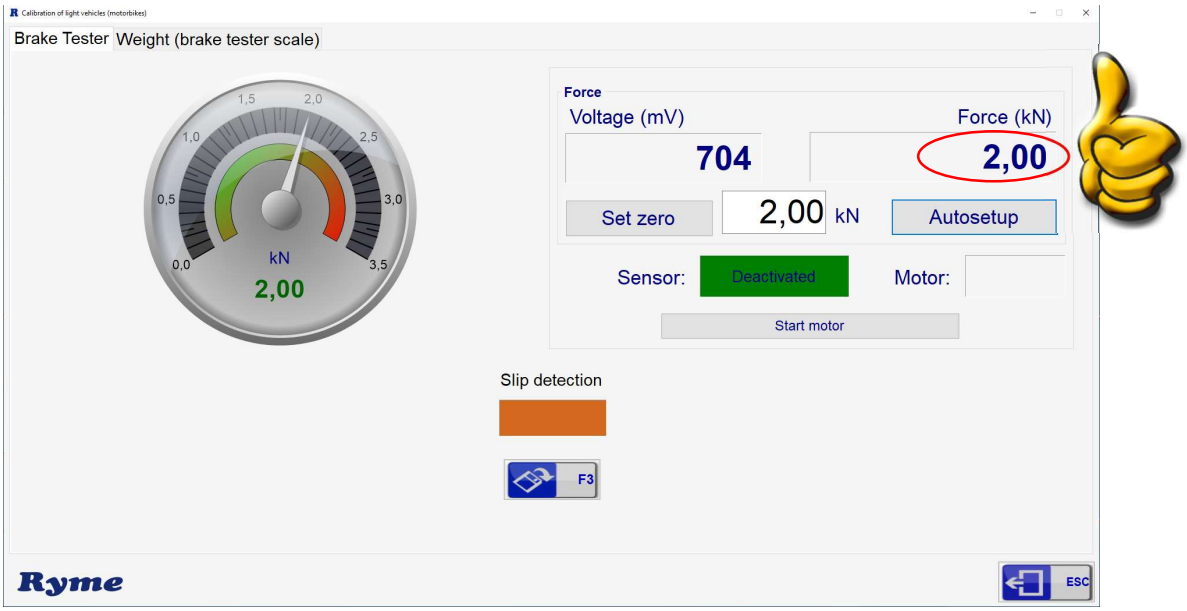
9.) Place the 30 kg weight in the lever notch corresponding to 2kN.



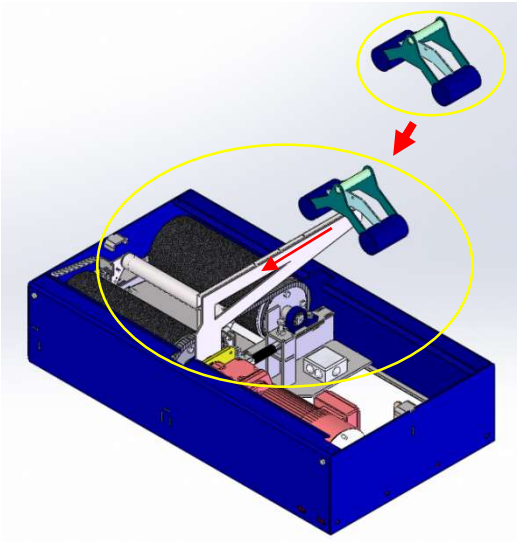
10.) Type with the keyboard in the auto-adjustment window 2 kN and click with the mouse on the Autosetup icon.



Then, a settings confirmation window will be displayed.

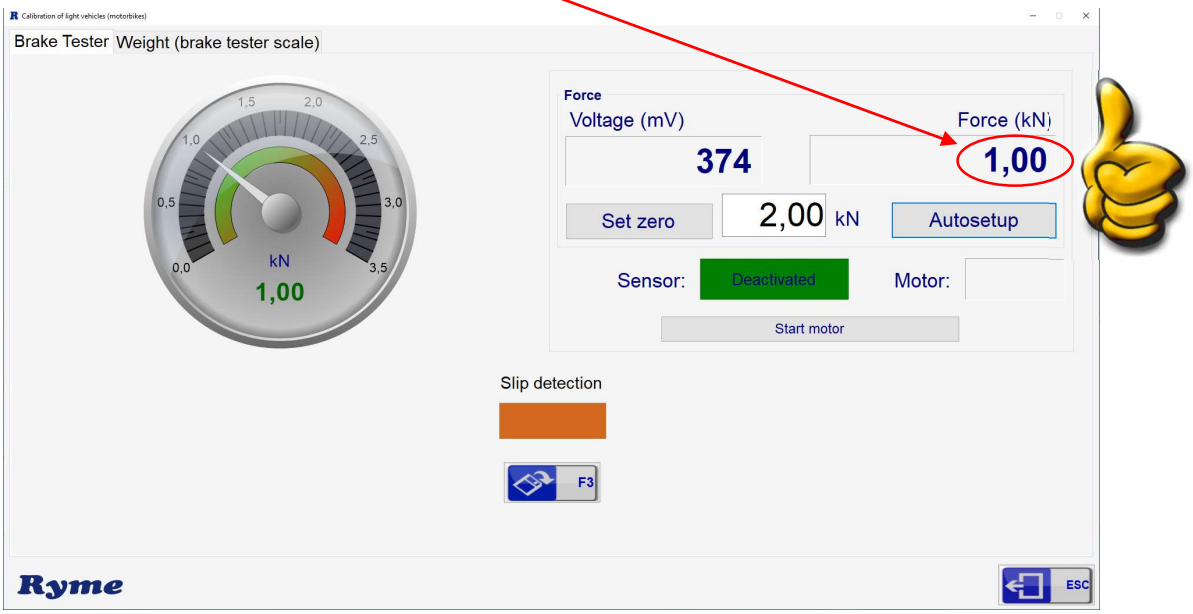


11.) Place the weight in the notch of the bar corresponding to 1kN.

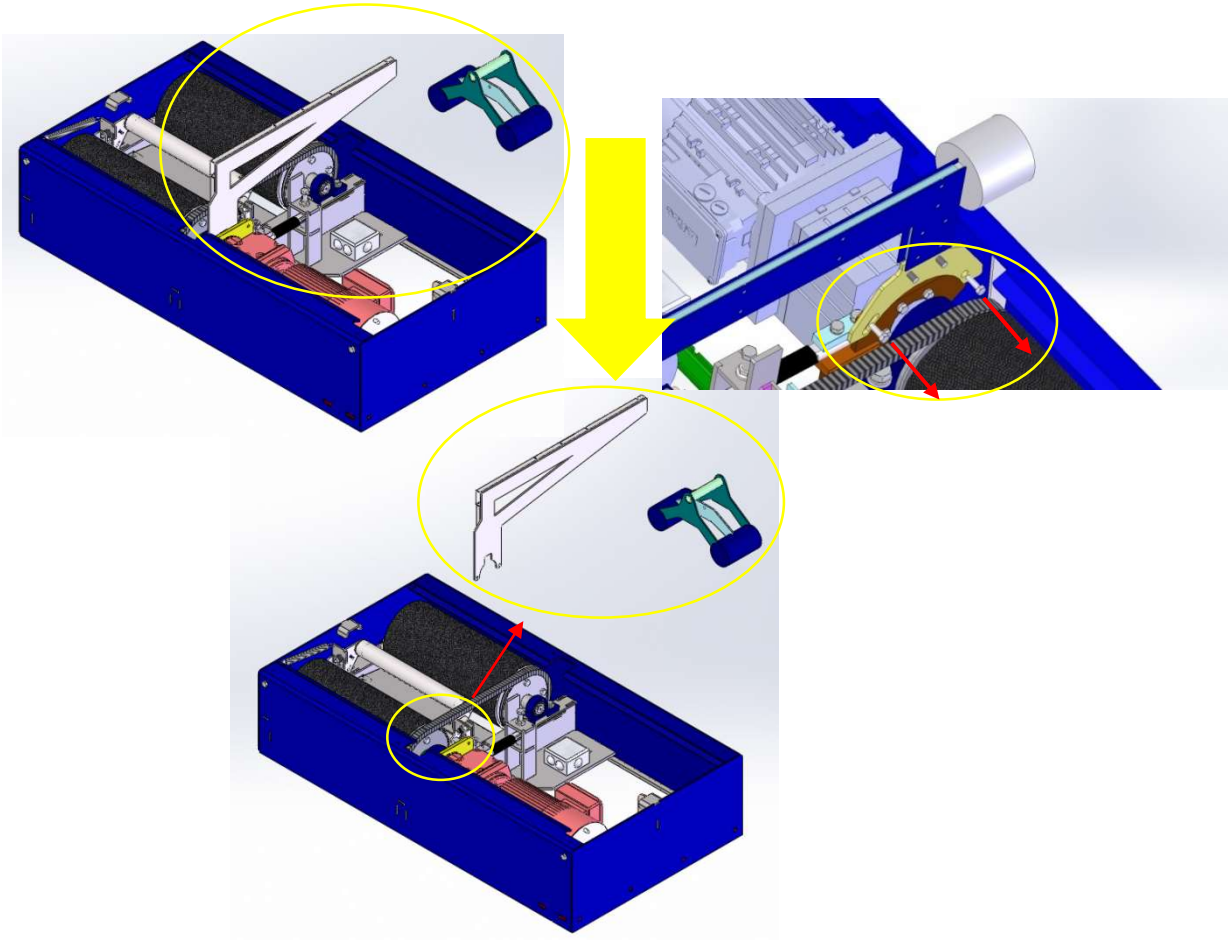


12.) Check on the monitor that the reading of the force is 1kN.

It can be between 0.99 to 1.01kN.

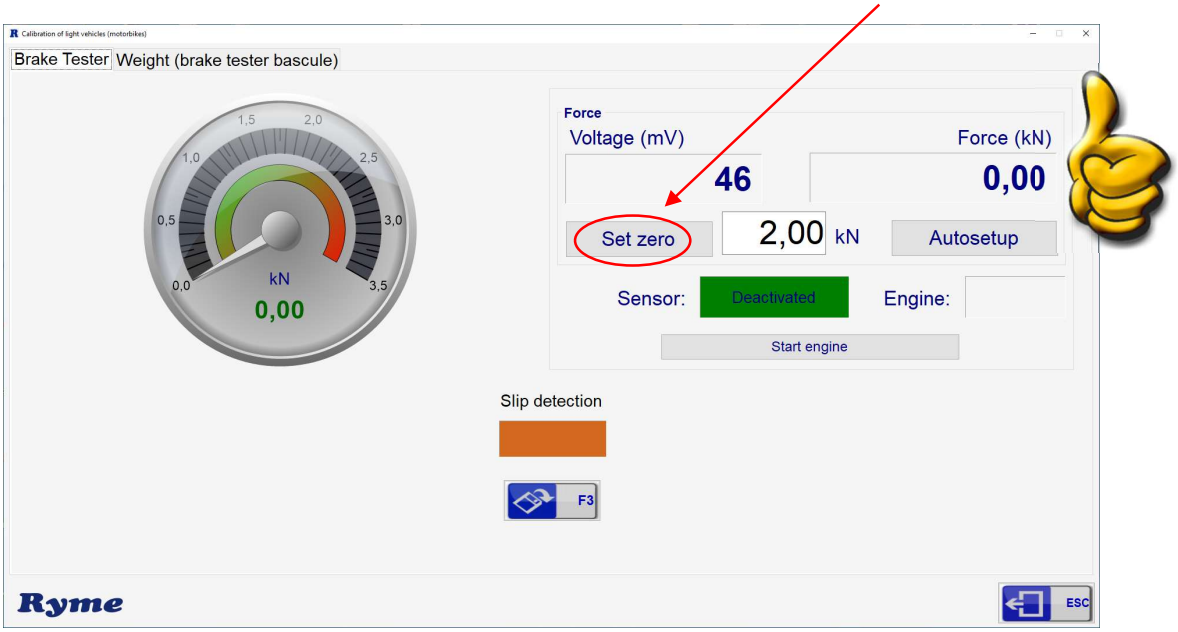


13.) Once these actions are performed, the calibration bar is removed.



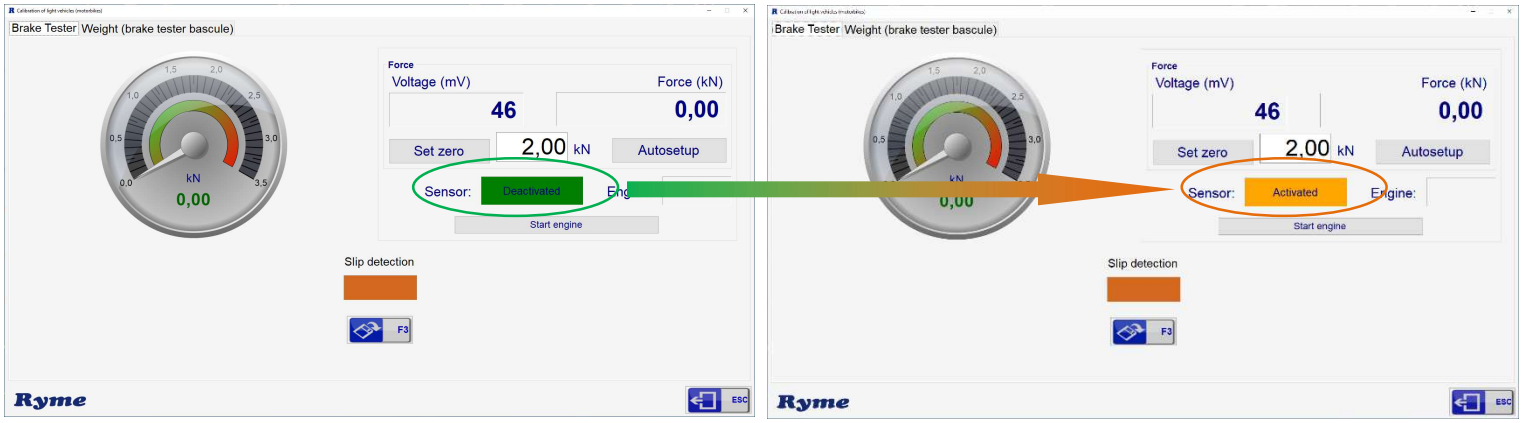
14.) Remove the calibration bar, measure again with the multimeter to obtain an offset voltage of +-100mV by turning the corresponding potentiometer.

15.) The zero is set again. To do this, in the calibration screen (and without the calibration bar), click with the mouse on the icon Set zero.

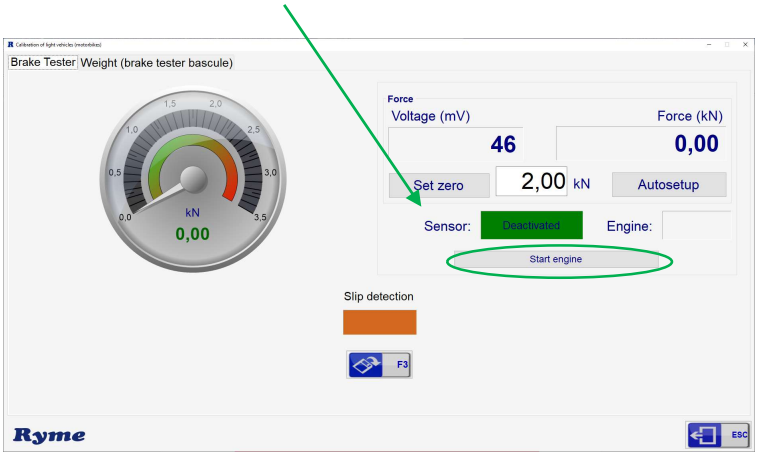


Note: from this same screen you can test the correct operation of the presence sensors, in green it will be deactivated and in yellow activated:

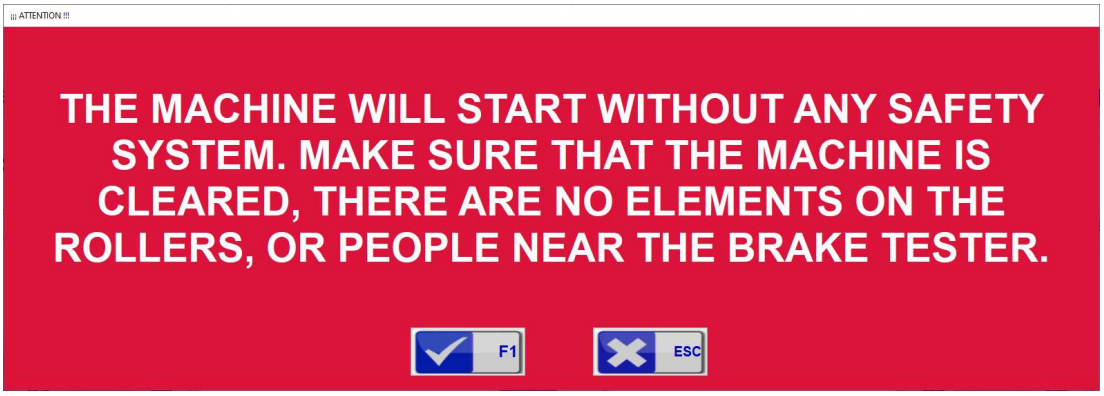
108 Motorcycle Brake Tester Calibration/Adjustment menu: sensor status

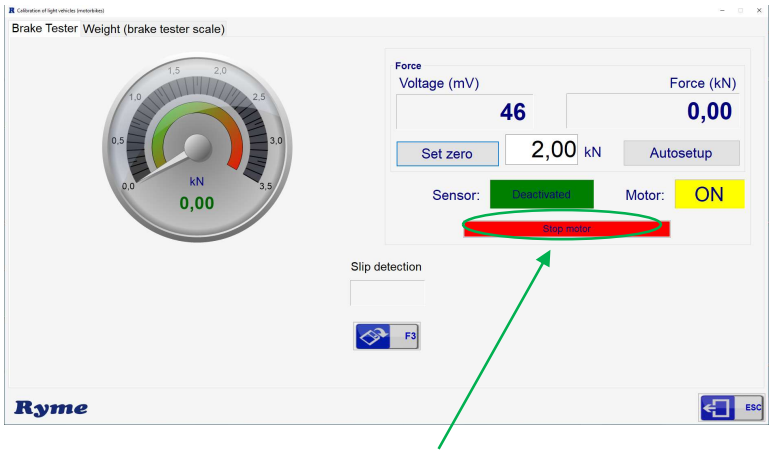


Concerning the motor, you will be able to start and stop it manually by clicking on the Start engine icon.



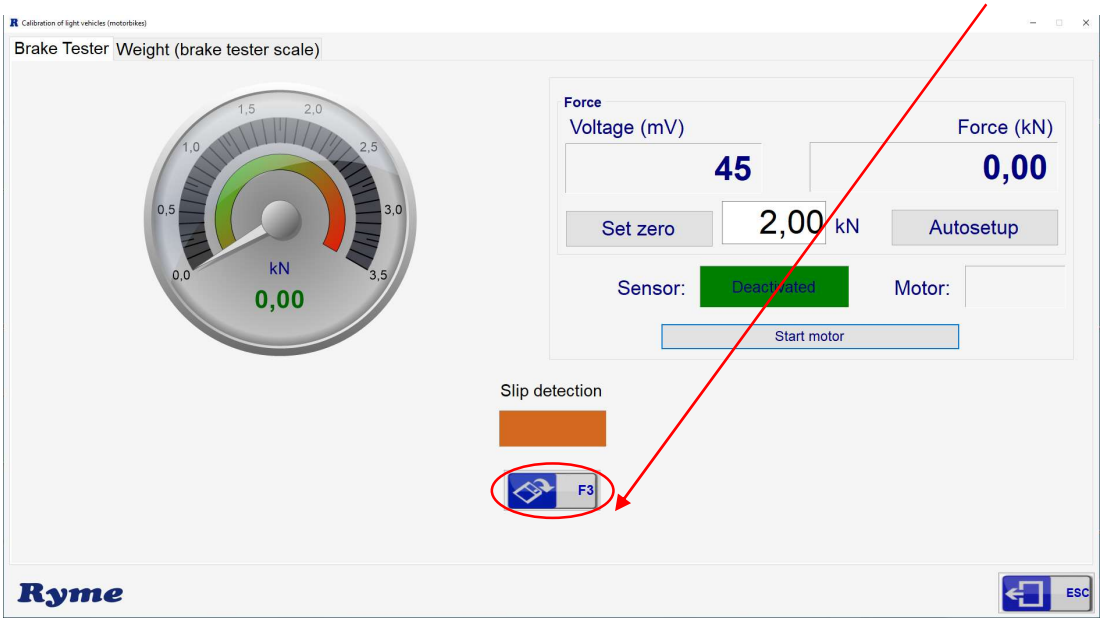
An alert message will warn you before starting:



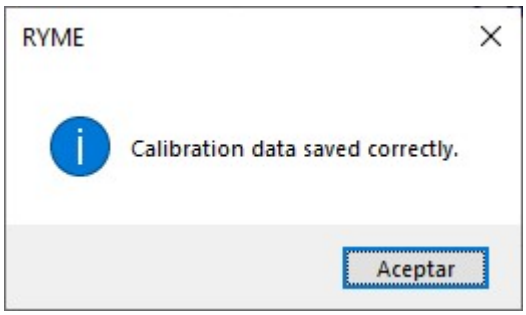


Click on the 'Stop motor' icon to stop the motor.

To save the calibration correctly it is important to make sure to press the 'F3' key on the keyboard or click with the mouse on the  icon.



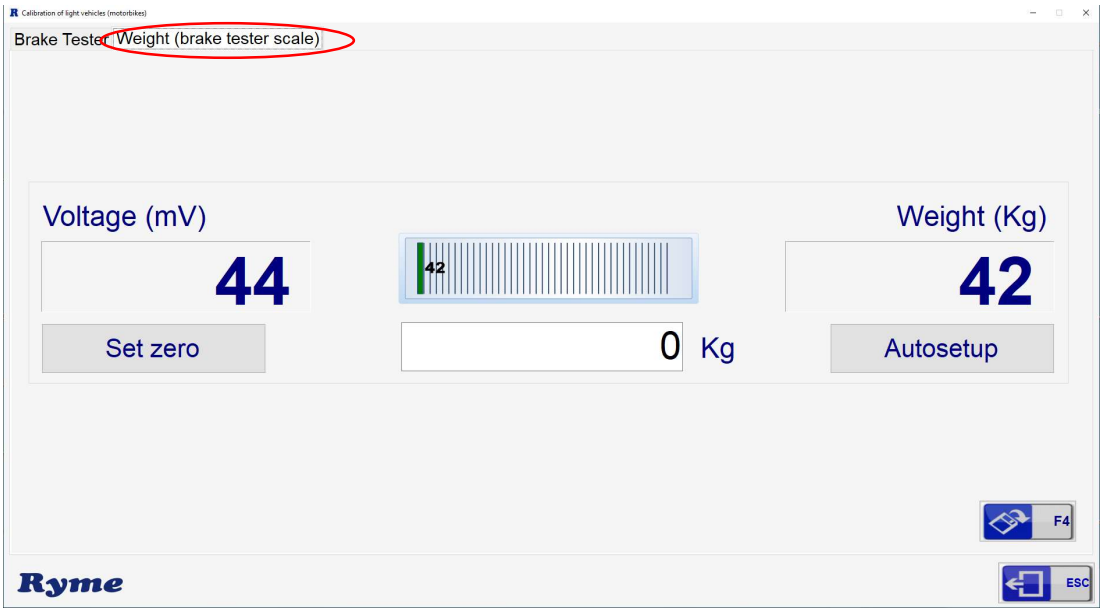
The program will indicate that it has been saved correctly with the following message:



7.3.2 Weight calibration (brake tester scale):

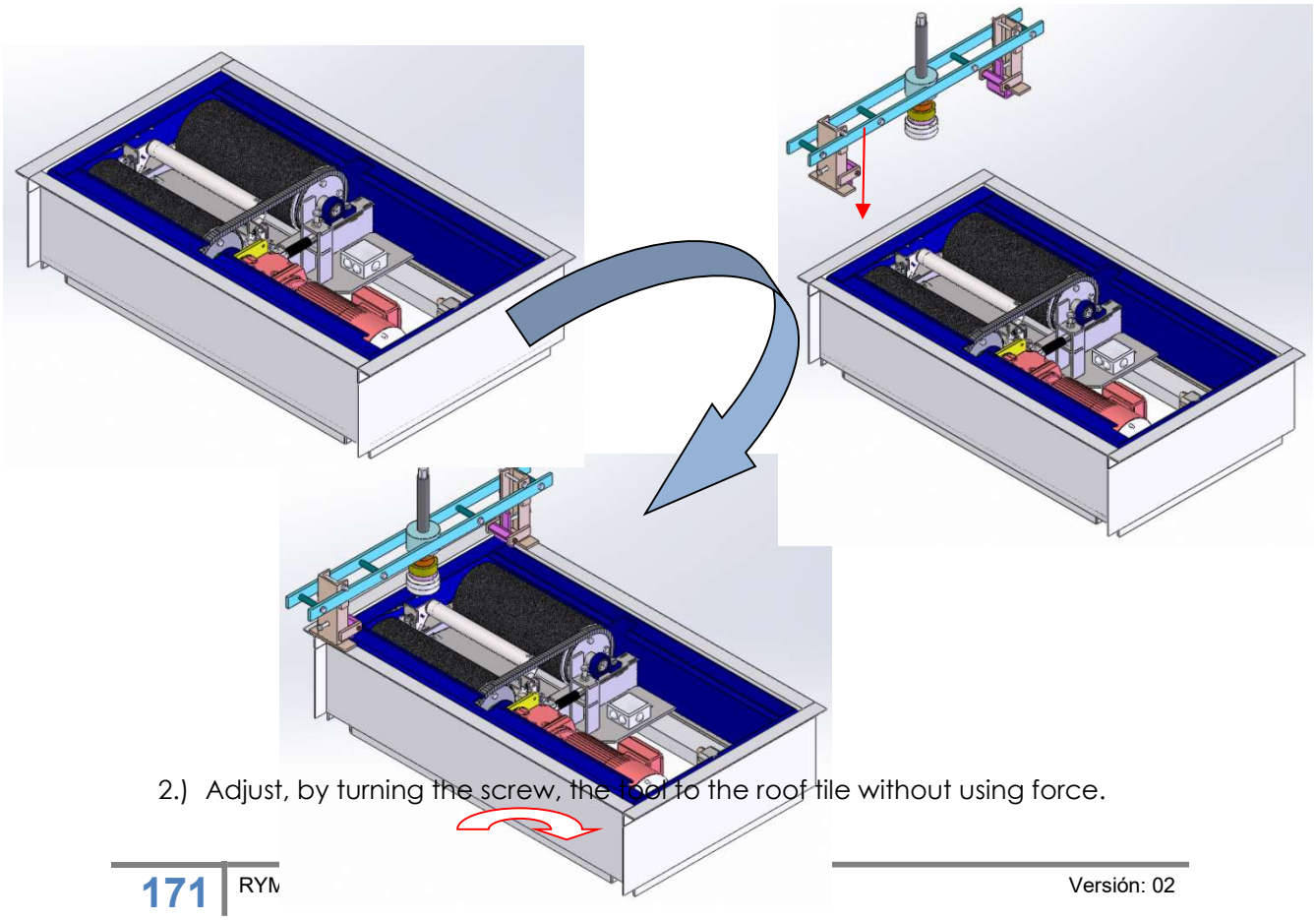
From this tab, Weight (brake tester scale), we will proceed to perform the calibration:

Note: Make sure that the brake tester has a scale.

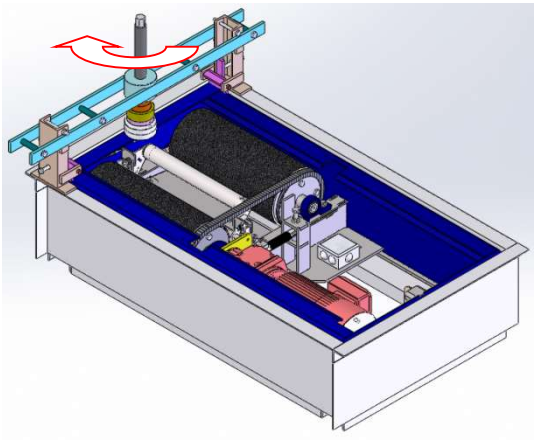


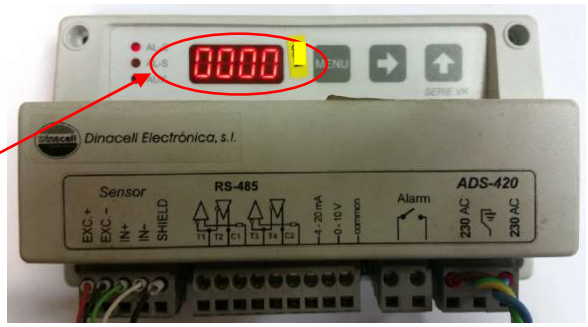
109 Motorcycle Brake Scale Calibration/Adjustment tab

1.) Place the calibration/adjustment tool on the left side of the brake tester (where the scale is located).

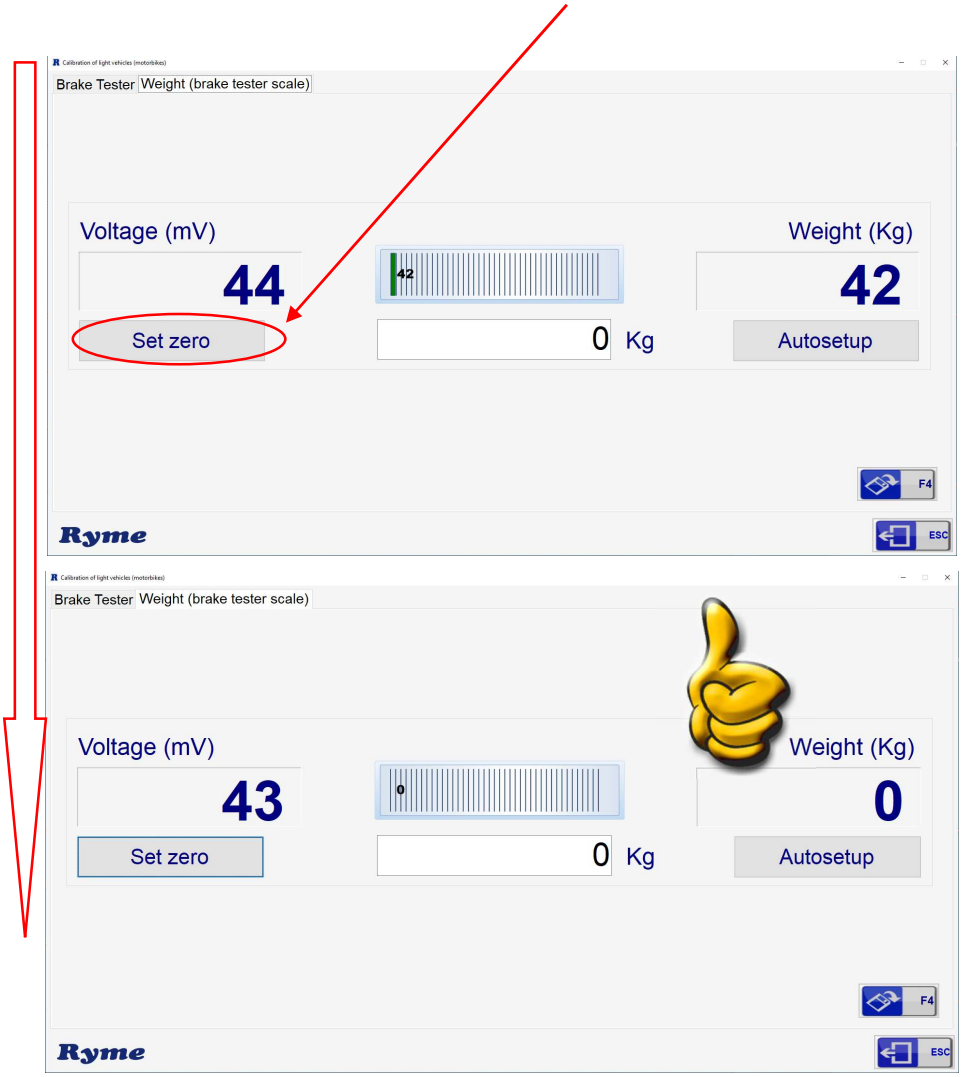


2.) Adjust, by turning the screw, the tool to the roof tile without using force.

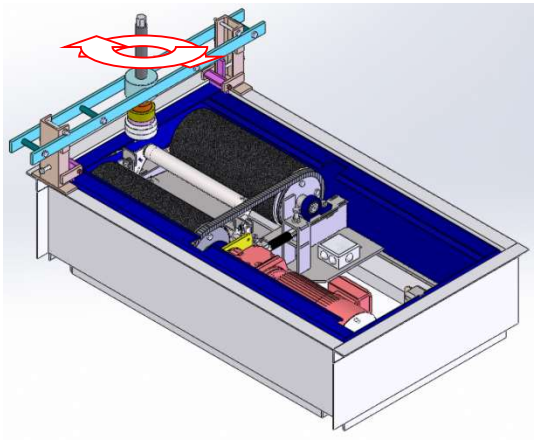


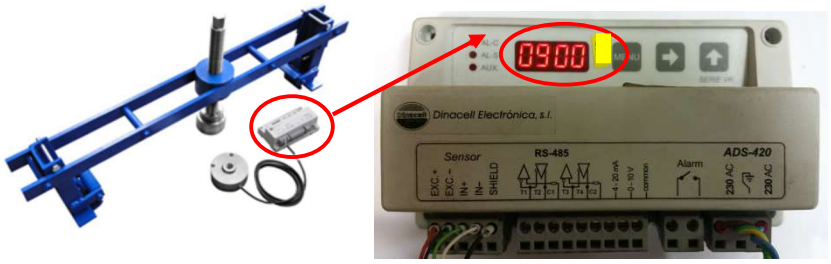

0000
MENU
Dinacell Electrónica, s.l.
Sensor
RS-485
ADS-420
Alarm
EXC.+
EXC.-
IN+
IN-
SHIELD
4 - 20 mA
0 - 10 V
common
230 AC
230 AC

3.) Set by software the zero. To do this, on the screen of calibration of the weight of the axle, click with the mouse on the icon Set zero, all this without any weight on the machine.

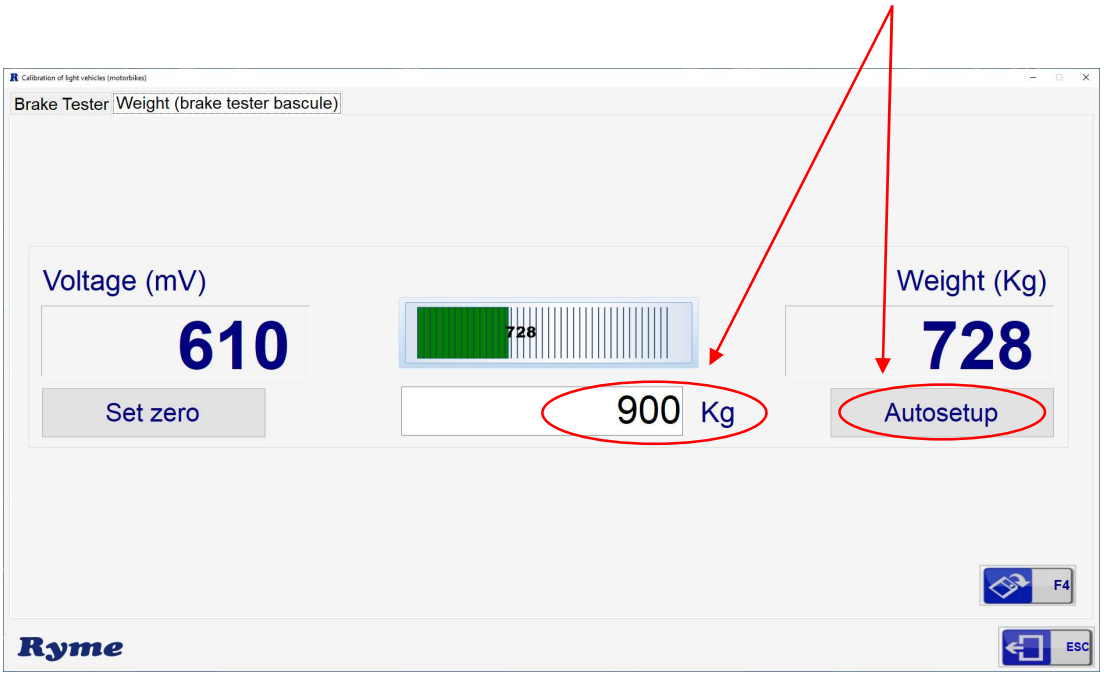


4.) Turn the screw of the calibration tool until it marks a reference measurement.

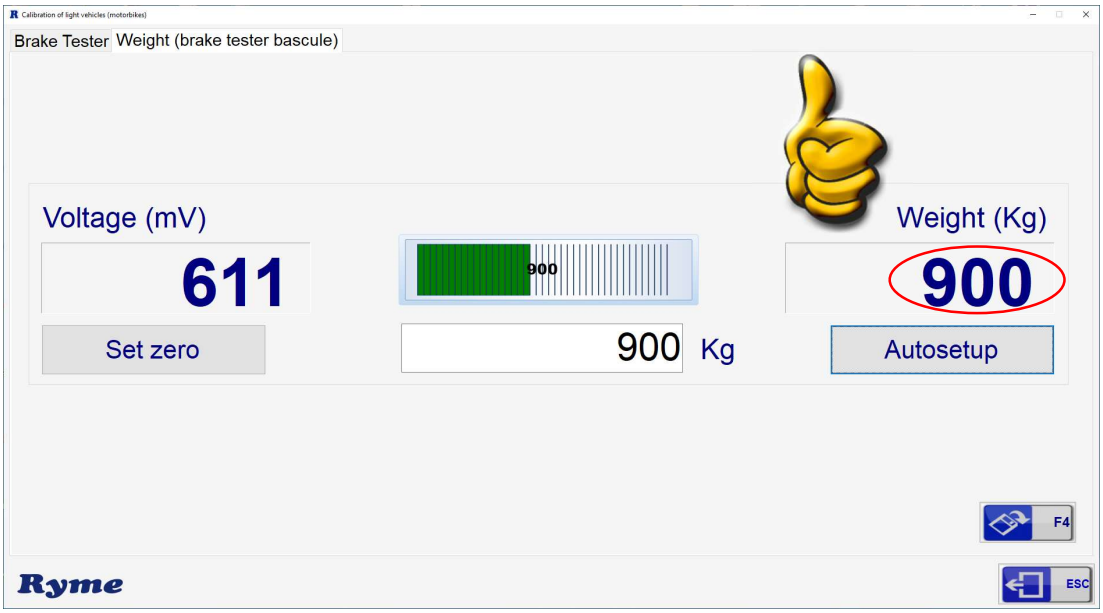




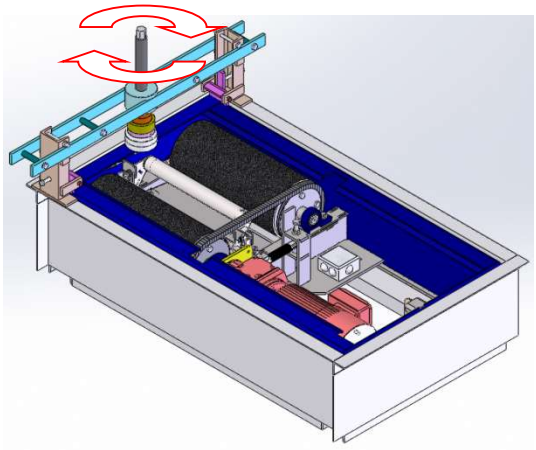
5.) Use the keyboard to enter the known weight in the auto-adjustment window and click on the Autosetup icon.

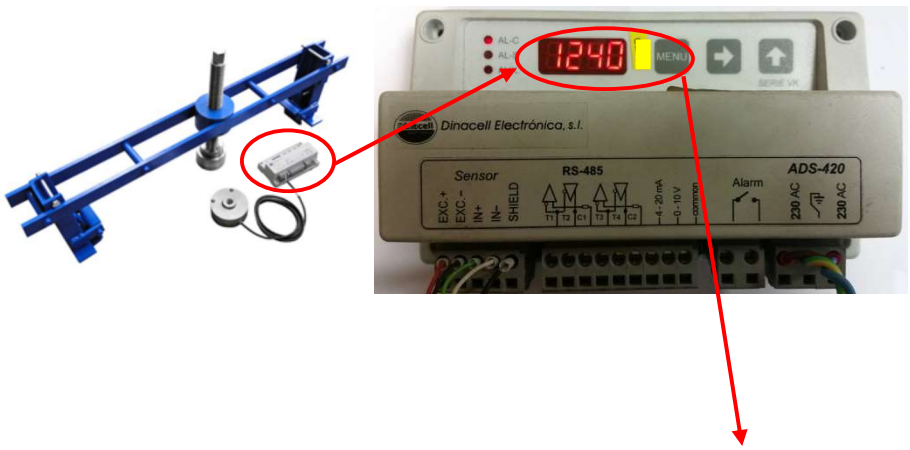


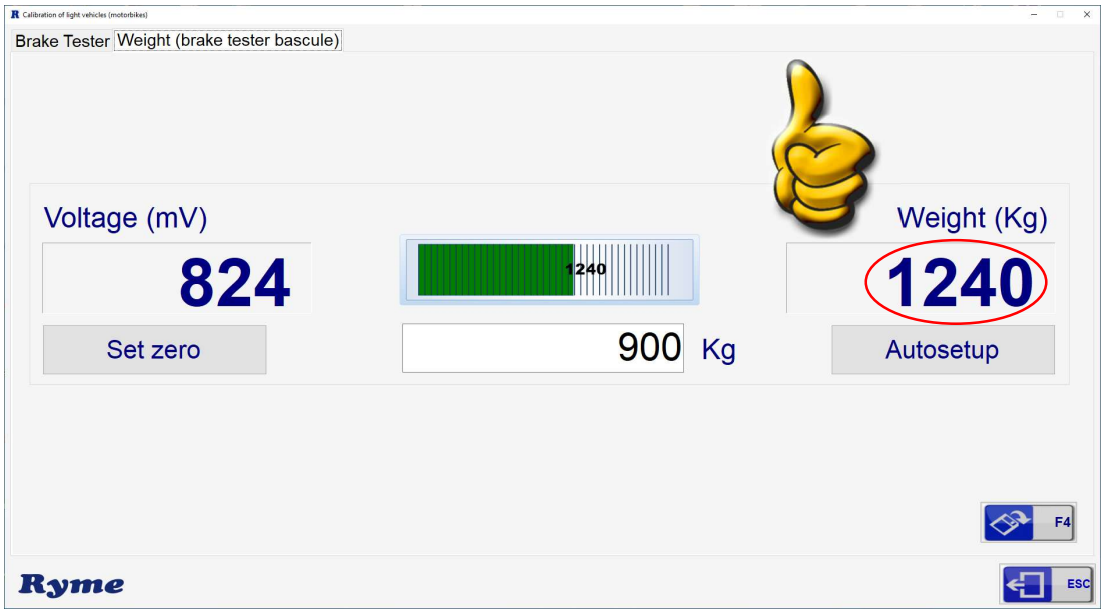
6.) A setting confirmation window will appear.



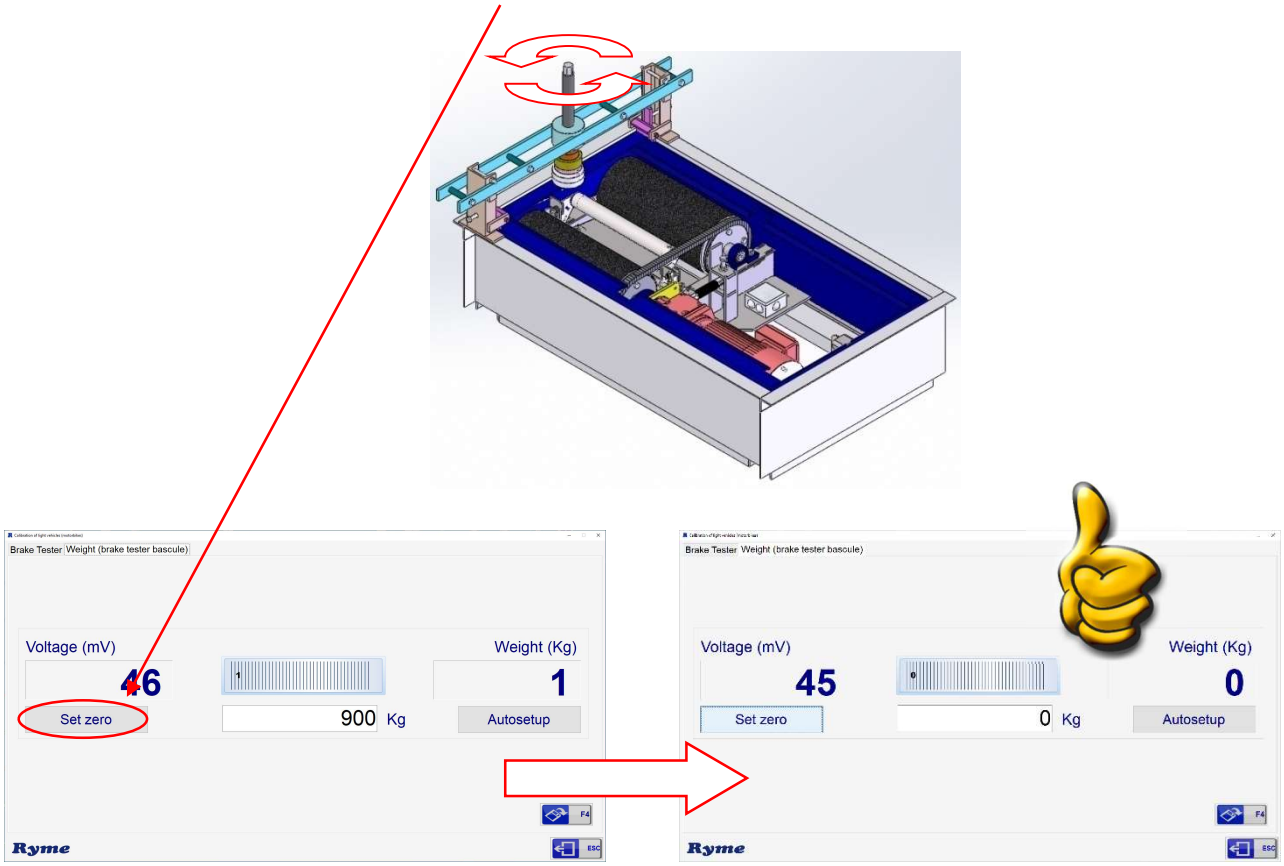
7.) Check with another weight (by turning the screw) that it gives us the correct measurement:





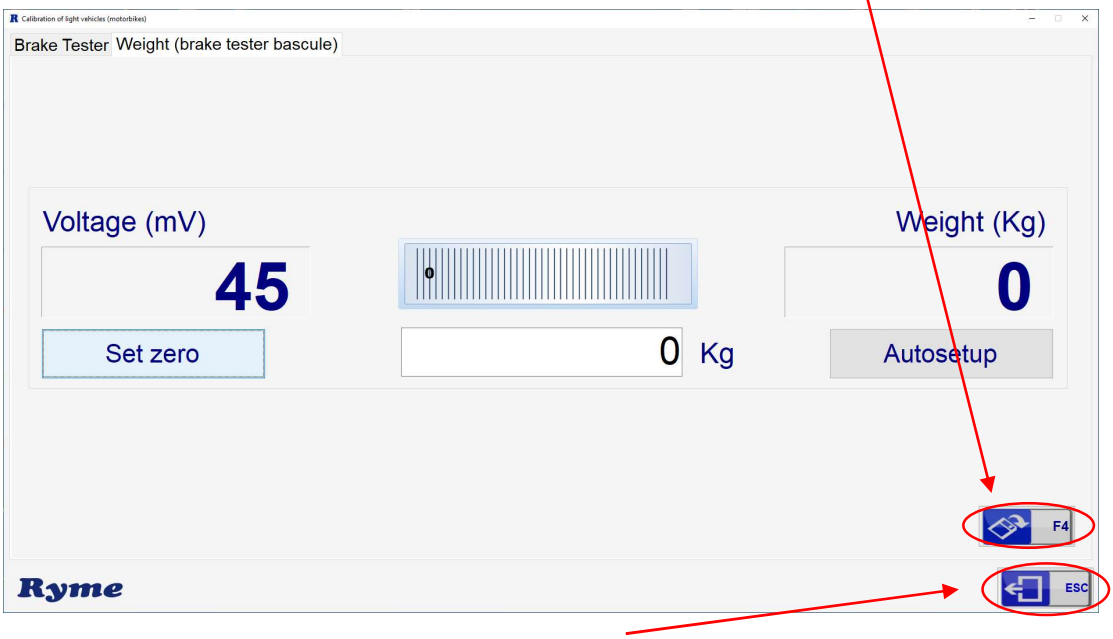


8.) After calibration, remove the tool and without any element in the brake tester click on the Set zero icon.



To save the calibration/adjustment correctly it will be important to make sure to press the 'F4' key on the keyboard or click with the mouse on the 

icon.



To exit, press the 'Esc' key on the keyboard or click on the 

icon.

8 General Machine Settings

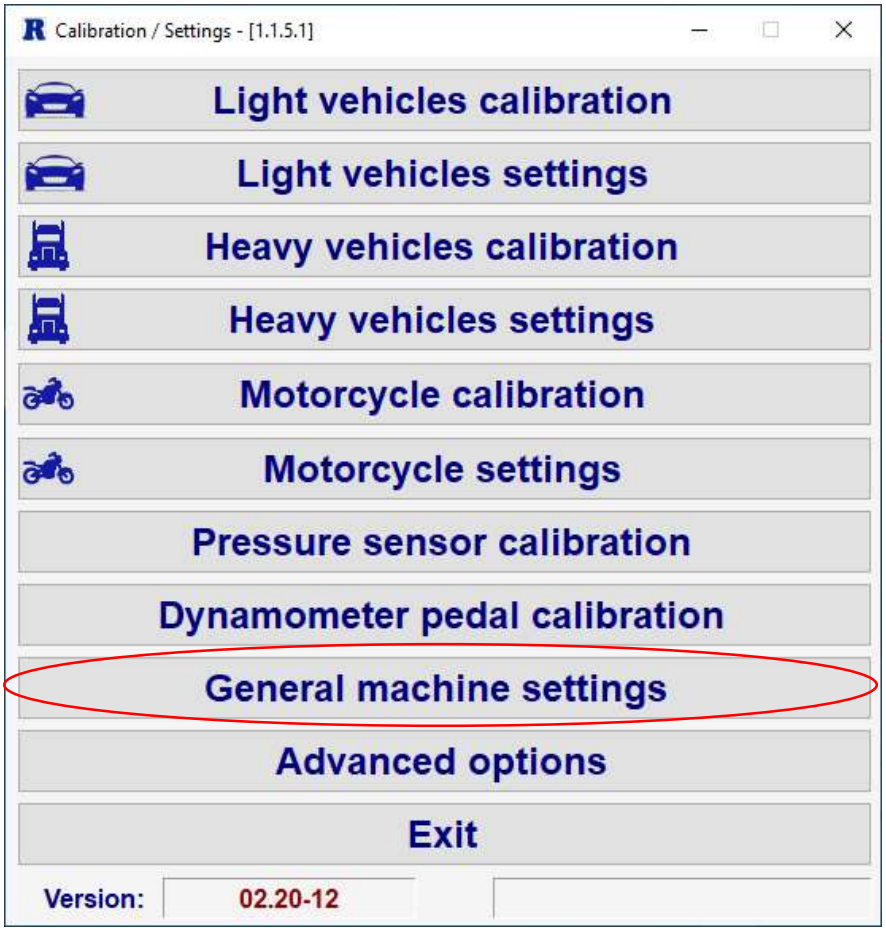
It allows you to set up Settings options that affect the general operation of the application that performs the **RYME_PCE** measurements.

Once the necessary changes have been made, you must click on the 

icon with the mouse or press the 'F3' key on the keyboard to save the changes.

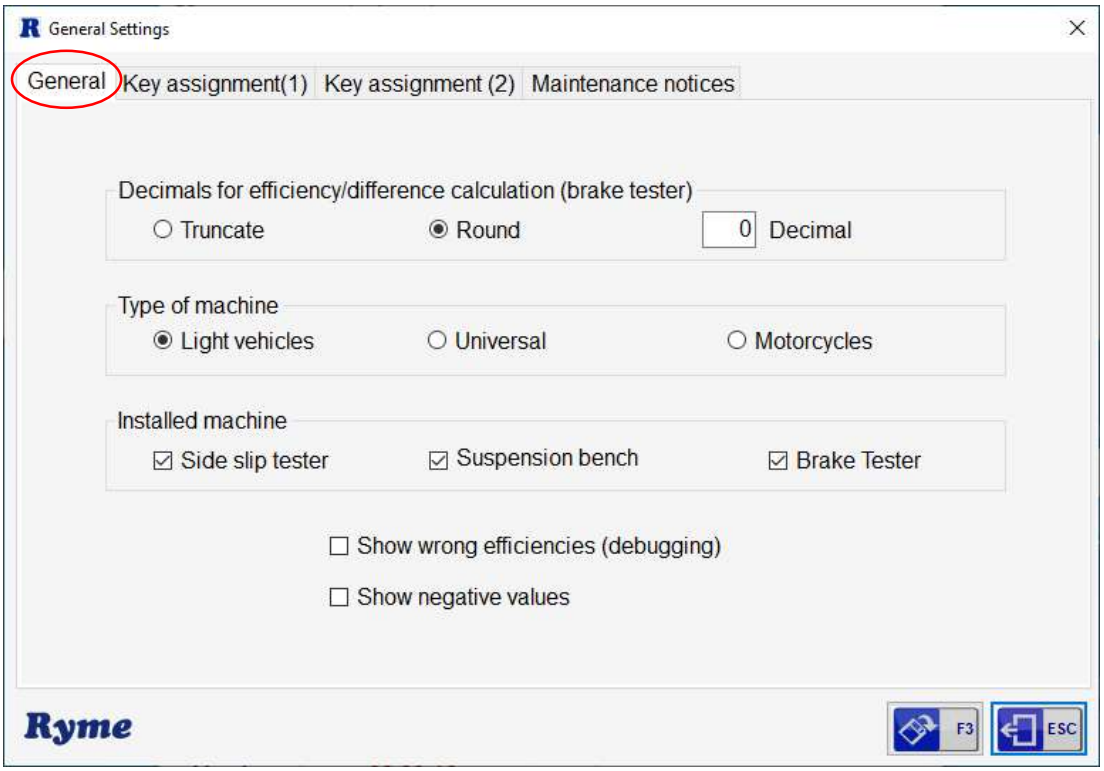
By pressing the 'Esc' key on the keyboard or clicking on the 

icon with the mouse, you will leave this screen without saving the changes made.



110 Calibration/Settings Menu: General Machine Settings

8.1 General



111 Genera Settings

Decimals for efficiency/difference calculation (brake tester): You will select, depending on the working system of the facilities, the option that best suits the data evaluation.

Type of machine:

- **Light Vehicles**: Machinery for measurements performed on light vehicles.
- **Universal**: Machinery for measurements performed on heavy and light vehicles.
- **Motorcycles**: Machinery for measurements performed on motorcycles.

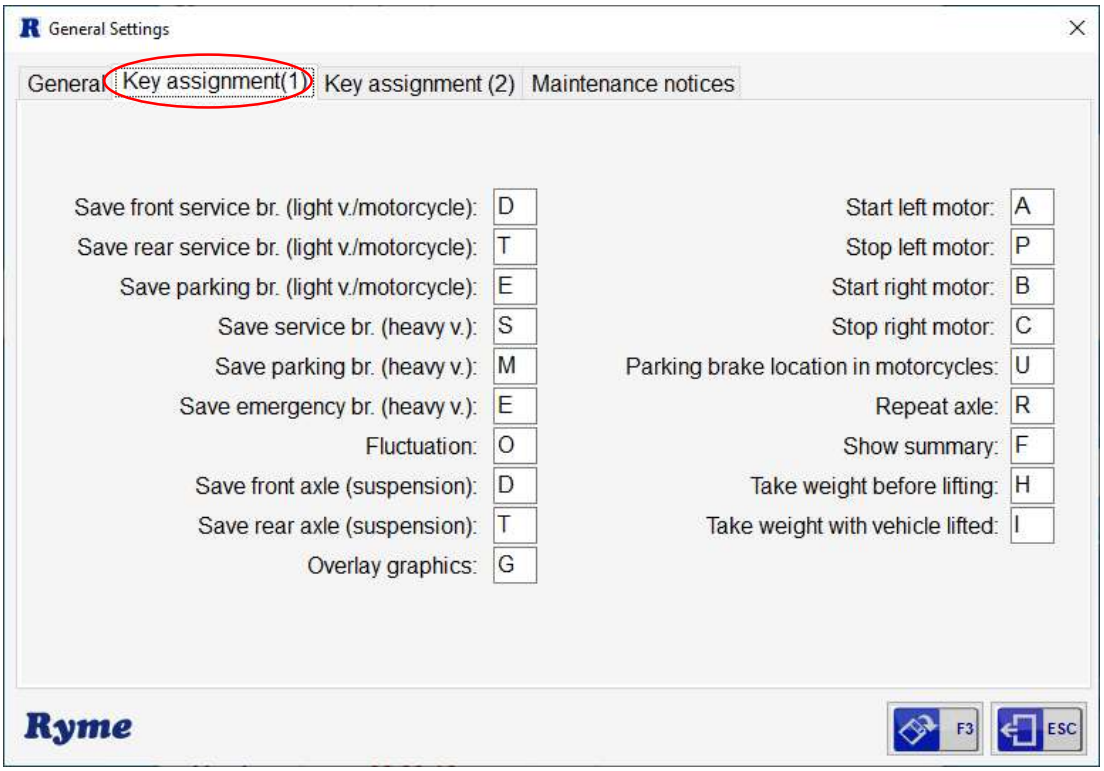
Installed machine: You select the machines installed and then make the necessary adjustments:

- **Side slip tester**
- **Suspension bench**
- **Brake tester**

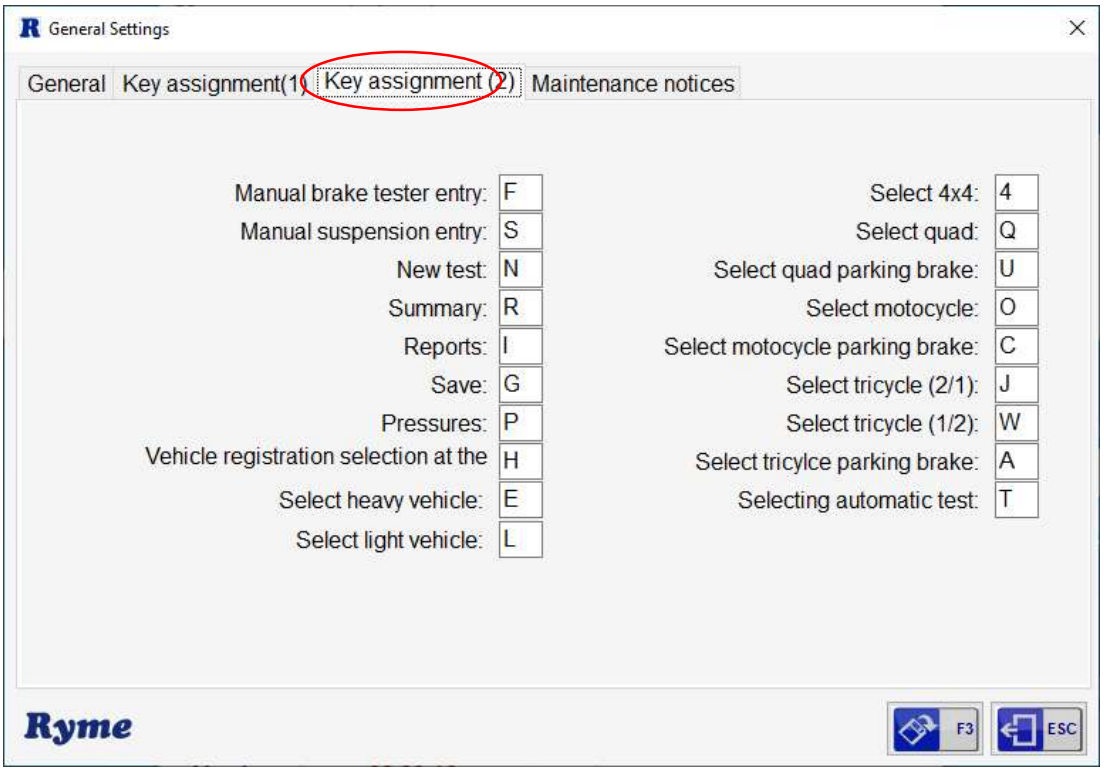
Show wrong efficiencies/Show negative values: Only for technicians' use

You must specify what machinery you have in the installation for the software to work properly.

8.2 Key assignment



112 First key assignment tab



113 Second key assignment tab

To perform actions on a measurement (measure fluctuation, save test), or to select menu options, the user can either make use of the pointing device (commonly known as a mouse), or use the keyboard, since a key (usually a letter) is assigned to each of the possible actions to be performed.

Each action is assigned a default letter, but the user can change these assignments by changing the letter he wants to associate with a particular action.

For example, the fluctuation measurement is done by default by pressing the letter 'O' when measuring the braking, but the user could assign to this action the letter 'V'.

Figures 112 and 113 show all the possible assignments that can be made.