



WBE 4140



BOSCH

de Instandsetzungsanleitung
Reifenmontiermaschine

en Repair instructions
Tire changer

es Instructions de réparation
Machine à monter les pneus

it Istruzioni di riparazione
Smontagomme

Contents English

1. Symbols used	25		
1.1 In the documentation	25	8.6 Ingressi ed uscite digitali	39
1.1.1 Warning notices - Structure and meaning	25	8.6.1 Protection micro switch	39
1.1.2 Symbols in this documentation	25		
1.2 On the product	25		
2. WBE 4140	26	9. Replacement interventions	39
3. How to use the machine and surfing menu	27	9.1 Pick-up replacement	39
3.1 Display	27	9.2 Replacement Easy Aludata calliper	40
3.2 Control keys	27	9.3 Width potentiometer positioning procedure	40
3.3 Menu navigation	27	9.4 Diameter potentiometer positioning procedure	41
3.3.1 Auto-diagnosis	27	9.5 Engine belt replacement	41
3.3.2 Calibration	27	9.6 Power board replacement	42
3.3.3 Settings	28	9.7 Video board replacement procedure	42
3.3.4 User-defined settings	28		
4. Faults	29	10. Suggested spare parts	43
5. How to up-to-date the software	31	11. Electric system	44
6. Configuration of the board	31		
7. Standard calibration	32		
7.1 Recalling of the calibration menu	32		
7.2 Calibration with wheel and sample weight	32		
7.3 Flange calibration	32		
7.4 Calibration of electronic vernier caliper/gauge arm	32		
7.4.1 Reference measurement	34		
7.5 Factory calibration	34		
7.5.1 Recalling of the calibration menu	34		
7.5.2 Calibration with sample weight	34		
7.5.3 Flange calibration	35		
7.5.4 Calibration of electronic calliper gauge/ measurement arm	35		
7.5.5 Factory settings	35		
8.2 Pick-up	36		
8. Diagnostics	36		
8.1 Recalling of the diagnostics menu	36		
8.2.1 Check of the phase difference	37		
8.2.2 Check of the external pick-up sensor (IN0)	37		
8.2.3 Check of the internal pick-up sensor (IN1)	38		
8.3 Encoder	38		
8.4 Engine and power board	38		
8.4.1 Check belt tensioning	38		
8.5 Potentiometers	38		
8.5.1 Diagnosis distance potentiometer(IN2)	38		
8.5.2 Diagnosis width potentiometer(IN3)	38		
8.5.3 Diagnosis diameter potentiometer (IN4)	39		

1. Symbols used

1.1 In the documentation

1.1.1 Warning notices - Structure and meaning

Warning notices indicate hazards and their consequences for the user or surrounding persons. Warning notices also describe the measures for preventing these hazards.

The signal word has a crucial importance. It indicates the probability of occurrence and the severity of the hazard in case of non-compliance:

Signal word	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate danger impending	Death or severe injury
	Possible danger impending	Death or severe injury
CAUTION	Possible dangerous situation	Minor injury

Below you will see an example of the “Live parts” warning notice by way of example, with the signal word **DANGER**:



DANGER – Exposure of live parts on opening the WBE 4140!

Risk of (fatal) injury or heart failure from electric shocks on contact with live components (e.g. master switch, printed circuit boards).

- Work on electrical installations or equipment is only to be performed by qualified electricians or trained personnel under the guidance and supervision of an electrician.
- Disconnect KTS 340 from the mains before opening.

1.1.2 Symbols in this documentation

Symbol	Designation	Explanation
!	Attention	Warns about possible property damage.
i	Information	Practical hints and other useful information.
1. 2.	Multi-step operation	Instruction consisting of several steps
➤	One-step operation	Instruction consisting of one step.
⇨	Intermediate result	An instruction produces a visible intermediate result.
➔	Final result	There is a visible final result on completion of the instruction.

1.2 On the product

! Observe all warning notices on products and ensure they remain legible!



DANGER – Exposure of live parts on opening the WBE 4140!

Risk of (fatal) injury or heart failure from electric shocks on contact with live components (e.g. master switch, printed circuit boards).

- Work on electrical installations or equipment is only to be performed by qualified electricians or trained personnel under the guidance and supervision of an electrician.
- Disconnect the WBE 4140 from the mains before opening.



Disposal

Dispose of used electrical and electronic devices, including cables, accessories and batteries, separately from household waste.



Direction of wheel rotation

Wheel must turn in direction indicated.

2. WBE 4140

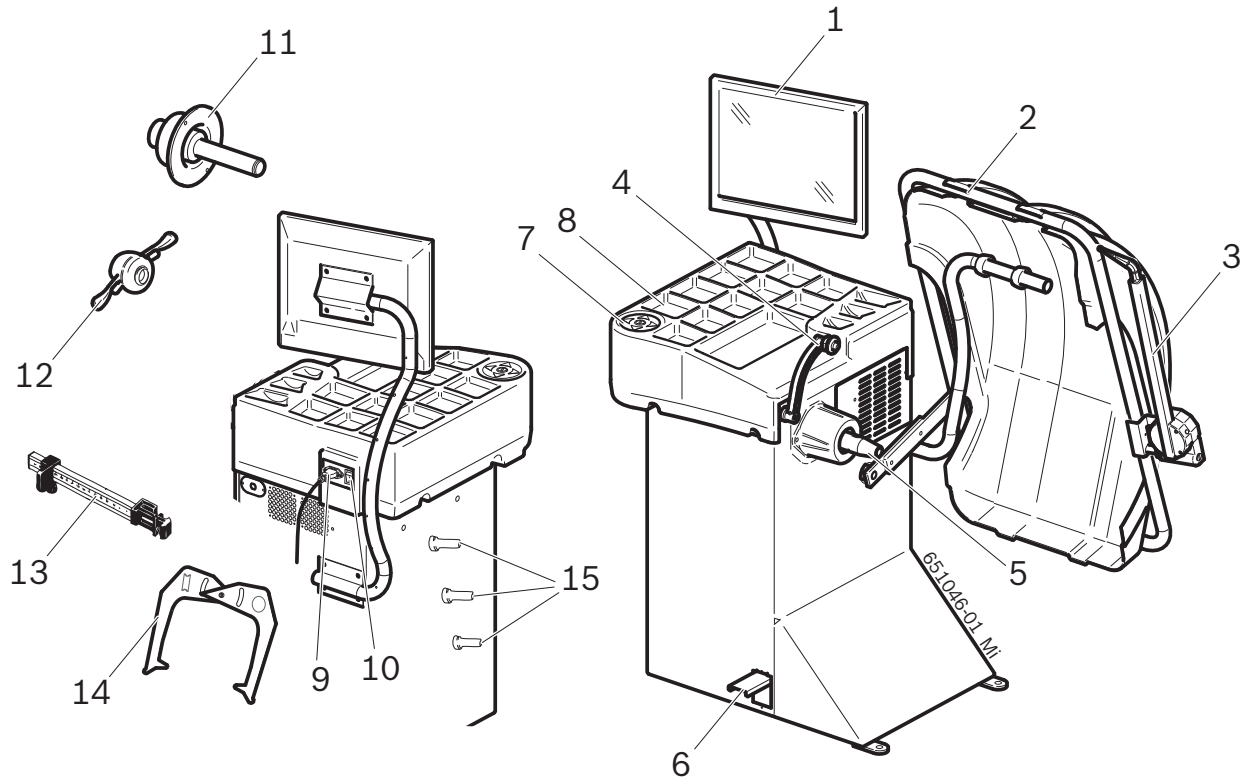



Fig. 1: WBE 4140


Item	Designation	Function/purpose
1	TFT monitor	Software display (measured values and operating instructions)
2	Wheel guard	<ul style="list-style-type: none"> Protection of operator against flying particles (e. g. dirt, water). Starting and stopping measurement, refer to Section 8.3.3.
3	Gauge arm (accessory)	Determination of rim width
4	Vernier caliper (electronic)	<ul style="list-style-type: none"> Recording of rim distance and rim diameter. Determination of positions for attachment of adhesive weights.
5	Cone of drive shaft	Flange mounting.
6	Pedal	Locking of shaft / wheel.
7	Control panel	Operation of WBE 4140, refer to Section 7.3
8	Tray	For storing balance weights and accessories.
9	Mains socket	Connection for power cord.
10	On/off switch	Switching WBE 4140 on and off.
11	Centering flange	Wheel attachment.
12	Quick-action clamping nut	Centering and attachment of wheel on cone.
13	Manual vernier caliper	Can be used as substitute if the electronic vernier caliper is defective.
14	Measuring compasses	Can be used as substitute if the rim width and rim diameter cannot be recorded electronically.
15	Clamping tool holders	For storing accessories.

3. How to use the machine and surfing menu



3.1 Display

 The initialization of the software is displayed approx. 20 seconds after switching on the WBE 4140. The start page is displayed after a further 40 seconds.



 If the image does not appear correctly, carry out self-calibration of the monitor (making reference to the monitor user manual).

The following menus can be selected on the start page

Simbolo	Denominazione	Qui si accede al menù
	Wheel Balancing	Balancing program
	Settings and service	Personal settings, calibration and customer service.

3.2 Control keys

The WBE 4140 is operated by way of the < I > key and the arrow keys. The corresponding functions are described in Table 1.









Tasto	Descrizione
Arrow keys ↑ → ↓ ←	Navigation in the menus and alteration of the rim data values
< I >	Confirmation of settings. Starts measurement. Ends measurement.




Tab. 1: Funzioni dei tasti comando

3.3 Menu navigation

We can divide the balancing machine menu in several submenus:

	Call-up of service menu (customer service only)
	Call-up of calibration menu
	Press < I > to return to the previous page.
	Settings (customer service only)
	User-defined settings

 The following symbols are used in the selection menus:

-  Automatic transfer (e.g. time)
-  Manual transfer (e.g. via pedal)
-  Function deactivated

3.3.1 Auto-diagnosis







→ Enter the password: < ↓ > < ↓ > < ↑ > to display the standard **diagnostics menu** (display only mode);

→ Enter the password < ↑ > < OK > < → > to display the **service diagnostics menu** (display only mode).

3.3.2 Calibration










 Enter the password: < → > < → > < ↑ >.

	Calibration with "Go" wheel.
	Flange calibration.
	Press < I > to return to the previous page.
	Vernier caliper and gauge arm calibration.










3.3.3 Settings




	Activates or deactivates the vernier caliper and the gauge arm.
	Press <OK> to return to the previous page.
	Positioning of adhesive weight (electronic vernier caliper, manual vernier caliper (3, 6 or 12 o'clock).
	
	
	
	


3.3.4 User-defined settings



	Activates or deactivates the screen saver
	Activates or deactivates acoustic acknowledgement signal
	Language selection.
	Activates or deactivates automatic start (start of measurement by closing wheel guard)
	Press < I > to return to the previous page.
	Selection of weight display grams (g) or ounces (oz)
	Selection of weight resolution 1 g / 0.05 oz or 5 g / 0.25 oz
	Residual value suppression: Entry of weight value below which the value "0" is to be displayed.
	

4. Faults

 Other possible malfunctions are primarily of a technical nature and are to be checked and if necessary rectified by a qualified engineer. Always contact the customer service of your authorized Bosch equipment dealer.

 To enable action to be taken quickly, it is important to inform customer service of the specifications on the rating plate (label on the flange end of the WBE 4140) and the nature of the problem.

Faults	Causes	Remedy
The displays do not light on switch-on	<ol style="list-style-type: none"> 1. Defective fuse or missing phase 2. Damaged fuse in electrical connection 3. Damaged fuse in control/display panel 	<ol style="list-style-type: none"> 1. Check the mains connection. 2. Replace the fuse in the electrical connection. 3. Replace the fuse in the control/display panel. Inform customer service. <p>Caution: Repeated fuse damage is an indication of a malfunction.</p>
1	<ol style="list-style-type: none"> 1. Setting and calibration data lost from PCB memory 2. One or more calibration operations (setting, calibration of electronic vernier caliper/gauge arm) not performed 	Check and correct calibration and settings.
2	Wheel guard raised prior to completion of measurement	Wait for end of measurement before raising wheel guard.
3	<ol style="list-style-type: none"> 1. Backward rotation of wheel on start of measurement 2. Incorrect connection of motor 	<ol style="list-style-type: none"> 1. Check that wheel is stationary on starting and stop it turning backwards on starting. 2. Check proper connection of motor.
4	<ol style="list-style-type: none"> 1. No motor operation, motor does not attain the necessary speed 2. Fault in electrical connection 3. Fault in PCB 	<ol style="list-style-type: none"> 1. Check mains voltage (probably too low). 2. Check electrical connection or power cord. 3. Replace the PCB.
5	<ol style="list-style-type: none"> 1. Balance weight not attached to wheel 2. Measurement sensors not correctly connected 	<ol style="list-style-type: none"> 1. Repeat calibration from the start and attach balance weight as specified by the process. (refer to 12.3). 2. Check the connection of the measurement sensors.
6	<ol style="list-style-type: none"> 1. Wheel guard not lowered 2. Damage to wheel guard safety switch 	<ol style="list-style-type: none"> 1. Lower wheel guard with wheel attached. 2. Replace wheel guard switch.
7	Excessive phase difference between the 2 measurement sensors	<ol style="list-style-type: none"> 1. Check for correct attachment of calibration weight. 2. Check machine connection; WBE 4140 probably not stable and vibrating excessively. 3. Check contact between measurement sensor and PCB. 4. Replace measurement sensor. 5. Replace PCB.
8	Inner measurement sensor not correctly connected, defective or open circuit in wire	<ol style="list-style-type: none"> 1. Check connection of left measurement sensor. 2. Replace measurement sensor.
9	Outer measurement sensor not correctly connected, defective or open circuit in wire	<ol style="list-style-type: none"> 1. Check connection of right measurement sensor. 2. Replace measurement sensor.
10	<ol style="list-style-type: none"> 1. Measurement sensor for position recognition defective 2. No motor operation 	<ol style="list-style-type: none"> 1. Check connection of light barrier PCB. 2. Check that the light barrier PCB is protected against light and provide a cover if necessary. 3. If the fault persists, check and if necessary replace the light barrier PCB. 4. Check the mains connection.
11	<ol style="list-style-type: none"> 1. Measurement sensor for phase recognition defective 2. No motor operation 	<ol style="list-style-type: none"> 1. Check connection of light barrier PCB. 2. Make sure the light barrier PCB is protected against light and provide a cover if necessary. 3. Check and if necessary replace the light barrier PCB. 4. Check the mains connection.
17	Weight outside setting range (weight required for balancing is more than 250 g)	<ol style="list-style-type: none"> 1. Check whether the wheel is correctly attached to the flange. 2. Determine the outer weight position (nevertheless), attach a 100 g weight and start a different measurement.
18	Wheel data not entered	Enter wheel data before performing measurement.
19	Input signal of right measurement sensor lower than that of left sensor	Interchange the connections of the two measurement sensors.

Faults	Causes	Remedy
20	1. Pedal pressed during measurement 2. Irregular rotational speed of motor 3. Wheel speed below minimum value	1. Do not press pedal whilst motor is in operation. 2. Make sure the WBE 4140 is not subjected to any impact during measurement. 3. Check mains voltage (probably too low).
21	The PCB has detected an excessively high wheel speed with the wheel guard open (shaft rotating at high speed although the machine has not been started): Power supply unit is deactivated	1. Switch off the WBE 4140 . 2. Lower the wheel guard, switch the WBE 4140 on again without moving the wheel. 3. If the error message persists, contact customer service.
22	Irregular measurement sensor signals	1. Check that the light barrier PCB is protected against light and provide a cover if necessary. 2. Check and if necessary replace the light barrier PCB. 3. Check and if necessary replace the display PCB.
29	ATTENTION: the calliper gauge is not in stand-by position.	1. Bring the calliper gauge back to stand-by position. 2. Repeat calibration of the electronic calliper gauge.
30	The measurement arms have been deactivated.	Calibrate them before reactivating them.
31	The pedal is pressed. Deactivation is in progress.	
32	The pedal has been pressed.	
33	Incorrect operational system!	Use a different board.
34	Re-start the system.	
35	Taper calibration error	
36	Out of tolerance taper calibration value	
37	Check the connection of the Printer	
38	Missing Term Text	
39	WINCE firmware version incorrect for selected language. The selected language will be replaced by English	
40	Emergency stop	
41	The calliper of the width must be calibrated	

5. How to up-to-date the software

The new generation of boards used by Sicam works on Windows CE; this allows our Research & Development Department to up-to-date the machines constantly in order to solve possible programming mistakes and to add functions to the machines like translations in several languages and special programmes. The updates are sent through USB driver or e-mail.



How to up-to-date the software:

1. Unzip the file that you have received by e-mail (intall. zip);
2. copy the whole “Install” folder in the USB driver;
3. connect the USB driver to the balancing machine;
4. start the machine;
5. wait for the update to be charged;
6. repeat the calibration of the machine.

! **Edis link:** Edis\SOFTWARE\systemsw\WBE4140

6. Configuration of the board

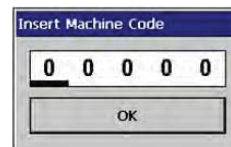
i The board is configured during the installing. It requires an activation code that determines the main details

i Every time that you install a new board or that you up-to-date the software manually, you must insert the activation when you turn on the machine for the first time.

i Entrare nel menu calibrazione factory per attivare la funzione illuminatore.

Machine code

When a new “neutral” board is charged, you have to insert an activation code to recognise the version of the balancing machine where the board is going to be installed. This code is also useful to charge the setting/parameters connected to those of the machine. Every version has a code that is inside the spare part packaging; otherwise you can ask the assistance to be provided with..



To insert the code press the arrow key <↑> e <↓> to increase the numbers and <←> e <→> to move to the following space.

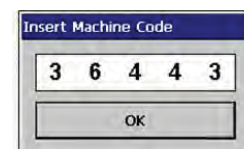
How to Reset the machine code

Follow these instructions to reset the machine code that has been inserted:




1. Press the ARROW KEYS <↑>, <↓>, <←>;
2. Insert the reset code (36443).

→ Now, when you turn on the machine, the board will need to be reactivated through a configuration code.



7. Standard calibration

 We recommend carrying out the standard calibration of WBE 4140 during commissioning, during the six-monthly maintenance operations or in the presence of imprecise measurement results, following the sequence below:

1. Flange calibration
2. Calliper gauge/measurement arm calibration
3. Calibration with wheel and sample weight.



At the end of every calibration carry out a control measurement.

7.1 Recalling of the calibration menu





1. From the "**Settings and Service**" menu select **Calibration** and confirm by pressing **<OK>**.



2. Enter password: **<=>> <=>> <↑>**.

→ The standard calibration menu is displayed.



	Calibration with wheel and sample weight.
	Flange calibration
	Back to main page.
	Calliper gauge and measurement arm calibration

7.2 Calibration with wheel and sample weight

 Keep to the indications displayed on the monitor.

1. Fix the wheel of a motor vehicle of average size and in excellent conditions (e.g. 5.5" wide, 14" diameter) on to the flange.
2. Select WBE 4140 Calibration and confirm by pressing **<OK>**.




⇒ Calibration is started.

3. Enter the data of the rim and confirm by pressing **<OK>**.

4. Press **<START>**.
⇒ Measurement is started.
5. Enter any balancing weight between 40 g and 120°g and confirm by pressing **<OK>**.
6. Apply the balancing weight of the value entered on the internal side of the wheel.
7. Press **<START>**.
⇒ Measurement is started.
8. Turn the wheel until the balancing weight is in 12 o'clock position.
9. Remove the balancing weight from the internal side of the wheel and apply it on the external side (12 o'clock).
10. Press **<START>**.
⇒ Measurement is started.
11. Turn the wheel until the weight is in 6 o'clock position.
12. Press **<OK>**.


→ Calibration is completed.

 The performed calibration is automatically and permanently saved.

7.3 Flange calibration

 Follow the instructions shown on the monitor.

1. Fit the flange (refer to Section 5).

 Do not clamp the wheel, do not use any clamping tools.

2. Select flange calibration and confirm with **<OK>**.



⇒ Calibration is started.

3. Close the wheel guard.
⇒ Measurement commences.
- Flange calibration completed.
→ Unbalance set to "0".

7.4 Calibration of electronic vernier calliper/gauge arm

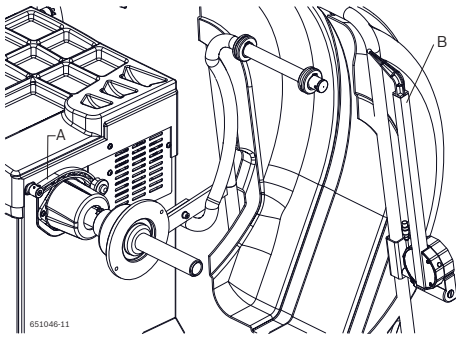
 Follow the instructions shown on the monitor.

1. Select calibration of the slide calliper and of the angular width gauge and confirm using **<OK>**.

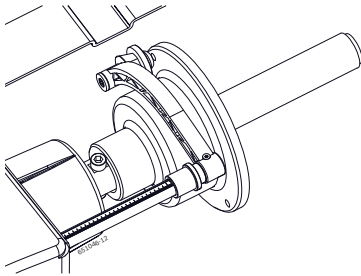


⇒ Calibration begins.

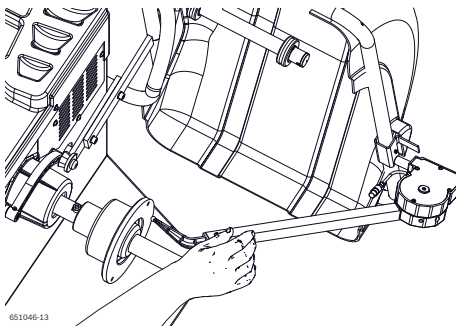
2. Move the slides with distance A and width B to standby position and press **<OK>**.



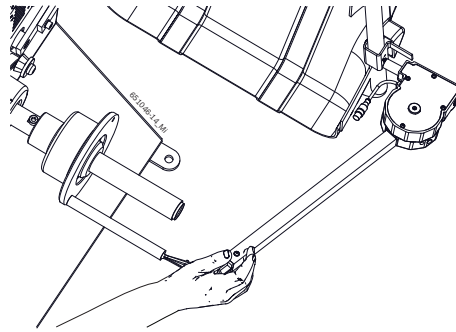
3. Move the reading cursor of distance 0 mm. Set the value read and press **<OK>**.
 4. Move the cursor of distance A against the interior of the flange. Measure and set the value read and press **<OK>**.



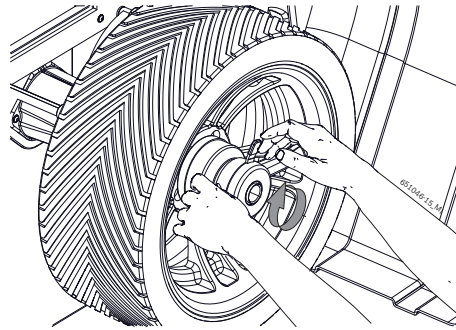
5. Keeping the distance A cursor in standby, move the cursor of width B width against the external part of the flange and press **<OK>**.



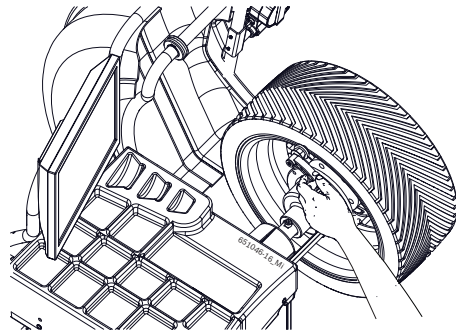
6. Assemble the width calibration pin on the external part of the flange. Move the width cursor against the end of the pin and press **<OK>**.



7. Remove the pin and assemble a 14" or 15" steel sample wheel using the relevant hold-down nut.




8. Set the wheel measurements and, with the distance reading cursor resting on the wheel itself, press **<OK>**.




⇒ Procedure completed.


! Valid procedure with updated SW 6.16 version, otherwise proceed with the software upgrade.


7.4.1 Reference measurement

 Exact centering of the wheel is a basic prerequisite for this reference measurement and for all balancing operations.

 Sound and automatic start are active in the following description (refer to Section 8.3.3).

1. Attach a motor vehicle wheel of medium size (e. g. width 5.5", diameter 14") and in very good condition to the flange.
2. Enter the wheel data (refer to Section 8.2).
3. Close the wheel guard.
 - ⇒ Measurement commences.
4. Create an artificial unbalance by attaching a test weight of e. g. 60 g to one of the two sides.
5. Close the wheel guard.
 - ⇒ Measurement commences.
 - ⇒ The WBE 4140 must display precisely this unbalance (value and position) on this side. The value indicated for the other side must not exceed 5 g.

 To check the position of the unbalance, turn the wheel until the position recommended for attachment of the balance weights is attained. The test weight attached must be vertically beneath the axis of rotation (6 o'clock position).


 Calibration must be repeated in the following cases:

- Deviation from specified unbalance value (greater than 1 g on test weight side, more than 5 g on other side).
- Deviation from specified unbalance position (test weight not between 5:30 and 6:30 position).


6. Remove the test weight.
7. Release the wheel and turn it through approx. 35°.
8. Re-attach the wheel.
9. Close the wheel guard.
 - ⇒ Measurement commences.

→ On completion of this reference measurement, the display must not exceed a maximum unbalance of 10 g per side (15 g for particularly heavy wheels). This error may be caused by the rim centering tolerances. If this reference measurement indicates greater unbalance, the components used for centering the wheel must be checked for wear, play and contamination.

7.5 Factory calibration

 We recommend carrying out the factory calibration during software updating, replacement of the pick-up, of the measurement unit or of the board, following the sequence below:

1. Flange calibration
2. Calliper gauge/measurement arm calibration
3. Calibration with sample weight.

 At the end of every calibration carry out a control measurement.

7.5.1 Recalling of the calibration menu






1. From the "**Settings and Service**" menu select **Calibration** and confirm by pressing <OK>.



2. Enter password: <←> <↓> <→>.

→ The factory calibration menu is displayed.



-  Calibration with sample weight.
-  Flange calibration
-  Back to main page.
-  Calliper gauge and measurement arm calibration
-  Factory settings

7.5.2 Calibration with sample weight

 Keep to the indications displayed on the monitor.

1. Select **Calibration with sample weight** and confirm by pressing <OK>.





⇒ Calibration is started.

2. Bring the calliper gauge on the flange.
3. Bring the calliper gauge back to stand-by position
4. Press <START> or close the wheel protection cap.
 - ⇒ Measurement is started.


5. Apply the sample weight on the internal side of the flange.
6. Press **<START>** or close the wheel protection cap..
⇒ Measurement is started.
7. Remove the sample weight from the internal side of the flange and apply it on the external side (12 o'clock).
8. Press **<START>** or close the wheel protection cap.
⇒ Measurement is started.
9. Turn the flange until the weight is in 12 o'clock position.
10. Press **<OK>**.

→ Calibration is completed.


 The performed calibration is automatically and permanently saved.

 After having carried out factory calibration with sample weight, access the standard calibration menu

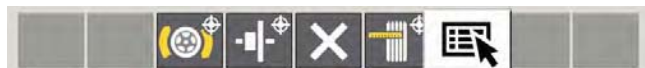
7.5.3 Flange calibration


 Follow the instructions for the standard calibration (see chap. 5.4.2).


7.5.4 Calibration of electronic calliper gauge/ measurement arm


 Follow the instructions for the standard calibration (see chap. 5.4.3).

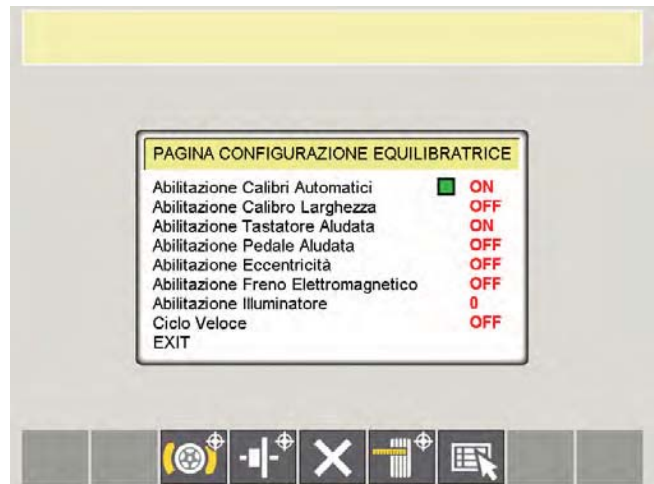
7.5.5 Factory settings



 The balancing machine factory configuration can be defined by enabling and disabling some operations;

 Scroll the several items of the components inside the menu with the buttons **<↑>** and **<↓>**;

 Define the ON/OFF status with the buttons **<←>** and **<→>**.



Descrizione	WBE 4140	WBE 4140 +cal.larghezza
Calibri automatici	ON	ON
Calibro larghezza	OFF	ON
Tastatore aludata	ON	ON
Pedale aludata	OFF	OFF
Eccentricità	OFF	OFF
Freno elettromagnetico	OFF	OFF
Abitazione illuminatore	OFF	OFF
Ciclo veloce	OFF/ON	OFF/ON

8. Diagnostics

I The diagnostics can be used during after-sales assistance for an in-depth check of the various functions of the WBE 4140.

I This procedure is essential to identify a malfunctioning of the sensors.

8.1 Recalling of the diagnostics menu

1. From the "Settings and Service" menu select **Diagnostics** and confirm by pressing <OK>.



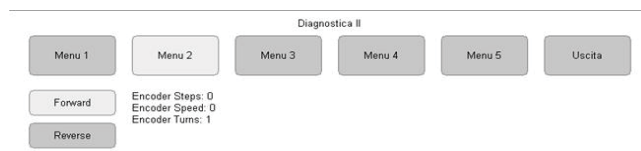
2. Enter password: <↓> <↓> <↑>.
 - The standard diagnostics menu is displayed (display only mode).
3. Enter password: <↑> <OK> <→>.
 - The service diagnostics menu is displayed (amendment mode).

I Once the password is correctly entered, access is gained to the diagnostics menus; to scroll the pages use keys <←> and <→>;

I to activate and deactivate the various functions use keys <↑>, <↓> and <OK>.



- Fig. 2: Menü 1:**
- Software version of the machine
 - Calibration parameters
 - Carry out a check cycle
 - Machine status



- Fig. 3: Menü 2:**
- Check encoder disk
 - Check engine revs

- Check relay condensers

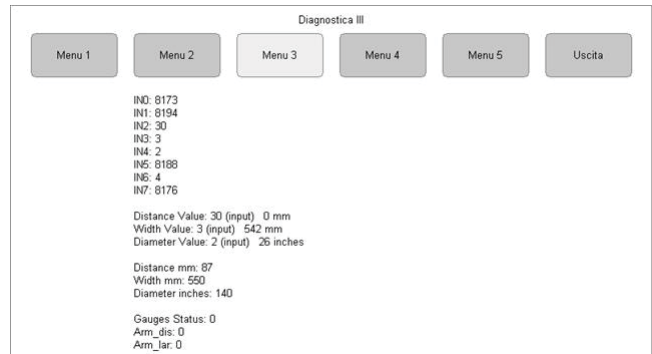


Fig. 4: Menü 3:

- Check measuring gauges potentiometers

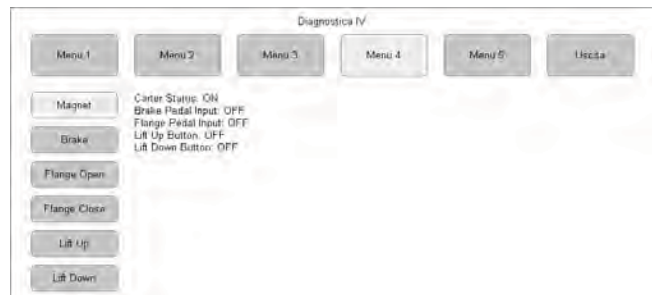


Fig. 5: Menü 4:

- Test protection micro switch input
- Test flange micro switch input
- Test aludata magnet output
- Test electromagnetic brake output
- Test pneumatic flange output
- Test hoisting device

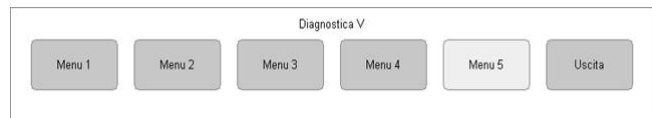


Fig. 6: Menü 5: empty



Fig. 7: Menü 6: output

8.2 Pick-up

I Balancing system

The apparatus used to measure the unbalance of the wheels has a mechanical system based on a 1° degree lever. The piezo-electric sensors, positioned in the lower part of the shaft at the two ends, detect the vibrations converting the force in electric voltage.

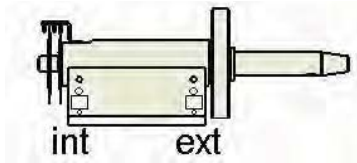


Fig. 8: Position of the piezo-electric sensors

Voltages

The piezo-electric sensors, depending on the position they are placed, receive a different stress and charge. The one inside the shaft on the left is excited with a lower amount compared to the external one. It can therefore be affirmed that the ratio between the two is of 2; or that the voltage measure by the external pick-up is twice greater than that of the internal pick-up.

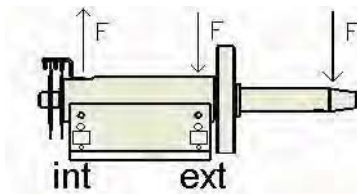



Fig. 9: Stresses distributed on the shaft

8.2.1 Check of the phase difference

 The term phase indicates a particular moment during the performing of a periodic phenomenon (in this case, the electric signal caused by the pick-ups during the wheel cycle). When two signals are considered (one caused by the internal pick-up and one by the external) it is the phase difference between them, meaning the difference of the read voltages. For example, with reference to fig. 10, if the black signal represents the voltage of the external pick-up and the red signal the voltage of the internal pick-up, it can be affirmed that the voltages are in antiphase, meaning that the offset is equal to 180° (the peaks of a signal coincide with the grooves of the other and vice-versa).

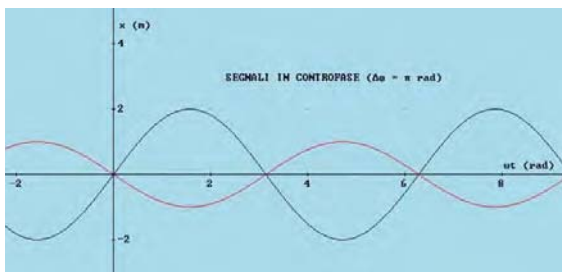


Fig. 10: Ratio between the voltages measured by the pick-ups

1. Access the self-diagnosis menu (Menu 1).

→ The displays show the values read by the pick-up in sequence during the last cycle and the phase difference in degrees.


Int Value: 8194
Ext Value: 8173


VINT: 0.00 VEXT: 0.00 Dif.Fase: 0.00

Internal weight: 0.0 Position: 0
External weight: 0.0 Position: 0
Static weight: 0.0 Position: 0


2. Fix the wheel of a motor vehicle of average size and in excellent conditions (e.g. 5.5" wide, 14" diameter) on to the flange and carry out a perfect balancing.
3. Apply a sample weight (e.g. 100 g) on the external side of the wheel.
4. Press <START> or close the wheel protection cap.
 - ⇒ Measurement is started.

→ At the end, checking the measured values, the voltage value of the internal pick-up must always be small compared to the voltage value of the external pick-up and the ration between the external and internal pick-ups must be between 1.9 and 2.1.

 To calculation the voltage difference, divide the value of the external pick-up with that of the internal, in this way obtaining the ratio between the two.

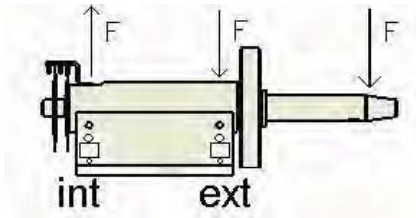
 If, when checking the ratio between the pick-up and the phase difference, out of tolerance values are found, replace the board (chap. 4.3) or replace the pick-up sensors (chap. 4.1.4). If after replacement of both the problem persists, it may be caused by a too high disturbance of the bearings of the measurement bench, therefore replace everything.

8.2.2 Check of the external pick-up sensor (IN0)

 The piezo-electric type sensor reads a force variation.

During appliance check, verify that:

- the stand-by value is half-way on the reading scale (e.g. 8170 +/- 100);
- by pushing the shaft downwards, the values decreases to zero;
- by lifting the shaft upwards, the value increases to end scale.



8.2.3 Check of the internal pick-up sensor (IN1)

The sensor is now assembled in the other position.

During appliance check, verify that:

- the stand-by value is half-way on the reading scale;
- by pushing the shaft downwards, the values increases to end scale;
- by lifting the shaft upwards, the value decreases to zero.

The piezo-electric sensors are identical and to distinguish them, during production, a red pick-up is assembled on the outside and a black on the inside.

8.3 Encoder

Indicates the function to directly check the step counter (encoder): the number of spaces varies from 0 to 255.

The malfunctioning of the apparatus is automatically detected by the program showing on the display "Err 10" or "Err 11".

➤ By keeping the entry displayed on the board, check which may be the cause of the fault to be able to adequately solve the problem (see table below).

Difetto	Correzione
The machine does not reach 255 spaces.	<ul style="list-style-type: none"> • Check that the disk is not obstructed by dust. • Check that the disk is intact.
The machine does not count any space.	<ul style="list-style-type: none"> • Check that the encoder is connected. • Replace the encoder.

8.4 Engine and power board

The functioning of the engine is completely managed by the power board.

➤ If the wheel does not turn listen if, by activating the cycle, a "click" from the relays is emitted from the power board..

Difetto	Correzione
The wheel does not turn.	<ul style="list-style-type: none"> • Check the electric connections. • Replace the engine or the condensers.

The engine does not reach the balancing speed	<ul style="list-style-type: none"> • Check the tensioning of the transmission belt. • Replace the engine or the condensers.
The wheel does not brake (in reverse).	<ul style="list-style-type: none"> • Check, and eventually replace, the power board. • Check, and eventually replace, the CPU board.

8.4.1 Check belt tensioning

To check the tensioning of the transmission belt, use the tensiometer for optibelt TT mini S belts (nominal value: 120 ±10 Hz).

8.5 Potentiometers

The potentiometer used is of multiturn type, where the shaft must fulfil more than one turn to go from one end of the run to the other.

➤ To check the correct functioning of the potentiometer, turn the head and check that, during the entire run, the value is not blocked.

It is necessary to check the values of the potentiometers when, during entering of the measurements, the machine displays the unacceptable values and, even after calibration of the callipers, the problem is not solved.

8.5.1 Diagnosis distance potentiometer(IN2)

Difetto	Correzione
The value remains blocked at scale end or between 0 and 40.	<ul style="list-style-type: none"> • Check that the cable is correctly connected. • Check that the steel cable is in its seat and is not cut. • Replace the connection cable. • Replace the potentiometer.
The value remains blocked between 100 and 16000.	<ul style="list-style-type: none"> • Check that the ring nut is correctly fixed. • Replace the connection cable. • Sostituire il potenziometro.
The values passes from 0 during the run.	Re-position the potentiometer (see following Instructions).

8.5.2 Diagnosis width potentiometer(IN3)

Difetto	Correzione
The value remains blocked at scale end or between 0 and 40	<ul style="list-style-type: none"> • Check that the cable is correctly connected. • Check that the ring nut is correctly fixed. • Replace the connection cable. • Replace the potentiometer.

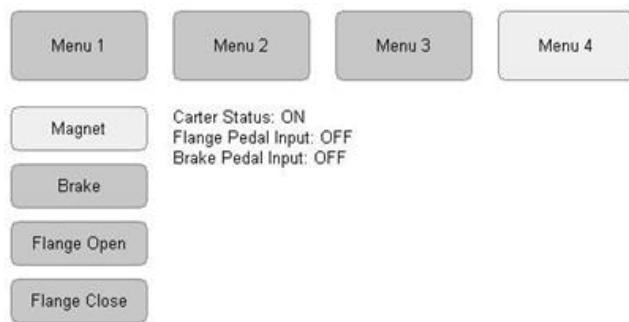
The value remains blocked between 100 and 16000.	<ul style="list-style-type: none"> • Check that the ring nut is correctly fixed. • Replace the connection cable. • Replace the potentiometer.
--	--

8.5.3 Diagnosis diameter potentiometer (IN4)

Difetto	Correzione
The value remains blocked at scale end or between 0 and 40.	<ul style="list-style-type: none"> • Check that the potentiometer is correctly fixed to the measurement arm. • Replace the connection cable. • Replace the potentiometer.
The value remains blocked between 100 and 16000.	<ul style="list-style-type: none"> • Check that the potentiometer is correctly fixed to the measurement arm. • Replace the connection cable. • Replace the potentiometer.
The values passes from 0 during the run..	Re-position the potentiometer (see following Instructions).

! After having replaced the potentiometer or after having detected that the fastening screw is loose, before proceeding with calibration, follow the instructions reported here.

8.6 Ingressi ed uscite digitali



8.6.1 Protection micro switch

I When the cover is lowered, if the machine functions correctly, the ON sign appears.

➤ Should the micro show problems, check the position of the functioning cam and of the same micro, as well as the cables' connection (see electric layout).

! A malfunctioning of the micro can cause the pneumatic flange to block.

9. Replacement interventions

9.1 Pick-up replacement

1. Remove the weights protection;

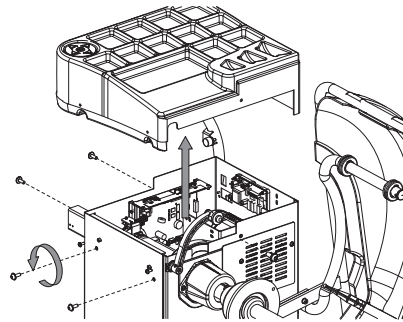


Fig. 11: Guard removal

2. Disconnect the action-centre;
3. Loosen the fixing screw of the feeler (fig.15, pos.1);
4. Extract the entire Easy Aludata calliper unit from the machine;
5. Loose the drive belt and remove it;
6. Loosen the 4 allen screws that keep it in position and extract the oscillating unit (fig.12);

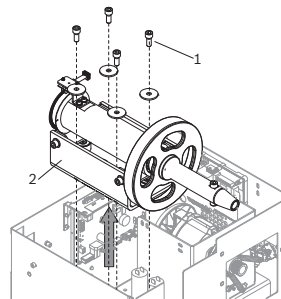


Fig. 12: Removal of the oscillating unit

7. Loose the locking nut put under the pick-up;
8. Unscrew position nut (fig.13, pos.1);
9. If necessary, insert the new pick-up;

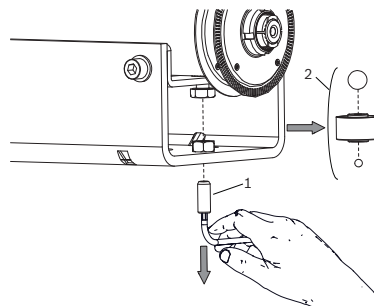




Fig. 13:

I To keep the spheres in position, use a little of oil grease;

10. Screw the nut until you cannot turn it manually;

 Manually: lock the nut making a half turn with the key;

 With a dynamometric key, apply a 4 n/m strength;

11. Keep the Allen key and fix the locking nut (fig.14);

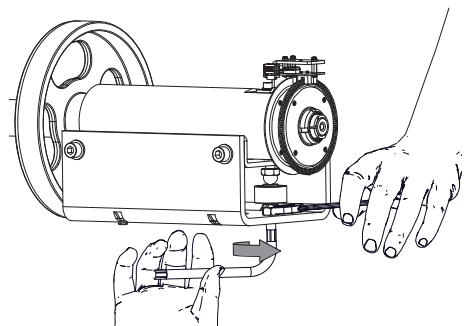



Fig. 14:

12. Mount again the shaft inside the machine;

13. Reconnect the engine.

 In order to check that the reparation has been successful, check the tensions again and go on making a new calibration of the machine.

9.2 Replacement Easy Aludata calliper

1. Remove the weights protection;
2. Disconnect the action-centre;
3. Loosen the fixing screw of the feeler (fig.15, pos.1);

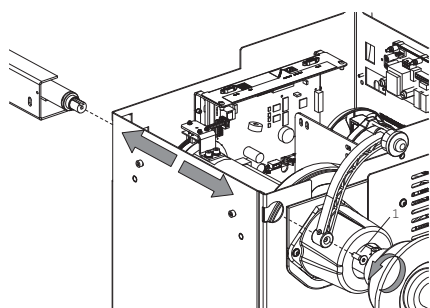


Fig. 15:

4. Extract the entire Easy Aludata calliper unit from the machine;
5. Replace the calliper unit
6. Reassemble it following the same disassembling procedure.

9.3 Width potentiometer positioning

procedure

1. Remove the left side protection without disconnecting the board;
2. start the balancing machine;
3. access the test menu;
4. keeping the 4 value displayed on the board, release the screw on the ring nut (fig.16);

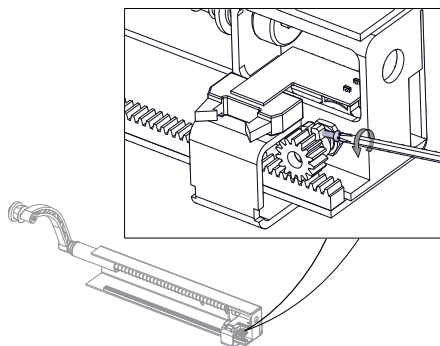


Fig. 16:

5. keeping the calliper in stand-by, turn the potentiometer using nose pliers (fig.17) to the value of 1000 ± 50 ;

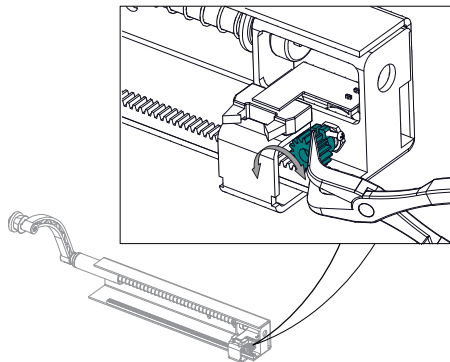



Fig. 17:

6. Lock the fixing screw ensuring that the upper surface of the pinion and of the rack are complanar;
7. check the correct functioning during the run;
8. close the machine;
9. proceed with calibration of the callipers.

 The above notes are to be used for the correct repairing; in case of replacing the entire calliper unit, proceed only with the calibration.

9.4 Diameter potentiometer positioning procedure

1. Remove only the carter without disconnecting the board;
2. Start the balancing machine;
3. Enter the test menu;
4. Keep the value IN4 of the board shown;
5. unblock the nut on the shaft "A" (fig.18, pos.1);

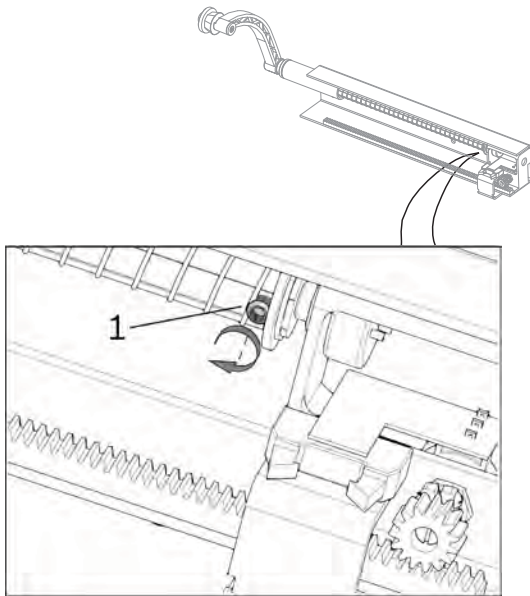


Fig. 18:

6. Slightly extract the rod of the calliper;
7. Now lean the gauge against the shaft, turn the potentiometer "B" as far as the value of 3000 ± 50 ;

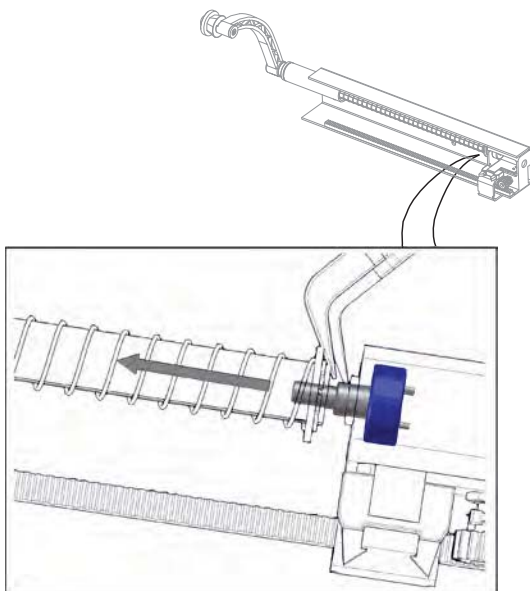


Fig. 19:

8. Block the nut "A" on the shaft (fig.18, pos.1);

9. Check the correct functioning during the stroke;
10. Close the machine;
11. Proceed with the calibration of gauges (chapter Calibration menu).

9.5 Engine belt replacement

1. Remove the weights protection;
2. Remove the central centring flange (fig.20, pos.1) and, once loosened the three screws (fig.20, pos.4) and the two screws (fig.20, pos.2);
3. Remove the pin cover in fig.20, pos.3 and the side cover of the motor closing in fig.20, pos. 5;

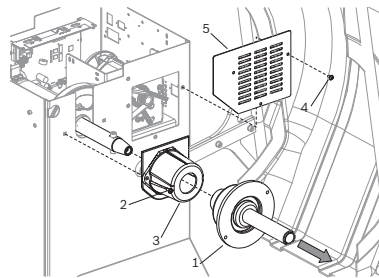


Fig. 20:

4. Remove the belt of the motor by loosening the three side screws (fig.21, pos. 1) and the screw (fig.21, pos.2) in order to loosen the belt;

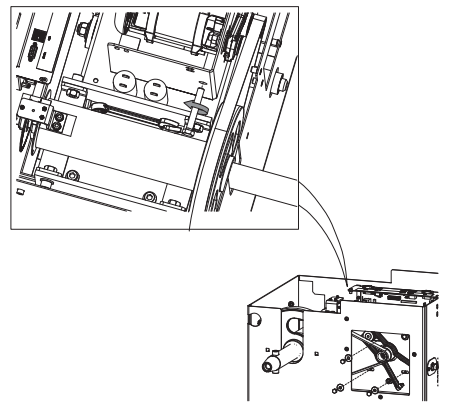


Fig. 21: Belt replacement

5. adjust the tension of the belt (by tightening the adjustment screw) until it is possible to manually rotate by 90° .

→ Belt tensioning check.

9.6 Power board replacement

1. Remove the weights protection;
2. Loosen the 5 rear screws using an allen wrench;

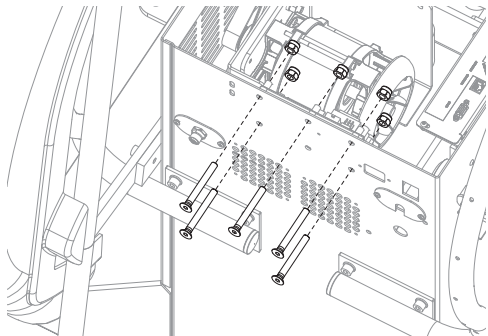


Fig. 22:

3. replace the board and restore connections.

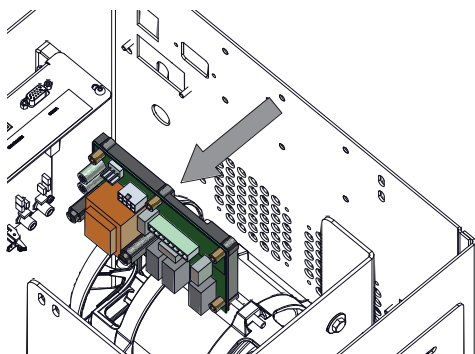
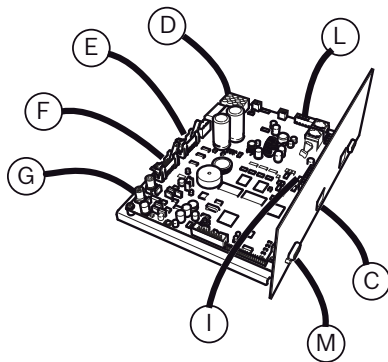


Fig. 23:

9.7 Video board replacement procedure

1. Remove the left and upper protections;
2. replace the board and restore connections;
3. configure the board.



- ! The piezo-electric sensors are identical and to distinguish them, during production, a red pick-up is assembled on the outside and a black on the inside. Mark the cables F and G before reconnecting them to be able to recognise them.

- ! When it is necessary to replace the board, activate the board and perform the various calibration passages.

10. Suggested spare parts

Fundamental tools for a correct assistance:

- Allen screws set
- Screwdriver (crosshead and slotted screwdrivers)
- Hex key set
- Tester (multimeter)



For spare parts contact AADGT-ASA.

11. Electric system

