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This manual instruction is suitable for wheel balancer WB-511.

This unit is made for the purpose of persons who have special techniques and certifications.

Safety Instructions

- Make sure all operators are properly trained. Improper operations may result in incorrect measurement.
- Environments should conform to the regulations in this instruction manual.
- Keep the guard in working order.
- Transportation and operations should strictly follow the regulations in this manual; otherwise, the manufacturer will not be responsible for the damage caused by improper transportation or operation.
- To use the equipment beyond its measurement range may cause damage to it and can not ensure precise measurement.
- If operators violate safety regulations thus damage the machine by dismounting safety devices, the manufacturer will immediately cease its safety promise.

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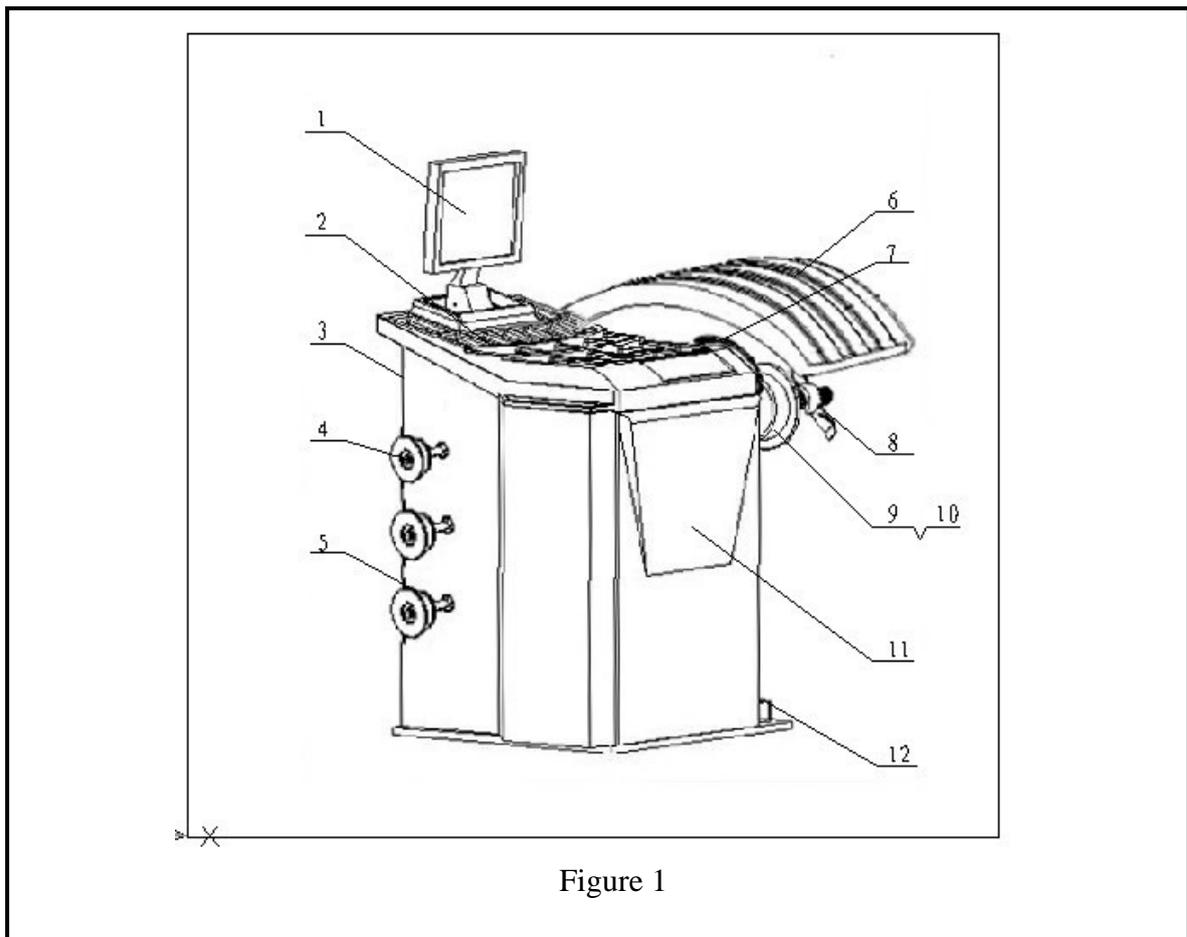
1、 Safety Instructions

- Make certain all operators are properly trained. Improper operations may result in incorrect measurement.
- Environments should conform to the regulations in this instruction manual.
- Keep the guard in working order.
- Transportation and operations should strictly follow the regulations in this manual, otherwise, the manufacturer will not be responsible for the damage caused by improper transportation or operation.
- To use the equipment beyond its measurement range may cause damage to it and can not ensure precise measurement.

If operators violate safety regulations thus damage the machine by dismounting safety devices ,the manufacturer will immediately cease it's safety promise.

2. Product Instruction

2.1 External Structural Drawing



1. Operation Board
3. ON/OFF

2. Counterweight Container
4. Cone

- | | |
|---|-----------------------|
| 5. Cone Arm | 6. Safety Guard |
| 7. Manually enter A, B, D measuring scale | 8. Quick Lock Hub Nut |
| 9. Shaft | 10. threaded end |
| 11. Balancer Body | 12. Brake Pedal |

2.2 Functions

- Dynamic Mode
- Static Mode
- Standard ALU1, ALU2, ALU3, ALU4, ALU5 Mode
- ALU1S, ALU2S Mode
- OPT(OPTIMIZATION) Balance
- SPLIT Function
- Unit Conversion in Different Countries (Areas)
 - g / oz, mm / inch
- Automatic Gauge
- Automatic Sticking Counterweight
- Self-calibration
- Guard Protection
- Self-check Error and Diagnostics
- Multi-language Chart Article Interface, the User Friendly Design, Built-in Operating Guide

2.3 Specifications

- Power Supply: 110V/220V 380V single phase or three Phase, Power frequency :50 Hz / 60 Hz
- Protection Class: IP 54
- Power Consumption: 260w
- Max Rotating Speed: 220 r /min
- Cycle Time: Average 8-12s
- Measurement Ranges:
 - Gauge length 10 --- 300mm
 - Rim Diameter: 9.5" — 28"
 - Wheel Width: 2.5" — 21"
 - Wheel Diameter: < 880 mm
- Error: $\leq \pm 1g$ 0.1 oz
- Noise: $\leq 70dB$
- Net Weight: 75kg
- Working Environment: Temperature: $-20^{\circ}C \sim 50^{\circ}C$, Humidity: $\leq 85\%$

3、Transportation

The balancer must be transported in the original package and be placed in the specified position. Use a forklift with corresponding capacity to move the packed machine and the direction of the forklift is shown in figure 2.

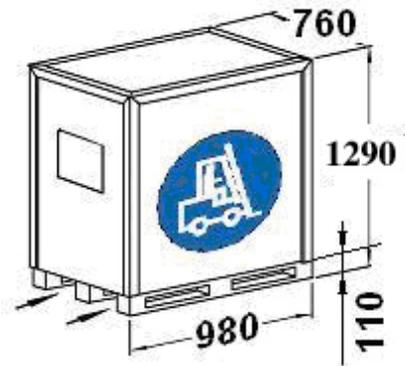


Figure 2

4、Opening Package

- Check the package. If there are some problems, please do not open it, and contact the supplier and the carrier at once.
- Make sure that the package is not damaged and then open the protection carton and plastic bag. Check the accessory case according to the packing list. Check whether the machine surface is in good condition and whether there is loss or damage to the parts.
- Dismount the bolts on the base and make the balancer steadily rest.. Please do not use the machine and contact the supplier at once if there are some problems.

5、Installation

5.1 Location

- The machine must be located in the working environment described in 2.3 and the ground should be solid.
- Sockets that match the power supply and motor power described in 2.3 are available nearby.
- Space for installing is big enough to meet the needs in figures 3 and ensures each part of the machine to work normally.
- Put up a shelter if placed outdoors.

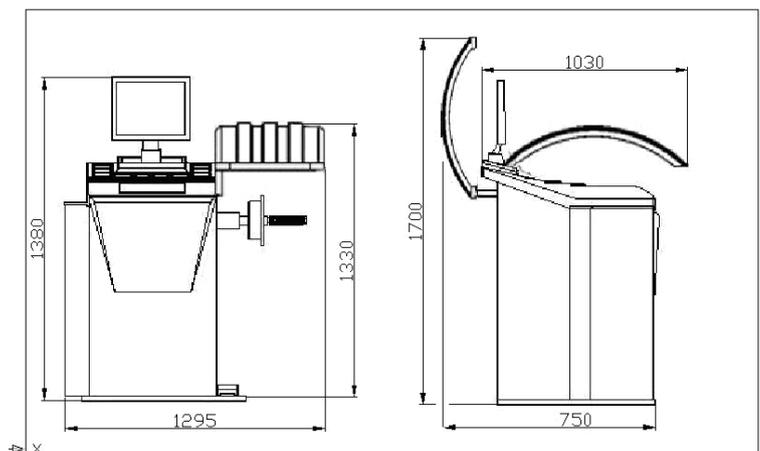


Figure 3

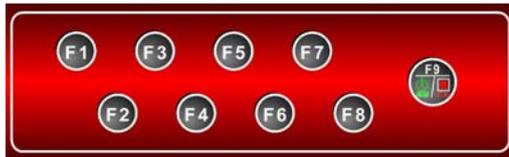


Figure 4

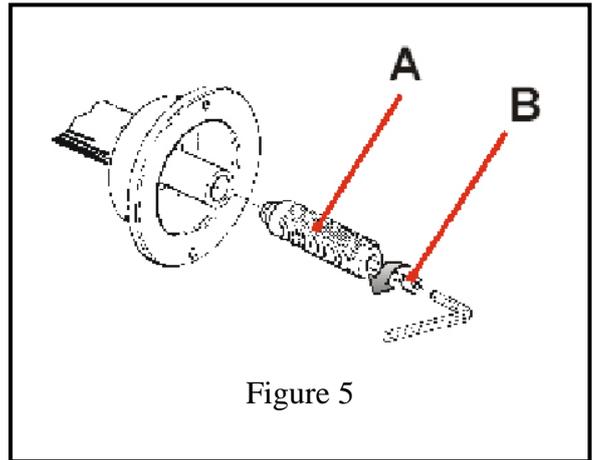


Figure 5

5.2 Installing parts

- Shaft . Take out the threaded end and bolts from the accessory case. Mount them firmly according to figure 5.
- Mount the cone on the corresponding arm.
- Mount the guard according to Appendix I.

5.3 Electrical Connection

Put the plug in the socket to finish installing the balancer

6、 Control Unit

F1----F9 are classic function keys whose functions are given by the prompt article appearing on the bottom of LCD screen.

Keypad tone can be on or off by the built-in system options.

7、 Operating Instructions

7.1 Self-check

When switched on, the system begins self-check and enter standard dynamic mode as it proceeds to 100% without error. Press any key to skip over self-check and enter standard dynamic mode directly.



Figure 6

7.2 Installing Wheel

Choose the optimal cone for the center hole and mount it on the balancer.(refer to figures 7 and 8)

The method shown in figure 8 is preferable because it approximates to installing wheel on a real car.

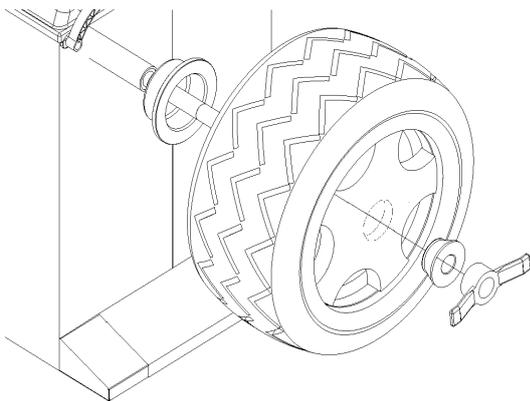


Figure 7

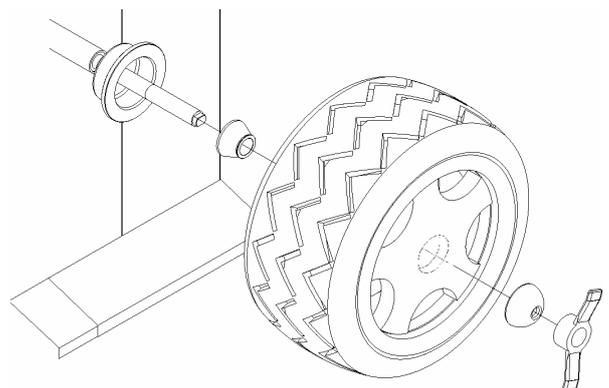


Figure 8

7.3 Wheel Parameters Input

Unlike ALU1S and ALU2S which need 4 parameters, other modes need 3 parameters.

Parameter values are shown in
Figure 9 dynamic and static mode

Figure 10 ALU1S mode

Figure 11 ALU2S mode

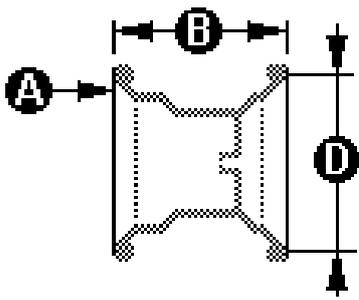


Figure 9

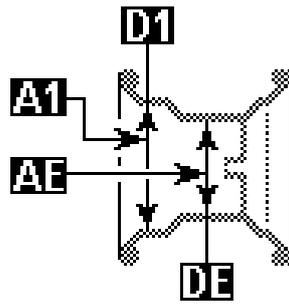


Figure 10

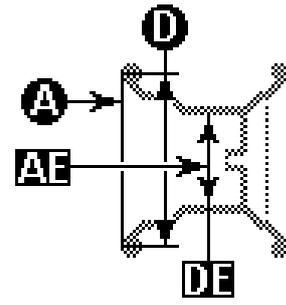


Figure 11

7.3.1 Input Wheel Parameters with Automatic Gauge

Pull the gauge against the rim keeping it in position for 2 seconds. A and D parameters are automatically input with a sound “beep”, and enter the state of B parameters input. Pull the gauge against the rim ,the computer will automatically input B value, As is shown in figure 12,

In this state, all parameters can be modified manually. Choose the parameter to be modified and press the key below the screen. For example, to modify Gauge A parameter, press  , a red line appearing in the A value interface indicates that Gauge A is selected. Press   to modify the current value. The increasing or decreasing range equals the step set by the setting state. (eg. If the step is 0.5 inch, To press  once will increase by 0.5 inch.) While inputting parameters, press  to convert the unit of parameters, like “mm” or “inch”

Input finished, Press  to save and return.



Figure 12

7.4 Standard Dynamic Mode

This function is to test the amount of unbalance on the inside and outside of the rim while a wheel is rotating. Placing counterweight on the tested position of both sides of the rim according to the displayed unbalance value can eliminate unbalance.

After installing the tire and inputting the parameters, Close the guard or press 

to start the motor and make the wheel rotate. During the rotating measurement, in case of emergency you can open the guard or press  to stop rotating. See figures 13、 14.



Figure 13



Figure 14

When the wheel stops rotating, the screen displays the inside and outside unbalance values, with the inside on the left and the outside on the right. Press  to convert the unit g/oz .

Rotate the wheel with hands and stop rotating when the red triangle cursor on the right moves to the middle of the rule. Place a counterweight of 34g on the 12 O'clock position outside the wheel; Keep rotating the wheel and stop rotating when the red triangle cursor on the left moves to the middle of the rule. Place a counterweight of 22g on the 12 o'clock position inside the wheel. See figures 15、 16.

Dynamic measurement finished.



Figure 15



Figure 16

7.5 Static Mode

After dynamic mode measurement, select static mode directly. The balancer will automatically calculate the result of static mode. To start again static mode , you have to install the wheel and input parameters first. In the interface of figure 13 press

F2 to enter mode selection interface shown in figure 17. and then press F2 to choose static mode. See figure 18.



Figure 17



Figure 18

Close the guard or press  to start the motor and make the wheel rotate (figure 19). While waiting, in case of emergency you can open the guard or press  to stop rotating.

When the wheel stops rotating, the right side of the screen displays the unbalance value. Rotate the wheel with hands and stop rotating when the red triangle cursor moves to the middle of the rule (figure 20). Place a counterweight of 20g on the 12 o'clock position. (Static mode has no division of inside and outside)

Static measurement finished.



Figure 19



Figure 20

7.6 ALU1--ALU5 Modes

ALU mode refers to five counterweight sticking modes reduced according to the shapes and sizes of most rims. (figure 21)

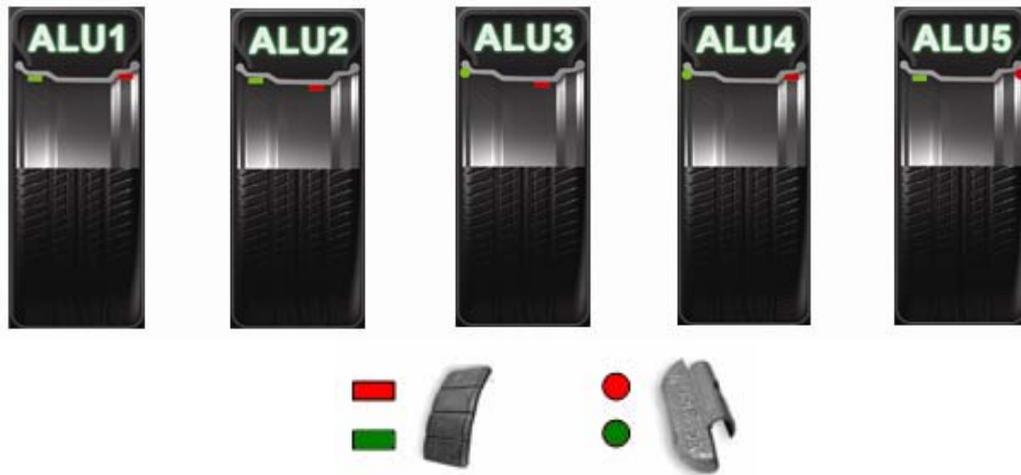


Figure 21

The measurement process of ALU is the same as that of standard dynamic mode. After measurement, stick counterweights according to the figure 22 or use a special purpose gauge to assist in sticking counterweights

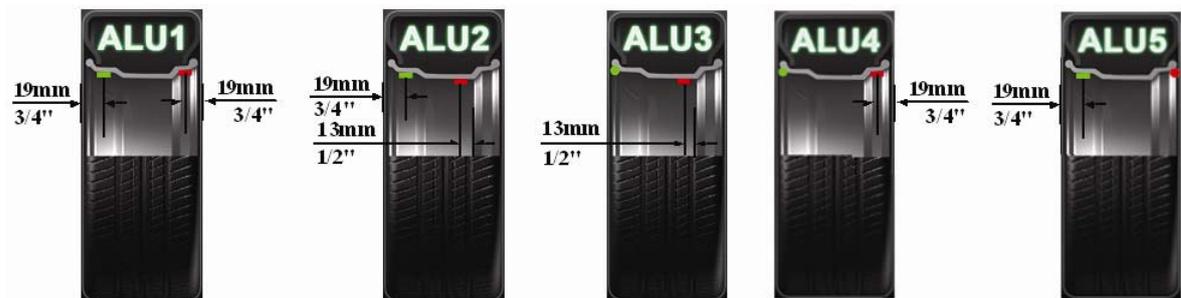


Figure 22

7.7 ALU1S , ALU2S Modes

ALU1S and ALU2S use automatic gauge to input the accurate size of the correction plane (refer to figure 21),The differences between them are:

ALU1S -----stick counterweight on both sides of rim.

ALU2S -----Clamp counterweight inside the rim, and stick counterweight outside

ALU1S and ALU2S compensate for ALU1-5, and they are more accurate than the traditional ALU modes. They are easier and faster as well.

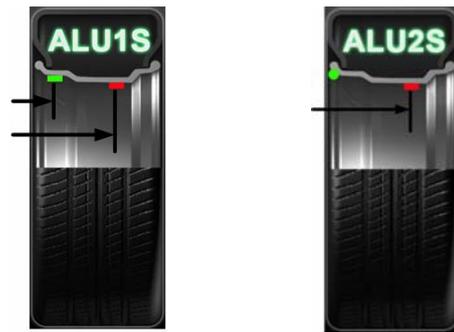


Figure 23

7.7.1 ALU1S,ALU2S Correction Plane Data Collecting

ALU1S has to choose two proper correction planes on both sides of rim. ALU2S only choose one proper correction plane on the outside of rim. Clean the position to be used to get ready for being stuck.

Mount the wheel. ALU1S collects the correction plane parameters as is shown in figure 24.

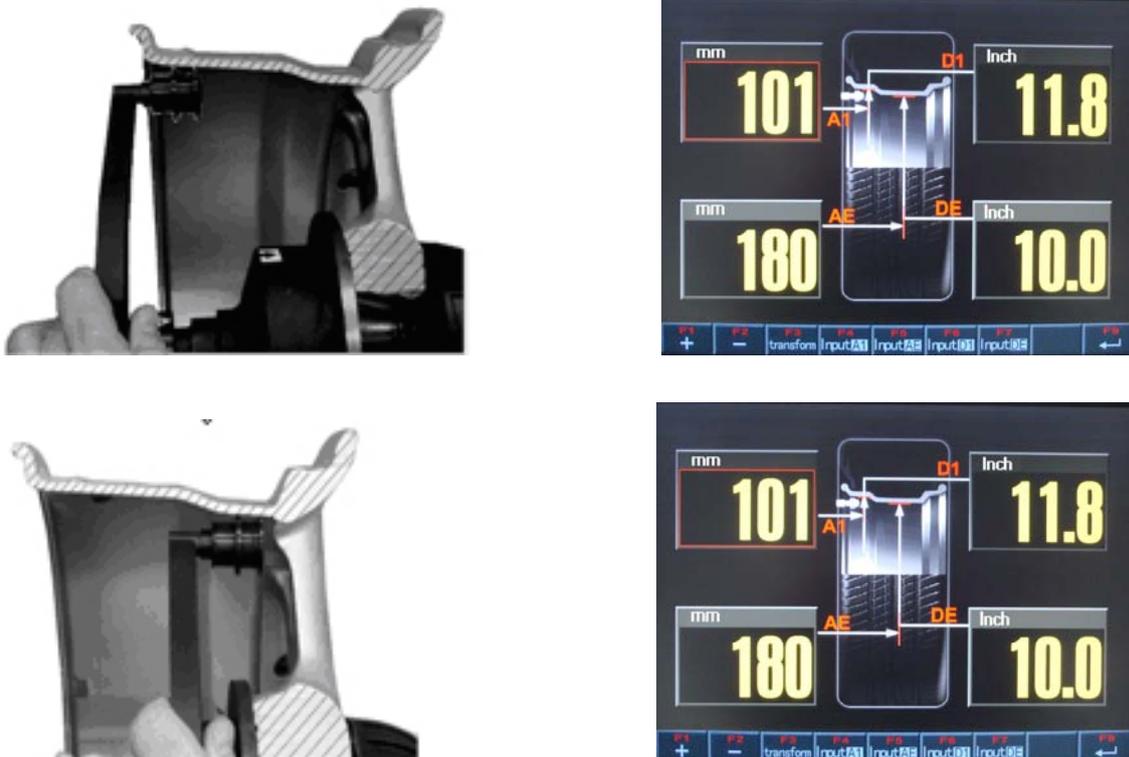


Figure 24

ALU2S collects parameters as is shown in figure 25.

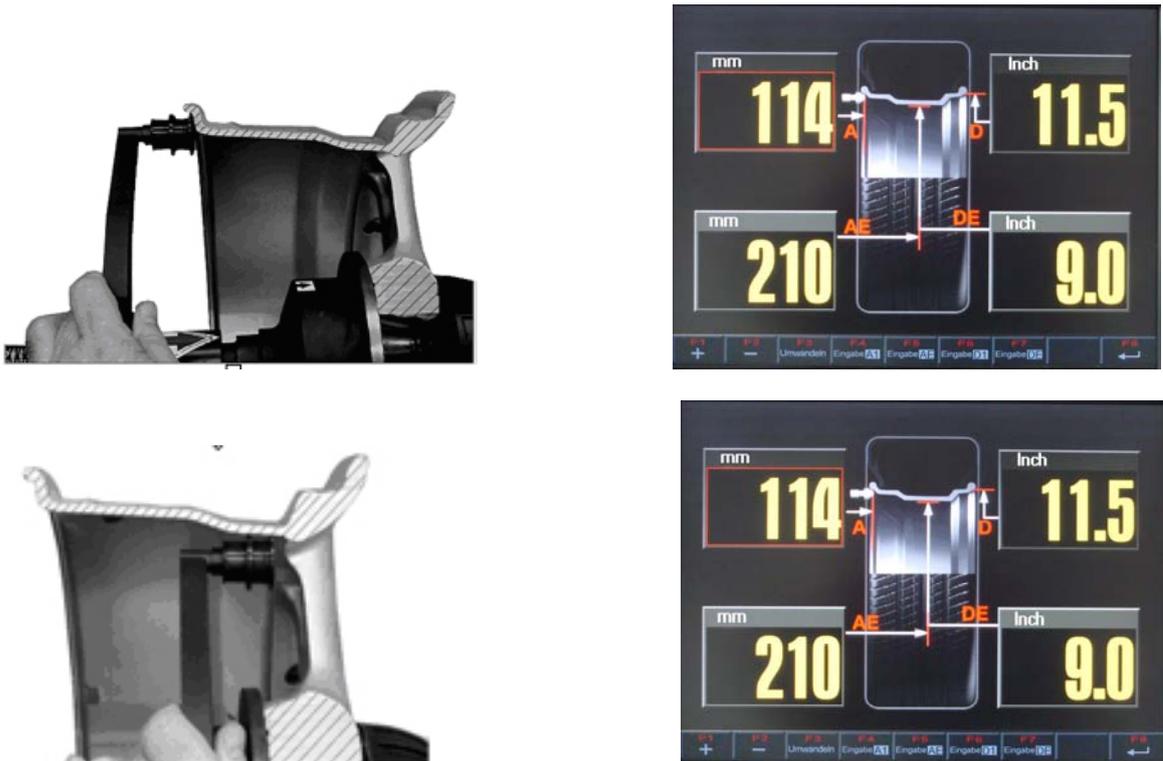


Figure 25

If you can't enter automatic parameter input interface by pulling Gauge A, Press F3 to enter parameter input interface in ALU1S and ALU2S interfaces. In the parameter input interface, relative parameters can be modified or input manually. Choose the parameter to be modified and press key below the screen. For example, to modify Gauge A parameter, press **F4 Input A**, a red line appearing in the A value interface indicates that Gauge A is selected. Press **F1 +** **F2 -** to modify the current value. The increasing or decreasing range equals the step set by the setting state. (eg. If the step is 0.5 inch, To press **F1 +** once will increase by 0.5 inch.) While inputting parameters, press **F3 Shift** to convert the unit of parameters, like "mm" or "inch" Input finished. Press **F8 ←** to save and return.

7.7.2 ALU1S , ALU2S Mode Operation

After collecting, close the guard, press START to measure. The process is the same as that of standard dynamic mode.

After measurement, the unbalance is displayed as is shown in figure 26. Rotate the wheel to the outside correction plane position. Because the position is set by the parameters collected by automatic gauge, the real correction position is not necessarily at 12 o'clock, in this case, locate the position with the gauge. Stick counterweight on the outside of rim according to figure 27. ALU1S operations of

sticking counterweights on both sides of rim are the same. ALU2S adopts clamping counterweights on the inside of rim, so the position is still at 12 o'clock.



Figure 26

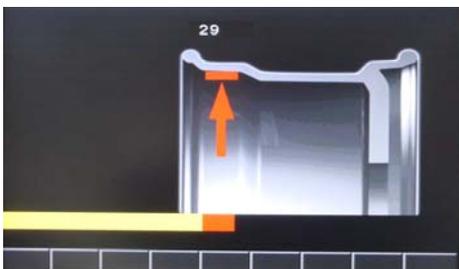
Note: The automatic gauge can only locate the 12 o'clock position, it will return to the measurement interface if at any other position. So it is better to use the brake pedal to locate it at 12 o'clock and do the following operation.



Pull the gauge at the correction plane position, pick up a counterweight of 55g and put it in the tip of the gauge, remove the protection paper of the adhesive tape.



LCD screen displays the sticking positioning .



Stick the counterweight at the position indicated



Firmly stick it with hand.

Figure 27

7.8 SPLIT Function

Under ALU2, ALU3, ALU1S, ALU2S mode, at the bottom of LCD displays  key, (see figure 28) This function can vector split unbalance weight between the two spokes on the outside of the wheel so as to hide the counterweights behind the wheel spokes and the wheel looks beautiful. Operate as follows:

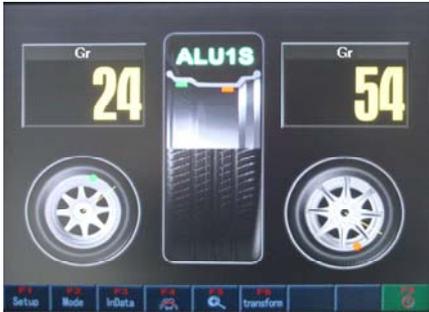


Figure 28

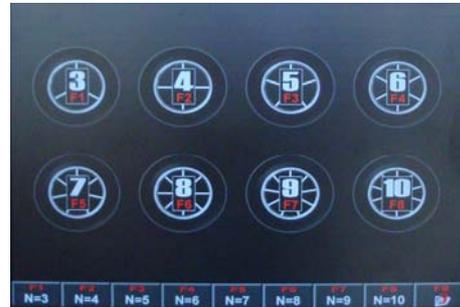


Figure 29

In the interface of figure 28, Press f4 to enter interface of figure 29. Choose the corresponding wheel according to the actual number of spokes. Press the key according to the prompt at the bottom of the screen and enter interface of figure 30. If you want to exit ,press  to return to the previous interface.



Figure 30



Figure 31

Take 8 spokes as an example. In the interface of figure 29 Press F6 to choose an 8 –spoke wheel according to the prompt at the bottom of the screen. A red line surrounding the picture of the corresponding 8-spoke wheel indicates that the wheel is selected. At the top of the picture appears a mark  , Which means that you can take any spoke as the first and begin to rotate the wheel to 12 o'clock position. Then press  to memorize the point .The system will return to the interface of figure 28, in which you press  to start the motor and make the wheel rotate as shown in figure 31. When the wheel stops rotating, it automatically enters the interface of figure 32.



Figure 32



Figure 33

The values on the right of figures 32&33 are two unbalance value after splitting . Rotate the wheel and stop rotating when the red cursor moves to the middle of the rule. Stick a counterweight of 51g on the 12 o'clock position. (see figure 32) On the other 12 o'clock position stick a counterweight of 3g (see figure 33).After the splitting operation ,Press  to exit.

7.9 OPT Function

OPT function is used to determine the best mating of tire and rim. When doing dynamic and static modes, if the static mode value is greater than OPT value (default 30g), the  key will appear on the screen (figure 34) and the system will start optimization. with the premise of optimization (eg. Inside 7g, outside 44g, static unbalance value 51g), operate as follows:



Figure 34



Figure 35

In the interface of figure 34,press  to enter OPT operation, see figure 35. Rotate the gas nozzle to 12 o'clock. Press  key to memorize the point. Mark with a chalk a reference mark on the tire.

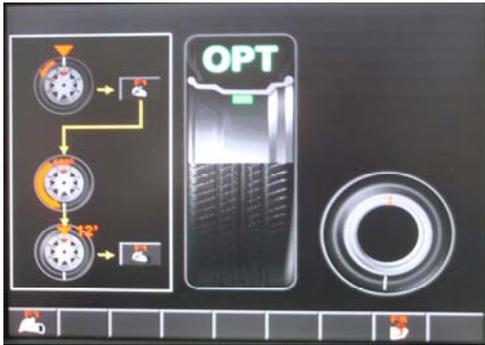


Figure 36



Figure 37

Remove the tire from the balancer using a tire changer. Assemble the tire and the rim again. Align the nozzle and the mark by rotating the tire on the rim by 180 degrees. Replace the tire on the balancer and rotate the gas nozzle to 12 o'clock again. Press  and then press START key to do OPT measurement as shown in figures 36&37.

After measurement, rotate the wheel as shown in figure 38. Mark again on the outside tire of the marked point with the chalk. Assemble the tire with the changer to make the new mark coincide with the nozzle. Now the displayed value is the residual value after optimization.(see figure 39)

OPT operation finished. Press  to exit.



Figure 38



Figure 39

7.10 Motorcycle Mode

Motorcycle mode is the same as standard dynamic mode except that it needs special motorcycle fixtures and extending arms.(see 7.4)

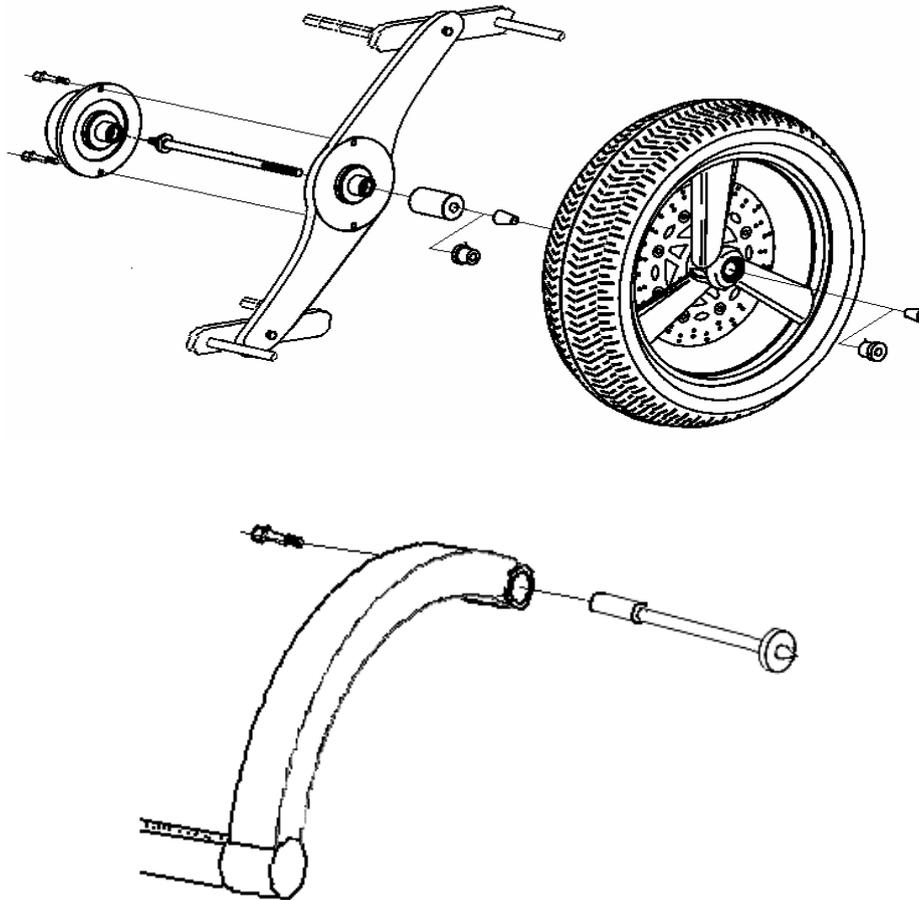


Figure 40

7.11 Setting Programs

It includes system setting, system testing, unbalance calibration, automatic gauge calibration and system information. (refer to figure 41)

Access: Under any mode, press SET key to enter.



Figure 41

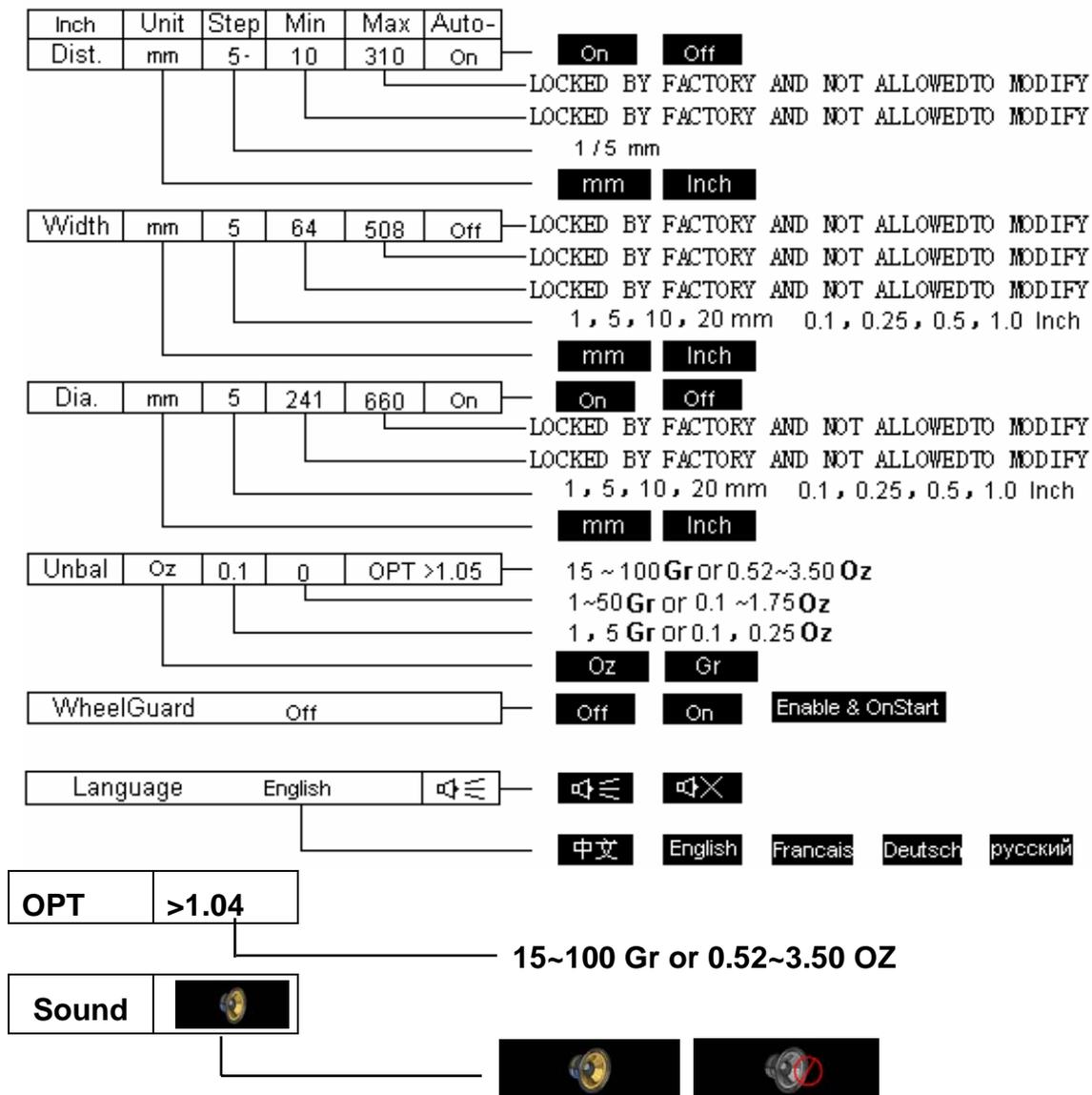


Figure 42

7.11.1 System setting

While the system is running, the state can be changed with function keys when necessary. For instance, modifying the weight unit while measuring. However, the state will return to the original state if the power is turned off and on again.

As shown in figure 42, Press direction key to choose the item to be modified. The red horizontal line under the corresponding item means that this item is in the state of editing. Press “+、—”key to modify the current value . Confirm it and press  to save and exit.



7.11.2 System Testing

The second section of program settings is system settings. (see figure 43)
 This function is used to maintain equipment, determine errors and check replaced parts.

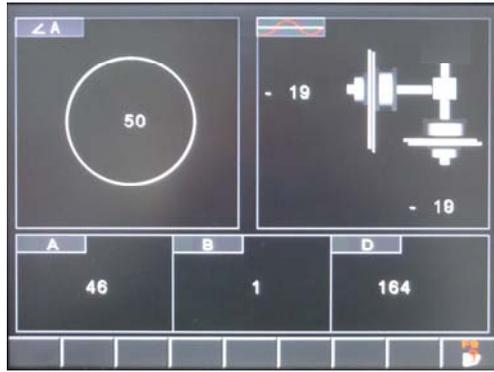


Figure 43

Phrase angle: The Left top corner in the interface of figure 43 is phrase angle test. Rotate the wheel and check if the phrase angle sensor reacts or if there is value displayed..

Piezoelectric sensor: The right top corner in the interface of figure 43 is piezoelectric test. Press the wheel to check if the piezoelectric sensor reacts and if there is value or position change displayed.

Automatic gauge: Pull the gauge to see if A and D measuring signals react and the values change; Turn on Gauge B (if it is available) and check if B signal reacts and value changes.

7.11.3 Unbalance Calibration

The third section of program settings is unbalance calibration. It is used to initialize the new machine and remove the old equipments' measurement errors caused by total loss from use , parts ageing and replacing, or strong impact.

Choose a wheel with small unbalanced value and install it on the balancer. Input the wheel parameters then calibrate it as shown in figure 46.

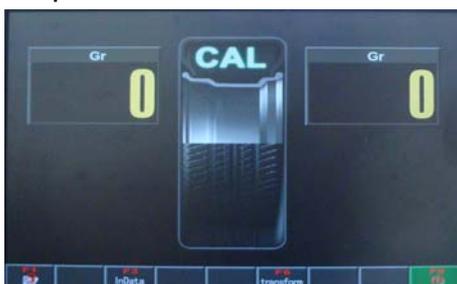


Figure 44

Rotate the wheel to calibrate for the first time without placing standard counterweight.



Figure 45

Rotate the wheel to calibrate for the second time by placing a counterweight of 100g on the outside of rim.



Figure 46

Rotate the wheel to calibrate for the third time by placing a counterweight of 100g on the inside of rim.

After measurement, return to setting program menu automatically or by pressing  Calibration finished.

7.11.4 Automatic Gauge Calibration

It is used to initialize the new machine and remove the old equipments' measurement errors caused by total loss from use , parts ageing and replacing, or strong impact. The procedure is shown in the following figure.

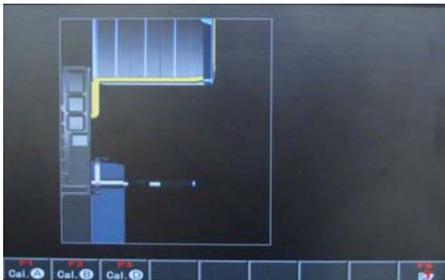


Figure 47

The fourth section of program setting is automatic gauge calibration. Press F4 to enter calibration as shown in figure 47.

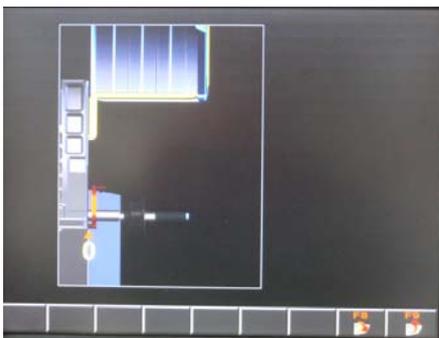


Figure 48

In the interface of figure 47, press  to enter Gauge A calibration shown in figure 48. Keep the gauge in the original position ,press  to memorize the original position and enter the next item.(see figure49)

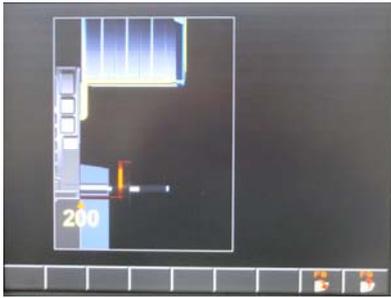


Figure 49

Pull the gauge to 200mm, press  to memorize the current position and return. Gauge A calibration finished.

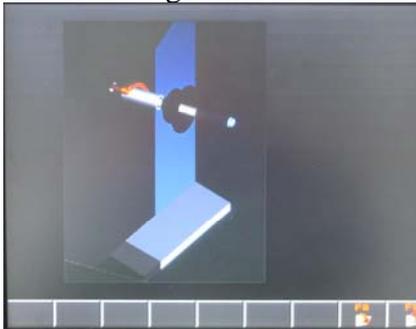


Figure 50

In the interface of figure 47, press  to enter gauge D calibration as shown in figure 50. Hang the gauge on the rotating shaft of the balancer and press  to memorize the original position and enter the next item.

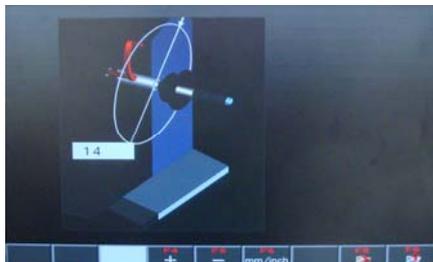


Figure 51

Raise the gauge and reach the edge of the rim with the gauge tip to measure the rim diameter. If it doesn't accord with the actual value, modify it by pressing "+、—" .Confirm it and press  to save and return.

Gauge D calibration finished.

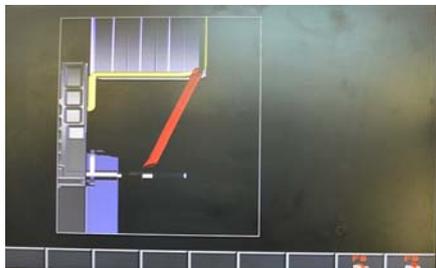


Figure 52

Option B scale calibration interface, the measurement foot rest to zero at the same time by check save button, and then move the measurement end to the spindle matcher end at the same time by check save button and confirm later put back the measurement ruler, correction over.

8 Prompt Information

Users can process prompt information according to the following instructions.



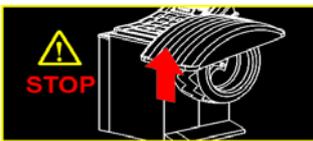
It gives Information to prompt the current state of the system during measurement.



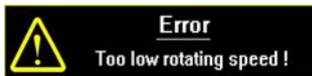
It reminds that START key is pressed without closing the guard when the guard is set enabled



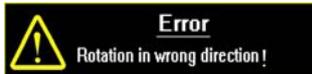
Interrupt measurement in emergency! System gives the prompt when the STOP key is interrupted accidentally



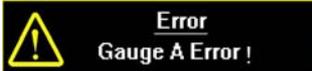
When the guard is opened artificially during rotation measurement, the balancer stops suddenly and prompt is given.



Prompt is given and measurement is stopped when rotating speed is too low to meet the basic measurement needs,



The measurement rotation is in wrong direction. This usually will appear in the three-phase motor control balancer due to sequence errors

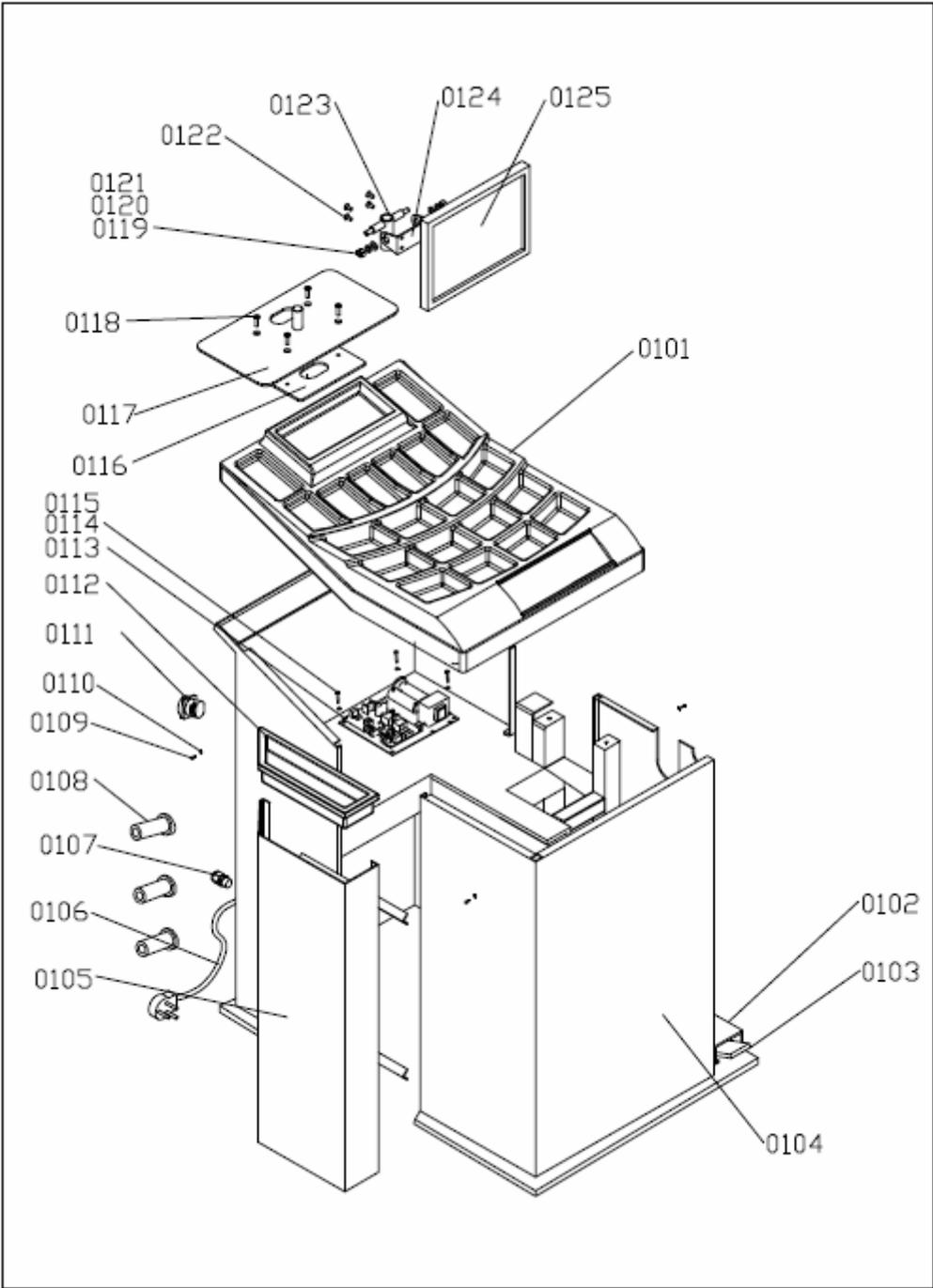


It prompts gauge inner error. Check the error in system testing. The normal problem can be solved by automatic gauge self-calibration, otherwise, check the sensor of the gauge.

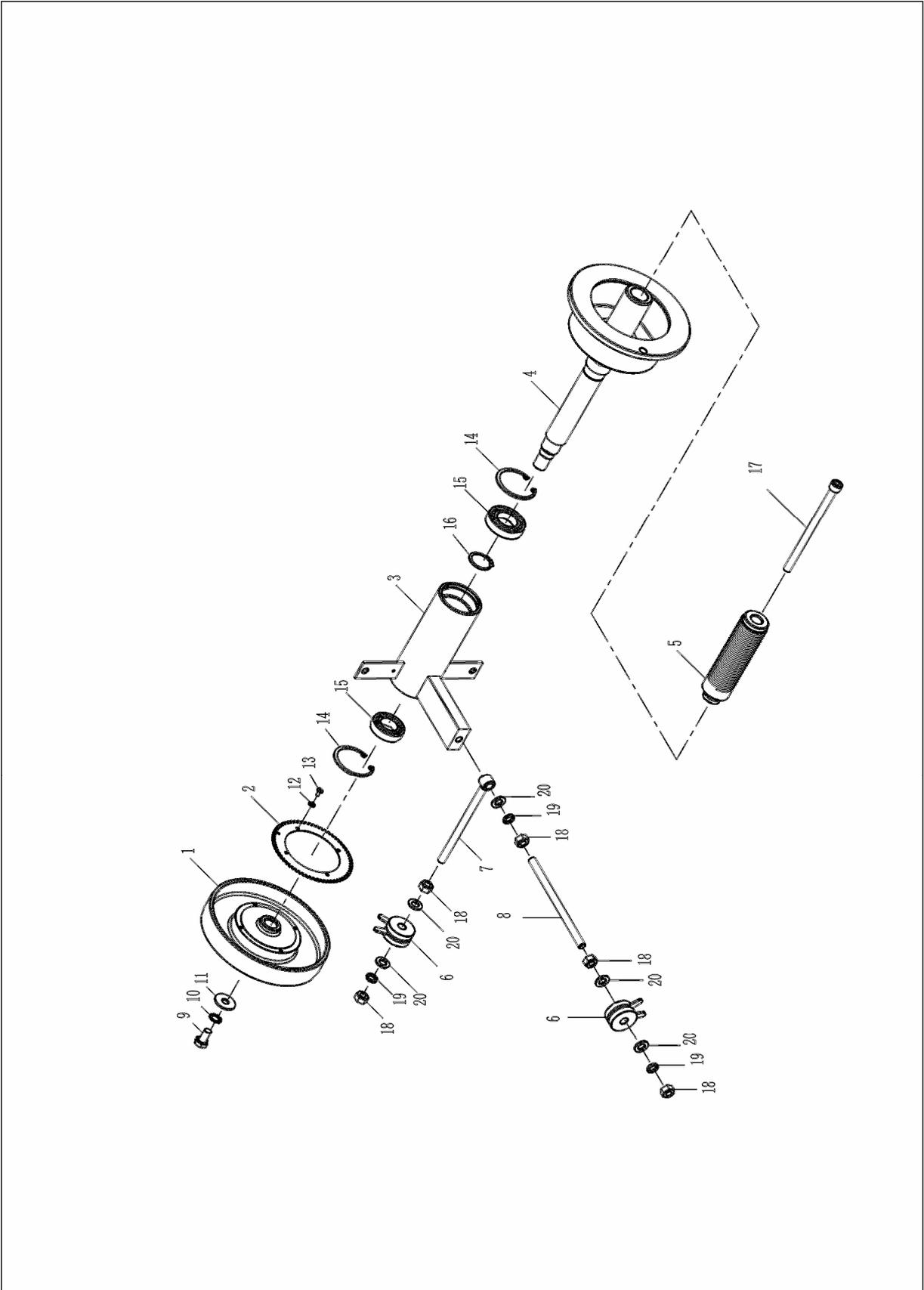


This is an extension .No gauge B is equipped in this model.

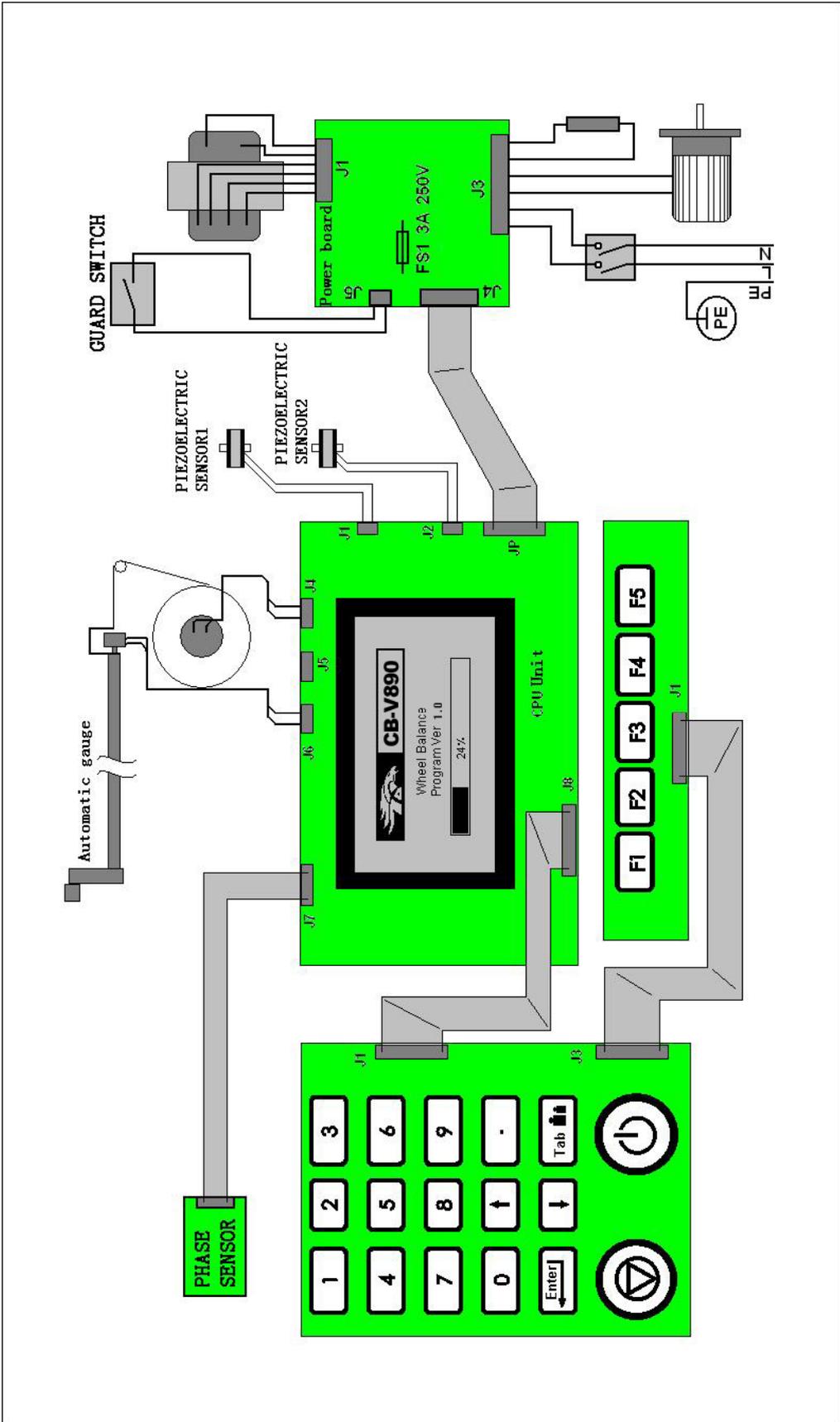
Appendix I



Appendix II



Appendix III



C E R T I F I C A T E



of Conformity
EC Council Directive 2006/42/EC
Machinery

Registration No.: AM 50174682 0001

Report No.: 16700486 002

Holder: Tongda Auto Maintenance Equipment
Co., Ltd.
No. 6 High-Tech Development
District, Yingkou,
Liaoning 115004
P.R. China

Product: Wheel balancer
(Wheel Balancer)

Identification: Type Designation: S2000-1 CB-80 CB-1200D CB-500
CB-530 CB-550 CB-V890 CB-800
CBL-860 CB-580 CB-1280

Serial No.: Engineering Sample

Remark: Refer to test report 16700486 002 for details.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Date 03.02.2010



Certification Body

J. Hoehne
Dipl.-Ing. J. Hoehne

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE LAUNCH PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

PROTEC electronic product is warranted against defects in materials and workmanship for one year (12 months) from date of delivery to the user. This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and PROTEC shall not be liable for any consequential or incidental damages. Final determination of defects shall be made by PROTEC in accordance with procedures established by PROTEC. No agent, employee, or representative of PROTEC has any authority to bind PROTEC to any affirmation, representation, or warranty concerning PROTEC automotive meters, except as stated herein.

Disclaimer

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Order Information

Replaceable and optional parts can be ordered directly from your PROTEC authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

If you have any questions on the operation of the unit, please call: +1-905-569-8878

If your unit requires repair service, return it to the manufacturer with a copy of the sales receipt and a note describing the problem. If the unit is determined to be in warranty, it will be repaired or replaced at no charge. If the unit is determined to be out of warranty, it will be repaired for a nominal service charge plus return freight. Send the unit pre-paid to: Protec Equipment Canada

5-2410 Dunwin Drive, Mississauga,
Ontario, Canada L5L 1J9