WHEEL BALANCING MACHINE

INSTRUCTION MANUAL

INDEX

1. Introduction

An imbalanced wheel will make the wheel jump and steering wheel wobble while driving. It can baffle the driver to drive, aggrandize the cleft of combine area of steering system, damage the vibration damper and steering parts, and increase the probability of the traffic accidents. A balanced wheel will avoid all these problems.

This equipment adopts the new LSI (Large Scale Integrated circuit) to constitute the hardware system that acquires processes and calculates information at a high speed.

Read the manual carefully before operating the equipment to ensure normal and safe operation. Dismantling or replacing the parts of equipment should be avoided. When it needs repairing, please contact with technique service department. Before balancing, ensure the wheel fixed on the flange tightly. Operator should wear close-fitting smock to prevent from hanging up. Non-operator does not start the equipment.

No use while beyond the stated function range of manual

2. Specification and Features

2.1 Specification

- Max wheel weight：65kg
- Power supply：DC12V 1A
- Rotating speed：about 120r/min
- Cycle time：8s
- Rim diameter：10〃～24〃(256mm～610mm)
- Rim width：1.5〃～20〃(40mm～510mm)
- Noise：＜70dB
- Net weight：30Kg
- Dimensions：

2.2 Features

- Adopt 6 LED display, it has flexible interface operating function;
- Energy saving, motor free, hand spin;
- Various balancing modes can carry out counterweights to stick, clamp, or hidden stick etc;
- Intelligent self-calibrating;
- Automatic self error diagnosis and protection function;
- Applicable for various rims of steel structure and aluminum alloy structure;

2.3 Working Environment

- Temperature: 5~50℃；
- Altitude ≤4000m；
- Humidity: ≤85%

3. The Structure of Dynamic Balancer

Dynamic balancer consists of mechanical section and electrical section:

3.1 Mechanical section

Mechanical section consists of support bracket and rotary main shaft; they are together fixed on the frame.

3.2 Electrical system

（1）The microcomputer system consists of the LSI, new high speed Micro CPU, LED display and keyboard.

（2）Speed testing and positioning system consists of gear and opto-electronic coupler.

（3）Horizontal and vertical pressure sensor

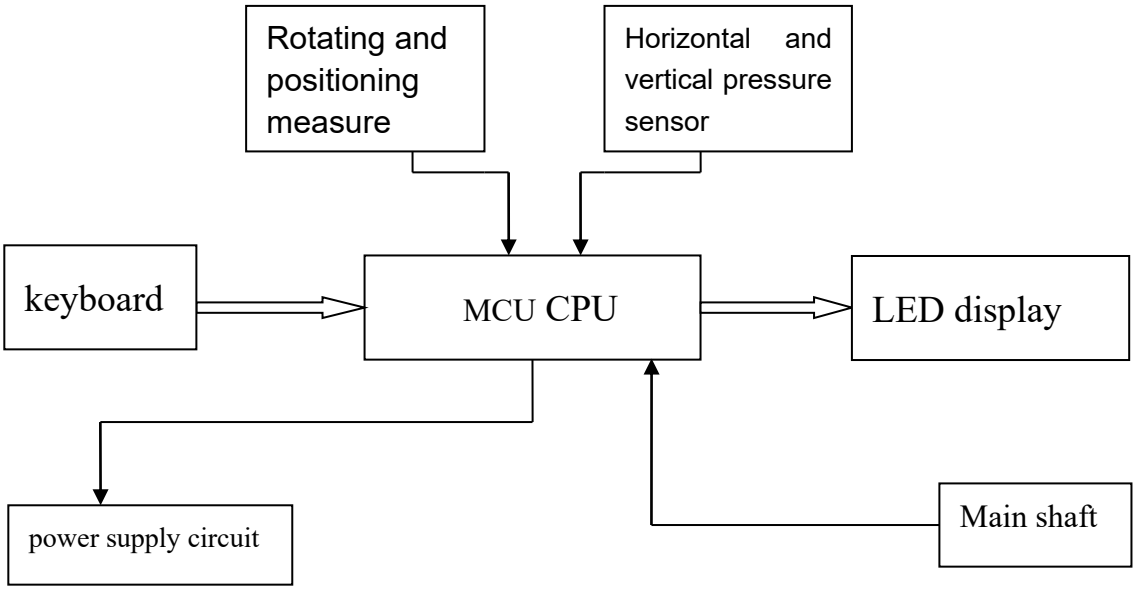


Fig 3-1 Electric system figure

4. Installation of Dynamic Balancer

4.1 Opening and Checking

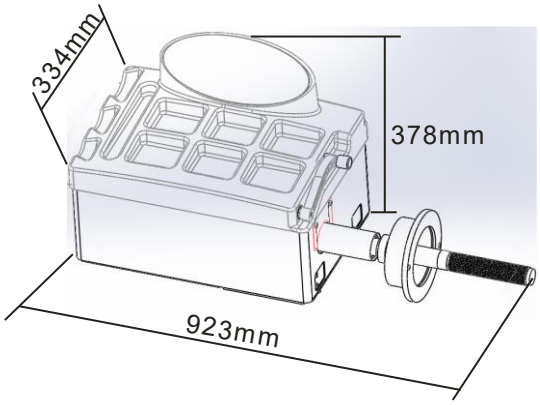
Open the package and check whether there are damaged parts. If there are some problems, please do not use the equipment and contact with the supplier. Standard accessories with equipment are shown as follow:

Screw stud of drive axis	1
Balancing pliers	1
Allen wrench	1
Measure caliper	1
Quick release nut	1
Cone	3
Counterweight (100g)	1

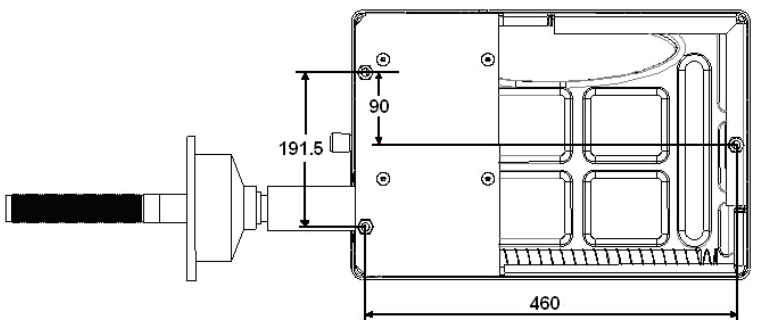
4.2 Installing machine

4.2.1The balancer must be installed on firm platform which is more than 60CM high and fixed with 3pcs M8 screws

4.2.2 There should be 500mm around the balancer in order to operate conveniently



Overall size



Installation holes position (bottom view)

4.3 Installing screw rod

Install screw rod on the main axis, then fasten the bolt. (Refer to Fig 4-1)

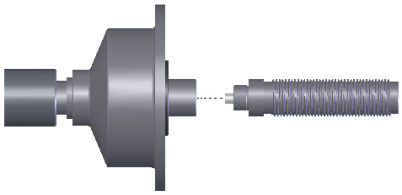


Fig 4-1

5. LED display control panel and function keys

5.1 Introduction of display control panel

Fig 5-1is figure of keyboard and display，introduction is as follows:

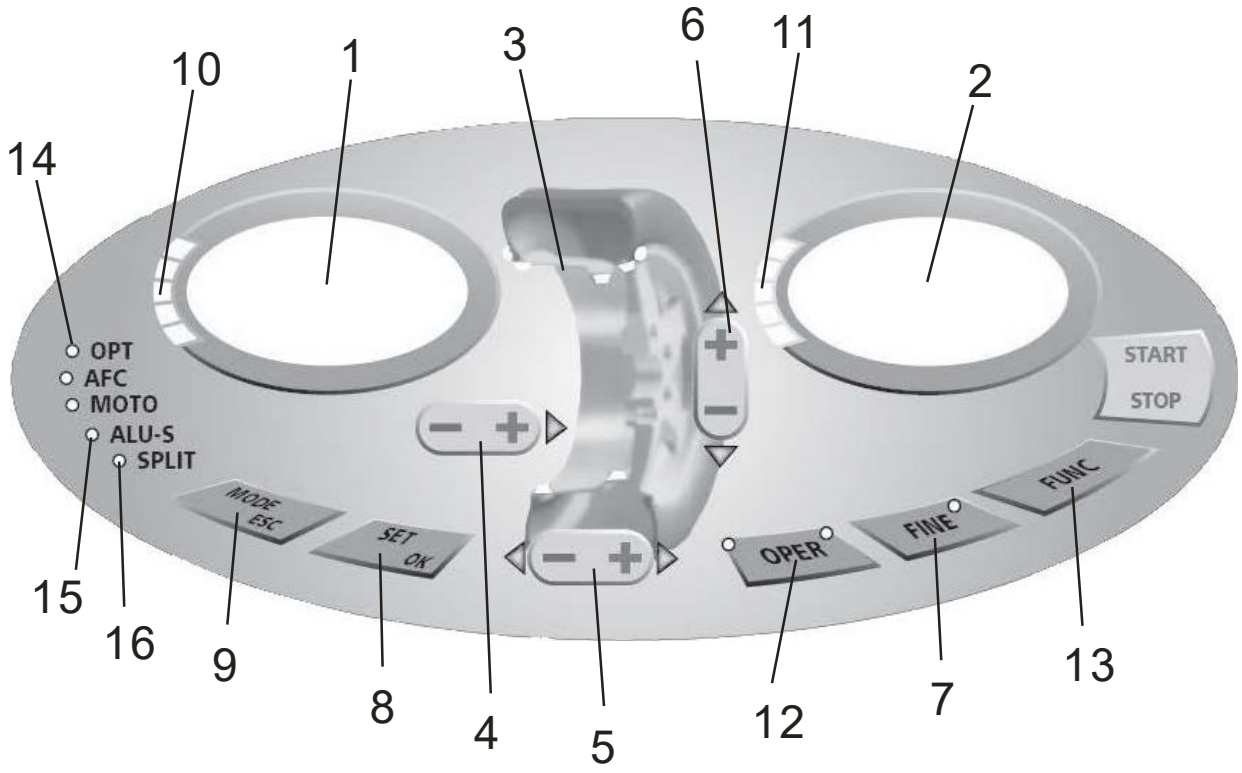


Fig 5-1

1- Digital readout, amount of imbalance, inside
2- Digital readout, amount of imbalance, outside
3- Balancing mode
4- Push buttons, manual DISTANCE setting
5- Push buttons, manual WIDTH setting
6- Push buttons, manual DIAMETER setting
7- Show real imbalance amount (less than 5gram), function key ①gram/ounce ②mm/inch ③self-calibration
8- Push button, re-calculation
9- Function key of selecting balancing mode
10- Show imbalance position of outside
11- Show imbalance position of inside
12- Push button, optimization of unbalance
13- Split function

14- Indication of optimization
15- Indication of ALU-S mode
16- Indication of split

NOTE：Only use the fingers to press push buttons. Never use the counterweight pincers or other pointed objects.

5.2 Main keys and keys combination function：

[a↑] or [a↓] input distance (code 4)
[b↑] or [b↓] input rim width (code 5)
[d↑] or [d↓] input rim diameter (code 6)
[SET] re-calculation
[FINE] Show real imbalance amount
[MODE] Function key of selecting balancing mode
[FINE]+ [SET] Self-calibration
[FINE]+ [a↑] + [a↓] conversion between gram and ounce
[SET] + [MODE] Self-testing
[FINE] + [MODE] Machine setting

NOTE:

1. After selection of gram or ounce , setting can remain after machine power off

2、Choose unit of mm for rim width and diameter, setting can not remain after machine power off

6. Installation and Demounting of the Wheel

6.1 Checking the wheel

The wheel must be clean, none sand or dust on it, and remove all the primal counterweights of the wheel. Check the tyre pressure whether up to the rated value. Check positioning plane of rim and mounting holes whether deformed.

6.2 Installing the wheel

6.2.1 Select the optimal cone for the center hole when there is center hole on the rim.

6.2.2 Two ways of installing the wheel: A. positive positioning; B. negative positioning.

6.2.2.1 Positive positioning (refer to Fig 6-1):

Positive positioning is commonly used. It operates easily, and it is applicable for various rims of common steel structure and thin duralumin structure.

6.2.2.2 Negative positioning (refer to Fig 6-2):

Negative positioning is used to ensure the inner hole of steel rim and main axis is positioning accurately when the outside of wheel deforming. Apply for all the steel rims, thick steel rims especially.

6.2.3 Install wheel and cone on main axis. Ensure the cone can clamp the wheel before screwing handle. Wheel can rotate after screwing down

6.3 Demounting the Wheel

6.3.1 Demount the handle and cone.

6.3.2 Put the wheel up, and then take it down from main axis.

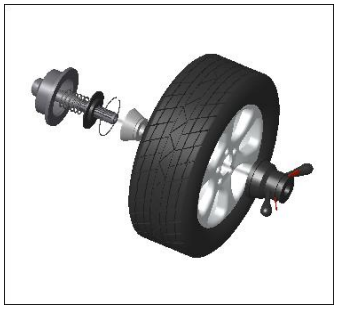


Fig 6-1

Fig 6-2

Note: do not slip wheel on main axis to prevent main axis from scuffing while installation and demounting the Wheel

7. The input methods of data of rim and balancing operation

7.1 The power-on state of the machine

After the power-on of the machine, it starts initialization automatically. The initialization will be finished after two seconds. The machine enters normal dynamic balancing mode(clamp counterweights on the both rim edge) automatically, as in Fig 7-1, ready for input data of rim

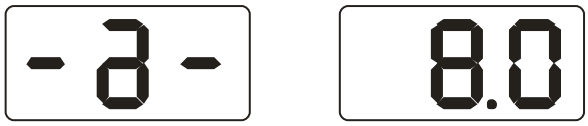


Fig 7-1

7.2 Data of wheel input method for normal dynamic balance mode and wheel balancing operation

7.2.1After power is on, machine enters normal balancing mode, as below figure

7.2.2Input rim data：

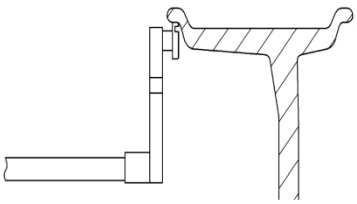


Fig 7-2

Move scale to make handle head touch rim edge inner position as Fig 7-2, get value a, put back scale. Push [a-] or [a+] to input a value

7.2.3Input rim width

Get rim width data showing on rim , or measure rim width by caliper, push [b-] or [b+] to input b value

7.2.4Input rim diameter

Get rim diameter data showing on rim , or measure rim diameter by caliper, push [d-] or [d+] to input d value

7.2.5 Balancing operation against normal dynamic balancing mode

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand

away to let wheel rotate. When display shows “STOP”，wheel stops and display shows data. Slowly rotate wheel, when inside position indication LEDs all light, （Fig 5-1（10））, at the 12 o’clock position of rim inside , clamp weights equal to value shown on the left side display（Fig 7-3）。Then slowly rotate wheel, when outside position indication LEDs all light, （Fig 5-1（11））, at the 12 o’clock position of rim outside , clamp weights t equal to value shown on the right side display（Fig 7-4）. Rotate wheel by hand again, move hand away when display is off. When both side display are on, wheel stops and balancing is completed.

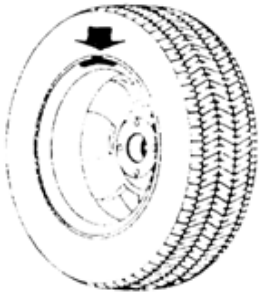


Fig 7-3

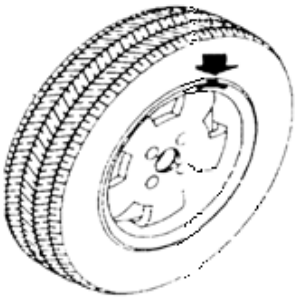


Fig 7-4

7.3 Static (ST) balancing mode data input method and balancing operation

（ST）mode is suitable for rims on which weights only can be sticked at middle position, such as motorcycle rims.

Under normal mode, measure diameter d value (Fig 7-5)，press [d-] or [d+] to input d value.（a value and b value can be any value ）. Press [MODE] key to make ST mode indication light on, enter static （ST）balancing mode, mode indication as following figure.

Fig 7-5

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. Then right display shows ST and left display shows static imbalance amount as Fig 7-6. After wheel stops rotating, slowly rotate wheel, when inside position indication LEDs （Fig 5-1（10）） and outside position indication LEDs （Fig 5-1（11））all light，stick weights equal to value shown on the left side display, at the 12 o’clock position of middle rim (Fig 7-5). Again manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. When both side display are on, wheel stops and balancing is completed.

Fig 7-6

7.4 ALU-1mode data input method and balancing operation

Follow 7.2 to input rim data, press [MODE] key, mode indication as below figure, then enter ALU-1 mode to balance wheel

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. When display shows “STOP”, wheel stops and display shows data. Slowly rotate wheel, when inside position indication LEDs all light, （Fig 5-1（10））, at the 12 o’clock position of rim inside edge , stick weights equal to value shown on the left side display（Fig 7-7 left）。Then slowly rotate wheel, when outside position indication LEDs all light,（Fig 5-1（11））, at the 12 o’clock position of rim outside edge , stick weights equal to value shown on the right side display（Fig 7-7 right）. Rotate wheel by hand again, when display shows “RUN ---”, move hand away to let wheel rotate. When both side display are on, wheel stops and balancing is completed.

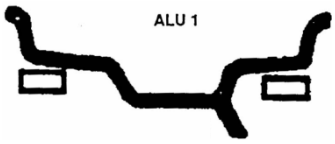


Fig 7-7

7.5 ALU-2 mode data input method and balancing operation

Follow 7.2 to input rim data, press [MODE] key, mode indication as below figure, then enter ALU-2 mode to balance wheel

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. When display shows “STOP”, wheel stops and display shows data. Slowly rotate wheel, when inside position indication LEDs all light, （Fig 5-1（10））, at the 12 o’clock position of rim inside edge , stick weights equal to value shown on the left side display（Fig 7-8 left）。Then slowly rotate wheel, when outside position indication LEDs all light,（Fig 5-1（11））, at the 12 o’clock position of rim inside , stick weights equal to value shown on the right side display（Fig 7-8 right）. Rotate wheel by hand again, when display shows “RUN ---”, move hand away to let wheel rotate. When both side display are on, wheel stops and balancing is completed

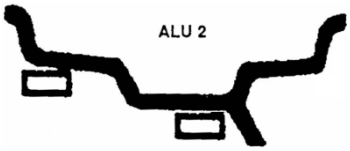


Fig 7-8

7.6 ALU-3 mode data input method and balancing operation

Follow 7.2 to input rim data, press [MODE] key, mode indication as below figure, then enter ALU-3 mode to balance wheel

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. When display shows “STOP”, wheel stops and display shows data. Slowly rotate wheel, when inside position indication LEDs all light, （Fig 5-1（10））, at the 12 o’clock position of rim inside edge , clamp weights equal to value shown on the left side display（Fig 7-9 left）。Then slowly rotate wheel, when outside position indication LEDs all light,（Fig 5-1（11））, at the 12 o’clock position of rim inside , stick weights equal to value shown on the right side display（Fig 7-9 right）. Rotate wheel by hand again, when display shows “RUN ---”, move hand away to let wheel rotate. When both side display are on, wheel stops and balancing is completed

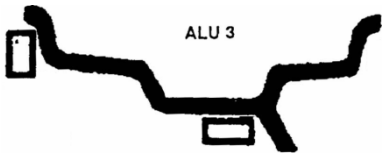


Fig 7-9

7.7 ALU-S mode data input method and balancing operation

Above three ALU modes may not be suitable for all structure rims. Balancing performance is not good under above three ALU modes for some rims. Then ALU-S mode can be adopted. Input rim data method as follows:

Press [MODE] key, to make ALU-S mode indication light on. Mode indication as following figure :

As per Fig 7-8 or Fig 7-9, move scale to rim inside (aI position), measure rim inner distance (aI) value, press [a-] or [a+] to input aI value

Move scale further inside to aE position, measure distance aE value, press [b-] or [b+]to input aE value

Measure rim diameter at aI position, press [d-] or [d+] to input dI value

Measure rim diameter at aE position, press [FINE] and [d-] or [d+] to input dE value

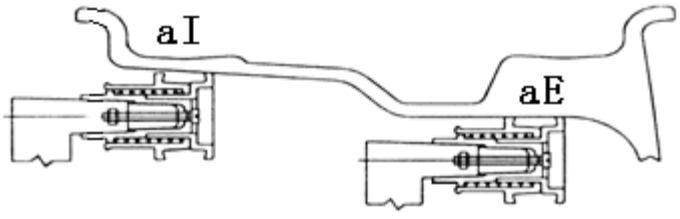


Fig 7-8

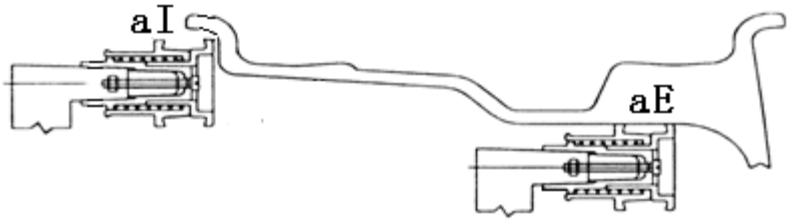


Fig 7-9

Input rim data, manually rotate wheel, when display shows “RUN ---”, move hand away to let wheel rotate. When display shows “STOP”, wheel stops and display shows data. Slowly rotate wheel, when inside position indication LEDs all light, （Fig 5-1（10））, at the 12 o’clock position of rim inside aI position, stick weights equal to value shown on the left side display. Then slowly rotate wheel, when outside position indication LEDs all light,（Fig 5-1（11））, at the 12 o’clock position of rim outside aE position, stick weights equal to value shown on the right side display. Rotate wheel by hand again, when display shows “RUN ---”, move hand away to let wheel rotate. When both side display show 0, balancing is completed

7.8 Counterweight split and Hidden-Stick Mode

This mode can split counterweights between two spokes into two section counterweight and the two section counterweights may be sticked behind two adjacent spokes so that counterweights are hidden . This mode is based on ALU-S mode.

Follow 7.7 operation, if outer side counterweight sticking position is not behind spokes, and user needs to hide counterweight behind spokes, user can operate as follows:

Press [FUNC] key, SPLIT indicator light（Fig 5-1（16））is on, spoke numbers inputting interface appears（Fig 7-10）. Press b+ or b- key to input spoke numbers, press [FUNC] key;

Fig 7-10

Slowly rotate wheel, make one piece spoke vertical upwards, press [FUNC] key

Slowly rotate wheel, find two imbalance positions following the imbalance position indication light, stick counterweights equal to two sections value at 12 o’clock position behind spokes. Quickly rotate wheel to balance wheel. Counterweights split and hidden operation is completed.

7.9 Recalculation

Before wheel balance testing, sometimes operator may forget input current data of rim. Data can be inputted after wheel balance testing. Then it is not necessary to make balancing test again. Operator only needs to press [SET] key, system can re-calculate imbalance value with new data. Under interface showing imbalance value, press [SET] key to check current inputted data of rim

8. Imbalance optimize

If wheel imbalance value over 30 gram, system will be display “OPT”, indicate to carry out

imbalance optimize

Imbalance optimize have two operation method:

8.1 Already display balance value

If already finish balance testing, when you need process imbalance optimize, press OPT key, display Fig 8-1;

Fig 8-1

Use chalk mark a reference point on the flange and rim and tyre, use tyre changer to exchange rim and tyre by 180°

Re-install wheel on the balancer and make sure mark of reference point between the flange and rim must be on the same position. Quickly rotate wheel to balance wheel, after rotation stop, display Fig 8-2;

Fig 8-2

As per above Fig 8-2, left display shows percent of optimize. If before optimize static value is 40 gram, optimized percent is 85%, so after optimize static value only 6 gram remain (15%×40gram=6gram);

Slowly rotate wheel by hand, when both end sides two of position indicator light flash (Fig 8-3)，use chalk to make a mark on the tyre

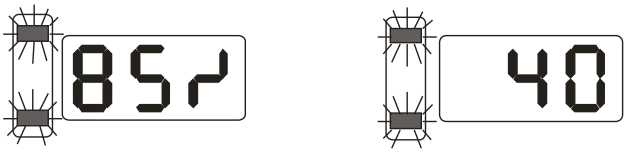


Fig 8-3

Slowly rotate wheel by hand again, when both side middle position indicator light flash (Fig 8-4)，use chalk to make a mark on the rim

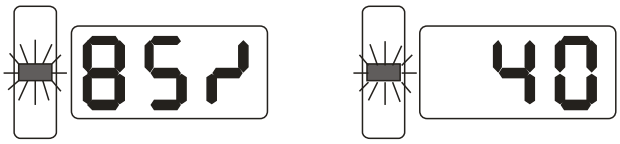


Fig 8-4

Demount wheel from balancer, use tyre changer to demount tyre from rim. Remount tyre on rim to make tyre and rim marks at same position. Optimize complete.

8.2 After power on and before balancing, also may process imbalance optimize directly

Turn on the power, install wheel, press OPT key, left side display shows OPT, quickly rotate wheel for balance testing. When rotation stops, display shows Fig 8-1, follow 8.1 operation. Press [SET] key to stop operation

9. Self-calibrating of Dynamic Balancer

The self-calibrating of dynamic balancer was finished before ex-factory, but the system parameter may vary because of long-distance transportation or long-term use, which may cause error. Therefore, users can make self-calibrating after a period of time.

9.1 After the power-on of the machine, the initialization is finished (Fig 7-1), install a middle size balanced rim which can be clamped with counterweight, follow 7.2 to input data of rim;

9.2 Press [FINE] + [SET] key (Fig 9-1), manually rotate wheel, when display is off , move hand away to let wheel rotate. When display shows “REDUCE”, it means rotary speed is too faster now. When rotary speed reaches normal speed, display shows “RUN ---”. When display shows “STOP” , wheel stops rotating, display is as Fig 8-2 .Press [SET] key to exit;

Fig 9-1

9.3 As per Fig 9-2, clamp a 100 gram counterweight on anywhere of outside of rim, manually rotate wheel, when display is off, move hands away to enter next step, Press [SET] key to exit;

Fig 9-2

9.4 As per Fig 9-3, wheel stops rotating, calibration ends. Demount tyre, now balancer is ready to work.

Fig 9-3

NOTE：when you doing self-calibration, input date of rim must be correct,100 gram counterweight must be correct, otherwise self-calibration result will be wrong, wrong self-calibration will be make balancer measure precision decline.

10. Gram-Oz conversion operation

This operation for counterweight weight unit conversion (gram-Oz)

10.1 Press [a-] or [a+] key，Fig 7-1；

10.2 Press [FINE] and hold it，then press [a+] and [a-] keys，weight unit is converted to Oz

10.3 Again press [FINE]+ [a+]+[a-] keys，weight unit is converted to Gram

10.4 Repeat 10.3 operation to convert weight unit between Gram and Oz

11. Other function settings

11.1 Minimum value display settings

Select minimum display value, if wheel imbalance value is less than setting value, displayed result will be 0. Press FINE key, real imbalance value can be shown.

Press [FINE] + [MODE] keys, show Fig11-1 which means if imbalance value is less than 5 gram, displayed result will be 0, press [b-] or [b+] key to set minimum display value : 5,10 or15. Press [a+] key to save current setting and enter next step.

Fig 11-1

11.2 Key-tone clue on function settings

This function can turn on or off key-tone. When turn on this function, every time press key, system will emit a “di” tone. When turn off this function, press key and there is no tone

Follow 10.1 and press [a+] key to enter，show Fig 11-2，right side display shows ON, means the function has been turned on. Display showing OFF means the function has been turned off. Press [b-] or [b+] key to shift function between “ON” and “OFF”. Press [a+] key to save current setting and enter next step.

Fig 11-2

11.3 Display monitor brightness settings

This function is for setting display brightness according working environment and user need

Follow 10.2 and press [a+] key to enter, show Fig 11-3, right side display shows brightness level. Totally 8 levels. Level 1 means dimmest display. Level 8 means brightest display. Default level is 4 . Press [b-] or [b+] key, to change levels. Press [a+] key to save current setting and enter next step .

Fig 11-3

11.4 INCH and MM conversion operation

Most rims has sizes unit INCH. If the unit is MM, system unit can be set to MM. If value has decimal, current unit is INCH. If value has no decimal , current unit is MM. This setting does not retain when machine is power off. System default unit is INCH

Follow 10.3, press [a+] key to enter (Fig 11-4), right side display shows ON, means unit is INCH,shows OFF, means unit is MM. Press [b-] or [b+] key, to shift “ON” and “OFF”. Press [a+] key to save current setting and exit.

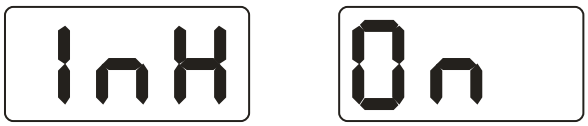


Fig 11-4

12. Machine self test function

This function is for checking whether all inputted signals are normal and supports trouble analyses.

12.1 LED and indicator light check

Press [SET] + [MODE] keys，indicator light and LEDs light. This function can check whether LEDs or indicator light are damaged. Checking ends and display shows Fig 11-1. Enter position sensor signal check. Prss [SET] key to exit.

12.2 Position sensor signal check

This function can check whether position sensor, main shaft, main board circuit are with

error. As per Fig 12-1, slowly rotate main shaft, value shown in right side display changes accordingly . Rotate clockwise, value increases ; Rotate anticlockwise, value decreases. Normally, value changes among 0-63 . Press [a+] key to enter press sensor signal check. Press [SET] key to exit.

Fig 12-1

12.3 Press sensor signal check

This function can check whether press sensor , main board signal circuit and power board are with error.

Follow 12.2 and press [a+] key to enter (Fig12-2). Then lightly press main shaft, if normally, values shown on display should be changed. Press [a+] or [SET] key to exit.

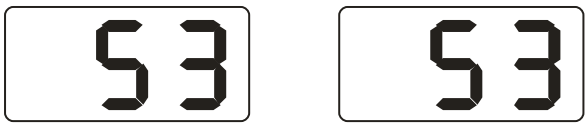


Fig 12-2

13. Trouble shooting

13.1 Manually rotate wheel to rating speed, LEDs are not off and balancing test is going on. Computer board, position sensor and cables should be checked.

13.2 After machine power on, there is no display. Check power switch indicator light. If light is off, power supply gets problem. Otherwise, check power board, computer board and cables.

13.3 Inaccuracy of precision normally is not caused by balancer. It may be caused by wrong wheel installation, inaccurate counterweight or inaccurate 100g weight. The original 100g weight must be kept properly for self-calibration only

13.4 Unstable data and poor repeatability of data normally are not caused by balancer. It may be caused by wrong wheel installation or unstable installation of machine. Machine should be well fixed on ground by bolt.

Hint: check precision right method:

Input right date of wheel(a. b. d value),consult instruction do a self-calibration, process balance operation, note down date of first time, clamp 100 gram counterweight on the outside edge of wheel(when outside indicator light all on is top zenith position), again process balance operation, this data of outside display addition data of first time, should be 100±2, manually slowly rotate the wheel, when light of outside all on, check 100 gram counterweight whether at 6 o'clock position, if value is not 100 gram or 100 gram counterweight is not at 6 o'clock position, balancer precision has problem, if amount is 100 gram, follow same method check inside, check inside whether amount is 100 gram and at 6 o'clock.

14. Maintenance

14.1 The daily maintenance of non- professionals

Before the maintenance, please switch off the power-supply.

13.1.1 Check whether the wire of electricity part connects reliably.

13.1.2 Check whether the pressed screw of the main axis is loose

13.1.2.1 Locking nut can not fix wheel tighten on main-axis

13.1.2.2 Use hexagonal wrench to tighten the pressed screw of the main-axis.

14.2 The maintenance of professionals

The maintenance of professionals can only be carried out by the professionals from the factory

14.2.1 If the imbalance value of tested wheel has obvious errors and does not improve after self-calibrating, this proves the parameter in the machine has altered, so the user should ask for professionals

14.2.2 The replacing and adjustment of pressure sensor should be operated according to the following methods, and the operation should be carried out by professionals

The steps are as follows:

1. Unlash the No.1, 2,3,4,5 nuts.
2. Dismantle the sensor and nut.
3. Replace No.6, 7 the sensor organ.
4. Install the sensor and the nut according to the Fig 14-1. (Pay attention to the sensor's direction.)
5. Tighten No.1 nut emphatically.
6. Tighten the No.2 nut to make the main axis and the flank of cabinet, and then emphatically tighten the No.3 nut.
7. Tighten the No.4 nut (not too emphatically), then tighten No.5 nut.

14.2.3 The replacing of circuit board and the organ on it should be carried out by professionals

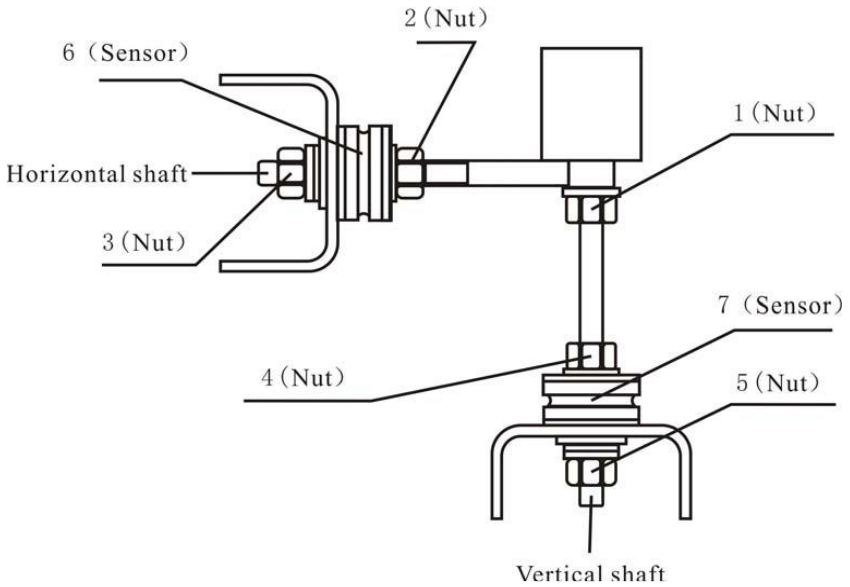


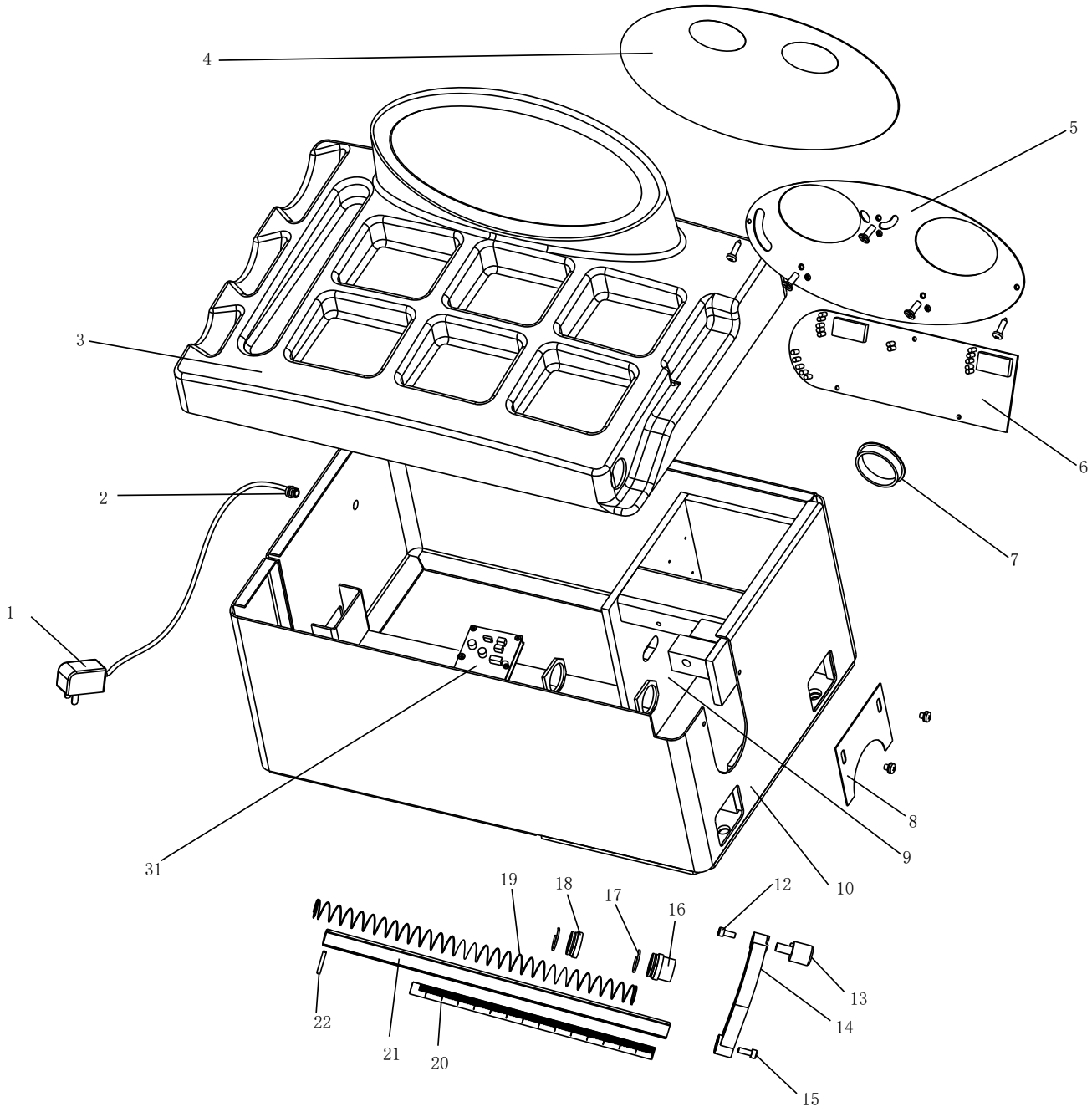
Fig14-1

15. Trouble-error code list

When balancer display hint of error, can follow consult below list to remove the trouble:

Code	meanings	cause	remedy
Err 1	principal axis not spin or have not spin signal	1. computer board fault 2.connection-peg untouched	1.change computer board 2.check cable connections
Err 2	The rotation speed is low	1. position sensor fault 2. wheel not impacting or weight too light 3. computer board fault	1. change position sensor 2.repeat impacting wheel 3. change computer board
Err 3	Miscalculation	too high imbalance	Repeat the self-calibration or change computer board
Err 4	principal axis wrong rotation direction	1. position sensor fault 2. computer board fault	1. change position sensor 2. change computer board
Err 6	Sensor signal transact circuit not working	1. power supply board fault 2. computer board fault	1. change power supply board 2. change computer board
Err 7	Lose date of interior	1. Incorrect self-calibration 2. computer board fault	1. Repeat the self-calibration 2. change computer board
Err 8	Self-calibration memory fault	1. not put 100 gram on the rim when self-calibration 2. power supply board fault 3. computer board fault 4. press sensor fault 5. connection-peg untouched	1.follow right method repeat self-calibration 2. change power supply board 3. change computer board 4.change press sensor 5.check cable connection

16. Exploded drawings



17. Spare parts list

No.	Code	Description		No.	Code	Description
1	DD06003000001	Power Adapter		18	JZ12001800080	Plastic bush
2		Power Interface		19	JZ11700200027	Spring
3	JZ12001800097	Head with tools-tray		20	JZ20205100025	Graduated strip
4	JZ12300500063	Key board		21	JZ20205100016	Rim distance gauge
5	JZ20203100108	Key fixed plate		22	FJ26005000002	Pin
6	JZ12300100088	Computer board		23	FJ21010000003	Nut
7	CF03001000008	Plastic cover		24	FJ15001000001	Washer
8	JZ20202500081	Plate		25	FJ15003000001	Washer
9	JZ20202500080	Mounting base		26	FJ15006000006	Washer
10	JZ20202500066	Chassis		27	JZ20203000096	Support
				28	FJ22012000010	Screw
12	FJ19018000006	Screw		29	JZ30303600054	Complete Shaft
13	JZ12000200129	Head		30	JZ12300100127	Position Pick-up Board
14	JZ12001800021	Handle		31	JZ12300200010	Power Board
15	FJ22009000093	Screw		100-312	JZ20204600008	Screw
16	JZ12001800081	Plastic bush		100-315	DD18010000003	Sensor Assembly
17	JZ11700400026	Spring		100-317	JZ20204600006	Screw