_____ WHEEL BALANCING MACHINE

INSTRUCTION MANUAL INDEX

SPECIAL MAINTENANCE (For specialized personnel only)

1- GENERAL

1.1 - GENERAL SAFETY RECOMMENDATIONS

- Before starting to use the balancing machine, carefully read the operating instruction manual.
- Keep the manual in a safe place for future reference.
- Forbide removing or modifying machine parts as this would impair correct operation. Please get in touch with the Technical Service when needing repairs.
- Do not use strong jets of compressed air for cleaning.
- Use alcohol to clean plastic panels or shelves (AVOID LIQUIDS CONTAINING SOLVENTS).
- Before starting the wheel balancing cycle, make sure that the wheel is securely locked on the adapter.
- The machine operator should not wear clothes with flapping edges. Make sure that unauthorized personnel do not approach the balancing machine during the work cycle.
- Avoid placing counterweights or other objects in the base which could impair the correct operation of the balancing machine.
- The balancing machine should not be used for purposes other than those described in the instruction manual.

1.1.1- STANDARD SAFETY DEVICE

- Stop push button for stopping the wheel under emergency conditions.
-The safety guard of high impact plastic is with shape and size designed to prevent risk of counterweights from flying out in any direction except towards the floor.

A micro-switch prevents starting the machine if the guard is not lowered and stops the wheel whenever the guard is raised.

1.2 - FIELD OF APPLICATION

The machine is an automatic digital wheel balancer designed to balance wheels up to 65 kg. The distance and diameter dimensions are acquired automatically by moving the measuring gauge.

The computer automatically controls the “S” function (for alloy wheels with correction just on the inside).

The manual push button calibration system allows a sufficiently wide range of adjustment also for wheels other than ordinary ones (motorcycles and racing cars). Certain ALU functions are available for wheels of unusual shape and for setting the optional functions of the wheel balancer. (See specific sections).

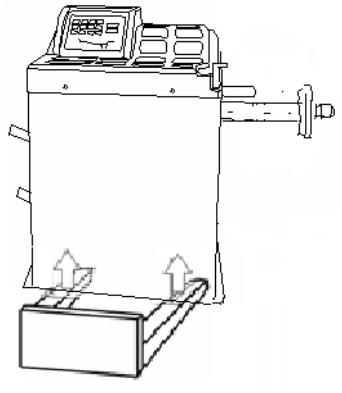
An optional kit is available for automatic rim width measurement.

1.3 - TECHNICAL DATA

Max. wheel weight	65kg
Max. power consumption	300W
Single phase power supply	110/220V - 50/60Hz
Balancing accuracy	1g
Balancing speed	approx. 200 rpm
Rim diameter	10″ to 24″ (265 to 615 mm)
Rim width	1.5″ to 20″ (40 to 510 mm)
Cycle time	7 sec
Net weight with guard (excluding adapters)	105 kg
Overall dimensions (with guard)(L X W X H)	1200 ×1400 ×1670mm
Sound pressure level during work cycle	<70 dB (A)
Operating temperature range	from 0° to 50℃

2 - HANDLING AND HOISTING

N.B. NEVER USE OTHER POINTS TO HOIST THE MACHINE



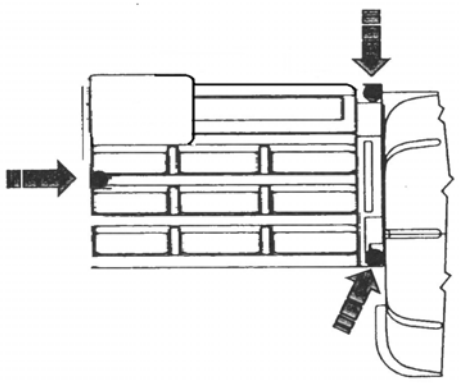


Fig.1

3- COMMISSIONING

3.1- ANCHORING

The machine can operate on any flat non resilient floor. Make sure that the machine rests only on the 3 mounting points provided (fig. 1).

The following requirements are must for spot of installation

1. Level horizontal floor, rigid, preferably concrete or tiled.
2. Sufficient lighting (but without dazzling or very bright lights).
3. Protected from atmospheric conditions.
4. Pollution-free area.
5. Noise level lower than provided for by current regulations.
6. The work place must not be exposed to dangerous movements from other machines in operation.
7. Explosive, corrosive and/or toxic materials should not be stored in the same place.

Warning:

From the control position the operator must be able to see the entire apparatus and the surrounding area. Within the area you must prevent access to unauthorized persons and objects that may constitute a source of danger.

Lever the base to lift the balancing machine. In no circumstances should and force be applied to other parts, such as the mandrel, the headstock, the casing or the accessories tray.

It is advisable but not obligatory to fix the machine to the floor, using the φ12 holes in the three support feet (access to two is obtained by removing the adapter support).

Make sure that the machine rests only on the 3 mounting points provided (fig. 1).

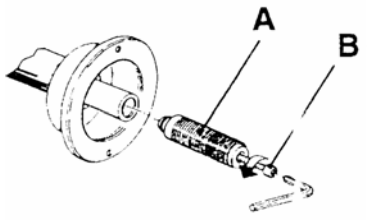
3.2 - ELECTRICAL CONNECTION

WARNING: **The electrical connection must be made by specialized personnel. Connection to the single phase mains must be made between phase and neutral, and never, under any circumstances, between phase and earth (ground). Efficient earthing (grounding) is essential. The firm declines all responsibility and warranty in the event of incorrect connection.**

Before connecting the machine to the mains through relative cable, check that the mains voltage matches the one shown on the nameplate at the back of the balancing machine. Rating of the electrical connection should be on the basis of the machine electrical power consumption (see nameplate).

- The machine mains supply cable should be fitted with a plug conforming to current regulations.
- It is recommended to provide the machine with its own electrical connection through an appropriate circuit breaker.
- When connection is made directly to the main control panel without using any plug, it is advisable to padlock the main switch of the wheel balancer in order to limit its use to authorized personnel only.

3.3 - ADAPTER MOUNTING



The wheel balancer is supplied complete with cone type adapter for fastening wheels with central bore. Other optional adapters can be mounted:

a) Remove threaded end piece A after backing off screw B.

b) Mount the new adapter

3.4 - WHEEL GUARD ASSEMBLY AND ADJUSTMENT (Dwg.3 - Exploded views) Fig.2

1. Fasten the components to the base as described in exploded drawing 3.

b) The position of wheel guard is adjustable, adjust guard to keep enough space between wheel and guard Adjust the angular position of the micro-switch control (item 42).

4 - CONTROLS AND COMPONENTS

4.1- AUTOMATIC RIM DISTANCE AND DIAMETER GAUGE

This gauge allows automatical measuring distance of the wheel from the machine and the diameter at the point of application of the counterweight.

4.2 - CONTROL PANEL AND DISPLAY

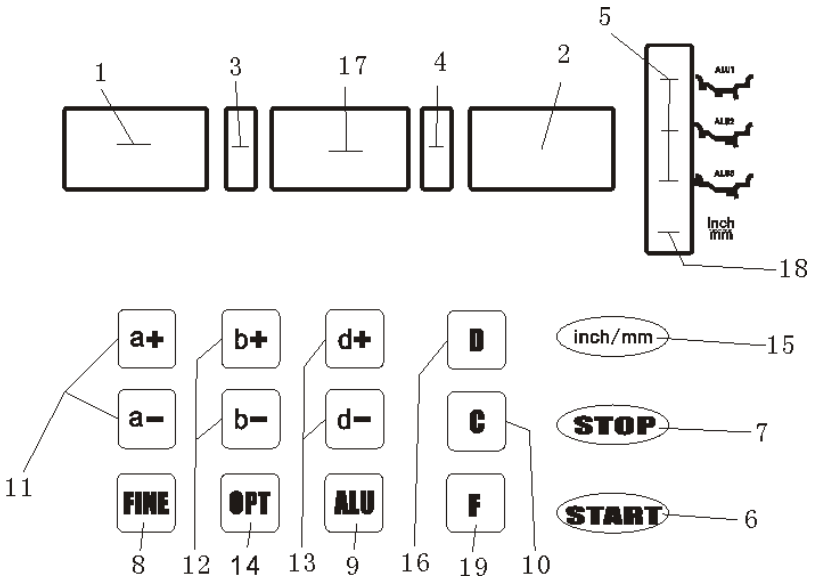


Fig.3

1- Digital readout, AMOUNT OF UNBALANCE, inside or “DISTANCE” dimension
2- Digital readout, AMOUNT OF UNBALANCE, outside or “DIAMETER” dimension
3- Digital readout, POSITION OF UNBALANCE, inside
4- Digital readout, POSITION OF UNBALANCE, outside
5- Indicator, “ALU” correction mode selected
6- Push button, cycle start
7- Push button, emergency and selection of special functions
8- Push button, unbalance display pitch and threshold
9- Push button , selection of “ALU” mode of correction
10- Push buttons for recalculation and self-calibration
11- Push buttons, manual DISTANCE (a) setting

12- Push buttons, manual WIDTH (b) setting
13- Push buttons, manual DIAMETER (d) setting
14- Push button, optimization of unbalance and split unbalance
15- Selection of dimensions, inch/mm
16- Push button, self-diagnostics, self-calibration and split unbalance
17- Digital readout, “STATIC” unbalance or “WIDTH” dimension
18- Indicator of dimensions in mm
19- Selection, “STATIC” or “DYNAMIC” correction

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

5 - INDICATIONS AND USE OF THE WHEEL BALANCER

5.1 - AUTOMATIC MEASUREMENT OF DIMENSIONS

Two types of measurement are provided, namely:
-STANDARD WHEEL, valid also for correction modes “ALU 1-2”.
-“ALU-S”, very useful for wheels with correction on the inside only.

5.1.1. - STANDARD WHEELS

-Move the gauge to measuring positioning as illustrated in fig.4. During gauge movement, the displays are unlit indicating that the gauge is not steady.

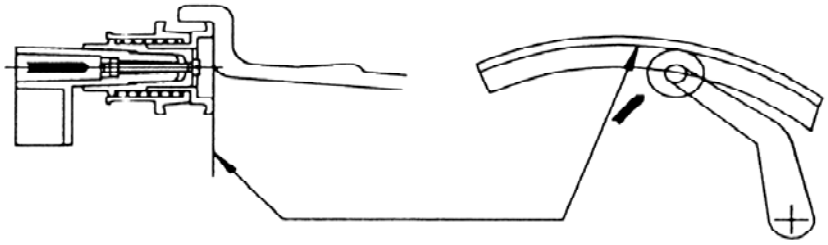
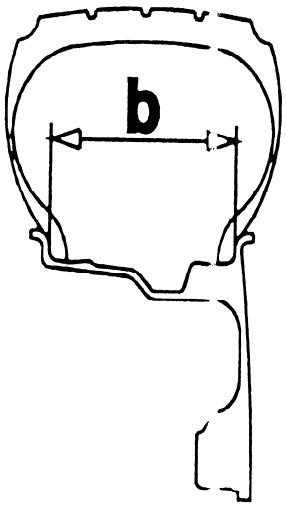
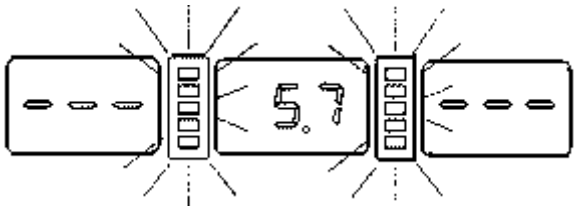


Fig. 4 - DISTANCE + DIAMETER

- Hold the gauge still in position for approx.2 sec.
-Successful memorization is given by the display as shown in fig .5.
-Return the gauge to position 0. (The values measured in automatic mode appear on the display).





N.B. Until the gauge is returned to position 0(zero), the following buttons are enabled:

D **self-diagnostics**

STOP + **FINE** **Rim distance gauge calibration**

Fig. 6

5.1.2 ALU- WHEEL

This method is used exclusively for the automatic rim distance +diameter gauge as follows:

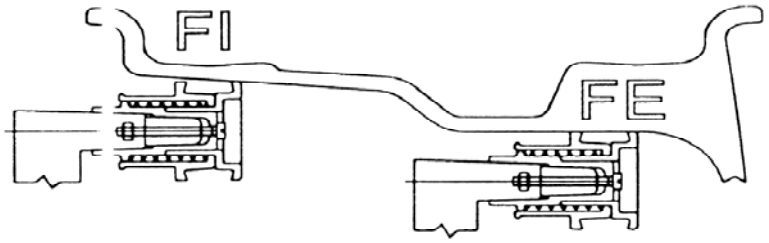


Fig.7

After the measurement for inside FI as shown in fig.7, move the gauge again for memorizing the data for outside FE; hold the position for at least 2 seconds.

Successful memorization is given by the display as indicated in fig.8.

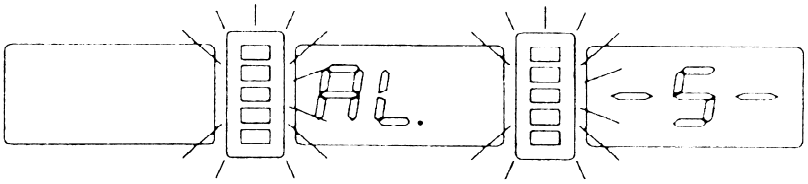


Fig.8 (LED ALU "S" lit up)

-Return the gauge to position "O". The measured "ALU" dimensions appear on the display as also indicated in 5.2.2.

5.2 – MANUAL PRESETTING

5.2.1- STANDARD WHEELS

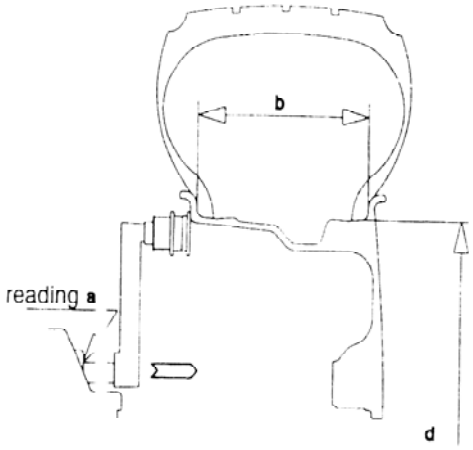


Fig. 9

DISTANCE:

-Preset distance "a" of the wheel inside from the machine after measuring with relative gauge.

DIAMETER:

-Preset nominal diameter "d" marked on the tire.

WIDTH:

-Preset as described for **AUTOMATIC DISTANCE + DIAMETER MEASUREMENT** (fig.6)

5.2.2- ALU-S WHEEL

-Measure the dimensions according the scheme given below:

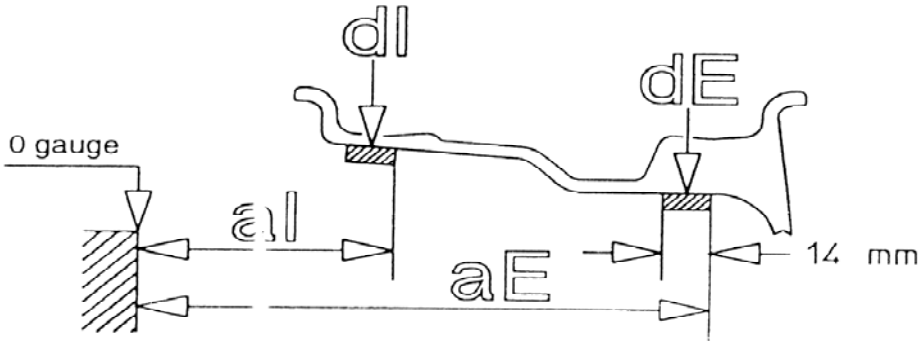


Fig.10

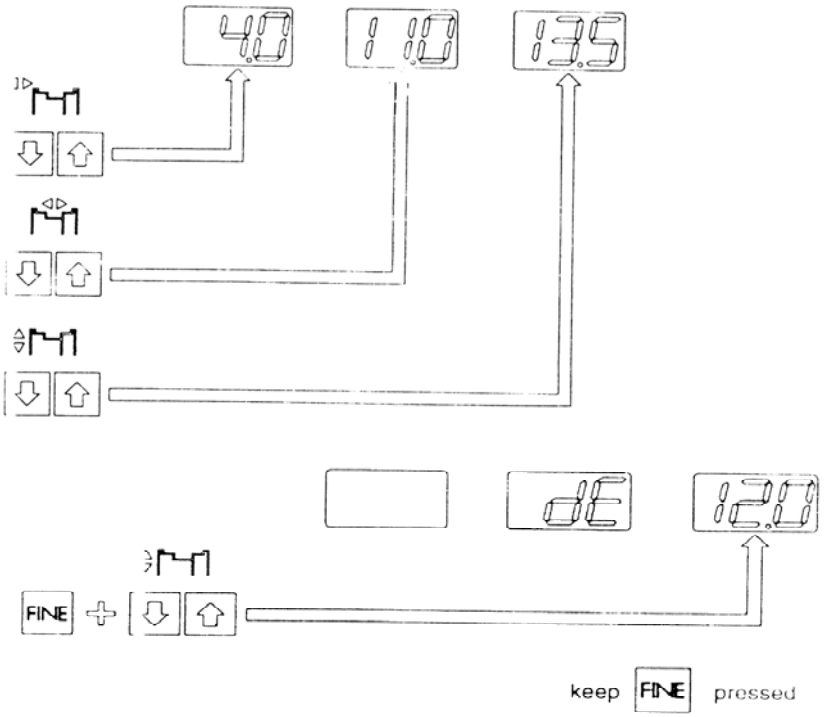
PRESETING:

6 To change **aI** press **a+** **or** **a-**

7 To change **aE** press **b+** **or** **b-**

8 To change **dI** press **d+** **or** **d-**

9 To change **dE** press **Fine** **+** **d+** **+** **d-**

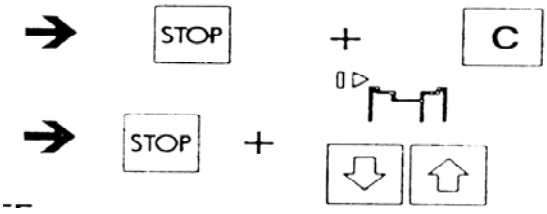


5.3-OPTIONS

SELECTIONS MEMORIZED ALSO WHEN MACHINE IS OFF:

-Start with guard closed ,press **Stop** **+** **C**

-Measuring unit gr/oz,press **Stop** **+** **a+** **+** **a-**



SELECTIONS LOST WHEN MACHINE IS OFF:

-UNIT of WIDTH and DIAMETER
Default unit :inch after the machine is on
(from "PRESETTING OF FIMENSIONS").
N.B.-LED 18 lit up when unit mm was selected.

5.4- RESULT OF MEASUREMENT

-To perform a measuring spin, close the guard (press **START** if the "**Start with guard closed**" function is not enabled, see section 5.3)

-In a few seconds the wheel is brought to operating speed and begin measuring unbalance, the unbalance values

remain on instruments 1 and 2 when the wheel stopped.

-The displays with LED's lit up indicate the correct angular position where to mount the counterweights (12 o'clock position).

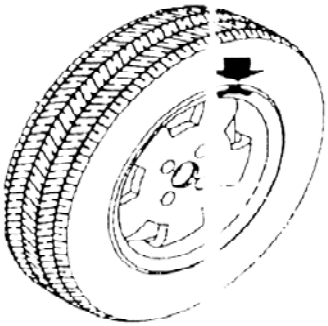


Fig.11 CORRECTION ON OUTSIDE

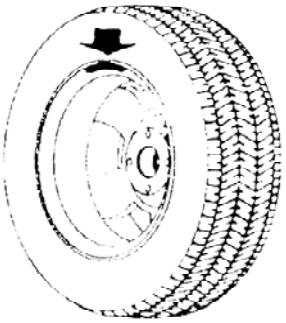


Fig.12 CORRECTION ON INSIDE

5.4.1-MINIMIZATION OF STATIC UNBALANCE

-When using the normal commercially available weights, with pitch 5 g, there could be a residual static unbalance of up to 4g. The damage of such approximation is emphasized by the fact that static unbalance is cause of most of the disturbances on the vehicle. The computer automatically indicates the optimum entity of the weights to be applied by approximating them in an "intelligent" way according to their position. (Pitch 5 grams /0.25 ounce).

-Press **FINE** to display the actual unbalance (Pitch 1grams /0.1 ounce).

-The instruments indicate "0" for unbalance less than 5 grams /0.4 ounce; to display the residual unbalance press **FINE**.

N.B. For static unbalance exceeding 30 grams, the wording [OPT] appears on display "17". In such case, when the [OPT] button is pressed, the system automatically passes onto the second unbalance optimization spin (see specific section).

5.4.2 RECALCULATION OF UNBALANCE VALUES

-you may proceed following operation if values "a.b.c" input incorrectly after procedure of balancing is over:

-Without repeating the spin, press **C**

-The new recalculated unbalance values appear.

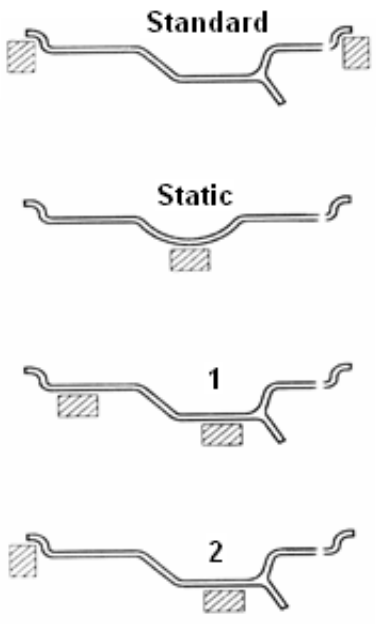


Fig.15

5.4.3-ALU AND STATIC MODES

The available functions allow indication of the correction weights to be placed in positions differing from the normal ones:

1. Press **ALU** to select the required **ALU** function, **F** for static correction.
2. The lit up **LED's** (5) clearly show the position selected as shown in fig,15.
3. The unbalance values are displayed corrected according to the chosen correction position.

Standard –Balancing or steel or light alloy wheels with application of clip-on weights on the rim edges.

Static- The STATIC correction mode is necessary for motorcycle wheels or when it is not possible to place the counterweights on both sides of the rim.

N.B. Read the unbalance position on indicator 3 or 4 (it does not which). For unbalance exceeding 30 grams, the wording [OPT] appears on display "1", it is possible to pass directly to the second unbalance optimization spin (see specific section).

"1"- Balancing of light alloy rims with hidden application of the inner adhesive weight. Outer weight position is on the adapter surface.

"2"- Combined application: clip-on weight inside and hidden adhesive weight on outside. Outer weight position is the same as "1".

5.4.4-SPLIT UNBALANCE CONTROL

SPLIT is only possible in the case of **ALU-S** mode on outside. It serves for concealing any stick-on unbalance correction weights behind the rim spokes.

TO PRESET THE NUMBER OF RIM SPOKES

4. Select a dimension at random on the displays.
5. Press buttons **D** + **OPT**.
6. Press either **b+** or **b-** to set the required number of spokes in the range 3 to 12.
7. Press buttons **D** + **OPT** to confirm the setting.

SPLIT UNBALANCE

8. Select **ALU-S** unbalance display.
9. Press **START** to perform a spin.
10. When the unbalance values appear on the displays, move a spoke at random to the 12 o'clock position and press buttons **D** +**OPT**

ALU- S UNBALANCE

The display as follow after wheel stopped:

11. The wording "**SPL**" appears on the central display.
12. An unbalance value appears on the outside. Apply a weight of equivalent value in the position indicated by full light of **LED**.
13. Gradually turn the wheel until an unbalance value appears on the outside display. Apply a stick-on weight of equivalent value inside the spoke in the 12 o'clock position.
14. Gradually turn the wheel until the second unbalance value appears in the outside display. Apply a stick-on weight of equivalent value inside the spoke in the 12 o'clock position. wheel will be balanced after wheel running stopped.

To return to normal display of the unbalance, perform a new spin by pressing **START** or buttons **D** +**OPT**.

5.4.5- UNBALANCE OPTIMAZATION

FOREWORD

The optimization operation serves to reduce the amount of weight to be added in order to balance the wheel. It is suitable for static unbalance exceeding 30 g. In many cases it improves the residual eccentricity of the tire.

Fig. 16

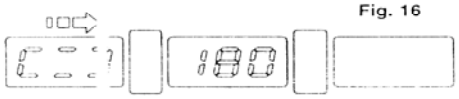


Fig. 17

1st CASE: BALANCE SPIN ALREADY MADE

If the static unbalance exceeds 30 grams, also the wording "**OPT**" appears (display "**17**" if **DYNAMIC** unbalance or **AL** functions are selected; display **1** if **STATIC** unbalance is selected).

When the **OPT** button is pressed, the system displays as follows:

15. Prompt for rim-tire rotation is indicated on the displays. Mark with chalk a reference point on the adapter and rim so as to be able refit the rim in the same position on the machine.
16. With the aid of a tire remover, turn the tire on the rim by 180°.
17. Refit the rim on the adapter in the same position as previously.
18. Press **START**.The second measuring spin is made.
19. The following is obtained:

Fig. 18

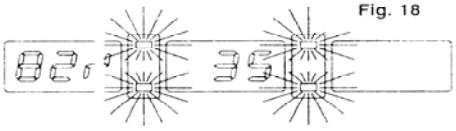
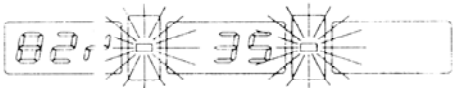


Fig. 19



Left display: **%** (symbol) of possible reduction of unbalance compared to actual wheel situation.

Central display: actual static unbalance in grams. This is the value which can be reduced by wheel-rim-rotation.

Example: the static unbalance of 35 grams can be reduced by 82%. After the operation, there should be a residual unbalance of approx.6 grams.

LDE: turn the wheel until the outer LED's light up: mark the tire in the top point.
In the same way, mark the rim in the position indicated by the innermost **LED's**.
20. Make the two rim and tire marks coincide (by turning them again on a tire remover): optimization is obtained.

When STOP is pressed, the unbalance reduction operation is ended and the system returns to measuring the wheel unbalance.
N.B. If the static unbalance does not exceed 30 grams and optimization is required just the same see the 2nd case.

2nd CASE: BALANCING SPIN NOT YET PERFORMED
(or else with static unbalance less than 30 grams)

21. Press **OPT**. The wording "**OPT**" appears on display "**1**".
22. Press **START**. The first measuring spin is made.
23. At the end of the spin, indication is given of rim-tire rotation as in figure 16. Carry out the operations described for the 1st case.

6- SETUP

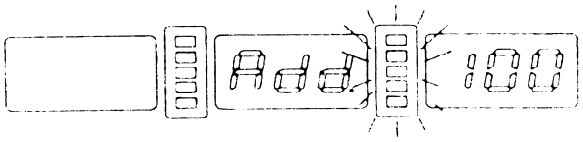
6.1- SELF- CALIBRATION OF THE WHEEL BALANCER

For self-calibration of the machine, proceed as follows:
24. Mount any wheel on the shaft, even if not balanced; better still if of an "adequate" size.
25. Preset the exact dimensions of the wheel mounted.

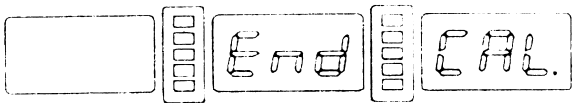
CAUTION!! Presetting of incorrect dimensions would mean that the machine is not correctly calibrated，therefore all subsequent measurements will be incorrect until a new self-calibration is performed with the correct dimensions!

-Press **D** + **C** ⇨ 

Until the positioning LED's change from flashing into steady. **(if after "D+C" keys are loosen, the display of LED do not keep contents of CAL,pls see N.B note)**

-Press **START** ⇨ 

- Add a 100 gram weight on the outside in any angular position.

-Press **START** ⇨ 

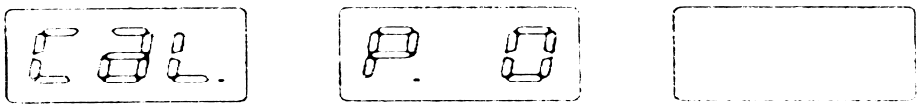
-**MACHINE CALIBRATED**

-Remove the reference weight and balance the wheel as described previously.

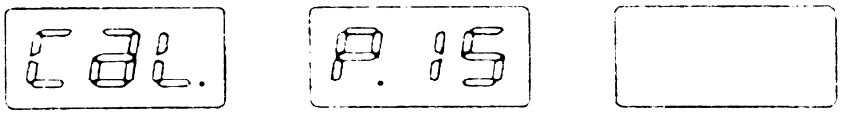
The values derived by the machine from the self-calibration cycle are automatically memorized in a special memory which retains them even when the machine is switched off. Hence each time the machine is switched on again, it is ready for correct operation. However, the self-calibration operation can be repeated whenever required or if there is some doubt as to the correct operation of the machine.
N.B. pls pay more attention ,if "D+C" keys are loosen, the display of LED of left and right will be zero, it is possible that the shield of wheel was not closed ,pls laiy down shield for normal operation.

6.2- CALIBRATION OF AUTOMATIC GAUGES

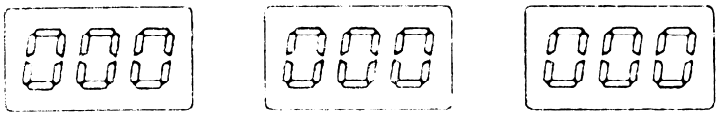
6.2.1 RIM DISTANCE GAUGE

Press **STOP** +**FINE** ⇨ 

-Shift the distance gauge to position “0” and keeping it quite still.

-Press **ALU** ⇨ 

Move the gauge to position “15” and

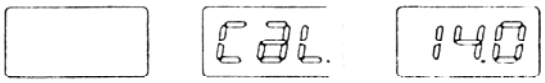
-Press **ALU** ⇨ 

-Return the gauge to rest position. **CORRECT CALIBRATION**

-The wheel balancer is ready for operation.

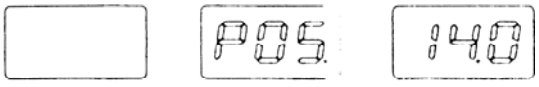
N.B. In the event of errors or faulty operation, the writing “**CAL**” “**P.O.**” appears on the display: shift the gauge to position **0** and repeat the calibration operation exactly as described above. If the error persists, contact the Technical Service Department. In the event of incorrect input in the rim distance gauge calibration function, press **STOP** to cancel it.

6.2.2- DIAMETER GAUGE

-Press **STOP** + **OPT** ⇨ 

-Currently preset diameter.

-Set the diameter with which to calibrate the machine (10-18”).

Press **ALU** ⇨ 

-Move the gauge tip into measuring position (Fig.4) and keeping it still,

Press **ALU** ⇨ 

-Return the gauge to rest position **CORRECT CALIBRATION**

-The wheel balancer is ready for operation

In the event of incorrect input in the diameter gauge calibration function, press **STOP** to cancel it.

6.3- SELF DIAGNOSTICS

-Press **D**. The system tests for the correct operation of the displays and **LED's** of the PC board ,then wording **POS** appears on display "**17**". At this point, correct operation of the position sensor can be checked:

-When the wheel is moved slowly, the "**ALU 1**"**LED** should start flashing. When switching from reset, the wording "**0**" should appear on display "**2**" (once every 360°).

-When the wheel is moved in the running direction, the "**ALU2**" **LED** should remain lit.

-When the wheel is moved slowly in the opposite direction, the "**ALU**" "**S**" **LED** should remain lit.

-Press button **ALU**

-A number appears on display "**1**", which varies when moving the rim distance gauge and represents a value for calibrating the potentiometer used in automatic distance measurement (Only for experts).

-It is possible to switch to the distance calibration function by pressing **STOP** +**FINE** both together.

-Press the button **ALU**.

-A number appears on display "**1**", which varies when moving the diameter gauge and represents a value for calibrating the potentiometer used in automatic diameter measurement (Only for experts).

-It is possible to switch to the diameter calibration function by pressing **STOP** +**OPT** both together.

7- ERRORS

7.1- ERRORS CODE AND EXPLAINATION

Various abnormal conditions can arise during machine operation by the microprocessor, they appear on the display as:

Err. **- -**

ERROR	MEANING
1	No signal of rotation, could be caused by faulty position transducer or the motor not starting or by something preventing the wheel from turning.
2	During the measurement spins, wheel speed had dropped to below 60 r.p.m. Repeat the spin.
3	Errors in mathematical calculation, most likely caused by too high wheel unbalances.
4	Direction of rotation incorrect.
5	Guard open before starting the spin.
7	Faulty memory of self-calibration values. Repeat the self-calibration.
8	Error during self-calibration. Could be due to a second spin made without adding the reference weight, or else a break in the force transducer cable.
9	Too high a diameter value for gauge calibration (max. value=18").
12	Error in mathematical calculations for the SPLIT UNBALANCE function.

If the error persists, consult the Technical Service Department.

7.2 – INCONSISTENT UNBALANCE READINGS

It could happen that after balancing a wheel and removing it from the balancing machine, then again mounting it on the balancing machine, the wheel is found not to be balanced.

This does not depend on incorrect indication of the machine, but only on a faulty mounting of the wheel on the adapter; i.e. between the two mountings, the wheel has assumed a different position with respect to the balancing machine shaft center line.

If the wheel is mounted on the adapter with screws, it could be possible that the screws have not been correctly tightened: they should be tightened one in crosswise fashion: or else (as is frequently the case) the wheel has been drilled with too wide tolerances.

Small errors, up to 10 grams (0.4 oz) are be considered normal in wheels locked by a cone: the error is normally greater for wheels locked with screws or studs.

If, after balancing, it is found, upon refitting the wheel on the vehicle, that it is still out-of-balance, this could be due to unbalances on the car brake drum; or very often this is due to the holes for the screws of the rim and drum sometimes drilled with too wide tolerances. In such case, a readjustment could be advisable using the balancing machine with the wheel mounted.

8- ROUTINE MAINTENANCE

Switch off the machine's power supply before executing any maintenance operations.

8.1 Adjusting the belt pulley

1) Slightly loosen the four screws that support the motor and move the motor to adjust the belt tension.
2) Block the four motor screws carefully, check that the belt does not play laterally and touch the casing when in movement.

8.2 Computer board replacement

Machine parameters input:

N.B before proceed following operation, pls make sure the shield closed, it is possible not proceed further operation if the shield was not closed.

When the computer board is to be replaced by a new one, it is necessary to insert the machine parameters.

To perform this operation, act as follows: press push buttons D + C as to execute the self-calibration; When the position LEDs stop flashing press the following push buttons within 5 seconds and with the proper sequence: **a-** **+** **a+** **+** **ALU** **.**

After having pressed **a-** and **a+**, the displays turn off ,and after having pressed ALU the present value of fixed distance "DF" appears: modify by **b+** and **b-**.

Press to pass **a+** to the modification of the "I" value.

On the right display appears the present value (in%) and on the left one appear the "I" writing and the symbol "-" if the correction is negative, or "+" if it is positive. Modify by **b+** **and** **b-**.

By pressing the push button **a+** on the right display , the "S " value appears: to modify it, press the push buttons **b+** and **b-**.

To finish, press **a+**.

Configuration basic values: See the sticker beside the power board.

After having modified the machine parameters, execute again the self-calibration.

NOTE: the values with which the machine has been calibrated in the factory are reported inner frame base on an adequate data plate.

9- TO CHANGE SUPPLY VOLTAGE

(See spare parts lists and power layout diagram)

The machine can run on 110V or 220V

To change the supply voltage, proceed as follows:

1. Replace motor.
2. Make the necessary modifications to the power board.
    1) Replace the capacitor
    2) Replace the resistance

10- INSTALLATION OF THE AUTOMATIC GAUGES

N.B. For correct automatic measurement of the dimensions, after calibration the potentiometers as described below, proceed to carry out the special function "AUTOMATIC GAUGE CALIBRATION" (6.2).

To interrupt the functions, press **C**

10.1- CALIBRATION OF THE DISTANCE POTENTIOMETER (DWG.1)

-Remove the weight shelf and refit the tip on the gauge rod.

-Back-off the screws fastening the pulley on the potentiometer shaft.

-Select self-diagnostics by pressing **D**

-After testing for correct display operation, press **ALU**

-The wording **dIS**, appears on display "**17**" while display "**1**" shows a number which varies when the distance gauge is moved and represents a reference for potentiometer calibration.

-With the gauge fully retracted, turn the potentiometer shaft keeping the pulley still until the lowest possible number is read.

-Increase by four numbers, then tighten the set screws to lock the pulley on the shaft.

10.2- CALIBRATION OF THE DIAMETER POTENTIOMETER (DWG.1)

-Again press **ALU** after performing the calibration described in point **10.1**

-The wording **dIA** appears on the left display while the right display shows a number which varies when the gauge is turned and represents a reference for potentiometer calibration.

-Remove the diameter potentiometer from the gauge rod after backing off relative set screw.

-Slightly pull out the gauge rod and rest its stop on the machine shaft in external position close to the base.

-Turn the potentiometer shaft until reading **34** on the display, then again insert it in its correct working position.

-Lock the potentiometer with relative set screw.

11- CHECKING OF THE POSITION SENSOR

To check efficiency of the position sensor, carry out the following tests:

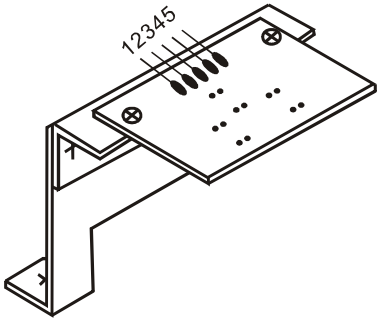
1、Make sure that none of the three photocells rub against the position pick-up disc and in the **RESET** tooth.

2、Using a voltmeter set to the **Vdc**. scale, test the following voltages (the machine should be switched on but without rotation).

-between earth (ground)4 and **5** wire+5 **Vdc** steady

-between earth (ground)4 and **2** wire (RESET) +4.5 to 4.8 **Vdc** when the **RESET** tooth is in photocell and "**0**" **Vdc** when the **RESET** tooth is outside the photocell

-between earth (ground)4 and the **1** wire (**CLOCK**) and between earth and the **3** wire (**U/D**) when turning the machine shaft very slowly. Variations in voltage should lie between "**0**" **Vdc** and 4.5 to 4.8 **Vdc**.



N.B. when the position sensor requires replacement, remove just the PC board after backing off the two mounting screws. This is because repositioning is easier if the mounting bracket is not moved.

12- ASSEMBLY OF THE PIEZO MEASURERS

FORSWORD: Before touching the piezo transducers, search for the fault in other parts because correct assembly is difficult and the machine loses its calibration.

Problems of excessive compensation and out-of-phase sometimes depends on a fault in the piezo measurers. To replace them, proceed as follows:

1. Remove the weight shelf. Remove nuts 1 and 2 with relative cup springs and washers.
2. Back-off screws 3, 4 and 5 then disassemble the various parts.
3. Reassemble the various parts without tightening the nuts being careful to follow the correct sequence.

N.B. Mount the piezo units in accordance with the position of the colored wires shown in the drawing.

4. Keeping the spindle perfectly aligned, tighten nut 5 with a spanner, and nuts 3 and 4 by hand (by half a turn with the spanner if necessary).
5. Refit the washers, cup springs and nuts 1 and 2. Tighten the nuts fully in order to fully regain the elasticity of the cup springs, This will automatically ensure correct pre-loading on the piezo (a torque wrench can be used set to 400kg·cm.).

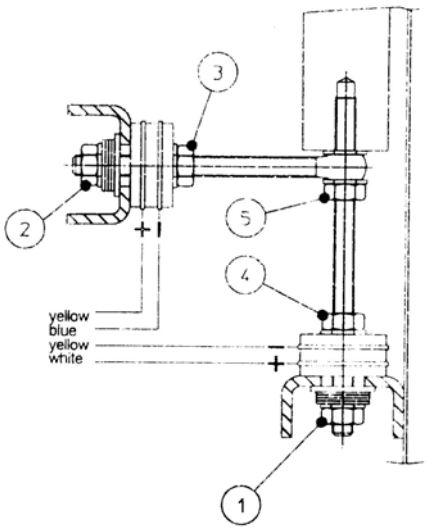


Fig.25

6. For correct operation, insulation of the piezo crystals should be greater than 50 M ohm.

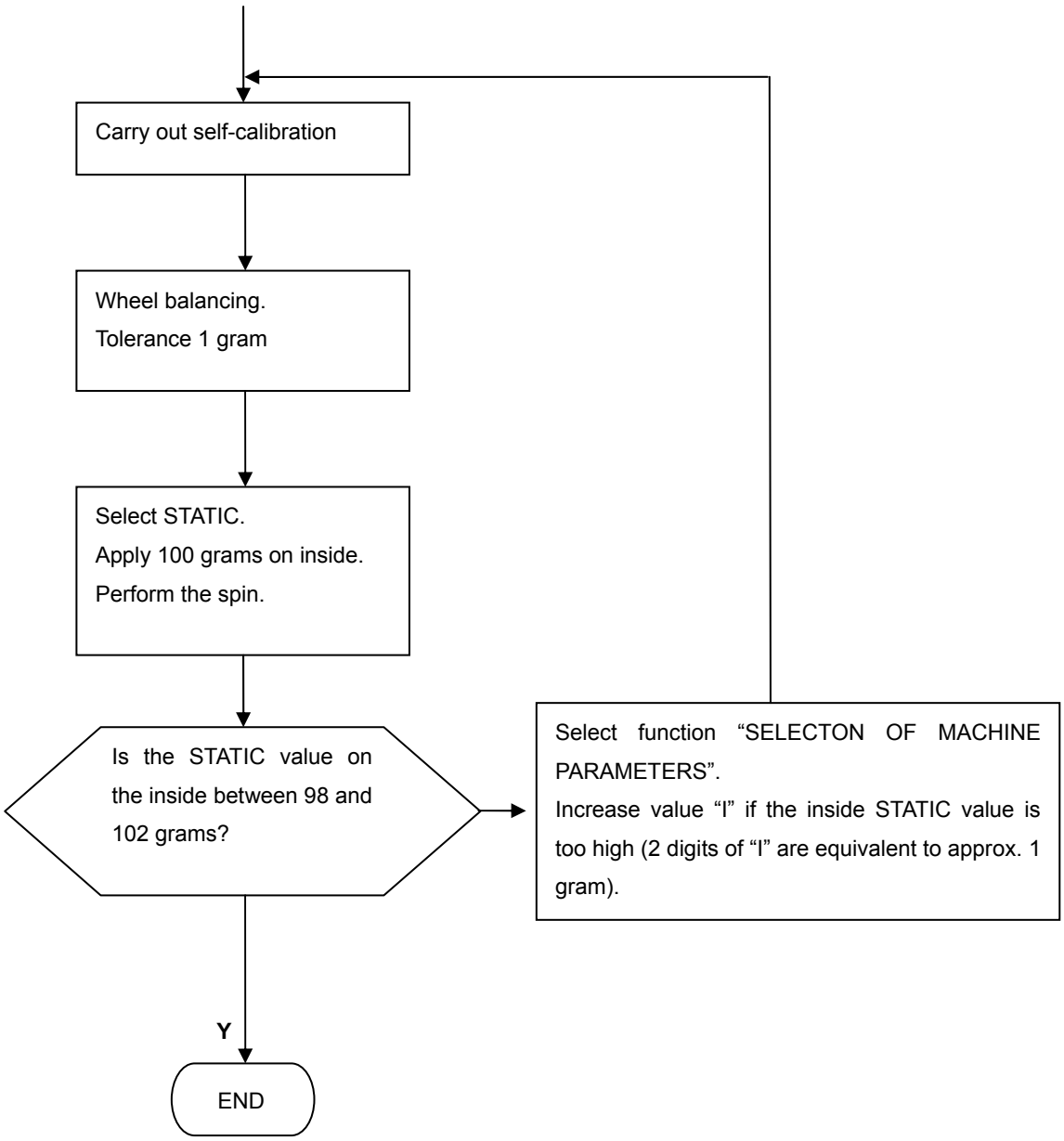
7. Reassemble the various parts.
8. Again carry out the automatic calibration.

13-LOGIC TROUBLE SHOOTING SEQUENCE

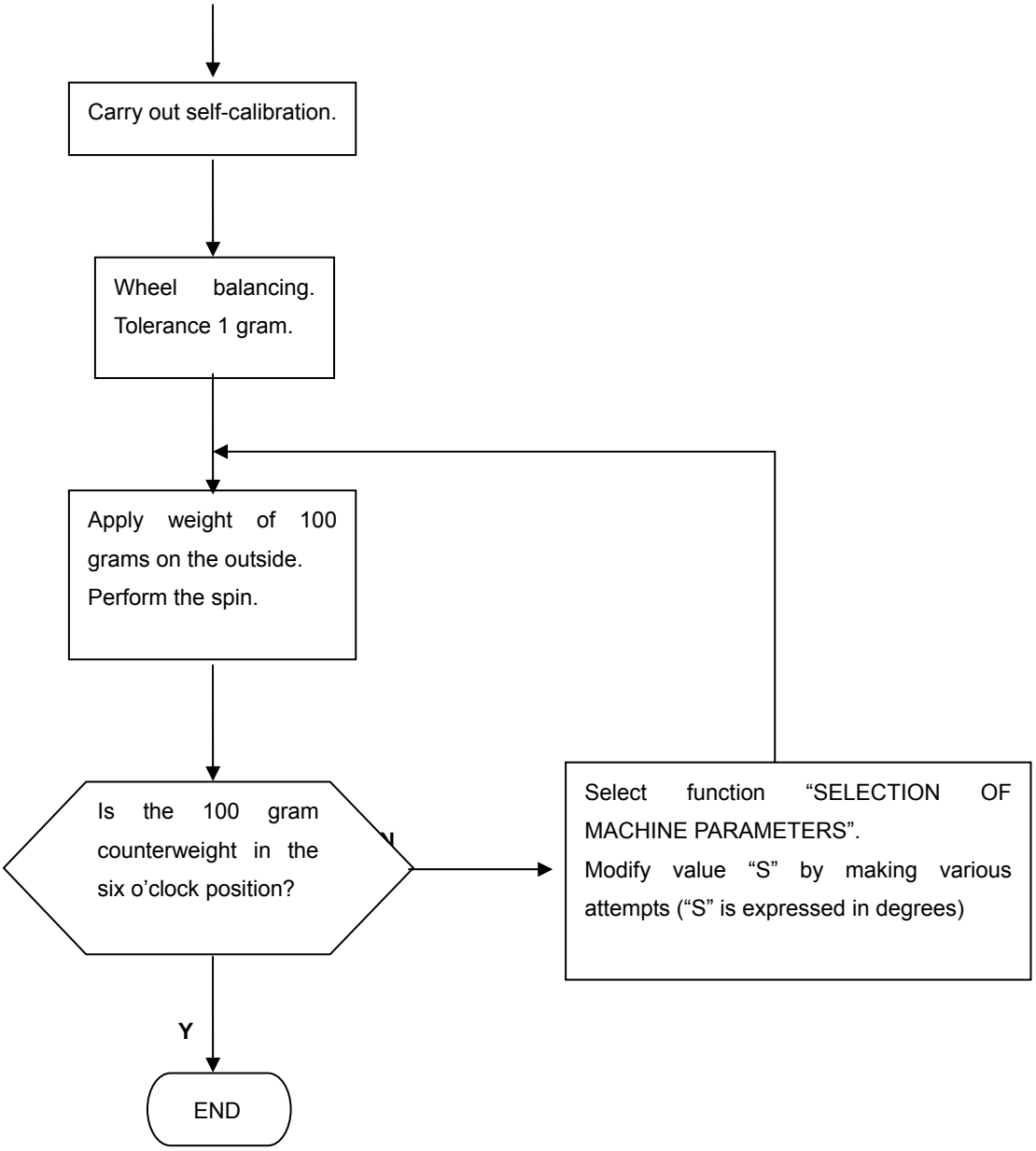
N.B. Before carrying out any test ,disconnect braking resistor R on the contractor. Reconnect R only at calibration of testing. When the power or computer board requires replacement, repeat the self-calibration of the balancing machine.

N.B. When the computer board is replaced , preset the machine parameters indicated on relative nameplate.

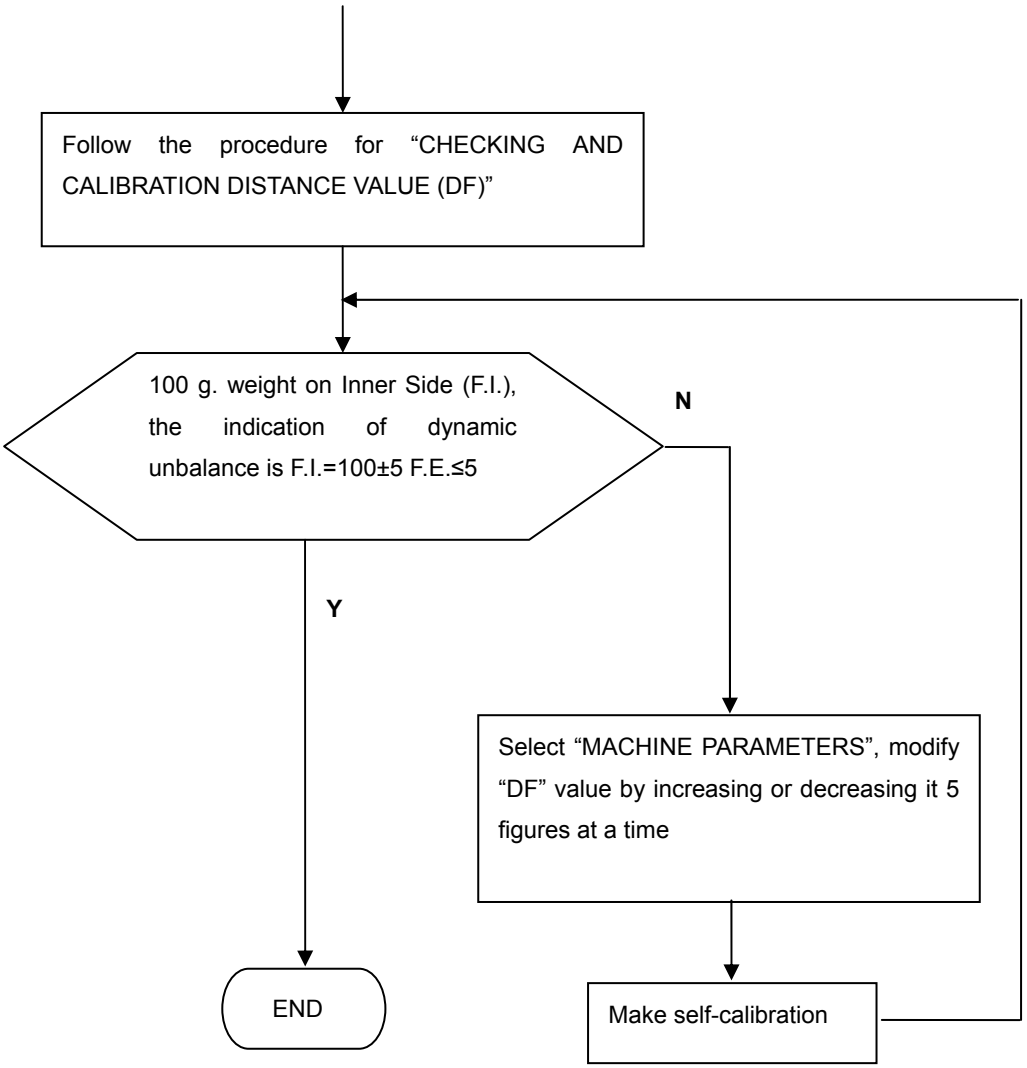
13.1-CHECKING AND SETTING OF STATIC VALUE (STI)



13.2- CHECKING AND SETTING OF UNBALANCING POSITION



13.3- CHECKING AND CALIBRATION OF FIXED DISTANCE VALUE (DF)



14- POWER SUPPLY LAYOUT DIAGRAM

(220 V CONNECTION)

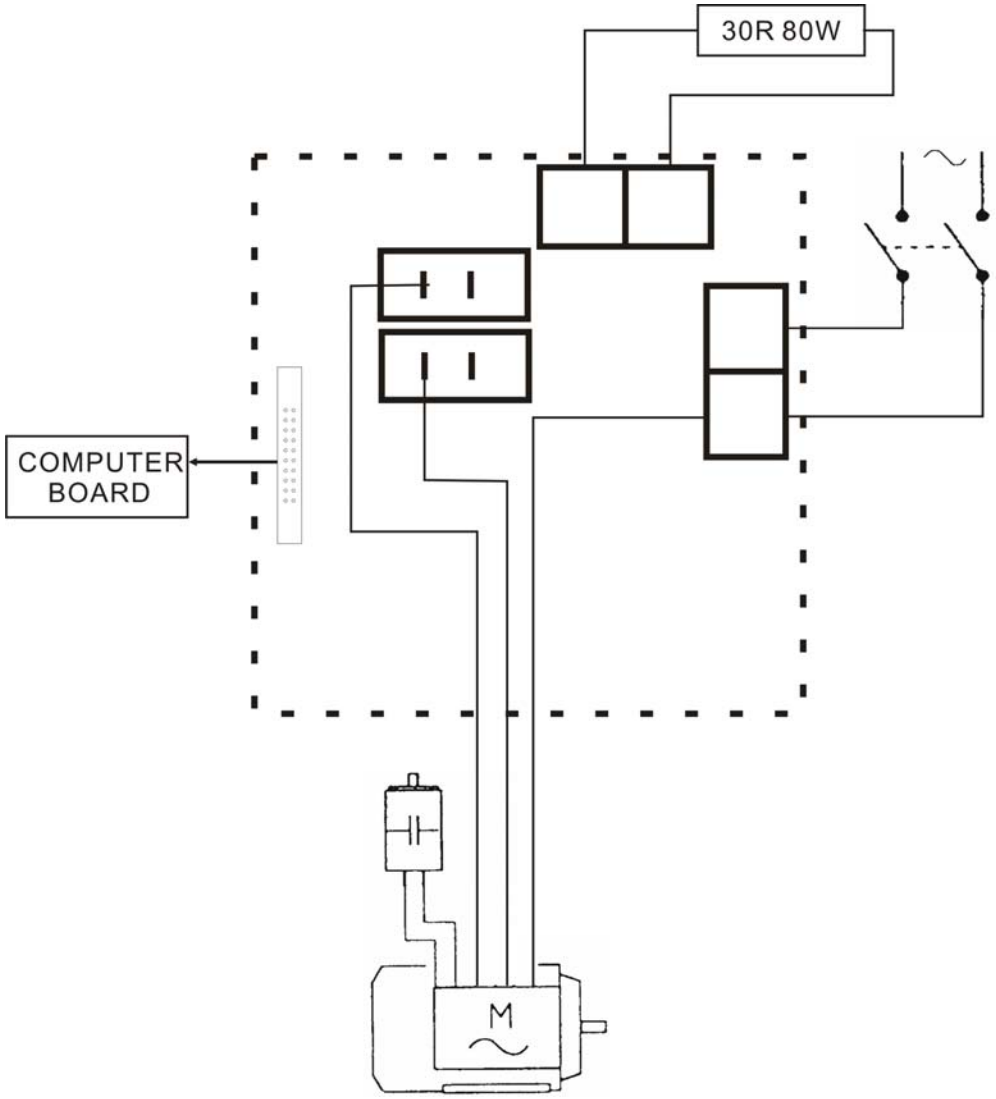


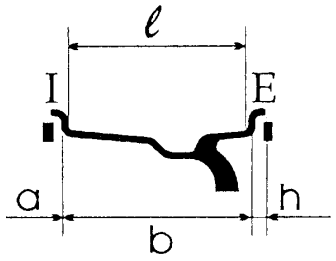
Fig.26

15- WHEEL MEASUREMENT AND PRESETTIG ON THE BA LANCING MACHINE

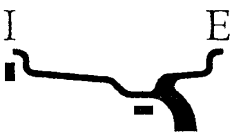
The ever increasing need for more accurate calibration and use of ALU function mean that it is important to establish how to measure the rim and how the balancing machine interprets the preset data. Hence a description is now given of how to modify the preset dimensions automatically in order to obtain the distances of the correction planes, which are defined as through planes for the centers of gravity of the corrective weights.

Consider a typical rim: size "ℓ", given as width by the rim manufacturer, differ from the measurement of the distance between the correction planes for the rim thickness and physical dimensions of the counterweight, whose center of gravity is located at distance "h" from the resting point of the rim edge.

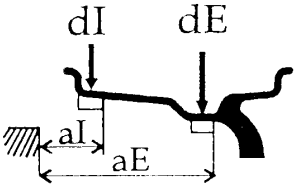
The balancing machine automatically corrects the measurement preset by adding 2×h=6 mm to the measurement. Measurement "b" made with the gauge is generally more accurate even if very similar to the measurement "ℓ" known to the rim user. The two measurements differ only by the thickness of the sheet metal, usually about 2 mm per side. Such insignificant distance means that an accurate calibration can be obtained regardless of whether the inner rim with "ℓ" or outer width "b" is preset. It is good rule to add 1/4 inch to the value given by the manufacturer. As regards the ALU functions, the machine performs the following approximations in addition to the systematic correction regarding the center of gravity of the counterweight as seen above.



ALU1
a = a preset + ¾"
b = distance of adapter surface - 0 - a
d_I = d preset - 1"
d_E = d preset - 2 ½"



ALU2
a = a preset
b = distance of adapter surface - 0 - a
d_I = d preset
d_E = d preset - 2 ½"



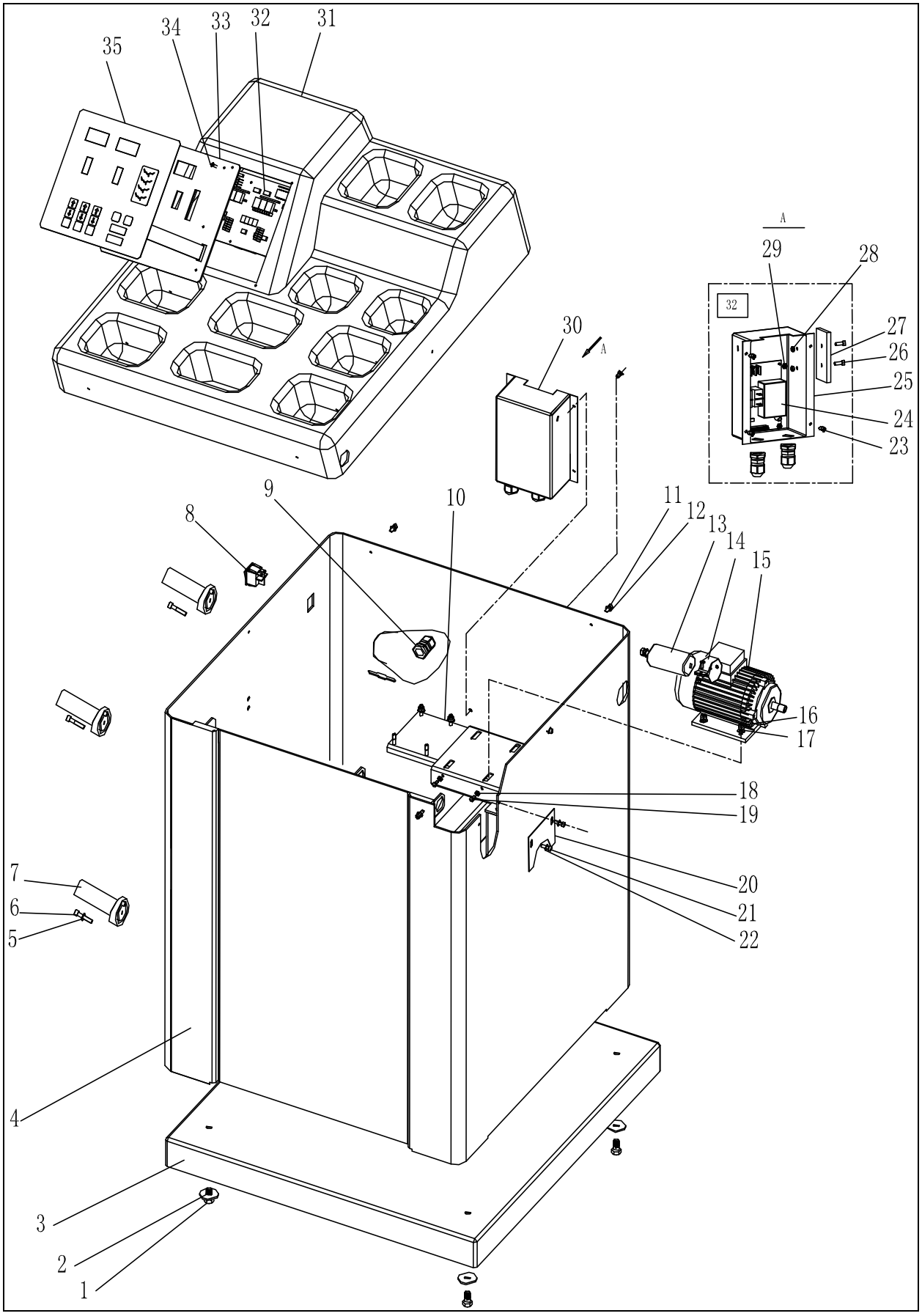
ALU-S
a = a_I preset - 8 mm
b = a_E - a_I
d_I = d preset
d_E = d_I x 0.8

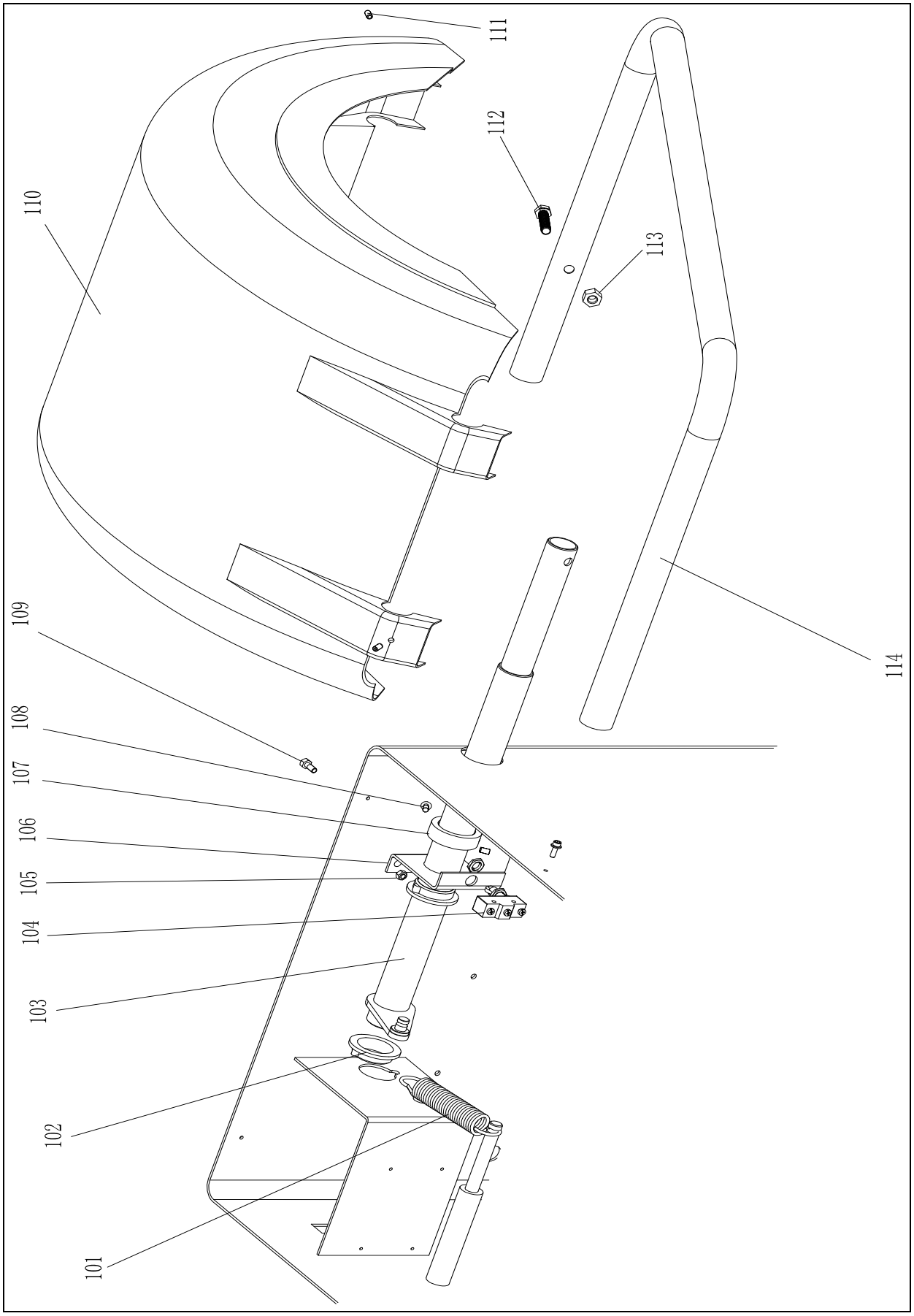
N.B. I=INSIDE
E=OUTSIDE

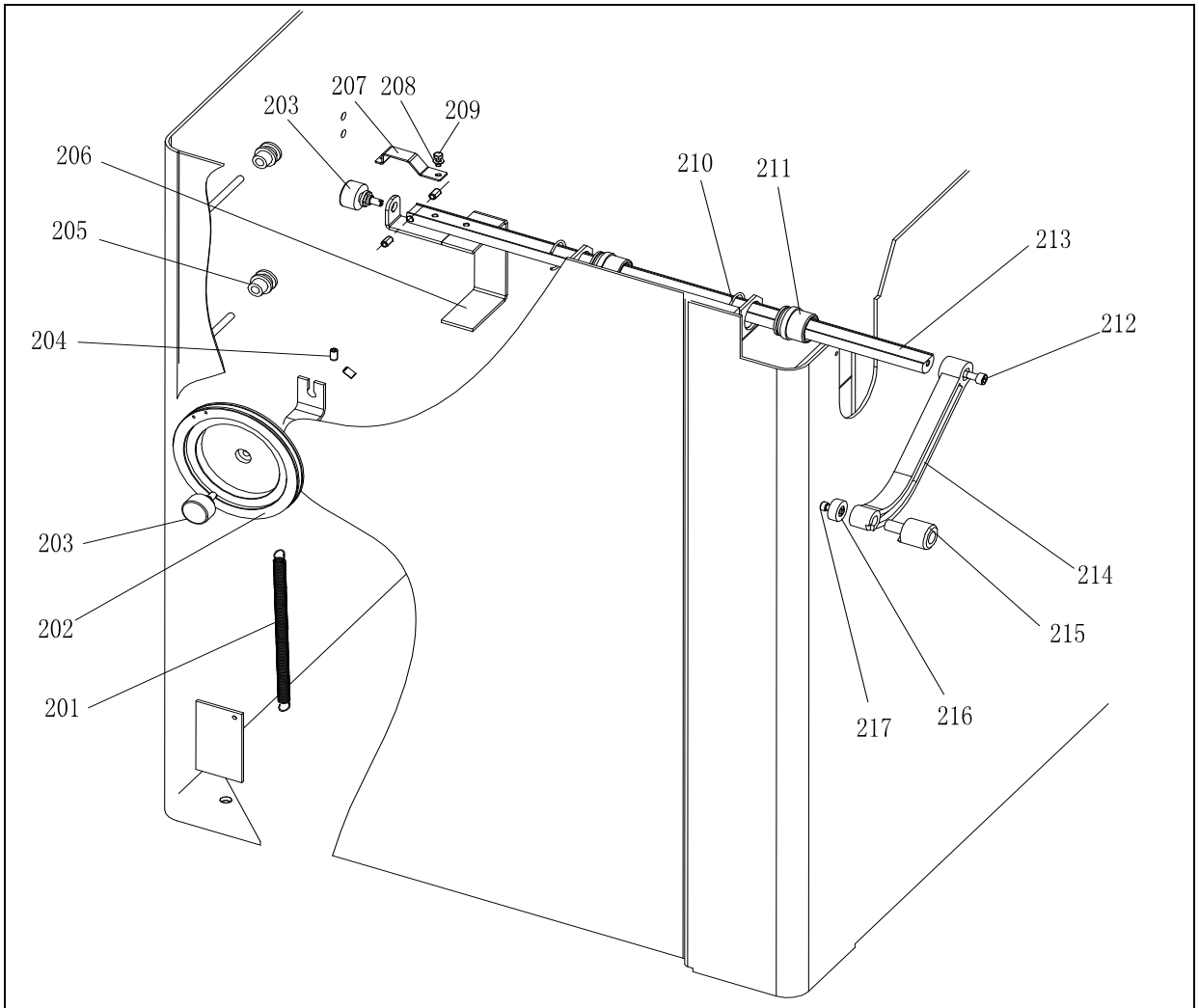
16- SPARE PARTS LIST

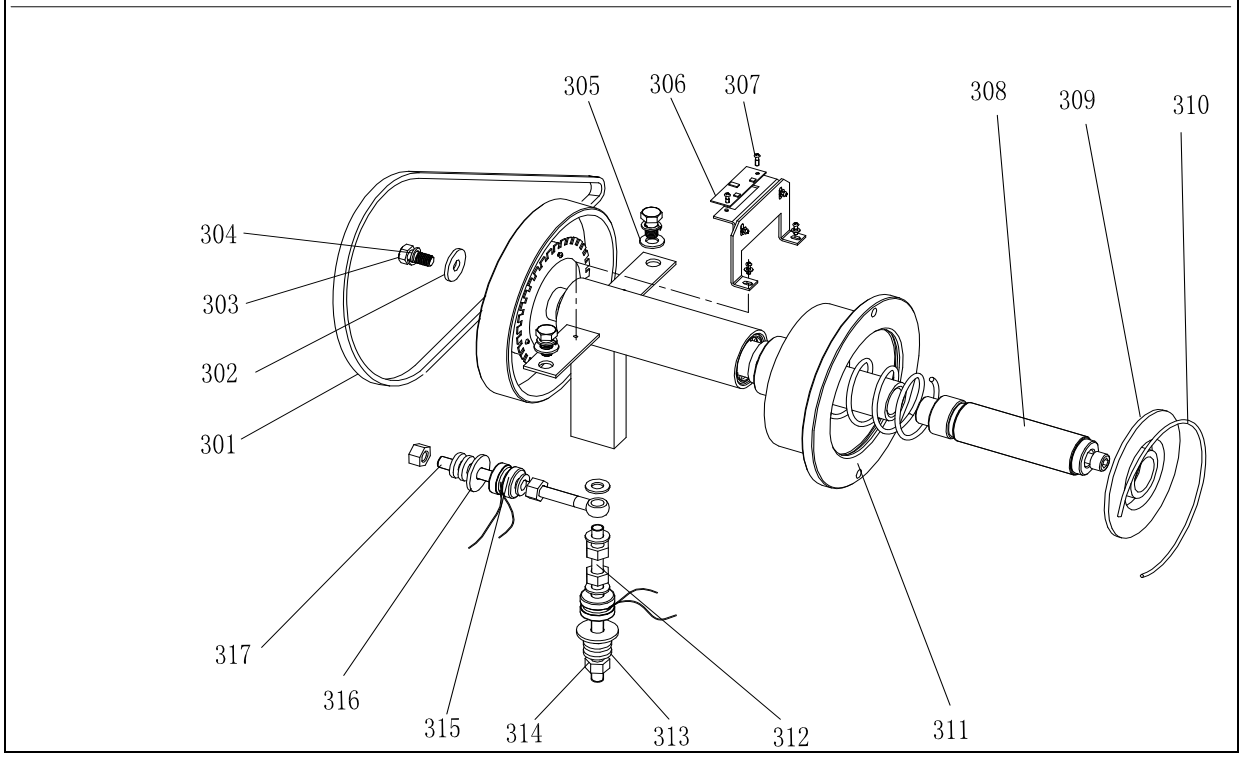
No.	Code	Description	Qt.	No.	Code	Description	Qt.
1	P-100-900000-0	Screw	4	108	B-024-060081-0	Screw	1
2	P-100-080000-0	Washer	2	109	B-040-102020-1	Screw	2
3	B-024-050061-0	Base	1	110	P-100-200000-0	Hood	1
4	B-024-050251-0	Body	1	111	B-007-060081-0	Screw	3
5	B-024-050251-0	Screw	3	112		Screw	1
6	B-040-050000-1	Washer	3	113	B-004-100001-0	Nut	1
7	P-000-001001-0	Tools hang	3	114	PX-100-200200-0	Shaft	1
8	S-060-000210-0	Power switch	1				
9	S-025-000135-0	Cable circlip	3	201	P-120-210000-0	Spring	1
10	PX-100-010920-0	Motor adjust board	1	202	P-120-250000-0	Bobbin winder pulley	1
11	B-024-050161-1	Screw	4	203	S-132-000010-0	Gauge sensor	2
12		Washer	4	204	B-007-060081-0	Screw	5
13	S-063-002000-0	Capaciter	1	205	PZ-120-260000-0	Pulley	2
14		Hoop	1	206	PX-120-240000-0	Heavy	1
15	S-051-230020-0	Motor	1	207	PX-120-230000-0	Caliper Hook	1
16	B-004-060001-1	Mut	4	208	B-040-050000-1	Washer	1
17	B-040-061412-1	Washer	4	209	B-024-050161-1	Screw	1
18	B-014-050351-1	Screw	2	210	P-100-520000-0	Seeger Ring	2
19	B-004-050001-1	Nut	2	211	P-100-170000-0	Plastic Bush	2
20	PX-100-110000-0	Plate	1	212	B-010-060161-0	Screw	1
21	B-024-050061-0	Screw	2	213	PZ-120-090000-0	Rim Distance Gauge	1
22	B-040-050000-1	Washer	2	214	P-822-160100-0	Handle Bar	1
23	B-050-100000-0	Screw	4	215	P-100-160200-0	Gauge head	1
24	PZ-000-020822-0	Power board	1	216	P-822-160700-0	ABS Washer	1
25	PX-800-120000-0	Power board box	1	217	B-010-050101-0	Screw	1
26	B-024-050251-0	Screw	2				
27	D-010-100100-1	Resistor	1	301	S-042-000380-0	Belt	1
28	B-024-060081-0	Nut	2	302	B-040-103030-1	Washer	1
29		Nut	4	303	B-014-100251-0	Screw	3
30		Complete power box	1	304	B-050-100000-0	Washer	3
31	P-800-190000-0	Head with tools-tray	1	305	B-040-102020-1	Washer	6
32	PZ-000-010120-0	Computer board	1	306	PZ-000-060100-0	Position Pick-up Board	1
33	B-007-060081-0	Screw	8	307	B-024-030061-0	Screw	4
34	PX-820-100000-0	Display fixed plate	1	308		Thread	1
35	S-115-008200-0	Key board	1	309	P-100-420000-0	Plastic Lid	1
				310	P-100-340000-0	Spring	1
101	S-042-000380-0	Spring	1	311	S-100-000010-0	Complete Shaft	1
102	P-100-180000-0	Sheath	2	312	P-100-080000-0	Screw	1
103	S-060-000410-0	Mirco switch	1	313	B-048-102330-1	Washer	4
104	PX-096-040000-0	Shaft	1	314	B-004-100001-2	Nut	5
105		Nut	2	315	S-131-000010-0	Sensor Assembly	2
106	B-014-060351-1	Shaft support	1	316	B-040-124030-1	Washer	2
107	PX-100-050000-0	Shaft sheath	1	317	P-100-070000-0	Screw	1

17- EXPLODED WHEEL BALANCER DRAWINGS




111
112
110
113
114
109
108
107
106
105
104
103
102
101


207
208
209
203
206
210
211
205
213
212
204
214
203
215
202
216
217
201


305
306
307
308
309
310
304
303
302
301
317
316
315
314
313
312
311