

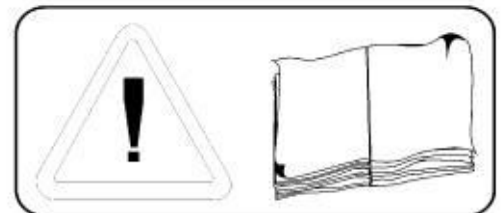
**INSTALLATION, OPERATION, MAINTENANCE MANUAL**

**KEEP THE MANUAL NEAR THE MACHINE ALL TIME  
AND MAKE SURE ALL USERS HAVE READ THIS**



**WHEEL BALANCER**

**ITEM NO: KWB380**



**FOLLOW THE INSTRUCTIONS CAREFULLY TO GRANT THE MACHINE A CORRECT FUNCTION AND  
LONG SERVICE LIFE.**

## TABLE OF CONTENT

<b>INTRODUCTION</b>	<b>3</b>
Intended use	3
Technical data	3
<b>GENERAL SAFETY RULES</b>	<b>3</b>
Control panel	4
<b>TRANSPORTATION</b>	<b>5</b>
<b>INSTALLATION</b>	<b>5</b>
Electrical connection	5
Wheel mounting	5
<b>PRESETTING OF DIMENSIONS</b>	<b>6</b>
<b>Optional features</b>	<b>9</b>
<b>WHEEL BALANCING</b>	<b>10</b>
<b>SELF-CALIBRATION</b>	<b>12</b>
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<b>ERROR</b>	<b>14</b>
<b>ROUTINE MAINTENANCE</b>	<b>15</b>
<b>SPECIAL MAINTENACNE FOR SPECIALIZED PERSONNEL</b>	<b>16</b>
<b>LOGIC TROUBLE SHOOTING SEQUENCE</b>	<b>18</b>
<b>CHECKING AND SETTING OF STATIC VALUE</b>	<b>20</b>
<b>CHECKING AND SETTING OF UNBALANCE POSITION</b>	<b>21</b>
<b>CHECKING AND SETTING OF FIXED DISTANCE VALUE</b>	<b>22</b>
<b>POWER PC BOARD LAYOUT</b>	<b>23</b>
<b>REPLACE THE POWER PC BOARD</b>	<b>24</b>



## KWB380 WHEEL BALANCER

### INTRODUCTION

**Thank you for purchasing the full automatic wheel balancer.**

This guide has been made in order to supply the owner as well the user with the basic instructions for a correct use of the machine. Read this guide carefully before using the machine and follow the instructions given by this guide carefully to grant the machine a correct function, efficiency and a long service life.

#### INTENDED USE:

This full automatic wheel balancer is designed to balance wheels with max weight of 70KG/154LBS. The calibration system is sufficient to cover different wheels from motorcycles to cars.

**Manufacturer and dealer will not hold responsibility for any damage caused from using of this wheel balancer for purposes other than those specified in this manual and therefore inappropriate, incorrect and unreasonable.**

#### TECHNICAL DATA

Max wheel weight:	65KG/143 Pound
Power supply:	220v, 1phase
Max. Power:	370W
Rim diameter:	10-24", / 254-610mm
Rim width:	1.5-20", / 38-508mm
Balancing accuracy:	1g / 0.035OZ
Balancing speed:	200 min <sup>-1</sup>
Noise:	<70dB
Net weight:	91KG / 200 Pound
Packing size:	960X575X1390MMmm

***(Please check motor plate of your machine before use)***

### GENERAL SAFETY RULES

#### a. BEFORE USE

Carefully read the operation manual before using the machine.

Checking the voltage, and frequency instructing on motor plate, wiring must be done by electricians only.

#### b. DURING USE

The machine must be operated by trained staff and can only be used for purpose described in this manual.

Do not wear unfit clothes such as large clothes with flounces, ties, etc; which could get caught by moving parts of the machine.

#### c. AFTER USE

Do not modify the machine without manufacturer's advice.

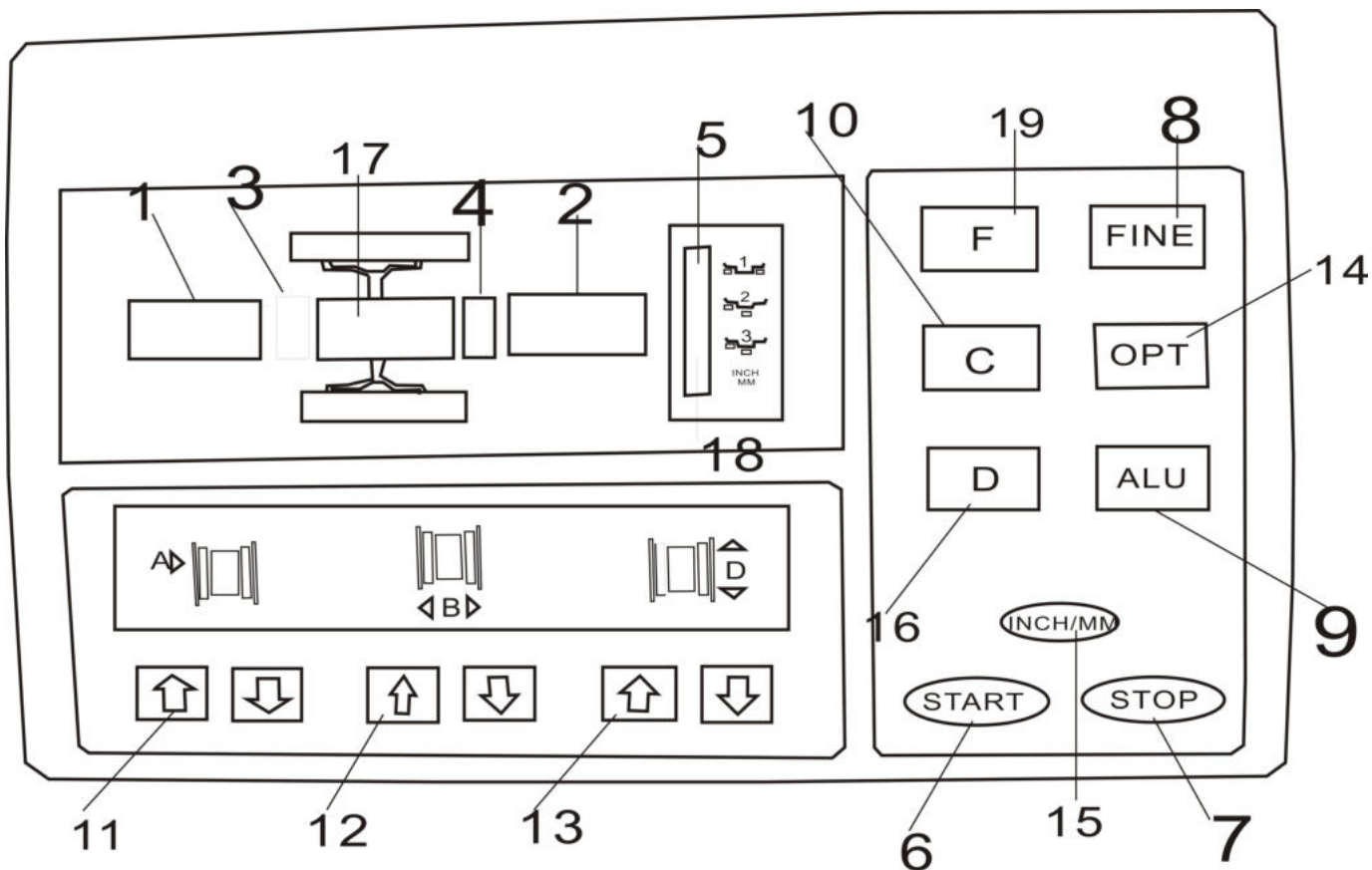
Do not use strong jet of compressed air for cleaning.

Use Alcohol to clean plastic panels, but avoid contaminating important board inside.

If the machine is not to be used any more, owners are suggested to make it unusable by removing the power supply connections, emptying the oil tank and disposing the liquids in accordance with the national laws in force.

## CONTROL PANEL

Fig 1.



1. Display of Amount of Unbalance, inside or DISTANCE dimension.
2. Display of Amount of Unbalance, outside or DIAMETER dimension
3. Indicator of Position of Unbalance, inside
4. Indicator of Position of Unbalance, outside
5. Indicator, correction mode "ALU" selected
6. Start button
7. Emergency stop button
8. Selection of unbalance display pitch and threshold
9. Selection of correct mode "ALU"
10. Push button for recalculation/self-calibration
11. Push button, manual Distance input (a)
12. Push button, manual Width input (d)
13. Push button, manual Diameter input (c)
14. Push button, optimization of unbalance
15. Selection of dimensions in inch/mm
16. Push button, self-diagnostics and self-calibration
17. Digital indicator, amount of "STATIC " unbalance or "WIDTH" dimension
18. Indicator, dimensions in mm
19. Selection of "STASTIC" or "DYNAMIC" correction

## TRANSPORTATION

The wheel balancer must be transported in its original packing and kept in the position shown on the package itself.

The packed machine should be moved by means of a forklift truck of suitable capacity. Insert the forks at the right points.

## INSTALLATION

The machine must be installed on level ground and there is no need to anchor the machine to the floor for correct operation

## ELECTRICAL CONNECTION:

**Electrical connection must be done by specialized people**

Before connecting the balancer to the power supply, check the voltage that showing on the nameplate at the back of machine.

The machine mains supply cable should be fitted with a plug conforming to current regulations.

It is advisable to provide the machine with its own electrical connection through a suitable circuit breaker.

When connection is made directly to the mains control panel, without using any plug, it is advisable to padlock the main switch of the balancing machine so that its use is limited only to authorized personnel.

## WHEEL MOUNTING

The machine is supplied as standard with a universal cone adapter. The adapter body build-in spring cannot be disassembled from the spindle. The threaded end is removable in order to allow mounting alternative adapters.

## ***PRESETTING OF DIMENSIONS***

Tow types of measurements are provided:

- **Standard wheels also valid for correction mode 1''-2''.**
- **S, very useful for wheels with correction just on the inside.**

### **1. STANDARD WHEELS**

Move the gauge into measuring position as described as following. During gauge movement, the displays go out showing that the gauge is not steady.

Fig 2.

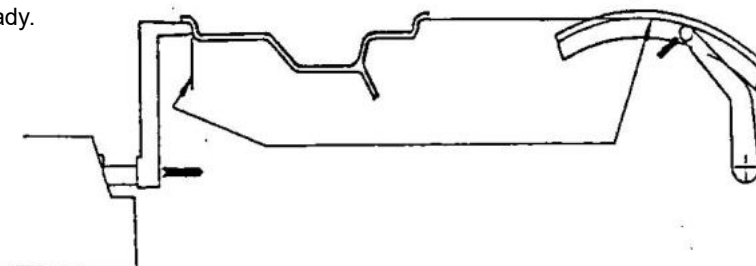
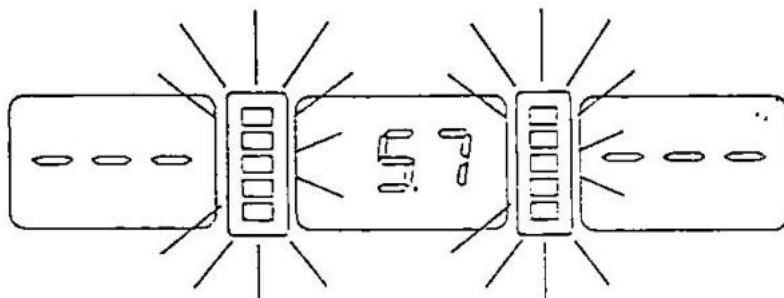


Fig 3.

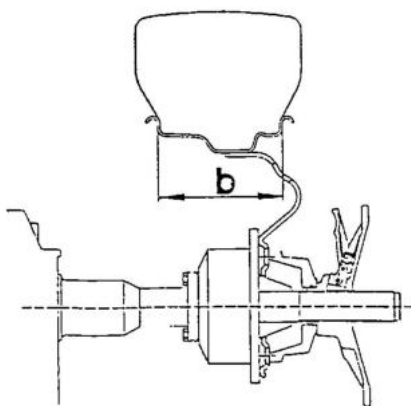


Keep the gauge stationary in position for about 2 seconds.

Indication of memorization is given by the display as showing in Fig 3

Move the gauge back to position 0 (The automatically measured values appear on the display)

Fig 4

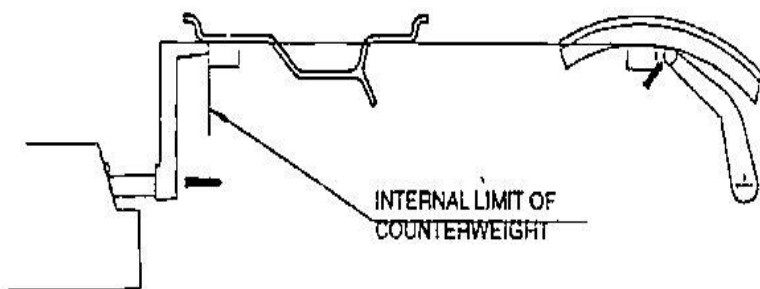


Manually preset width "b" which is normally stamped on the rim; or measure the dimension "B" using the standard caliper gauge

**WHEELS WITH WEIGHTS INSIDE (S)**

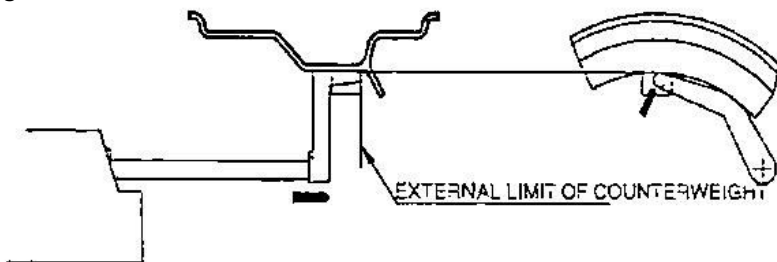
Just the automatic gauge is used in the following way:

Fig 5. "S" INSIDE



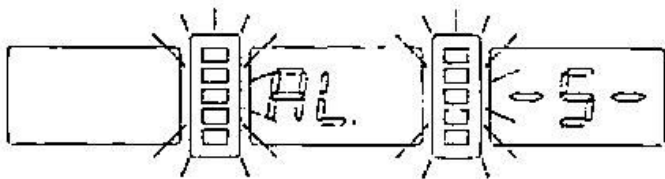
-Move the gauge into the position showing in Fig 5. After memorization (Fig 3) again shift the gauge as instructing in Fig 6 into the inside of the wheel.

Fig 6. "S" OUTSIDE



-Keep the gauge in position about 2 seconds. Indicator of memorization is given by the display as shown in Fig.7

Fig 7

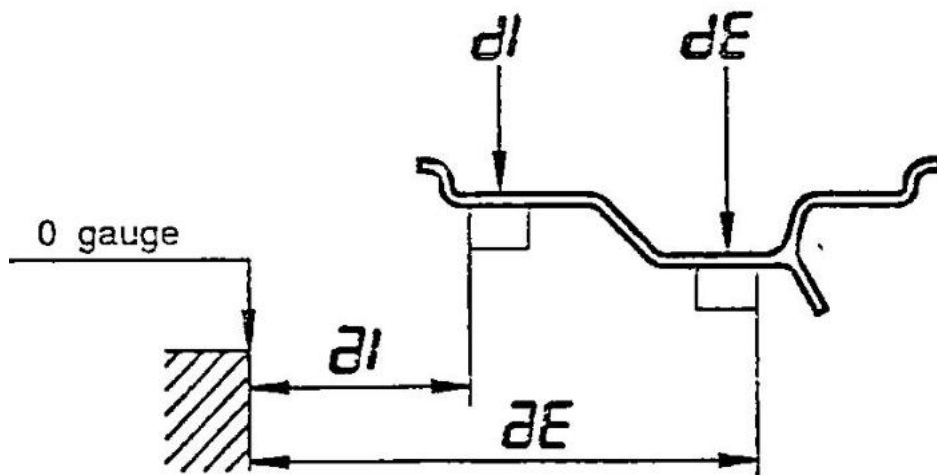


-Bring the gauge back to position "0". The measured "S" dimensions appear on the display.

### MANUAL MODIFICATION OF DIMENSJONS "S"

If required, it is possible to modify manually the dimensions measured in automatic mode. Follow Fig 8 to do it:

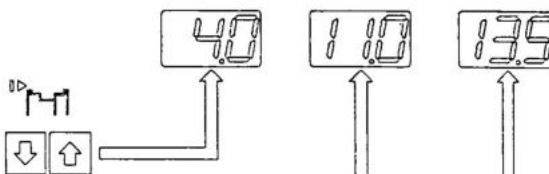
Fig 8



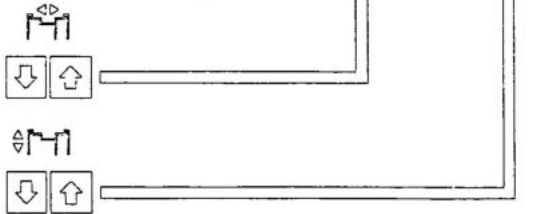
### SEQUENCE:

Fig 9

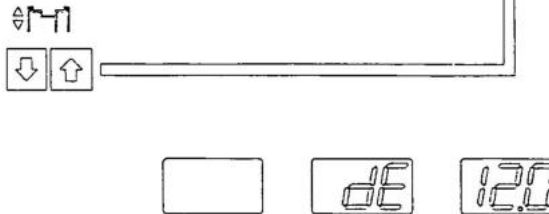
1. To modify "aI" press



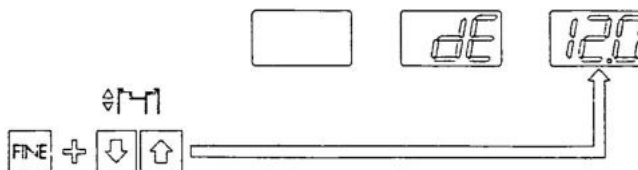
2. To modify "aE" press



3. To modify "dI" press



4. To modify "dE"

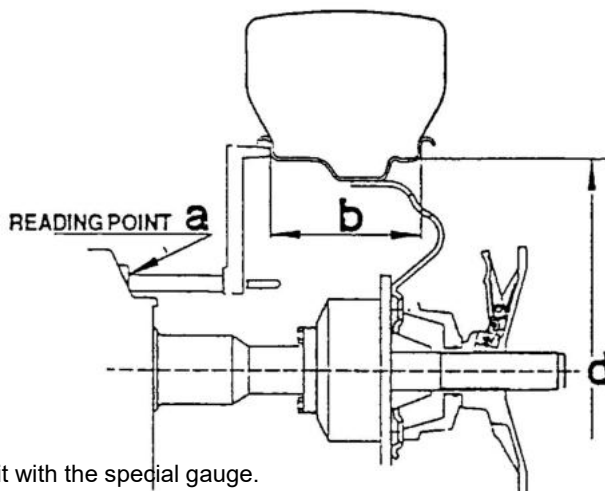


PRESS

Keep "FINE" pressed

**Fig 10**

If necessary, the dimensions can be entered or modified manually according to the following procedure:



**DISTANCE:**

-Preset distance "a" on the inside of the wheel after measuring it with the special gauge.  
Increment pitch 0.5cm.

**DIAMETER:**

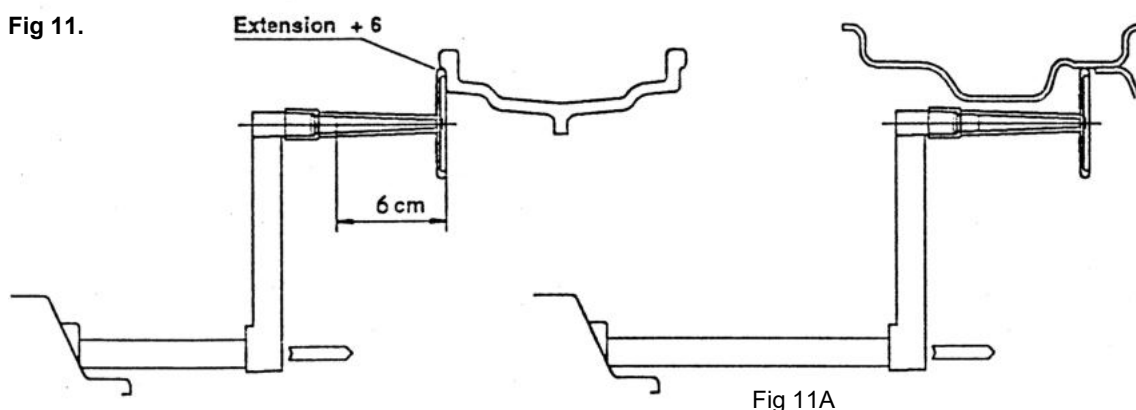
-Preset the nominal diameter "d" stamped on the tire.  
Increment pitches:  
-unit of measurement mm: 12/13mm  
-unit of measurement inch: 0.5"

**WIDTH:**

-Preset as for the AUTOMATIC MEASUREMENT mode.

**MANUAL PRESETTING WITH GAUGE EXTENSION**

**Fig 11.**



The extension increases the range of measurements of the gauge by 6cm (fig 11) and allows distance measurement also when the rim is of special shape (Fig 11A).

Proceed as follows:

- Fit the extension on the distance gauge
- Proceed to the distance measurement in the modes described earlier on.
- After reading value "a" on the index, reset the gauge to "0" and manually preset value "a+6".
- Press the diameter and width manually as described in fig 10




## OPTIOANL FEATURES:


Presetting memorized also when machine is switched off:

 +  +  UNIT of measurement of unbalance grams/ounces

 +  Start with guard closed

Presetting Lost when machine is switched off:

 UNIT of measurement of WIDTH inch  
(From "PRESETTING OF DIMENSIONS")  
NOTE: In inches each time machine is switched on.  
LED 18 lit up for selection in mm

 Unit of measurement of DIAMETER mm/inch  
(From "PRESETTING OF DIMENSIONS" by selecting DIAMETER)  
NOTE: In inches each time machine is switched on.  
LED 18 lit up for selection in mm

## **WHEEL BALANCING**

### **MEASUREMENT OF UNBALANCE**

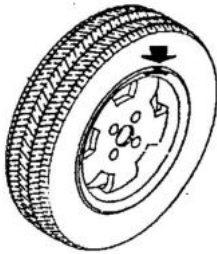
-To make a measuring spin, close the guard (press "START" if function "Start with guard closed" is not enabled. See OPTIONAL FEATURES)

-In a few seconds the wheel is brought up to speed and a new braking; the amounts of unbalance remain memorized on instruments 1 and 2.

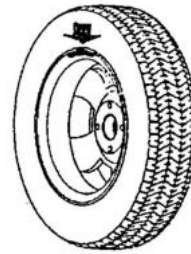
-The illuminated LED display show the correct angular position where to fit the counterweight (12 O'CLOCK position)

-In this screen, a light pressing of key "C" will display in sequence the preset dimensions.

**Fig 12 Correction on the outside**



**Fig 13. Correction on the inside**



### **DISPLAY OF UNBALANCE**

-Press the button "FINE" to display real unbalance amount (pitch 1gram/0.1oz)

-The instruments should show "GUD" for amounts of unbalance less than 5 gram (0.4oz); to display residual unbalance, press "FINE"

**NOTE: When static unbalance is greater than 30gram/1.1oz, the wording "OPT" appear on the display "17", In such case, press push button "14" and the system passes automatically on to the second unbalance optimization spin (see relative section)**

### **RECALCULATION OF THE UNBALANCE**

-Preset the new dimensions following the procedures described above.

-Without repeating the spin, press button "C"

-The new recalculated unbalance values are displayed.

### **MINIMIZE STATIC UNBALANCE**

-When standard commercially available weights with pitch of 5 every 5g, an unbalance of up to 4g can remain.

The damage of such approximation is conspicuous for the fact that most of the disturbance of the vehicle are caused by static unbalance. The computer **indicates** automatically the **optimum entity** of the weights to be applied, by approximating them in **intelligent** mode according to their position. (Pitch 5 gram/0.25oz)

-Press "FINE" to display actual unbalance. (Pitch 1 gram/0.1oz)

-The instruments show "0" for unbalance less than 5grams/0.4oz; to display the residual unbalance, press "FINE"

## AUTOMATIC WHEEL POSITIONING

Automatic wheel position is always performed with reference to the position of the unbalance on the outside. When a measurement is made of the STATIC unbalance, wheel positioning is automatic. Positioning accuracy is approx.  $\pm 20$  degree for wheel weighing up to 25kg. Positioning is never performed for wheels less than 13" in diameter.

## STATIC-ALU

The available functions show where to place the corrective weights in positions differing from the normal ones.

-Press "ALU" to select the required "ALU" functions "F" for static correction.

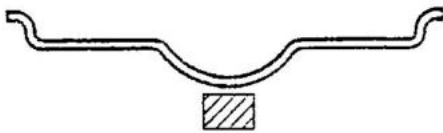
-LED's (5) when lit up, clearly show the position selected as indicated as below Fig 14.

The amounts of unbalance are displayed correct on the basis of the selected correction position.

Fig 14

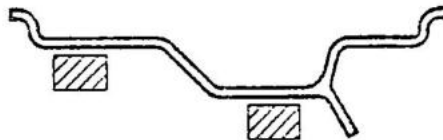


**STANDARD**- Balancing of steel or light alloy rims by applying clip-on weights on the rim edges.

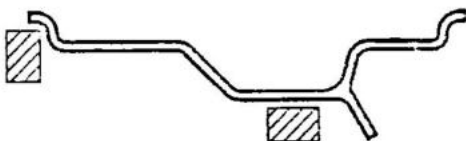


**STATIC**- STATIC correction is required for motorcycle wheels or when it is impossible to place the weights on both sides of the rim.

NOTE: The balance position can be read on indicator 3 or 4- it does not matter which. For unbalance values exceeding 30 gram/1.1oz, the wording "OPT" appear on display "1"; it is possible to press directly on to the second unbalance optimization spin.



**ALU1**- Balancing of light alloy rims with hidden application of the adhesive weights on the outside.



**ALU2**- Combined balancing: clip-on weight on inside; hidden application of the adhesive weight on the outside. (Position of the external weight as in ALU 1)



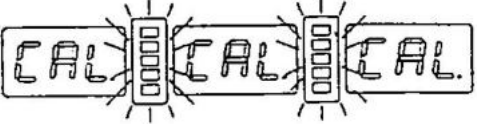
## SELF CALIBRATION


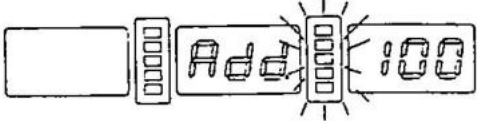
### CALIBRATING THE MACHINE

Proceed as following for machine self calibration

- Mount any wheel on the shaft, even if not balanced; better still if of an average size.
- Preset the exact dimensions of the wheel mounted.

NOTE: Presetting of incorrect dimensions could mean the machine is not correctly calibrated and therefore all subsequent measurement will be incorrect until a new self-calibration is performed with the correct dimensions;

PRESS  +  →  Until the positioning LED's pass from flashing to being steady.

PRESS  →  Add a weight of 100 grams on the outside in any angular position

PRESS  →  Machine calibrated


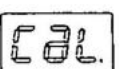
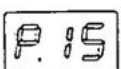

-Remove the master weight from the wheel and balance the wheel according to the previously described procedures.

The value measured by the machine with this self-calibration cycle is automatically memorized in a special memory which retains them even when machine is switched off. Hence when the machine is switched on again, it is ready to operate correctly. However, self-calibration can be carried out whenever required or when there is some doubt whether the machine is operating correctly.

### AUTOMATIC GAUGES

#### DISTANCE GAUGE

PRESS  +  →   

-Move distance gauge into position "0" and keeping it well held, press  →   

-Move the gauge into position "15" and press

 →   

Move the gauge back to reset position.

The machine is ready to work.

CALIBRATION CORRECTION

### DIAMETER GAUGE

PRESS + → -Diameter value currently preset  
-Preset the value with which the machine is to be calibrated.

PRESS →

-Bring the gauge tip into the measuring position and keeping it well held,

Press → CALIBRATION CORRECTI

-Move the gauge to rest position.

-The balancing machine is ready to work.

In the event of incorrect entry during the diameter gauge calibration function, press **STOP** to delete it.

### SELF-DIAGNOSTICS

#### Press button **D**,

the system carries out a test for correct operation of the displays and LED'S of the PC board, at the end of which the wording "**POS**", appears on display "17". At this point the position sensor can be checked for correct operation:

-Gradually move the wheel. The LED "1" should start flashing. Switching from reset, the wording "-0-" should appear on display "2" (once every 360 degrees).

-When the wheel is moved in required direction of rotation, LED "2" should remain lit up.

#### Press button **ALU**

-A number appears on display "1" which varies when the distance gauge is moved and represent a reference for the calibration of the potentiometer used in automatic distance measurement (only for expert personnel).

-It is possible to switch to the distance gauge calibration function by pressing push **STOP** and **FINE** buttons both at the same time.

#### Press button **ALU**

-A number appears on display "1" which varies when the diameter gauge is moved and represent a reference for the calibration of the potentiometer used in automatic diameter measurement (only for expert personnel).

-It is possible to switch to the diameter gauge calibration function by pressing push **STOP** and **FINE** buttons both at the same time.

Press button **ALU** to terminate the auto diagnostics function, such function can be interrupted at any moment by pressing button **C**.

---

**ERRORS**

Various abnormal conditions can arise during machine operation. If detected by microprocessor, they appear on the display the ERROR number:

<b>ERROR</b>	<b>MEANING</b>
1	No rotation signal. Could be caused by faulty position transducer, or motor not starting or something preventing the wheel from turning.
2.	During the measurement spins, wheel speed had dropped to below minimum 60 r.p.m. Repeat the spin
3.	Error in mathematical calculations; most probably caused by too high wheel unbalance.
4.	Rotation in opposite direction.
5.	Guard open before start of the spin.
7	Fault in memory of the self-calibration values. Repeat the self-calibration.
8.	Error during self-calibration. Could be due to the second spin made without adding reference weight, or else by a break in the transducer cable.
9.	Too high a diameter for gauge calibration;.

**INCONSISTENT UNBALANCE READINGS**

Sometimes after balancing a wheel and removing it from the balancing machine, then again mounting it on the balancing machine, it is found that the wheel is not 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. in 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 screw, it could be possible that the screws have not be correctly tightened- they should be tightened one by one crosswise or else (as often happened) holes have been drilled on the wheel with too wide tolerance.

Small errors, up to 10 grams(4 oz) are to be considered normal in wheels locked by a cone; the error is normally greater for wheels locked with screws or studs.

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

## ***ROUTINE MAINTENANCE***

**Warning! Before carrying out any operation, disconnect the machine from the mains.**

### **ADJUSTMENT OF THE DRIVING BELT TENSION**

1. Remove the weight holder shelf carefully not to tear away the electrical connections.
2. Slightly loosen the four screws fastening the motor. Then shift the motor until the belt is correctly tensioned.
3. Carefully retighten the 4 motor mounting screws. Check then when the belt is running, there is no side deviation.

### **TO REPLACE THE FUSES**

Remove the weight holder shelf to gain access to the power supply PC board and the two fuses mounted on it. If the failure persists, contact the manufacturer or dealer.

### **ADAPTERS:**

Plastic wheel holder sleeve: kept the inner rubber ring constantly lubricated.

## **SPECIAL MAINTENANCE**

(FOR SPECIALIZED PERSONNEL)

### **SETTING OF MACHINE PARAMETERS**

To set the machine parameters (DF; I; S), press keys "16"+"10" as in self-calibration. When the LED'S stop flashing, instead of performing the spin, press the following keys within 5 seconds and in the correct sequence.:

( ↓ a ) (11)      then    ( ↑ a ) (11)    then **ALU** (9)

After pressing ( ↓ a ) and ( ↑ a ), the displays go out. After pressing ( **ALU** ), the current fixed distance value of "DF" appears; it can be modified with ( ↑ b ) and ( ↓ b ). (Push button 12.)

Press ( ↑ a ) to modify parameter "I"

The current value (in %) appears on the right display "2", while the wording "I" appears on display "1" plus the symbol "-"; modify with ( ↑ b ) and ( ↓ b ).

Press ( ↑ a ) : the value "S" appears on display "2" ; modify with ( ↑ b ) and ( ↓ b ).

To finish, press ( ↑ a )

NOTE: When the **FINE** key is pressed during any one of the parameter presetting phases, the system interrupts such function and sets the parameter with basic values.

**Basic configuration values are DF=80    I=0    S=330**

After modifying such values, the machine requires self-calibration again.

Basic configuration values for F8 are:

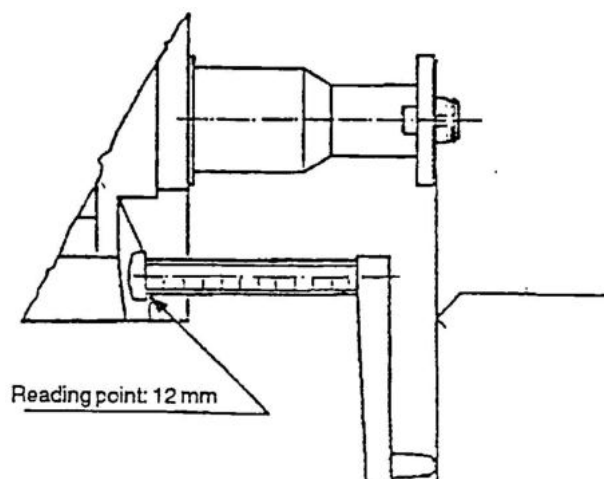
**DF=124,    I=0    S=330**

**N.B: The values at which the machine is set are given on a special nameplate inside the machine.**

### **CHECK AND CALIBRATE THE AUTOMATIC DISTANCE/DIAMETER GAUGES**

#### **CHECK**

Check that with the ruler for measuring the distance of the wheel Reads 12cm as measurement of the distance of the adapter support plane. If the graduated scale is changed, position it with the line indicating 12 at the fixed index limit (reading point) when the tip coincides with adapter support plane.





### **CALIBRATION OF THE DISTANCE POTENTIOMETER**

Calibration of the distance potentiometer

- Remove the weight holder shelf and refit on the gauge rod.
- Back-off the set screws fastening the pulley to the potentiometer shaft.
- Select self-diagnostics by pressing button "16" ,**D**.
- After the test for correct display operation, press **ALU**

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

- With the gauge fully retracted, turn potentiometer shaft holding the pulley still until the lowest possible number is read (about 30)
- Increase by 4 numbers and retighten the set screws fastening the pulley on the shaft.

### **CALIBRATION OF THE DIAMETER POTENTIOMETER**

-Press **ALU** after carrying out the **CALIBRATION OF THE DISTANCE POTENTIOMETER**.

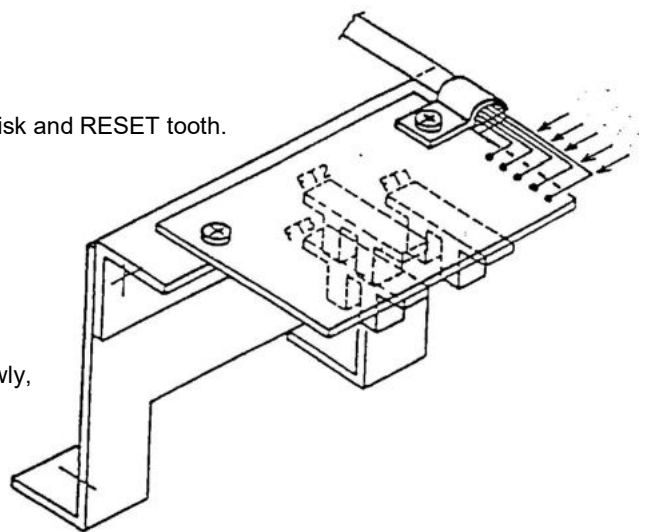
- The word "dIA" appears on the left display, while on the right display there appears a number which varies when gauge us rotated -and represents a difference for potentiometer calibration.
  - Lift out the diameter potentiometer from the gauge rod after loosing the mounting screw.
  - Slightly pull the gauge rod out and rest its locator on the machine shaft extremely close to the base.
  - Turn the potentiometer shaft unit 34 is read on the display, then reinsert the potentiometer is its correct working position.
  - Lock the potentiometer with relative set screw.
- Press "ALU" to quit the function after calibration.

NOTE: The function can be interrupted during any phase, by pressing "C".

### **CHECK THE POSITION SENSOR**

To check efficiency of the position sensor, proceed as follows;

1. Make sure that none of the three photocells rub against the phase disk and RESET tooth.
2. Using a voltmeter set to the Vd.c. scale, test the following voltages:
  - \*Between earth and red wire + 5 Vdc steady
  - \*Between earth and yellow wire (RESET)+4.5 to 4.8 Vd.c when the RESET tooth is the photocell.
  - \*Between earth and the green wire (CLOCK) and between earth and the white wire (U/D), when the machine shaft is turned very slowly, there should be a variation in voltage going from "0" to 4.5/4.8Vd.c.

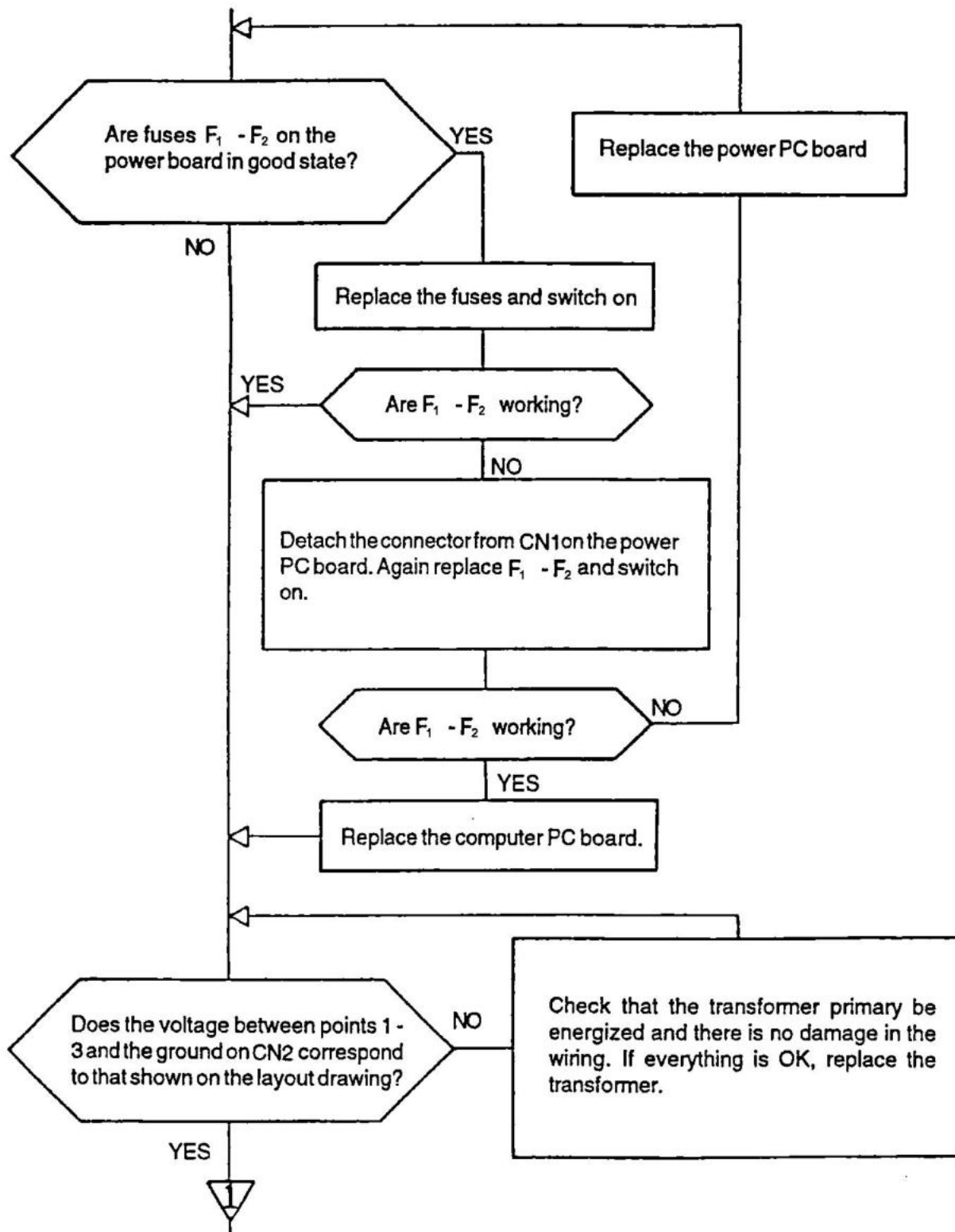


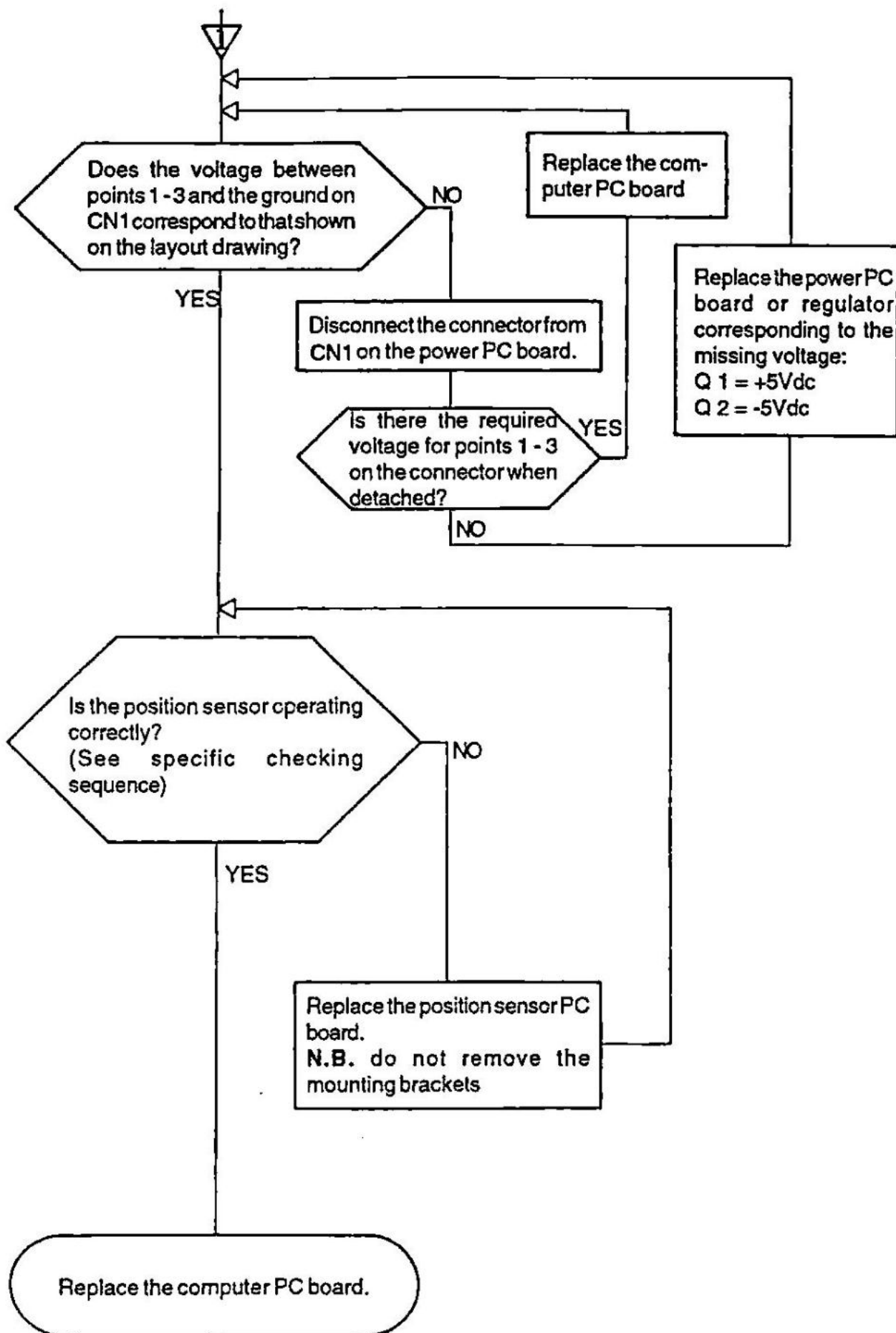
NOTE: When the position sensor requires replacement, remove just the PC board after backing-off the two mounting screws; as the mounting bracket is not moved, repositioning is easier.

## LOGIC TROUBLE SHOOTING SEQUENCE

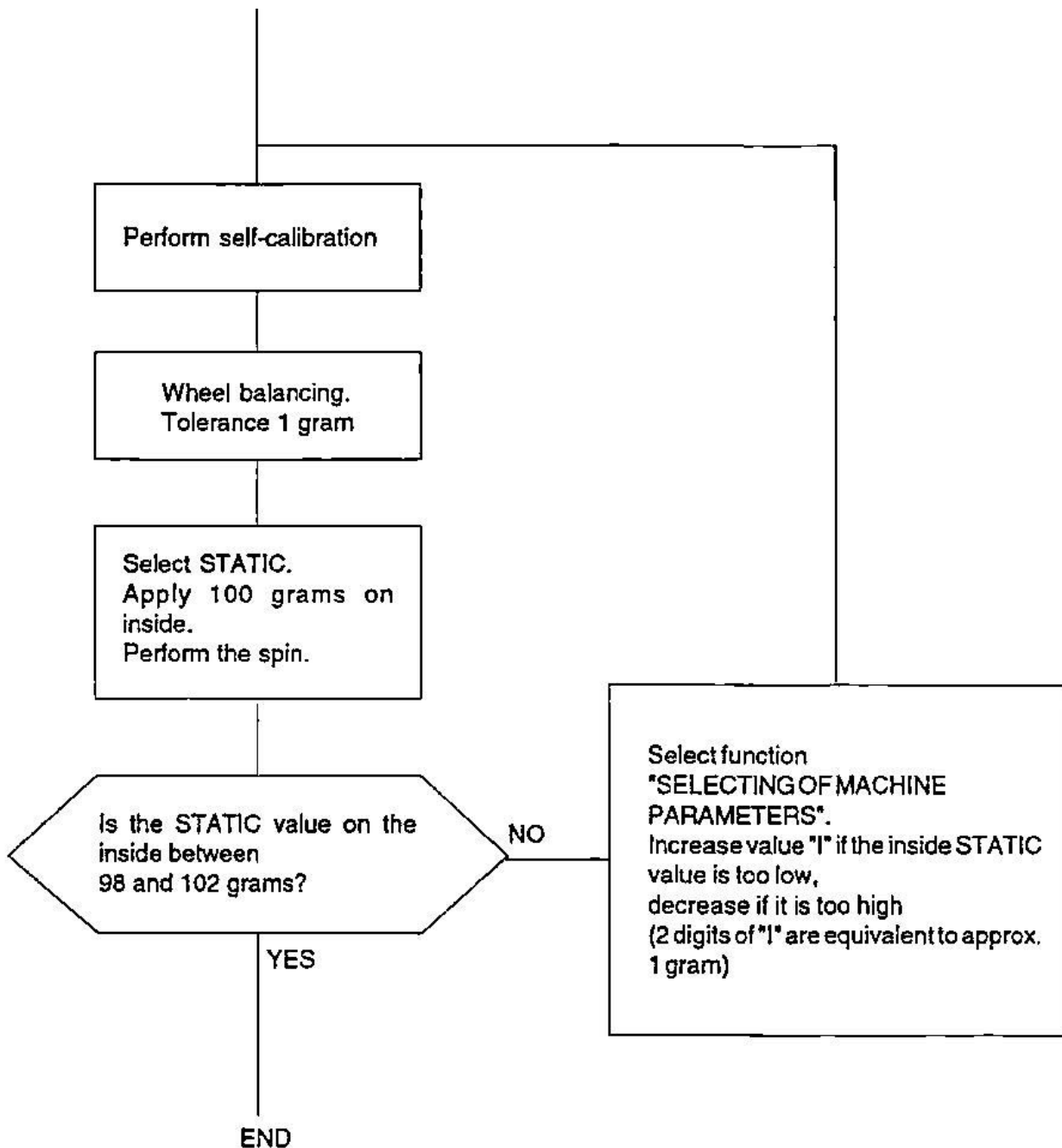
Before carrying out any tests, disconnect braking resistor R from the contractor. Only reconnect resistor R at end of testing. When power or computer PC boards require replacement, repeat the self-calibration of the balancing machine and calibration of the automatic gauge.

When the computer PC board is replaced, preset the machine parameters as shown on relative nameplate.

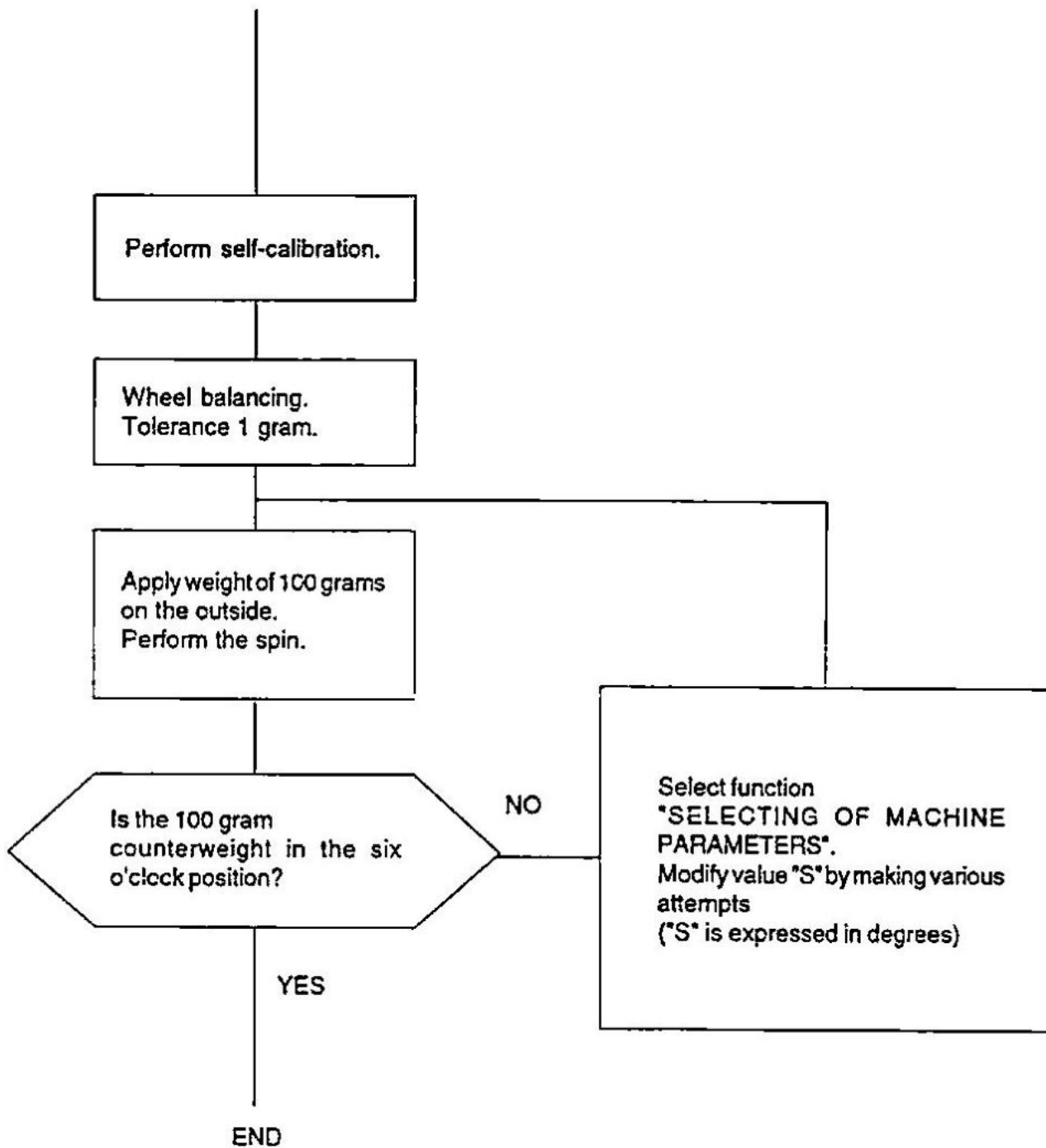




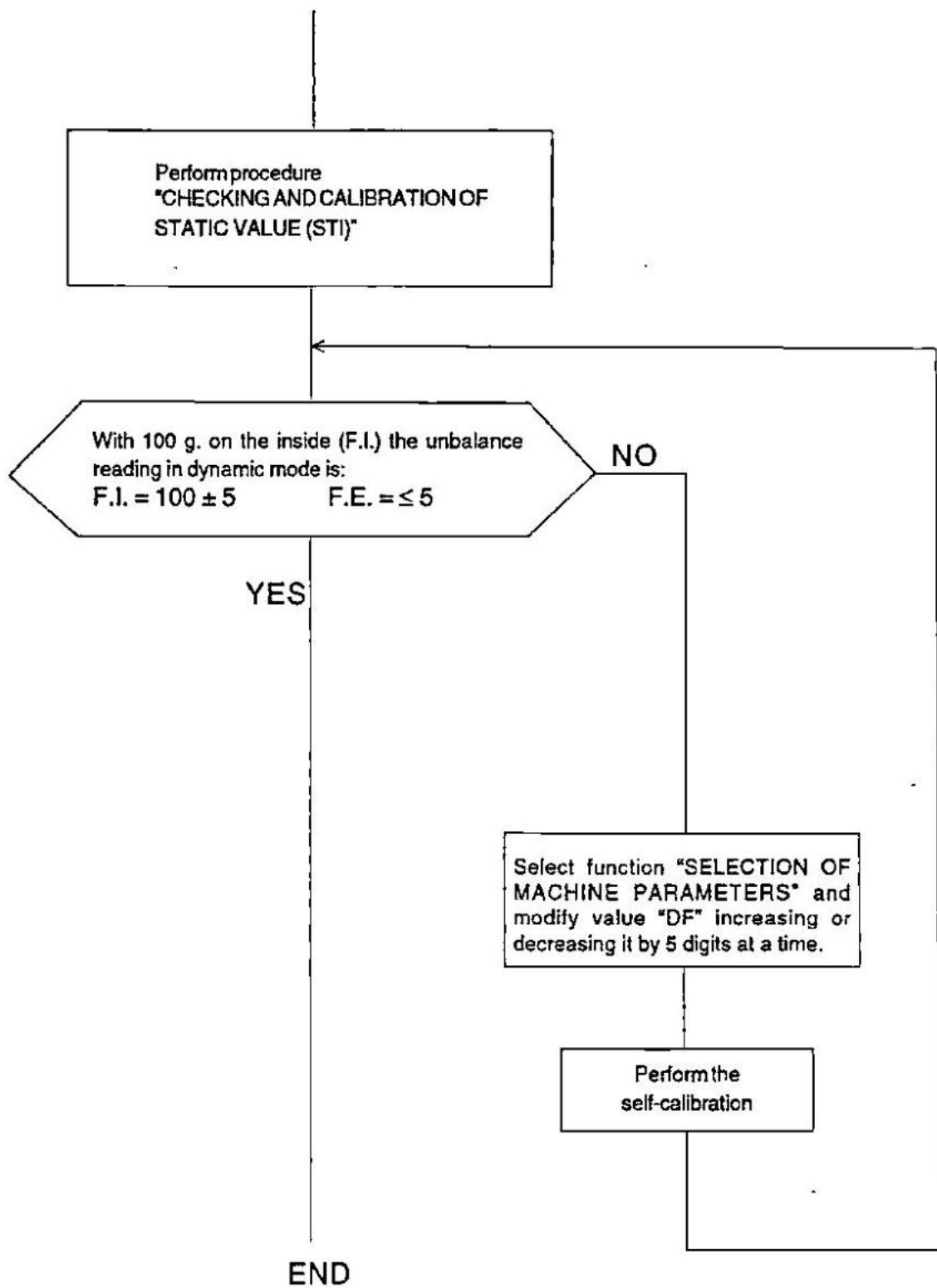
CHECKING AND SETTING OF STATIC VALUE (STI)



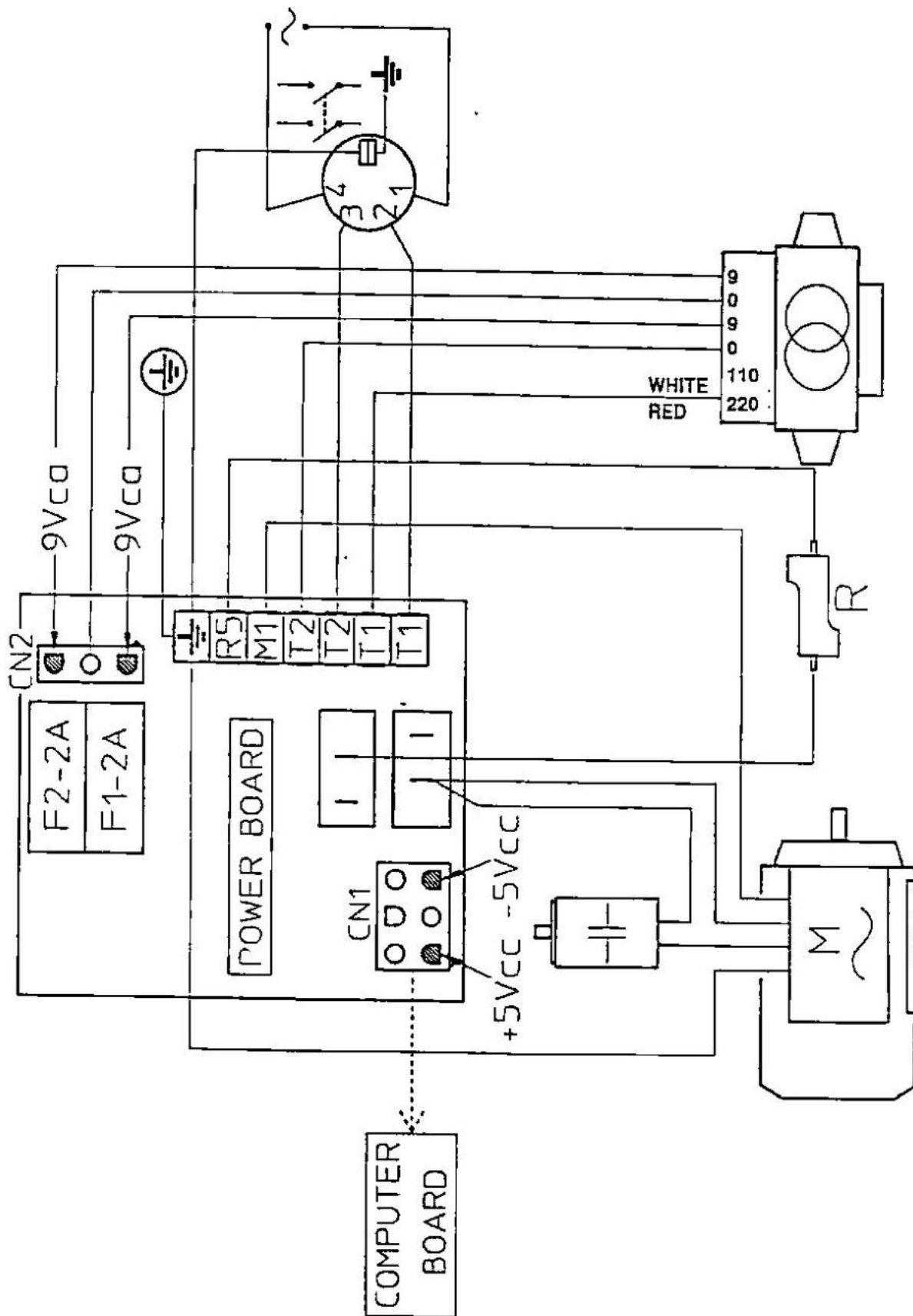
CHECKING AND SETTING OF UNBALANCE POSITION



CHECKING AND CALIBRATION OF FIXED DISTANCE VALUE (DF)



**POWER PC BOARD LAYOUT**



**REPLACE THE POWER PC BOARD**

