WHEEL BALANCER

USER MANUAL

INDEX

1-- DESCRIPTION OF THE BALANCING MACHINE

1.1--GRNERAL

It is an electronic balancing machine with microprocessor designed for balancing wheels weighting up to 65kg.
The push button controlled calibration system allows a range of adjustment which is also sufficient to cover wheels
Differing from ordinary ones (motorcycles and racing cars).
Special functions are also available to cater for wheels of unusual shape and there is provision for optional functions of the balancing machine.

1.2--TECHNICALDATA

Max wheel weight	65kg
Max power consumption	180 — 300w
voltage	230v / 50HZ
Balancing accuracy	±1g
Balancing speed	200r / min^{-1}
Rim diameter	from 10″ to 24″ or from 256 to 615mm
Rim width	from 1.5″ to 20″ or from 40 to 510mm
Cycle time	10s
Net weight	132kg
Overall dimensions of machine	1235×1240×1600 (h)
Sound pressure level in cycle	＜70dB (A)
Operating temperature range	from 0 to 50℃

1.3--RECOMMENDATIONS

-Before starting to use the balancing machine, carefully read the operating instruction manual.
-Keep the manual in a safe place for future reference.
-Refrain from removing or modifying machine parts which 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 LIOUIDS CONTAINING SOLVENTS)
-Before starting the wheel balancing cycle, mark sure that the wheel is securely locked on the adapter.
-The machine operator should not wear clothes with flapping edges; make user that unauthorized personnel do not approach the machine during the work cycle.
-Avoid placing counterweights or other bodies 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.

1.4--STANDARD SAFETY DEVICES

-stop push button for stopping wheel under emergency conditions.
-the safety guard of high impact strength plastic, is with shape and size designed to prevent risk of counterweights from flying out in any direction except toward the floor.
A microswitch prevents starting the machine if the guard is not lowered and it stops the wheel whenever the guard is raised.

2 HOISTING AND INSTALLATION

2.1 MACHINARY INSTALLMENT

2.1.1 Check parts are in good condition or not. Please contact supplier if any question.

2.1.2 Installed on the flat and solid ground, otherwise wrong measurement.

2.1.3 500mm around the machine is free for convenient operation.

2.1.4 Fasten the machine through the base eyelet .

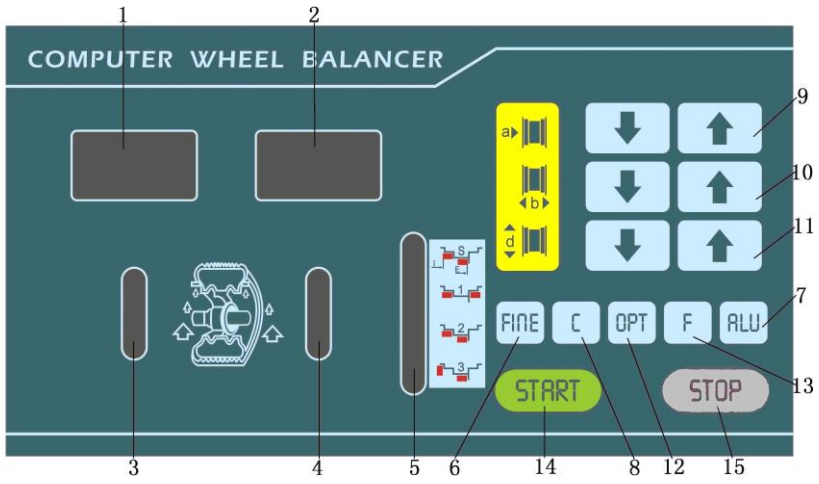
2.2 Electric connection (operated by special personnel)

2.2.1 Select related power supply according to technical data and add to automatic air switch.

2.2.2 Select the plug with ground wire. The wire of yellow and green is ground wire, connecting with floor . The wrong connection will damage the computer.

3--CONTROL PANEL

FIG.1



1. Digital display， AMOUNT OF UNBALANCE inside
2. Digital display， AMOUNT OF UNBALANCE, outside
3. Indicator, POSITION OF UNBALANCE, inside
4. Indicator, POSITION OF UNBALANCE, outside
5. Indicators, balance mode
6. Push button for reading unbalance<5g (0.3oz)
7. Push button, balance mode selection
8. Push button for re-calculate:/self-calibration
9. Push buttons a, manual rim DISTANCE input
10. Push buttons b, manual rim WIDTH input
11. Push buttons d, manual rim DIAMETER input
12. Push button, optimization of unbalance
13. Push button, rapid swiching between DYNAMIC /STATIC(selection of optional functions)
14. Cycle start push button
15. Emergency stop push button

NB: Only use the fingers press the push buttons, NEVER use the pincer for the counter weights or other pointed objects.

3.3 Function conversion keys

3.3.1 PRESETTINGS MEMORIZED ALSO WHEN MACHINE IS SWITCHED OFF:

F + + a + -a ⟶ -UNIT of measurement of unbalance grams/ounces

F + STOP ⟶ -Start with guard closed

PRESETTINGS LOSTED WHEN MACHINE IS SWITCHED OFF:

F + +b ⟶ -UNIT of measurement of width mm/inch

or

F + -b ⟶ (from "PRESETTING OF DIMENSIONS" by selecting WIDTH).

N.B:-In inches each time machine is switched on.

F + +d ⟶ -UNIT of measurement of DIAMETER mm/inch

or (form "PRESETTING OF DIMENSIONS" by selecting DIAMETER)

F + -d **N.B:**-In inches each time machine is switched on.

DISPLAY OF UNBALANCE:

F ⟶ Dynamic ⟶ Static ⟶ Dynamic

ALU ⟶ S > 1 > 2 > 3 > S

4--WHEEL MOUNTING

4.1 Spindle installment

Clean the anti-rust with industrial alcohol or gasoline before adapter mounting to protect installment precision. "0" on the adapter aims at "0"on the spindle, fasten with long bolts by six-angular spanner. (must be tightly for retesting precision)

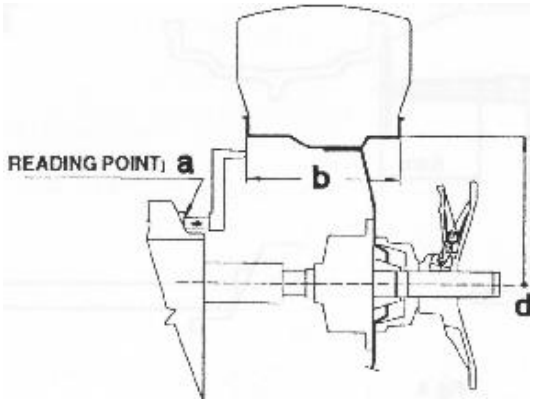
4.2 Tire installment

4.2.1 Mounting the cone which is suitable for rim aperture on the spindle. If the rim is less than "15",the smaller side of the cone towards outside, mounting cone and then the tire; If the rim is more than "16",the smaller side of the cone towards inside, mounting tire and then the cone.

4.2.2 Fasten with quick nut after above all.

5-PRESETTING OF DIMENSIONS

FIG.2



Rim data is stored in the machine. Input data and press [↑]or [↓] to get the right data.

FIG.3: DISTANCE

Press distance “a” on the inside of the wheel from the machine measuring it with the special gauge.(Increment pitch 0.5cm. Full scale 25cm)

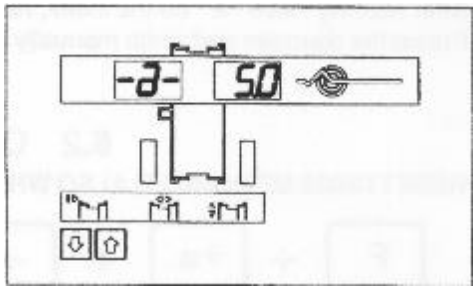


FIG.4: WIDTH

Preset the nominal width which is generally given on the rim, or else measure width “b” with the caliper gauge (supplied as standard).
(increment pitches:-unit of measurement mm:5mm
-unit of measurement inch:0.25 " the following is displayed: 0.2 for 1/4 " 0.5 for 1/2 " 0.7 for 3/4 ")

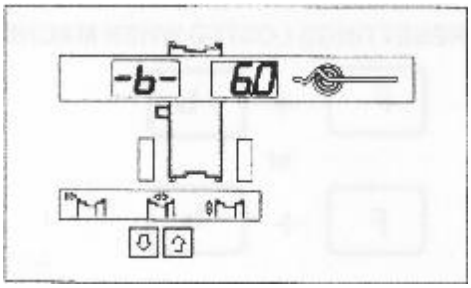
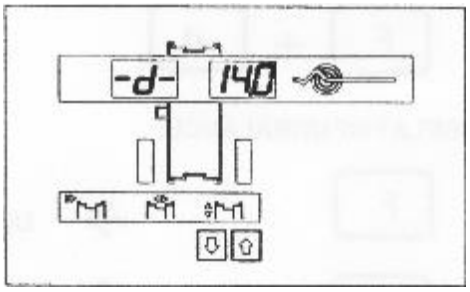


FIG.5: DIAMETER

Preset the nominal diameter “d” stamped on the type:
(increment pitches:
-unit of measurement mm:12/13mm
-unit of measurement inch:0.5 ")

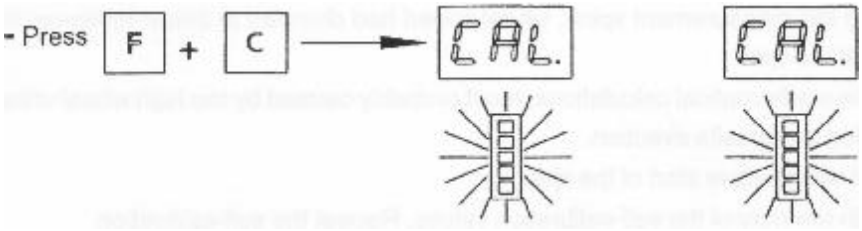


6--SELF-CALIBRATION

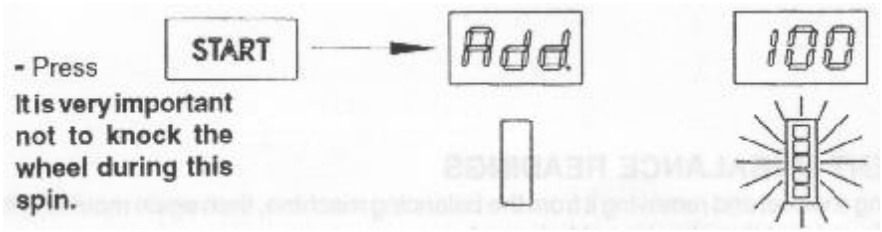
For machine self-calibration, proceed as follows:
-Mount any wheel on the shaft, even if not balanced; better still if of an “average” size.
-Preset the exact dimensions of the wheel mounted.

CAUTION*!!* Presetting of incorrect dimensions could mean the machine is not correctly calibrated and

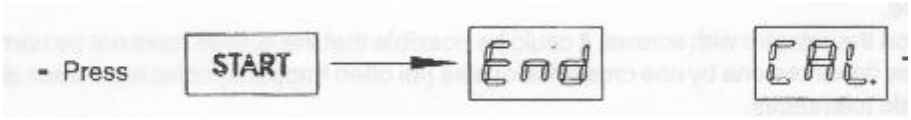
therefore all subsequent measurements will be incorrect until a new self-calibration is performed with the correct dimensions!



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



Add a weight of 100 grams (3.5 oz) on the outside in any angular position.



-MACHINE CALIBRATED
-remove the master weight from the wheel and balance the wheel according to the previously described procedures.

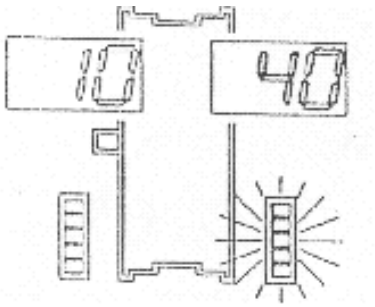
The values measured by the machine with this self-calibration cycle are automatically memorized in a special memory which retains them even when the machine is switched off. Hence when the machine is switched on again, it is ready to operate correctly. However, self-calibration can be carried out whenever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

7--WHELL BALANCING

7-1 MEASUREMENT OF UNBALANCE

- To make a measuring spin, close the guard (alternatively press) STA if selected).
-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 displays show the correct angular position where to fit the counterweights (12o'clock position).Start the breaker and keep it still.
-In this screen, a light pressing of key C will display in sequence the preset dimensions.

FIG.7: POSITIONING AND CORRECTION ON THE OUTSIDE



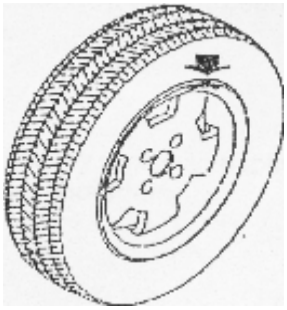
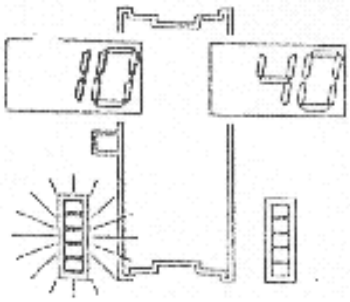
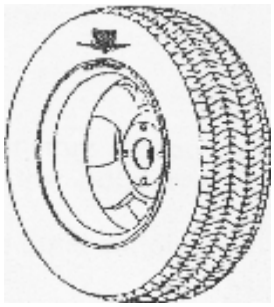


FIG.8: POSITIONING AND CORRECTION ON THE INSIDE





7.2- RECALCULATION OF THE UNBALANCE

-Preset the new dimensions following the procedures described above.

-Without repeating the spin, press [C]

-The new recalculated unbalance values are displayed.

7.3- TO MINMIZE STATIC UNBALANCE

-When standard commercially available weights with pitch of 5g every 5g, an unbalance of up to 4g can remain. The damage of such approximation is conspicuous for the fact that most of the distrubances of the vehicle are caused by approximating them in “intelligent” mode according to their position

- Press [FINE] to display actual unbalance (0-4g)

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

[FINE]

7.4-STATIC-ALU

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

-Press [ALU] o [F] to select the required function

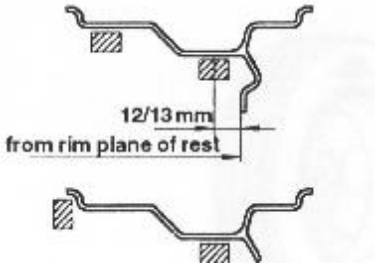
-The amounts of unbalance are displayed correct on the basis of the selected correction position.

FIG.9

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

Static- STATIC correction is required for motorcycle wheel or when it is not possible to place the counterweights on both sides of the rim.

(ALU)1- Balancing of light alloy rims with application of adhesive wights on the rim shoulders.



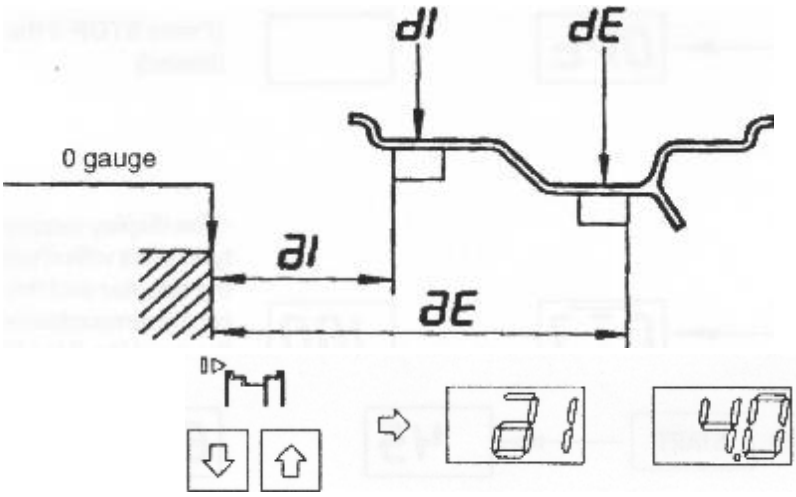
(**ALU)2-** Balancing of alloy rims with hidden application of the outer adhesive weight. Position of
the outer weight is the one shown in the figure.

(**ALU)3-** Combined balancing: clip-on weight on inside; hidden application of the adhesive weight on the outside (Mercedes).
(Position of the outer weight as in ALU2).

7.5-SPECIAL "S" FUNCTION

The function is used for unusually shaped alloy rims where "ALU2" is not able to guarantee sufficient accuracy.
-Select the S option (relative LED light up) through the [ALU] push button.
-Take note of the dimensions following the diagram given below:

FIG.10

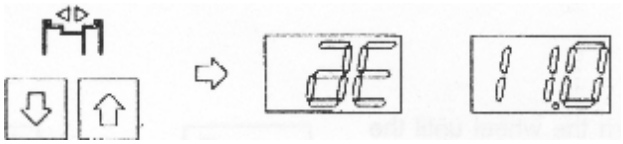


Sequence:

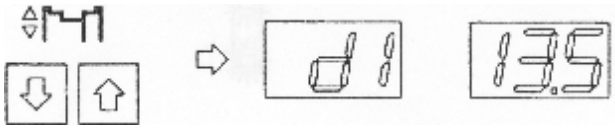
a) To modify al press

"al" The distance between machine body and inside counterweights
"aE" The distance between machine body and outside counterweights
"dl" The diameter dimension of inside counterweights of rim
"dE" The diameter dimension of outside counterweights of rim

b) To modify aE press

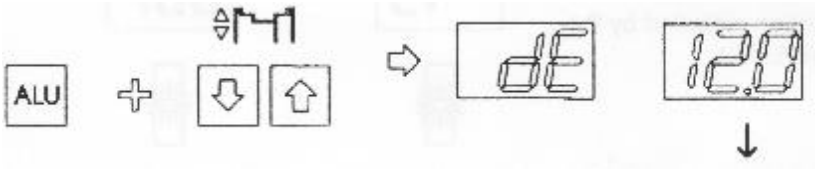


c) To modify dl press



N.B: by default dE is=0.8dl

d) To change dE press



(keep ALU pressed)

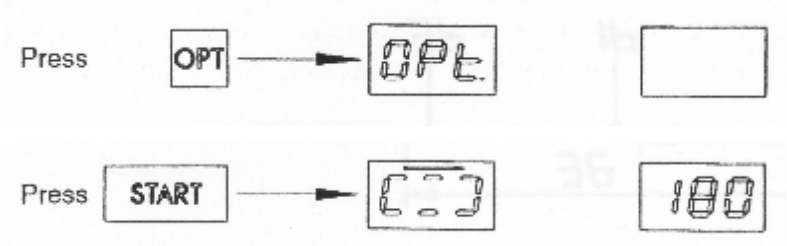
N.B: When dl is reselected, the system automatically returns dE=0.8dl.

The system automatically calculates the distance between the cents of gravity of the weights considering them to be about 14mm wide. To displace the unbalance associated with preset dimensions, press key [C]. if a spin has already been made, the system automatically recalculates the unbalance; otherwise press the [STRAT] key for a new spin.

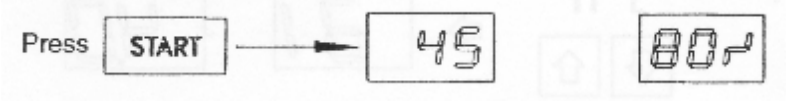
8—OPTIMIZATION OF UNBALANCE

8.1-This function serves to reduce the amount of weight to be added to the wheel to balance it.
-It is advisable for static unbalance exceeding 30 grams.
-In many cases an improvement of the residual eccentricity of the tyre can be achieved.
-The operations listed below should be carried out with great care in order to obtain the best possible results.

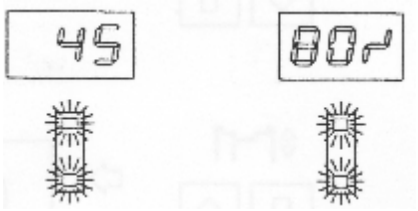
(Press STOP if the function is to be deleted)



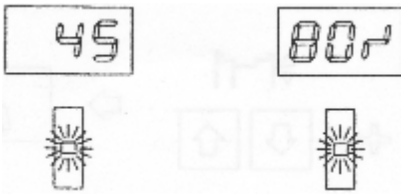
-The display requests rotation of the rim-tyre. Mark with chalk a reference sign on the adapter and rim in order that the rim can be remounted in the same position on the machine (Use index on the spindle).
-With the aid of a tyre remover, turn the tyre on the rim by 180°
-Refit the rim on the flange in the previous position.



Right display: value % (symbol)of possible reduction of the unbalance referred to the current wheel situation.
Left display: current static unbalance value in grams. It is the value which can be reduced by a wheel-rim rotation.
Turn the wheel until the outer LED's light up: mark the tyre at top point(12 o'clock position)



Likewise mark the rim in correspondence to the position indicated by the inner LED's.



-Make the two points concide.
-In the example given, an 80% reduction of the static unbalance of 45grams is obtained with a residue of about 9 grams.

8.2-**VISUAL WHEEL EXAMINATION**

In certain cases it is advisable to rotate the wheel with the guard open in order to inspect the condition of the tread.

-Press [F] while with the other hand press [START]

-A complete measuring spin is performed. At the end of the cycle, the function is automatically disabled.
WARNING: the use of this function is at risk of the operator.

9—ERRORS

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

ERROR	MEANING
1	No rotation signal. Could be caused by faulty position transducer, or something preventing.
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.
6	Fault in memory of the self-calibration values. Repeat the self-calibration.
7	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.

10—ROUTINE MAINTENANCE (Non specialized personnel)

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

10.1-ADJUSTMENT OF THE DRIVING BELT TENSION

1. Remove the weight holder shelf before careful 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. Please the accessory shelf back in position.

10.2-TO REPLACE THE FUSES

Remove the weight holder shelf to gain access to the power supply PC board and the two fuses mounted on this board. If the fuses require replacement, use ones of the same current rating.
If the failure persists, contact the Technical Service Department.

10.3-UNSTABLE BALANCE DISPLAY

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 every 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.

SPECIAL MAINTENANCE

(Only for specialized personnel)

11—TO CHECK THE DISTANCE GAUGE

11.1 The distance gauge does not require any adjustment. Just be careful when changing the graduated scale. Position it so as to read 0 at the fixed index limit(reading point) when the tip coincides with position shown in the figure.

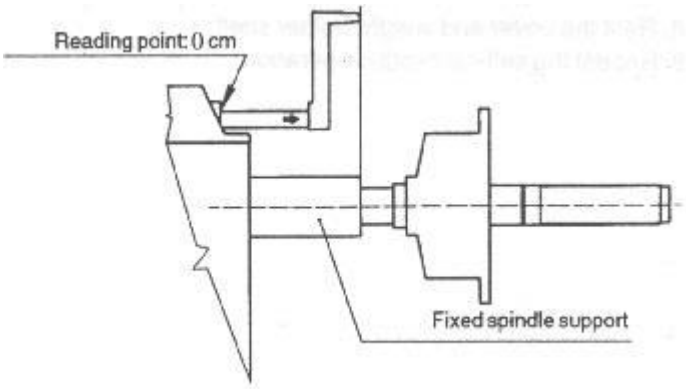
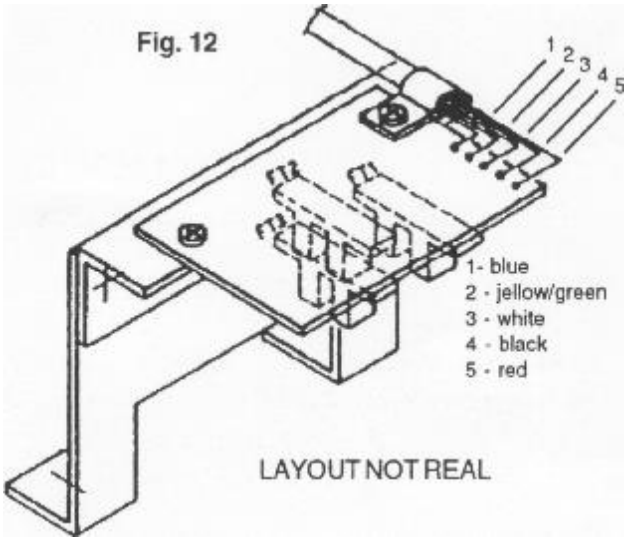


FIG.11

11.2 Check the position sensor

To check efficiency of the position sensor, proceed as follow:

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 (the machine should be switched On but without rotation):
   *between earth (ground) and red wire +5Vdc steady
   *between earth (ground) and yellow wire (RESET) +4.5 to 4.8Vdc when the RESET tooth is in photocell TCST 2000 and "0"Vdc when the RESET tooth is outside 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"Vdc to 4.5/4.8 Vdc.



CAUTION: 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.

11.3—ASSEMBLY OF THE PIEZO MEASURERS

ASSEMBLY INSTRUCTIONS

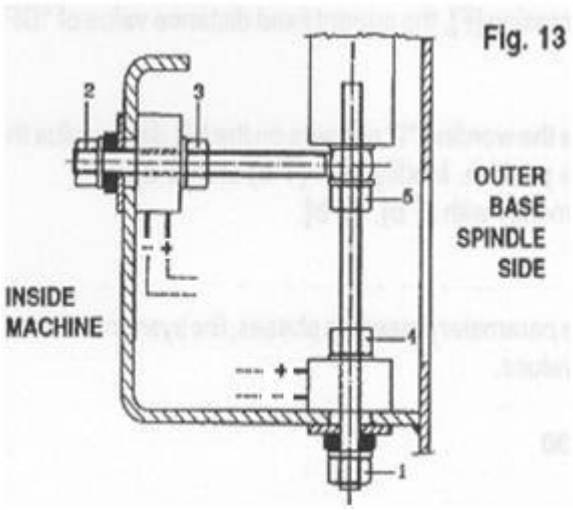


Fig. 13

Problems of excessive out-of-phase and compensation

sometimes depend on a fault in the piezo measurers.

To replace them, proceed as follows:

1. Dismounting cover and holder shelf.
2. Dismounting nuts 1 and 2 with relative cup springs and washers.
3. Dismounting nuts 3,4, then disassemble the various parts.
4. Reassemble the various parts without tightening the nuts being careful to follow the correct sequence.

N.B: the piezo units should be mounted in according with the position of the coloured wires shown in the drawing.

5. Keeping the spindle perfectly aligned, tighten nut 5 with a spanner and nuts 3 and 4 by hand (plus half a furn with the spanner if necessary).
6. Refit the cup springs and nuts 1 and 2. Tighten these nuts fully in order to fully regain the elasticity of the cup springs; then loosen them by half a furn. In this way the correct preloading of the piezo will be obtained (a troque wrench can be used set at 400kg.cm).
7. Cover the piezo units with a generous layer of silicone,

(***N.B.*** for correct operation, insulation of the piezo crystals should be greater than 50Mohm).

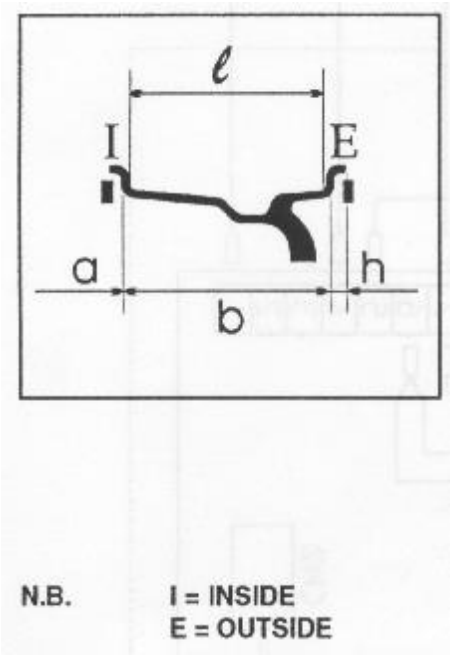
8. Refit the cover and weight holder shelf.
9. Repeat the self-calibration operation.

11.4--WHEEL MEASUREMENT AND PRESETTINGS ON THE BALANCING MACHING

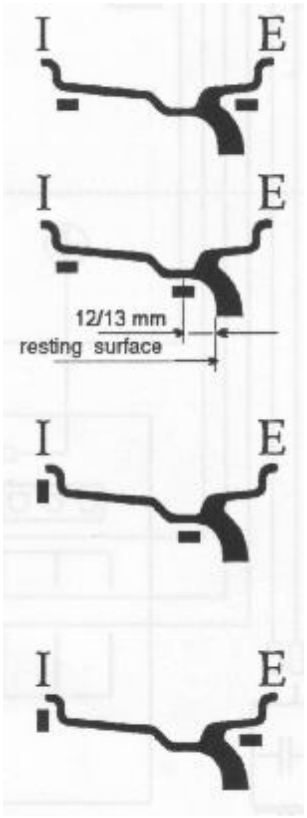
The ever increasing need for more accurate calibration and use of the ALU functions means that it is important to establish how to measure the rims and how the balancing machine interprets date. Hence a description is new given of how to moodily the preset dimensions automatically in order to obtain 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 thickness and physical 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 automatic corrects the measurement preset by adding 2×h=6mm to the measurement. Measurement “b” made with the gauge is generally more accurate even if every similar to the measurement “L” known to the rim user, the two measurements differ only by the thickness of the sheet metal, usually about 2mm 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 a 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.



−a



ALU1
a= a preset +3/4 "
b= b preset-1 1/2 "
d= d preset-1 "

AUL2
a= a preset +3/4 "
b= distance of adapter surface-1/2 " a
d1=d preset-1 "
dE=d preset-21/2 "

AUL3
a= a preset
b= distance of adapter surface-1/2 "

d1= d preset
dE=d preset-21/2 "

AUL4
a= a preset
b= b preset-3/4 "
d1=d preset
dE=d preset-1

11.5 Technical data setting up

The correct technical data makes sure the wheel balance precision.
Press {F}+{C},and then press the keys according t the following steps within 5 seconds when the light begins to shine. {-a}---{+a}----{F}.
When you press {-a} and {+a},the display screen will disappear.
Press{F},the present distance data will be on.
{DF}{125}, the right data is {DF},Press {+b}and {b}to change the data {DF}.
Press {+a}to shift data" I"
When{I}and {-3}are displayed, Data "I" is displayed on the right side. Press {+a} to shift data "S"
When {S} and {330} are displayed, press {+b} and {-b} to change data "S", and then press {+a}to conclude the operation.
Attention: Press <STOP> to stop the setting process during the operation.