



CEMB

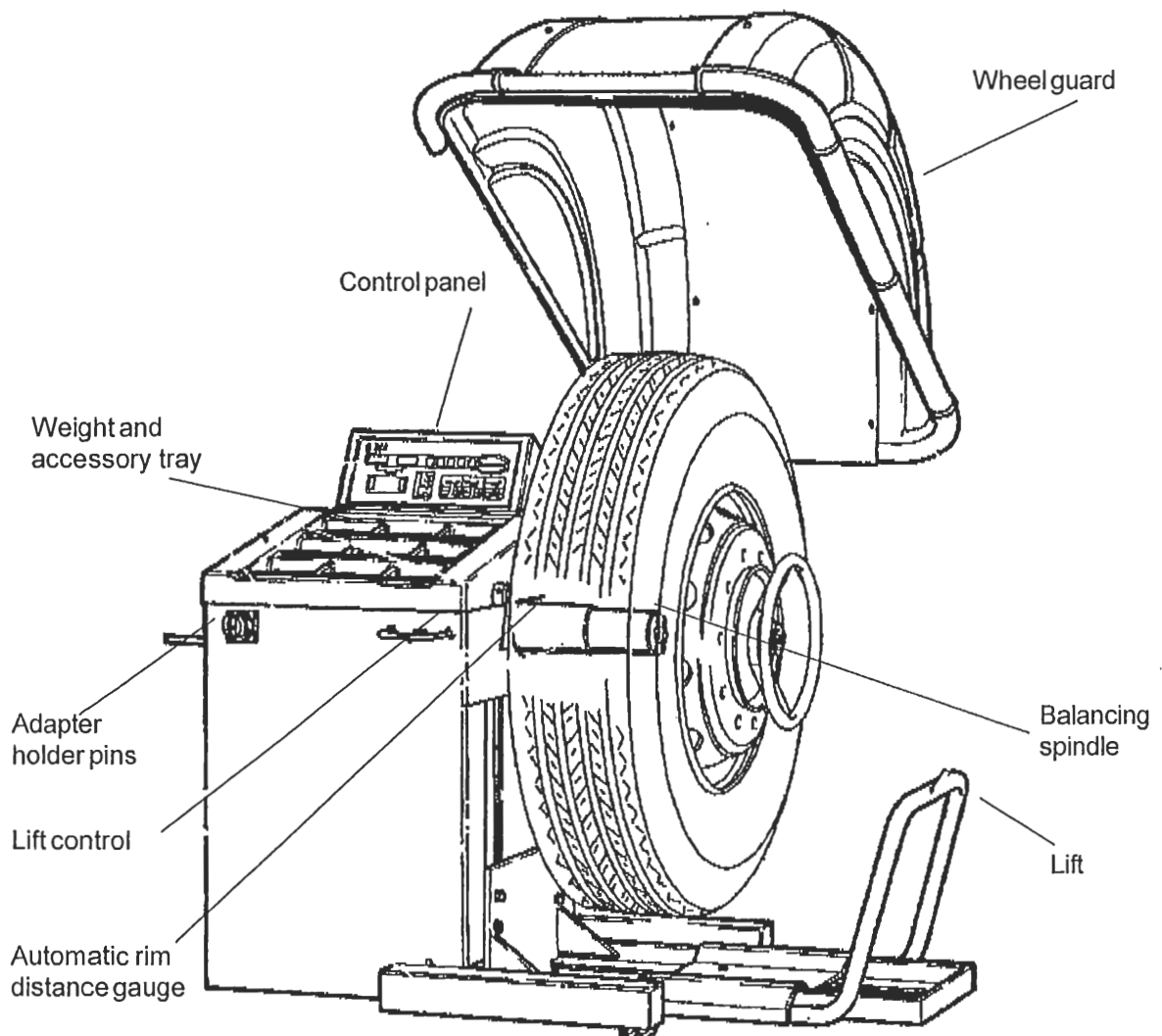
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C211

Automatic wheel balancer for heavy motor vehicles and cars

Nr.0147-2000.10

Operating and maintenance instruction manual



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- PNEUMATIC CIRCUIT DIAGRAM Dwg N° 16SP33464P
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- ENCLOSED : WIRING DIAGRAMS

Dichiarazione CE di Conformità
 Declaration of Conformity
 EG-Konformitäts-Erklärung
 Déclaration de Conformité
 Declaracion de Conformidad CE
 Declaração CE de Conformidade



EC-Verklaring van Overeenstemming
 Försäkran om CE-överensstämmelse
 CE-overensstemmelses-erklæring
 CE-overensstemmelses-erklæring
 CE-vaatimismukaisuus-vakuutus
 Δήλωση Συμμόρφωσης CE

La Ditta
 The Company
 Die Firma
 La Maison
 La Compañia
 A Empresa



Het bedrijf
 Företaget
 Virksomheden
 Virksomheten
 Υητιό
 Η εταιρία

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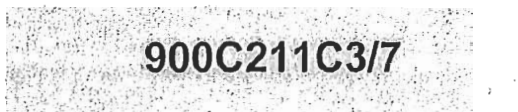
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Nr. di serie
 Serial Number
 Fabriknummer, usw
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 Numero de fabricacion
 Número de série



Serienummer
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 Αρ. Σειρός

Numero Distinta Base
 Manufacturing List Number
 Erstellungsliste nummer
 Numéro de liste de construction
 Numero lista de base
 Número da Lista de Base



Nummer basislijst
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 Αριθμός Καταλόγου Παραγωγής

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D.P.R. Nr. 459, allegato 1 del 24 Luglio 1996

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EN 292-1	X	EN 292-2	X	EN 294	X	EN 349	X
EN 418	X	EN 457		EN 60204-1	X	EN 60439-1	X
EN 50081-1	X	EN 50082-1	X	EN 50081-2	X	EN 50082-2	X

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27.07.00
 CEMB Spa
 Ing. Carlo Buzzi
 Carlo Buzzi

MANUFACTURING REVISION & UP-DATING

ct

MODEL : C211
VERSION : from B to C
PROGRAM VERSION :
SOFTWARE UP-DATING :

MODIFICATIONS :

- **New axis line with new 40 mm flanges**
- **New optical reflection phase enabler**
- **Cylinder balancing springs stronger by 30%**
- **Software upgrade**
- **New power transformer**
- **Distance axis gauge for ALUS 14" repositioned**

1 - DESCRIPTION OF THE WHEEL BALANCER

1.1 - GENERAL

The C211 machine is an electronic wheel balancer with microprocessor designed for balancing wheels up to 200 kg in weight.

The controls and indicator devices are all mounted on the front panel.

The push button calibration system allows a sufficiently wide range of adjustment to cater for wheels other than the ordinary ones (motor cycles and racing cars).

Certain functions are available for wheels of unusual shape and for setting the optional functions of the wheel balancer. The machine is equipped with a built-in pneumatic lift to facilitate mounting of large size wheels.


The lift is complete with a carriage running on castors with side bar having a dual function: ensuring operator safety and easier axial displacement of the wheel.

1.2 - TECHNICAL DATA

Max. wheel diameter	1300mm
Max. wheel weight	200 Kg
Max. power consumption	1100 W
Standard power supply	115/230 V single phase 50/60 Hz
Balancing accuracy	1 g for car / 10 g for truck
Balancing speed	100 r.p.m. for car wheels 70 r.p.m. for truck wheels
Rim diameter	10" to 26.5" or else 265 to 665 mm
Rim width	1.5" to 20" or 40 to 510 mm
Cycle time	8 to 20 sec
Net weight with guard (excluding cone adapters)	200 kg
Sound pressure level during work cycle	< 70 d B (A)
Operating temperature range	from 0° to 45° C
Min/max. compressed air pressure	8 to 10 Kg/cm ² approx 0.8 to 1 Mpa approx 8 to 10 Bar approx 115 to 145 PSI
Protection class	IP 54

- UNBALANCE DISPLAY PITCH

Car = 5 g (0.25 Oz) Truck = 50 g (1 Oz)

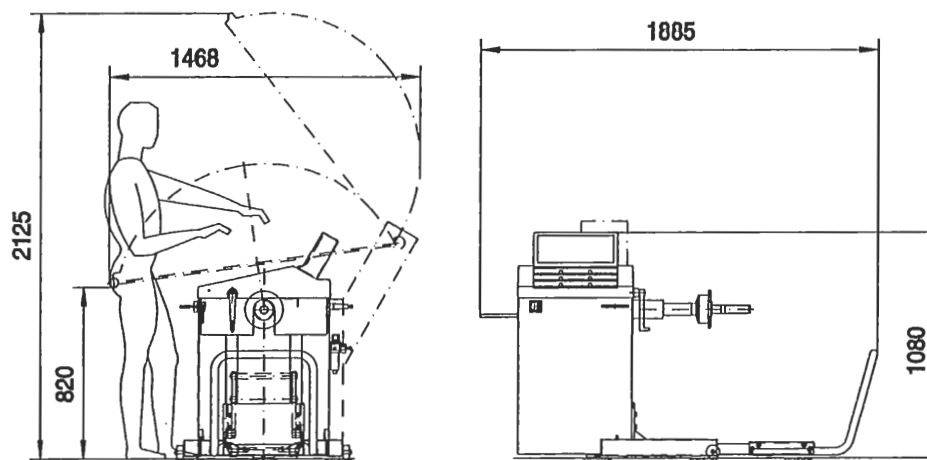
When  is pressed, the unbalance is displayed with pitch:

Car = 1 g Truck = 10 g

- UNBALANCE DISPLAY THRESHOLD

Car = 5 g (.3 Oz) Truck = 50 g (2 Oz)

OVERALL DIMENSIONS



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 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.

1.4- STANDARD SAFETY DEVICES

- Low rotation speed.
- 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 microswitch prevents starting the machine if the guard is not lowered and stops the wheel whenever the guard is raised.
- Protection system on LIFT control.

2- HOISTING AND INSTALLATION

To hoist the machine, lever only on the base where the 3 support points are located. Never, under any circumstance, apply force to other points such as the spindle, head, side guard or accessory shelf.

Check that the balancing machine touches the floor at the three support points.

The machine does not require anchoring to the floor for correct operation.

N.B.: The model without LIFT with protection must always be secured to the ground to ensure stability. The standard model with LIFT offers alternative options:

- Front wheel translation KIT
- Ground securing plate KIT

Fig. 1

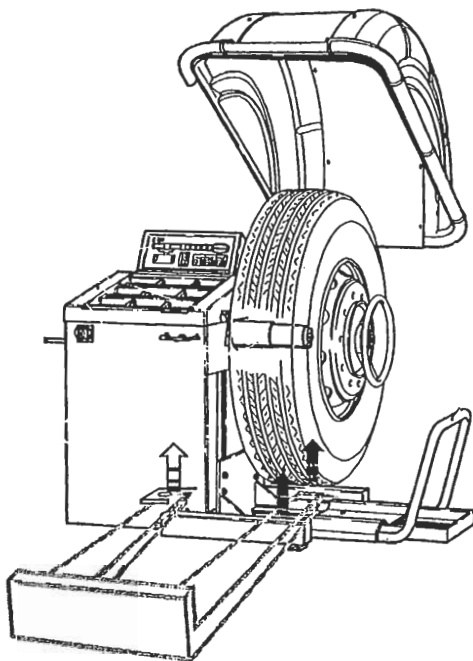
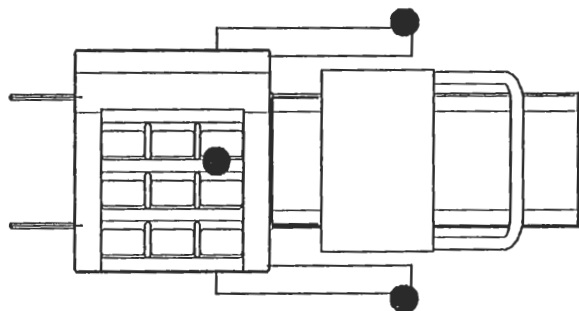


Fig. 1A



3 - COMMISSIONING

3.1 - ELECTRICAL POWER SUPPLY

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. CEMB 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 a slow acting safety switch rated at 4 A (230 V) or 10 A (115 V).
- When connection is made directly to the main control panel without using any plug, it is advisable to padlock the main switch of the balancing machine in order to limit its use to authorized personnel only.

3.2 - PNEUMATIC CONNECTION

Connect the machine to the compressed air main. Do not use the machine if there is no pressure. Max. permissible inlet pressure is 10 kg/cm² (approx. 10 bar or 145 PSI or 1Mpa). Make the connection to the pressure limiting unit at the back of balancing machine. The pneumatic circuit is designed to give the Lift considerable "flexibility" of movement in any position of its stroke; thanks to this the wheel position can be adjusted according to requirements with minimum manual effort.

3.2.1 - PRESSURE ADJUSTMENT FOR SPIN AND BRAKING DEVICE

Use relative knob on the compressed air preparation unit to adjust the pressure. Average pressure setting is 4 to 5 kg/cm² (approx. 4 to 5 BAR or 60 to 75 PSI or 0.4 to 0.5MPa).

N.B. An excessively high pressure could led to rapid wear on the rubber on the driving pulley.

Lubrication is essential for correct machine operation. Oil flow rate is adjustable via relative screw on the oil tank. Tighten or loosen the screw until a drop of oil falls per every 10 consecutive spins.

CAUTION! Only use mineral oil with average viscosity (30 cST at 40°C - WAIRSOL, LXOL grade).

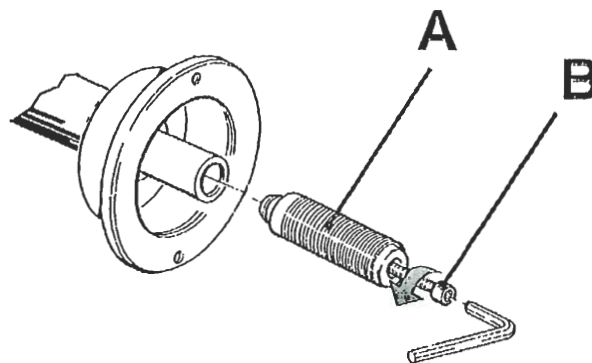
4 - ASSEMBLY

4.1 - ADAPTER MOUNTING

Fig. 2

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) Mount the new adapter (see enclosed brochures)



4.2 - WHEEL MOUNTING

The wheels should be fastened with one of the numerous adapters manufactured by CEMB (see enclosed brochures). **N.B.** Incorrect centering inevitably causes unbalance.

4.3 - GUARD MOUNTING AND ADJUSTMENT (OPTION)

- a) Fasten the components to the base as illustrated in specific exploded drawing.
- b) The positions of these guards can be adjusted using the special screws accessed from inside the main support.
- c) Check that the microswitch is held down when the guard is closed.
- d) Adjust the angular position of microswitch control.

5 - CONTROL PANEL

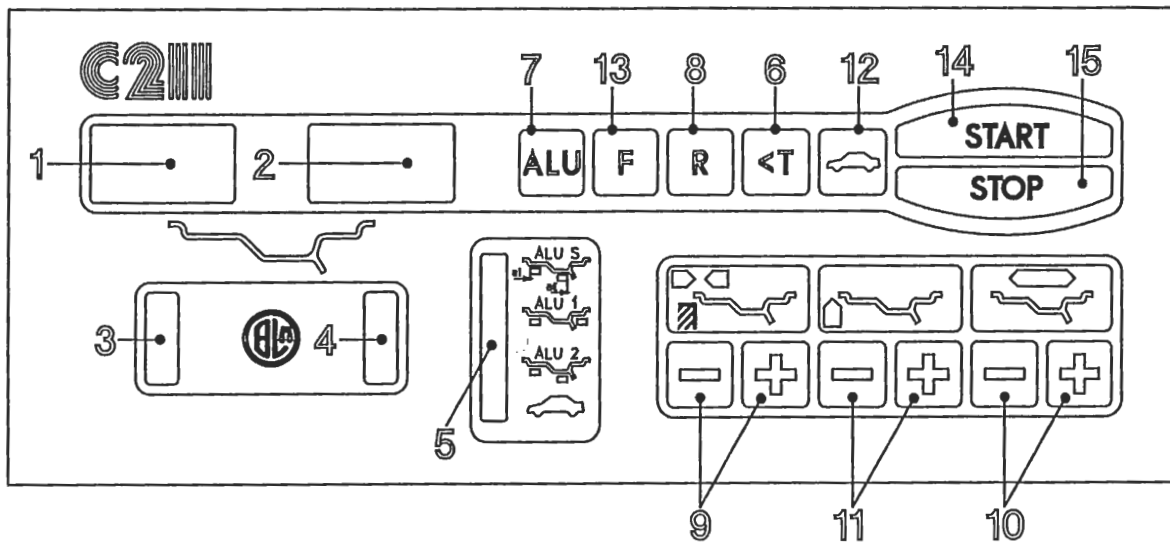


Fig. 3

- 1-2 Digital readout, UNBALANCE on inside/outside
- 3-4 Indicator, UNBALANCE POSITION on inside/outside
- 5 Indicator, correction mode selected
- 6 Push button, unbalance reading < 5 g (0.3 oz; options - calibration selection)
- 7 Push button, selection of correction mode
- 8 Pulsante per ricalcolo / autotaratura
- 9 Push button, manual DISTANCE setting
- 10 Push button, manual WIDTH setting
- 11 Push button, manual DIAMETER setting
- 12 Push button, car/truck selection
- 13 Push button, program selection
- 14 Push button, cycle start
- 15 Emergency push button, wheel lock/release

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

6 - PRESETTING OF DIMENSIONS

6.1 - AUTOMATIC MEASUREMENT

Two types of measurements are provided, namely:

- STANDARD WHEELS, valid also for correction modes ALU - 1-2
- ALU - S, very useful for alloy rims of special shape where ALU 2 does not guarantee sufficient approximation.

6.1.1 - STANDARD WHEELS

- Move the gauge into measuring position as shown in fig. 4. While the gauge is being displaced, the symbol shown in fig. 5 appears on the display in movement thus indicating that the gauge is not in a steady position.

Fig. 4

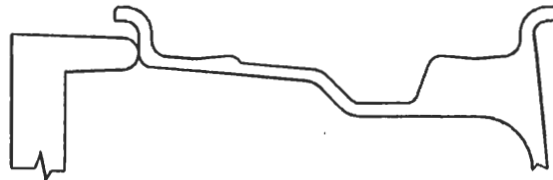
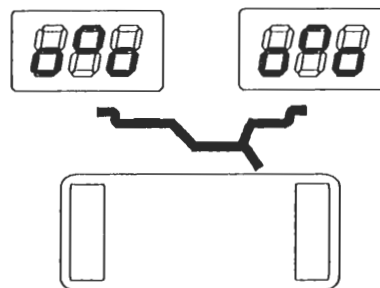
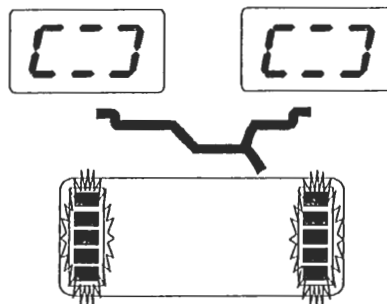


Fig. 5



- Hold the gauge still in position for approx. 2 sec.

Fig. 6

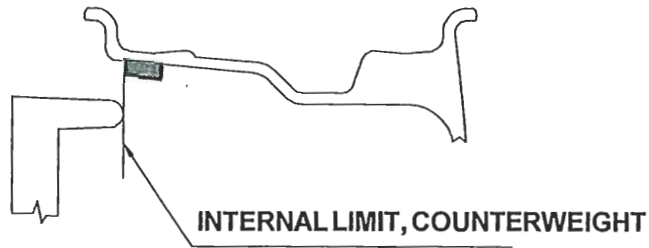


- Indication of successful memorization is displayed as shown in fig. 6.
 - Return the gauge to position θ .
 - Manually preset the diameter and width dimensions as described in section 6.2.
- N.B.** If the symbol of fig. 5 or 6 appears on the displays, the gauge is not in position θ . It is not possible to use the control panel, not even for making a balancing spin. Check the position.

6.1.2 - WHEELS WITH WEIGHTS INSIDE (ALU-S)

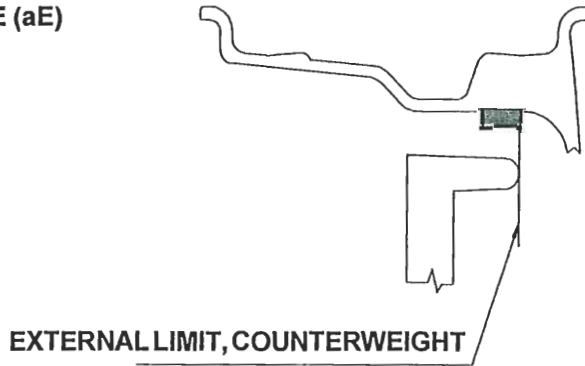
Use the automatic distance gauge as follows:

Fig. 7 ALU-S inside I (aI)



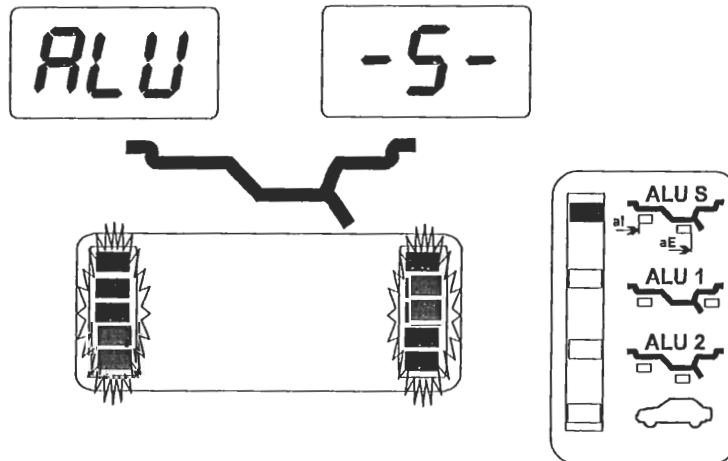
- Move the gauge to the position indicated in fig. 7; after successful memorization (fig. 6), move the gauge further to inside the wheel as shown in fig. 8.

Fig. 8 ALU-S outside E (aE)



- Hold the position for approx. 2 seconds. Successful memorization is indicated by the display as shown in fig. 9.

Fig. 9



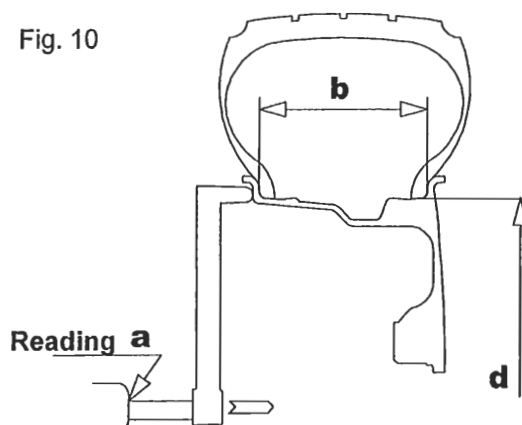
- Return the gauge to position 0. The measured distance *aI* appears on the display together with its value (see fig. 11).
- Preset the values for the diameter on the inside and diameter on the outside as described in points c) and d) in section 6.2.2.

6.2 - MANUAL PRESETTING

The dimensions can be entered or modified in manual mode by proceeding as follows:

6.2.1 - STANDARD WHEELS

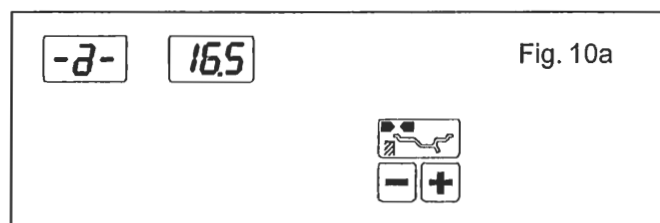
Fig. 10



- **DISTANCE:** preset distance "a" of the wheel inside from the machine after measuring it with relative gauge.

Increment pitch 0.5 cm

Full scale 40 cm

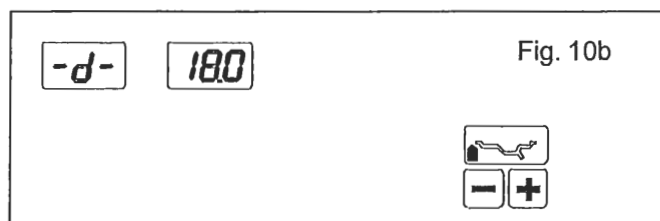


- **DIAMETER:** preset nominal diameter "d" marked on the tyre.

Increment pitches:

- unit of measurement in mm = 12/13 mm

- unit of measurement in inches = 0.5"



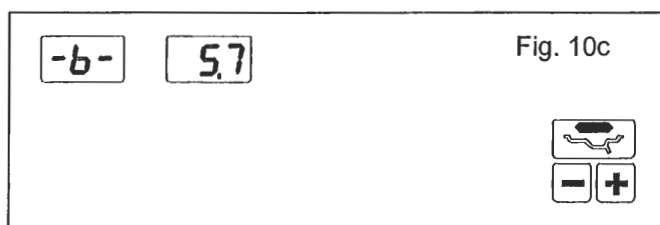
- **WIDTH:** preset the nominal width stamped on the rim or else measure dimension "b" of fig. 10 with the calliper gauge (standard accessory).

Increment pitches:

- unit of measurement in mm = 5 mm

- unit of measurement in inches = 0.25"

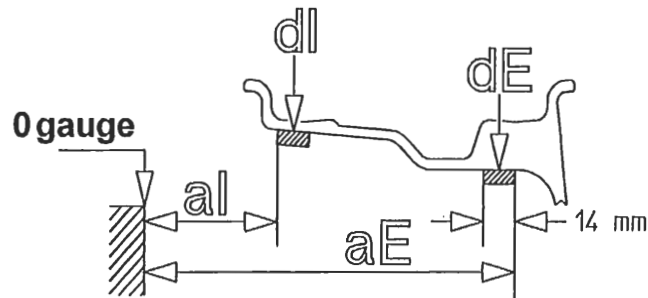
(.2 is displayed for 1/4"; .5 for 1/2"; 7 for 3/4")



6.2.2 - WHEELS WITH WEIGHTS INSIDE (ALU-S)

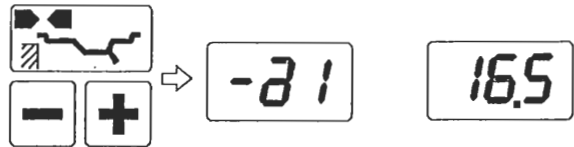
Measure the dimensions according to the scheme given below:

Fig. 11

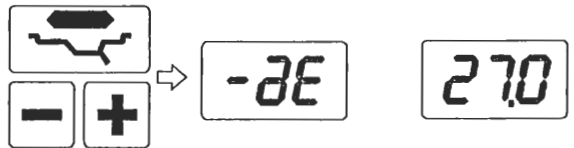


SEQUENCE:

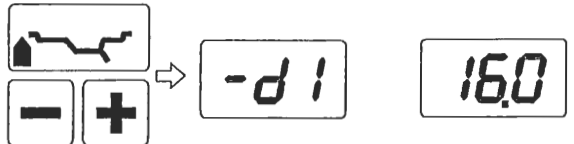
a) To change **al** press



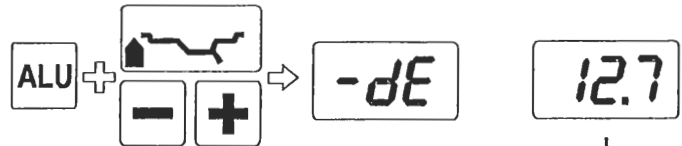
b) To change **aE** press



c) To change **dl** press



d) To change **dE**, press
N.B. dE by default = 0.8 dl



|
 ((keep ALU pressed))

N.B. When **dl** is reselected, the system automatically sets $dE = 0.8 dl$.

The system automatically calculates the distance between the centres of gravity of the weights by considering them approx. 14 mm wide. To display the unbalance regarding the preset dimensions,

press button **R** ; if a spin has already been made, the system automatically recalculates the

unbalance; otherwise press the **START** push button for a new spin.

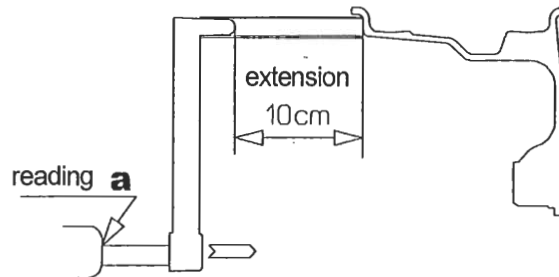
6.3 - PRESETTING WITH GAUGE EXTENSION

The extension increases the distance measuring range of the gauge by 10 cm (fig. 12).

Proceed as follows:

- Insert the extension on the distance gauge.
- Measure the distance as already described in the above procedures.
- After reading value "a" on the scale, return the gauge to 0 and preset the value "a + 10" in manual mode.
- Preset the diameter and width in manual mode as illustrated in fig. 10:

Fig. 12



6.4 - DOUBLE OPERATOR PROGRAM

This program allows memorizes the dimensions of two types of wheels.

Thus two operators can work simultaneously on two different vehicles using the same balancing machine.

The system always memorizes two programs regarding the last two spins carried out with the various preset dimensions.

When the machine is switched on, the programs are the same.

To change the program, press F

Display, Program 1:

DIMENSIONS: as shown in fig. 10a/b/c

UNBALANCE: as shown in fig. 13-14

Display, Program 2:

DIMENSIONS

UNBALANCE

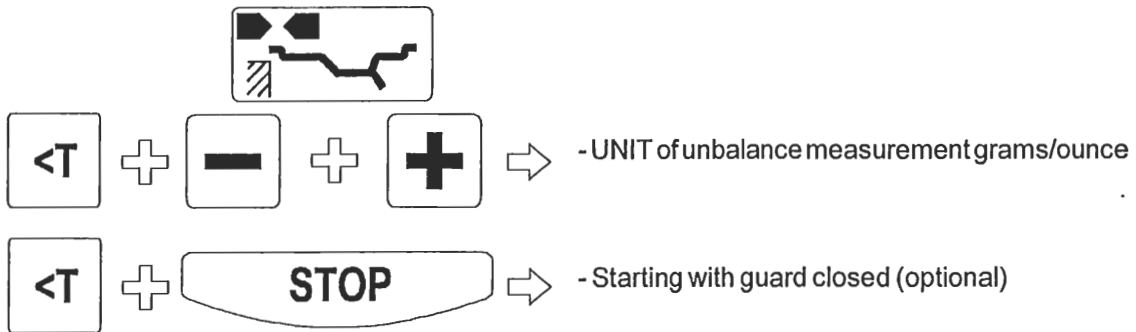
⇒	-a-	5.0	10.	40.	unit of measurement = grams
⇒	-d-	14.0			
⇒	-b-	6.0	.50.	3.75.	unit of measurement = ounces

N.B.

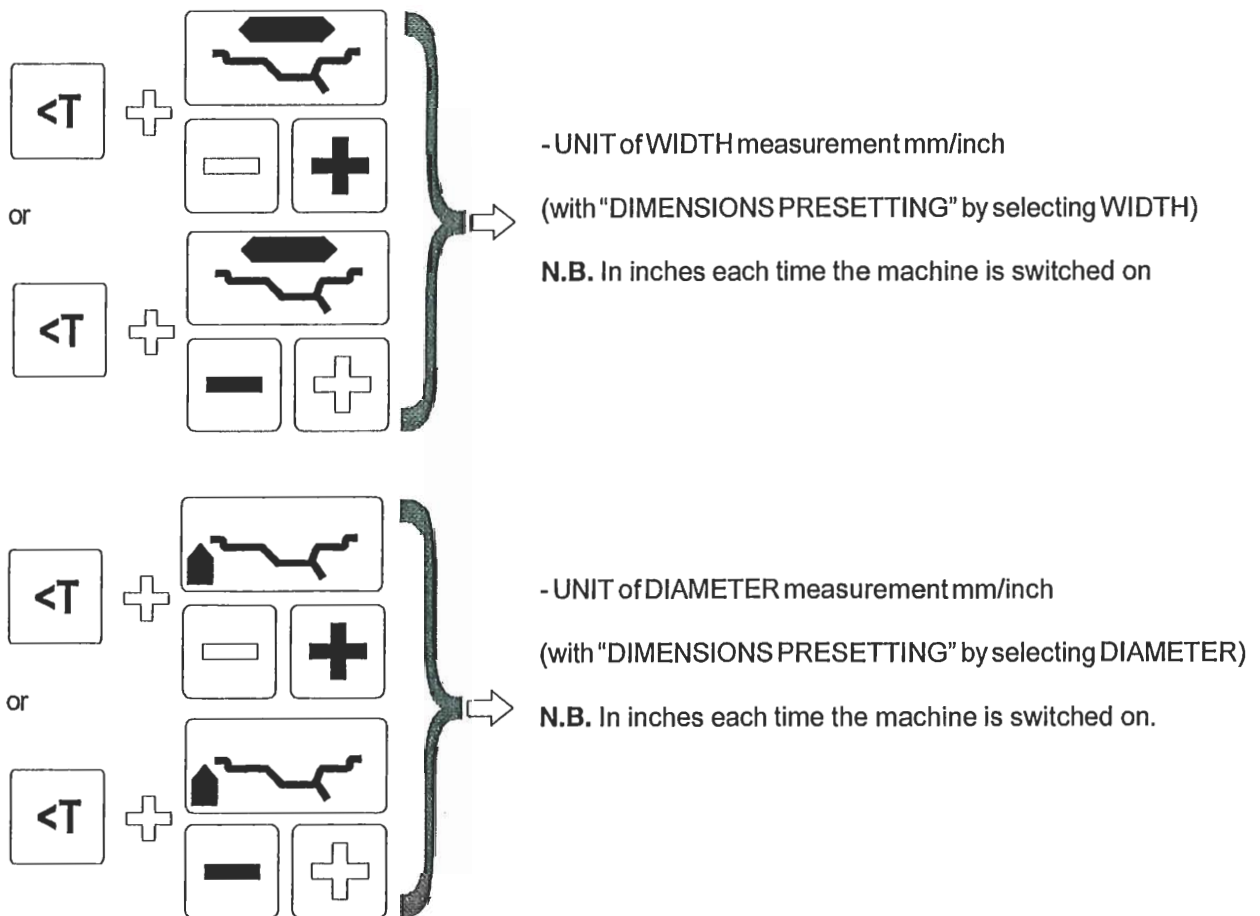
- Each time the dimensions are changed and a spin is performed subsequently, the system saves Program 1 in Program 2 while the current dimensions are saved in Program 1. In this way, the programs regarding the last two types of wheels balanced are always available.
- This mode of operating is also valid for dimensions regarding the special "ALU-S" function.

6.5 - OPTIONS

SELECTIONS MEMORIZED ALSO WHEN MACHINE IS SWITCHED OFF:



SELECTIONS LOST WHEN MACHINE IS SWITCHED OFF:



DISPLAY OF UNBALANCE:



7 - WHEEL BALANCING

7.1- UNBALANCE MEASUREMENT

- To perform a measuring spin, close the guard (press **START** if the "Start with guard close" function is not enabled: see section 6.5).
- In a few seconds, the wheel is brought up to speed and again braked; the unbalance values remain memorized on instruments 1 and 2.
- The displays with the LED's lit up indicate the correct angular position where to mount the counterweights (12 o'clock position).
- In this screen a light pressing of button **R** will cause the preset dimensions to appear in sequence:

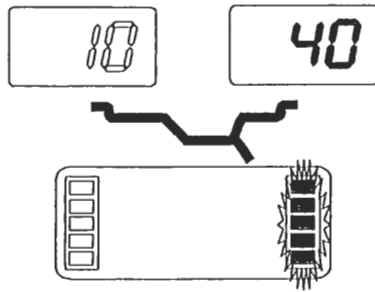


Fig. 13: CORRECTION ON OUTSIDE

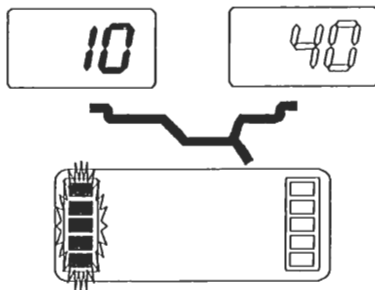
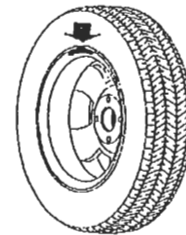


Fig. 14: CORRECTION ON INSIDE



STOP

: performs the wheel locking/release: useful for fixing the unbalance correction weights.

At the end of a measuring spin:

- search for the unbalance position on the outside.
- press **STOP** to lock the wheel.
- Apply the correction weight shown on the right display.
- press **STOP** to release the wheel.
- Proceed in the same way for the inside.

7.2 - RECALCULATION OF THE UNBALANCE

- Preset the new dimensions following the above described methods.
- Without repeating the spin, press **R**

The new recalculated unbalance values are displayed.

7.3 - MINIMIZATION OF STATIC UNBALANCE

- When using the normal commercially available weights, with pitch of 5 in every 5 g, there could be a residual static unbalance of up to 4 g. 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 for cars, 50 grams/1 ounce for trucks).

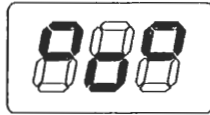
- Press **<T** to display the actual unbalance (Pitch 1 gram/0.1 ounce).

- The instruments indicate "0" for unbalance less than 5 grams/=4 for cars and 50 grams/2 ounces for trucks; to display the residual unbalance press **<T**.

7.4 - INDICATION OF COUNTERWEIGHT POSITION IN ALU-S

After calibrating the machine in ALU-S mode, proceed as follows to cancel approximations made in mounting the counterweights:

- Press **F** + **ALU** the following appears:

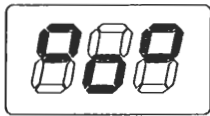


DISTANCE NOT DEFINED

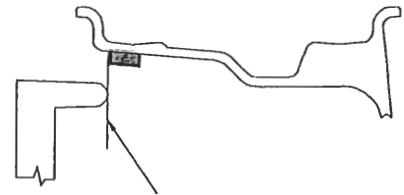
- Extract the distance gauge.

- The reaching of the correction application position for the unbalance correction weights is indicated by the unbalance display on the relative plane (see fig. 15)

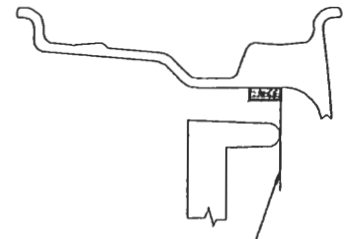
Fig. 15



DISTANCE FOR APPLICATION OF WEIGHT ON INSIDE



DISTANCE FOR APPLICATION OF WEIGHT ON OUTSIDE

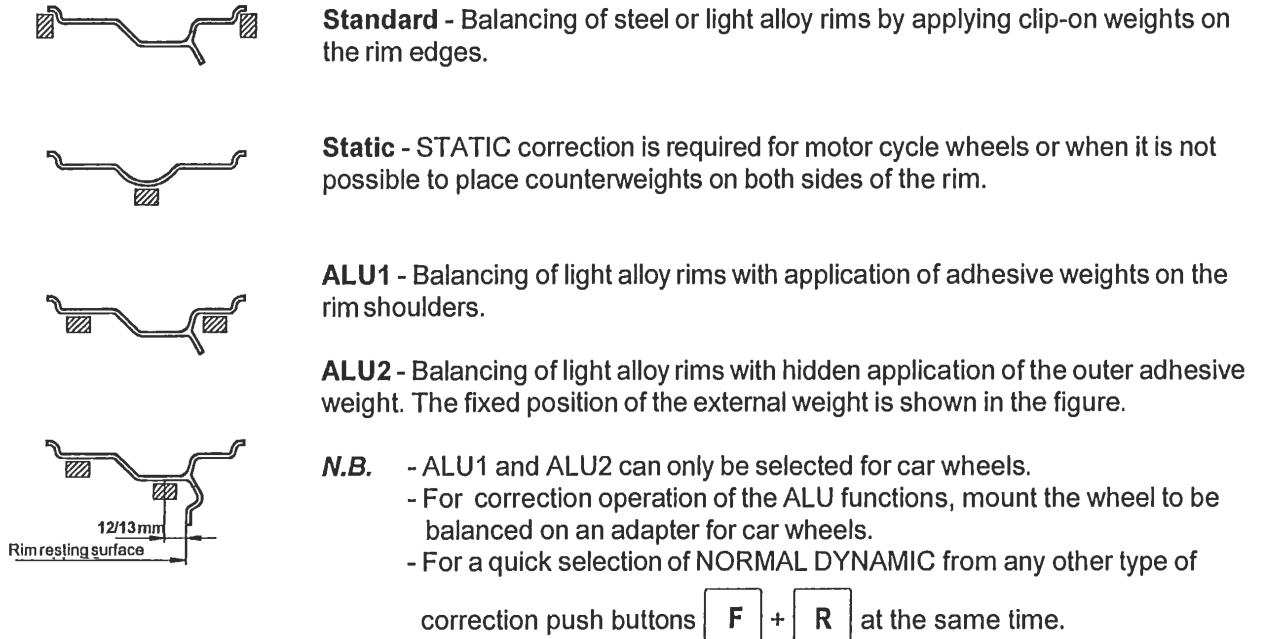


7.5 - STATIC - ALU

The available functions allows indicating the correction weights to be placed in the different positions compared to the normal ones:

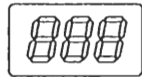
- Press **ALU** to select the required function (see 6.5).
- The unbalance values are displayed corrected on the basis of the correction position selected.

Fig. 16

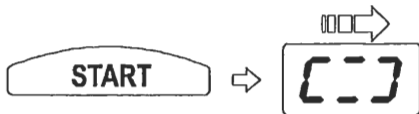


8 - UNBALANCE OPTIMIZATION

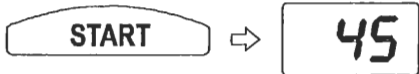
- This function serves to reduce the amount of weight to be added in order to balance the wheel.
 - It is suitable for static unbalance exceeding 30 g.
 - In many cases it is also possible to improve the residual eccentricity of the tyre.
 - The operations described below should be carried out with great care in order to obtain the best results.
- Press:



(Press **STOP** if it is wished to cancel the function)

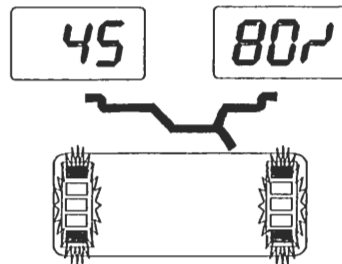


- The display prompts the operator to rotate the rim-tyre. Mark with chalk a reference sign on the adapter and rim in order to refit the rim in the same position of the machine. (Use scale on the spindle).
- With the aid of a tyre remover, turn the tyre on the rim by 180°.
- Refit the rim on the adapter in the previous position.

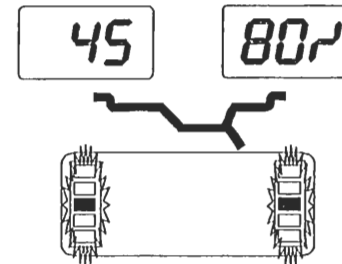


- RH display:** possible percentage reduction (symbol %) of the unbalance compared to the actual wheel situation.
- LH display:** actual static unbalance which can be reduced by wheel-rim rotation.

Turn the wheel under the outer LED's light up: mark the **tyre** in the 12 o'clock position.



In the same way, mark the **rim** corresponding to the position indicated by the innermost LED's.



- Make the two points to coincide.
- In this example, an 80% reduction of the static unbalance of 45 grams is achieved with a residual of approx. 9 grams.

8.1 - VISUAL WHEEL EXAMINATION

In certain cases, it is considered appropriate to rotate the wheel with the guard open in order to check the state of the tread.

- Press **<T>** and with the other hand press **START**

- One complete measuring spin is performed. The function is disabled automatically at the end of the cycle.

WARNING! The use of this function is at the operator's own risk and peril.

9 - SELF-CALIBRATION

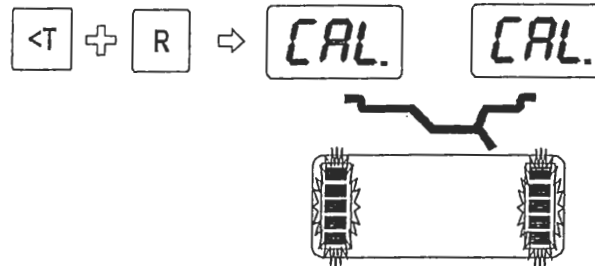
9.1 - WHEEL BALANCER

For self-calibration of the machine, proceed as follows:

- Fit a medium-sized metal wheel on the shaft. Example: 6" x 14" (± 1 "
- Preset the exact dimensions of the wheel mounted.

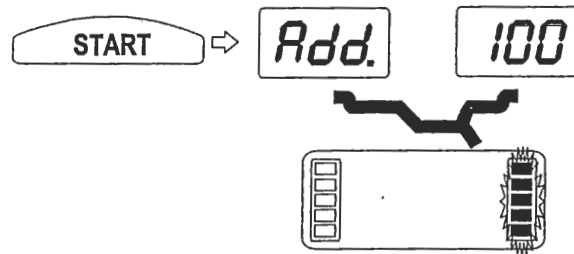
CAUTION!! Presetting of incorrect dimensions would mean that the machine is not correctly calibrated, therefore all subsequent measurements will be incorrect until a new self-calibration is performed with the correct dimensions!

- Hold down keys



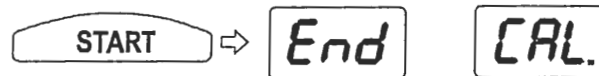
until the positioning LED's change from flashing into steady.

- Press



- It is highly important to avoid the wheel from being knocked during this spin.
- Add a 100 gram weight (3.5 oz) on the outside in any angular position.

- Press



- 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.

9.2 - AUTOMATIC RIM DISTANCE GAUGE

Press: <T> + ALU ⇒ CAL. P. 0.

Shift the distance gauge to position "0" and keeping it quite still, press:

F ⇒ CAL. P. 15

Shift the distance gauge to position "15" and keeping it quite still, press:

F ⇒ 000 000 CORRECT CALIBRATION

- Return the gauge to rest position
- The wheel balancer is ready for operation

N.B. In the event of errors or faulty operation, the writing **CAL P. 0** 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.

10 - ERRORS

Various abnormal conditions can arise during machine operation. When detected by the microprocessor, they appear on the monitor as:

ERROR	MEANING
1	No signal of rotation. Could be caused by faulty position transducer or by something preventing the wheel from turning.
2	During the measurement spins, wheel speed had dropped to below 60 r.p.m. Check encoder functioning (see 11) and repeat the launch.
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 performed without adding the reference weight or else there is a break in the force transducer cable.

10.1 - INCONSISTENT UNBALANCE READINGS

Sometimes after balancing a wheel and removing it from the balancing machine, it is found that, upon mounting it on the machine again, the wheel is not balanced.

This does not depend on incorrect indication of the machine, but only on 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 centre line.

If the wheel has been mounted on the adapter with screws, it could be possible that the screws have not been correctly tightened, i.e. crosswise one by one, or else (as often occurs) holes have been drilled on the wheel with too wide tolerances.

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

If, after balancing, the wheel is found to be still out-of-balance when refitted on the vehicle, this could be due to the unbalance of the car brake drum or very often due to the holes for the screws on 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 (For example, see our models L36, L38/2).

11 - SELF DIAGNOSTICS

When **<T** + **F** are pressed together, a test is enabled for the correct operation of the displays and

LED's of the PC board after the end of which the wording **POS.** appears on the left display. At this point, correct operation of the position sensor can be checked by looking at the positioning LED's regarding the outside:

- When the wheel is moved slowly in the direction of rotation of the machine, the AUTO LED should start flashing while the ALU-S LED should remain steady.
- When the wheel is moved slowly in the opposite direction, the AUTO LED should start flashing while the ALU1 LED should remain steady.

- When switching from reset, the wording " **0** " should appear on the right display.

- Press **F**.

- A number appears on the RIGHT display, which is useful for calibrating the rim distance gauge (only for specialized personnel).

- Press **F**.

12 - ROUTINE MAINTENANCE (SEE EXPLODED DRAWINGS) (Non specialized personnel)

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

12.1 - TO REPLACE THE DRIVING PULLEY

- Remove the head and the weight shelf being careful not to pull away the electrical cables.
- Unscrew the pulley mounting screw in order to replace the pulley.
- Check supply pressure of the spinner device (see 3.2.1).
- Excessive pressure will cause premature damage of the rubber.

12.2 - TO REPLACE THE BRAKE PAD

Back-off the two screws fastening the worn brake pad to the motor mounting brake. Securely fix the new brake pad by tightening the screws.

12.3 - TO REPLACE THE FUSES

Remove the weight shelf in order to gain access to the power supply board on which two fuses are installed. If the fuses need replacement, use ones of the same current rating. If the fault persists, contact the Technical Service Department.

12.4 - MAINTENANCE OF THE SPECIAL PNEUMATIC CIRCUIT

It is important to periodically clean the compressed air filter and check that there be sufficient lubricating oil. The bowl should be filled 3/4; to top up, use mineral oil of medium viscosity (30 cSt at 20° C) (WAIRSOL, LXOL grade). Normal oil flow rate is one drop every 10 operations.

N.B.: DRAIN FREQUENTLY ANY CONDENSATE BUILT UP IN THE FILTER BOWL VIA RELATIVE VALVE.

NONE OF THE OTHER MACHINE PARTS REQUIRE MAINTENANCE.

13 - RECOMMENDED SPARE PARTS LIST (References on the exploded drawings)

CODE	DESCRIPTION
182185730	Balancing spring
07FG33406	Rubber covered driving pulley
42FB37113	Complete brake pad
020620803	Bearing 6208-2Z Ø 40/80/18
67M38954M	Position pick-up board c/w cable
182185750	Spring, rim distance gauge 18575P
05PR33399	Display panel
511231002	Switch KL 1002 + Q 555
86PR33822	Complete panel
86SC33821	Computer board
86SC33823	Power board
681002000	Fuses DM 5x20 2A
86SB35583	Cable with DISTANCE potentiometer + board
162368905	Pneumatic control 368-905

SPECIAL PARTS FOR 230V MACHINES

86SZ45288	Complete power board
568001458	Capacitor 14MF 450V Faston
165000026	Illuminated anti-interference adapter
16SP33941	Set of solenoid valves 230V 50/60 Hz
160007221	Coil MB58 230V 50/60 Hz
611000308	Transformer 30VA (230V)

SPECIAL PARTS FOR 115V MACHINES

86SZ45289	Complete power board
568003558	Capacitor 35MF 450V Faston vite/screw M8
165000014	Illuminated anti-interference adapter
16SP33942	Set of solenoid valves 115V 50/60 Hz
160007222	Coil MB57 115V 50/60 Hz
611000307	Transformer 30VA (115V)

SPECIAL MAINTENANCE (only for specialized personnel)

14 - TO CHANGE SUPPLY VOLTAGE (See recommended spare parts lists and power layout diagram)

Machine **C211** can run on 110/115V - 50/60 Hz or 220/240V - 50/60Hz.

To change the supply voltage, proceed as follows:




- 1) Replace the motor.
- 2) Replace the entire power board or else modify the board as follows:
 - A) Replace the capacitor.
 - B) Connect, to contact T1 on the power board, the primary conductor of the transformer corresponding to the required voltage (Red for 230V - White for 115V)
 - C) Replace the set of solenoid valves.



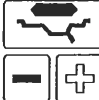

15 - SELECTION OF MACHINE PARAMETERS


(for references regarding keys and buttons, see figures 10a - 10b - 10c)

Press **<T>** + **R** as when carrying out self-calibration; when the position LED's stop flashing, instead of performing the spin, press the following within 5 seconds and in the correct sequence:










After pressing  and  the displays go out. After pressing  the current fixed distance

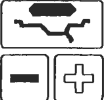



[DF] appears: change with   and  

Press  to pass on to modify value "I".

The right display shows the current value (in %) while the left display shows the wording "I" and symbol

"—" if the correction is negative; otherwise " / " if it is positive. Change with   ,  

When button  is pressed, the value "S" appears on the right display. To modify it, press  

 To end, press   

N.B. When **<T>** is pressed during any phase of setting the three parameters, the system interrupts such function and automatically sets the machine parameters with their default values.

Default values of the configuration : **DF = 130** **I = 0** **S = 330**

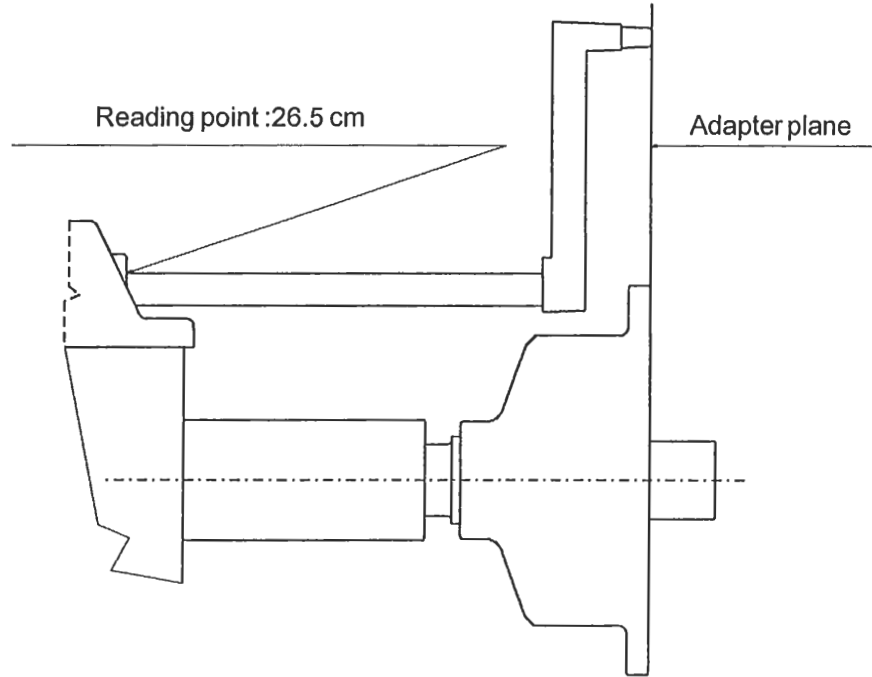
After changing the machine parameters, repeat the self-calibration.

N.B. There is a special chart inside the machine giving the values on the basis of which the machine has been factory tested.

16 - CHECKING OF THE RIM DISTANCE GAUGE

Check that the ruler used for measuring the DISTANCE of the wheels reads 26.5 cm as measurement of the distance from the adapter plane. If the graduated scale is changed, position it with the line indicating 26.5 at the fixed index limit (reading point) when the gauge tip coincides with the adapter plane.

Fig. 17



17 - CALIBRATION OF THE DISTANCE POTENTIOMETER

- Remove the weight shelf and refit the tip on the gauge rod.
- Back-off the screws fastening the pulley on the potentiometer shaft.
- Select the rim distance gauge number from SELF-DIAGNOSTICS (11).
- The number varies when the distance gauge is moved and represents a reference for calibration of the potentiometer.
- With the gauge fully retracted, turn the potentiometer shaft keeping the pulley still until the highest possible number is read.
- Decrease by two numbers, then retighten the screws to secure the pulley on the shaft

- Press **F**

- Perform SET UP (9.2).

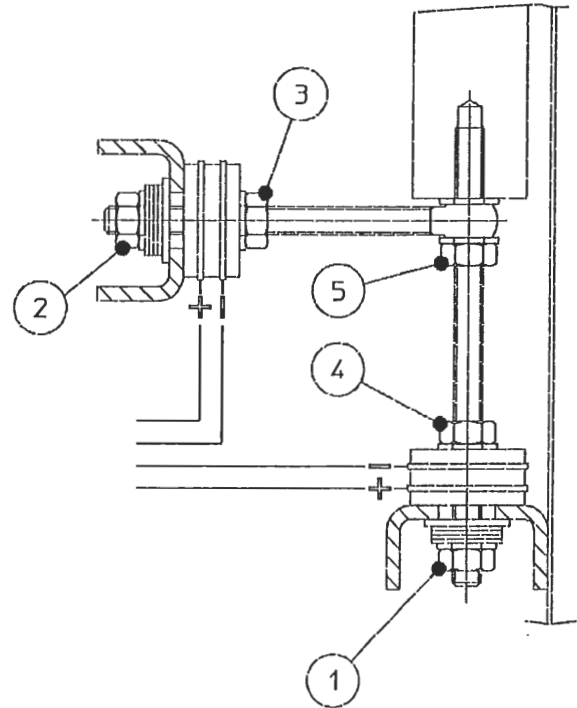
18 - ASSEMBLY OF THE PIEZO MEASURERS

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.
 2. Remove nuts 1 and 2 with relative cup springs and washers.
 3. Back-off screws 3, 4 and 5 then disassemble the various parts.
 4. 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 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 (by half a turn with the spanner if necessary).
 6. 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, then loosen them by half a turn. This will automatically ensure correct preloading on the piezo (a torque wrench can be used set to 400 kg. 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 50 Mohm).
8. Reassemble the various parts.
 9. Again carry out the automatic calibration.

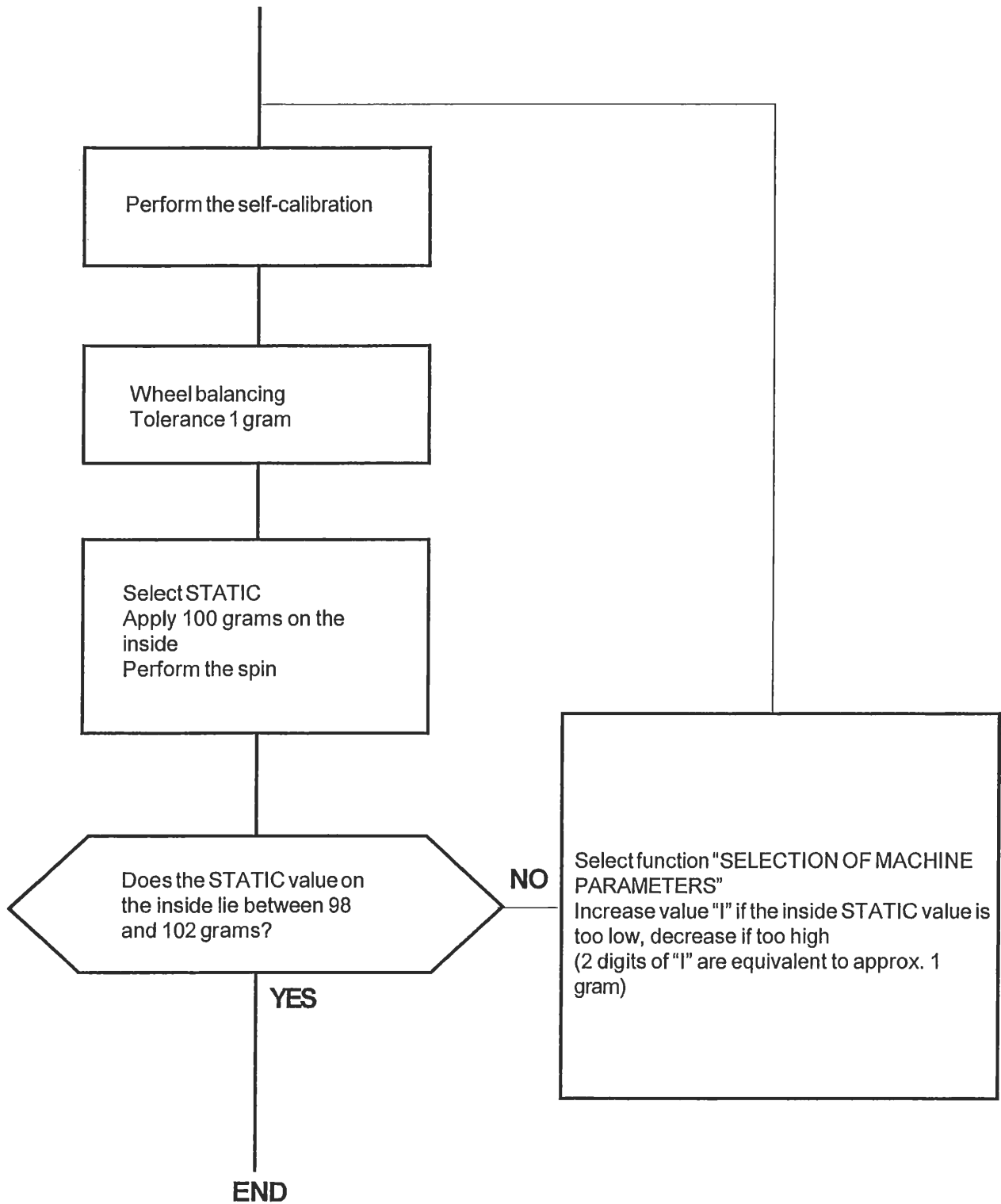
Fig. 18



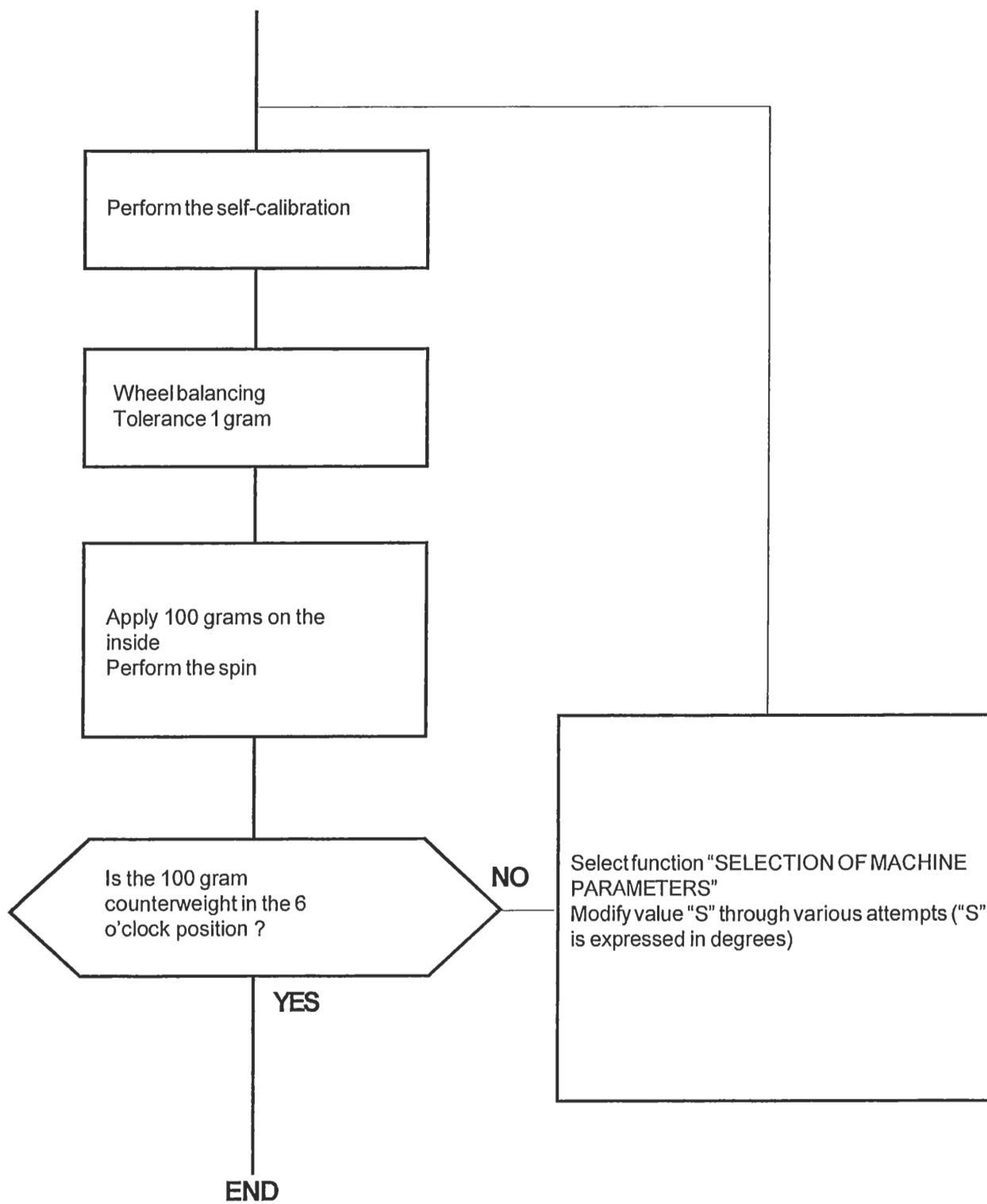
yellow
blue
yellow
white

19.1 - CHECKING AND CALIBRATION OF THE STATIC VALUE (STI)

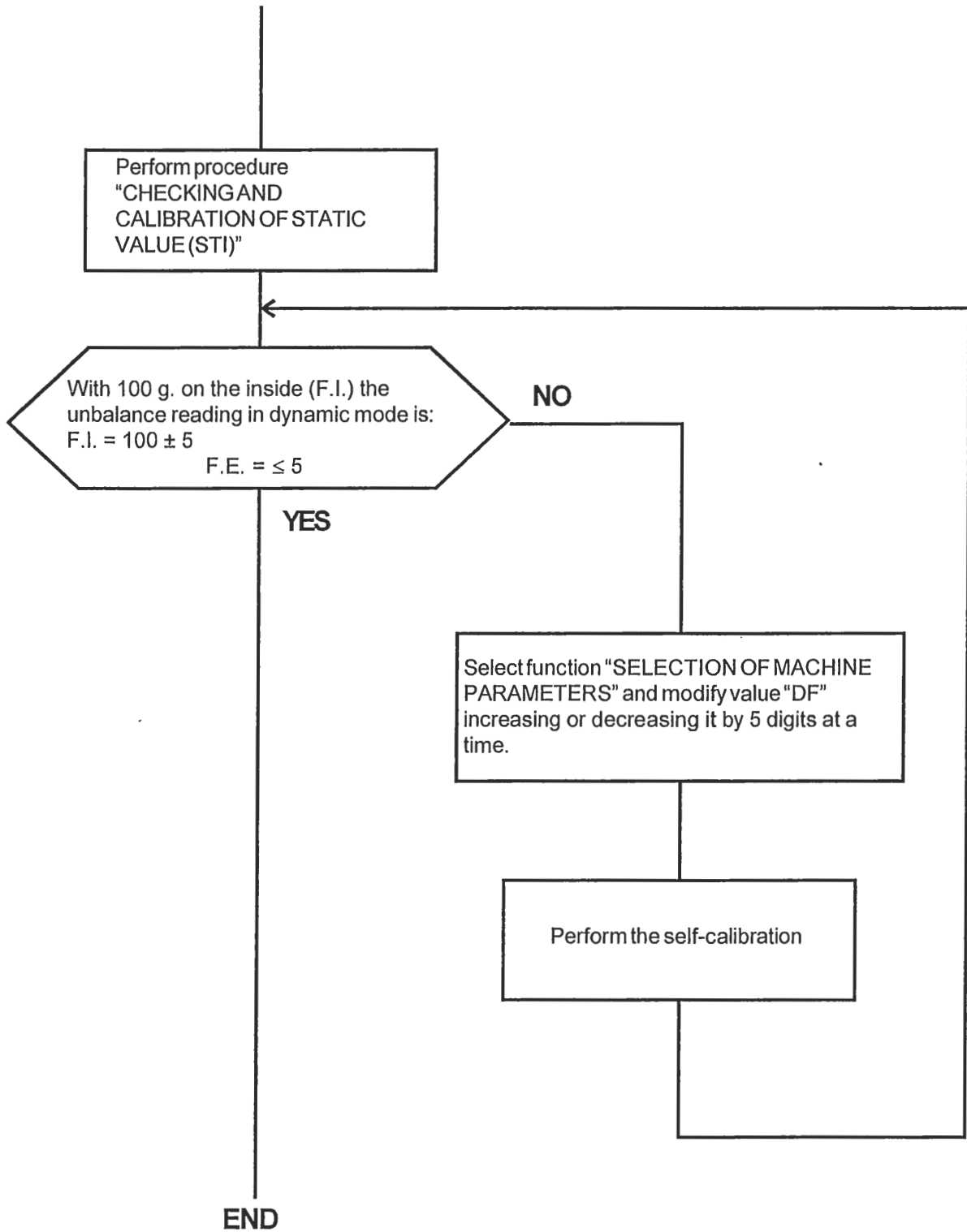
(Perform with car wheel of average size)



19.2 CHECKING AND CALIBRATION OF UNBALANCE POSITION (Perform with car wheel of average size)

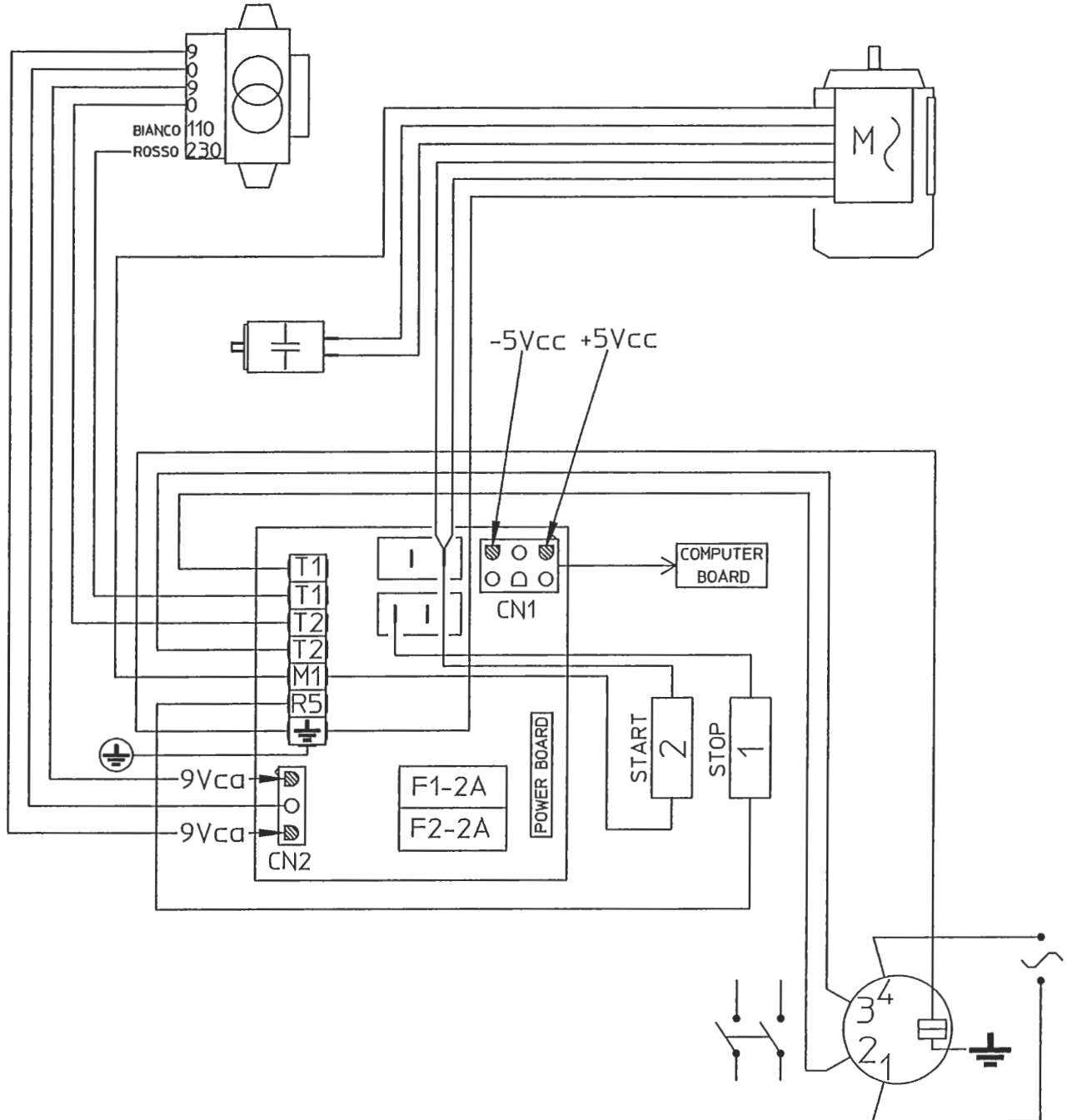


19.3 - CHECKING AND CALIBRATION OF FIXED DISTANCE VALUE (DF) (Perform with car wheel of average size)



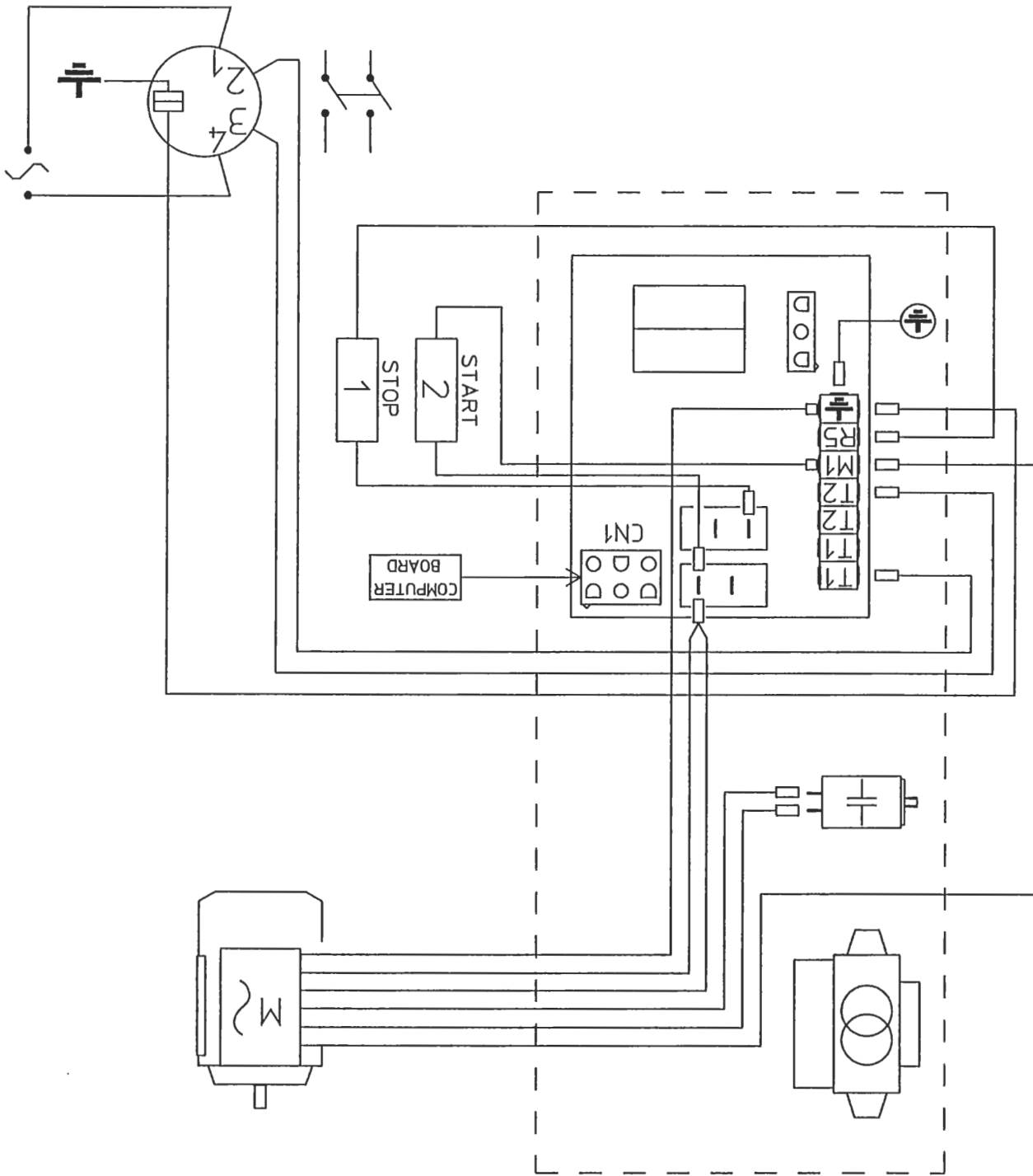
20 - POWER SUPPLY LAYOUT DIAGRAM (230V connection)

Fig.19



21 - POWER SUPPLY LAYOUT DIAGRAM (Check voltage)

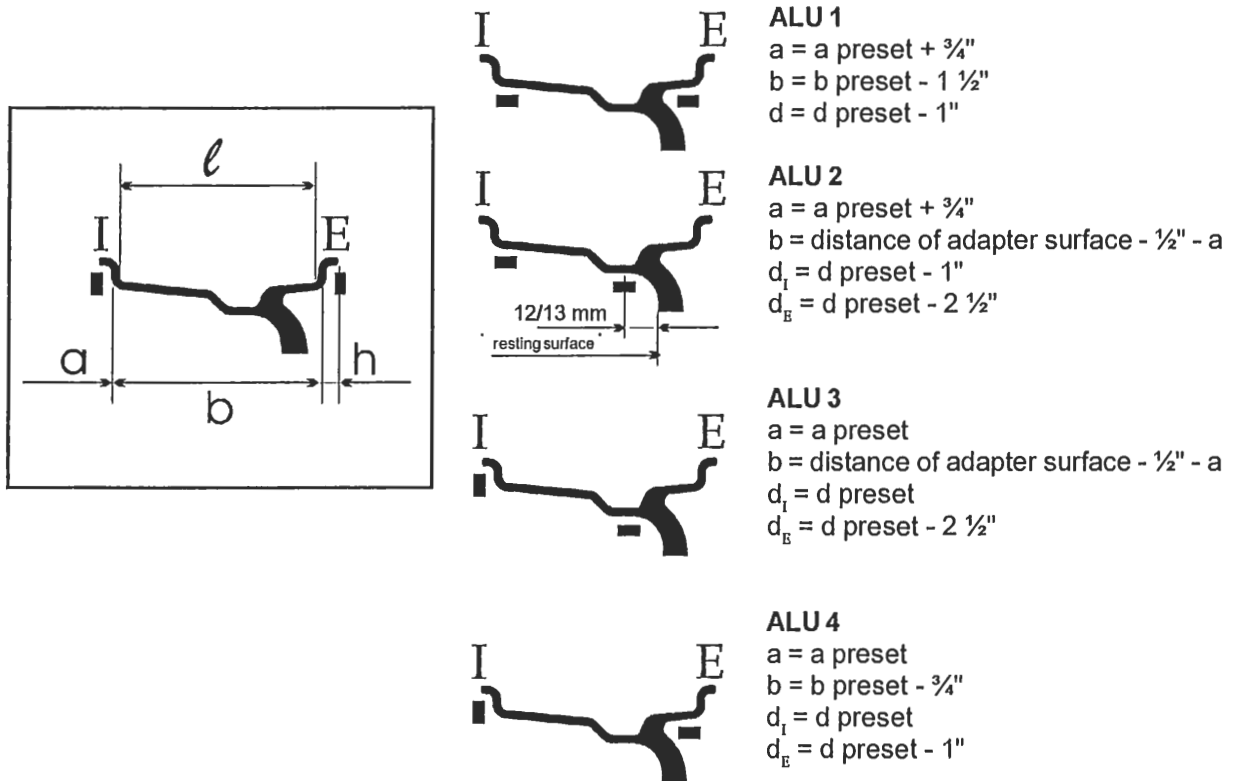
Fig. 20



22 - WHEEL MEASUREMENT AND PRESETTING ON THE BALANCING MACHINE

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 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 centres of gravity of the corrective weights.

Consider a typical rim: size " ℓ ", given as width by the rim manufacturer, differs from the measurement of the distance between the correction planes for the rim thickness and physical dimensions of the counterweight, whose centre 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 $2 \times h = 6 \text{ mm}$ 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 a good rule to add $\frac{1}{4}$ 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 centre of gravity of the counterweight as seen above.



23 - HOW TO CHECK FUNCTIONING AND ACCURACY

Further to some notices informing us of defects and unaccuracies not clearly traceable, we are explaining hereunder the procedure how to check functioning and accuracy to help us to detect problems.

FIRST CHECKS

Accurate wiping of adapter and cones
Spring cover sliding
Shaft end blocking

GAUGE CALIBRATION (use an average size iron wheel i.e. 14" x 6" ± 1") - See 11-16-17)

DIST:

Calibrate gauge and check accuracy.
Tolerances: DIST.= 5 mm

CALIBRATION (see 9)

Use the same wheel as for gauge calibration
Set accurate measures, in manual mode if necessary
Make self-calibration

CHECKING MACHINE CALIBRATION

Make 10 spins without loosening the wheel and detect MAX oscillations

F.I. (Inner side)= F.E. (Outer side)= (tolerance ± 2)

Put 100 gr. on FE first and then on FI using an accurately balanced wheel) Detect rates

F.I.= F.E.= POS.E.= F.I.= F.E.= POS.I.=

(tolerance 3%)

CHECKING THE ADAPTER

Turn a fine balanced wheel upside down (180°) and detect unbalance rates

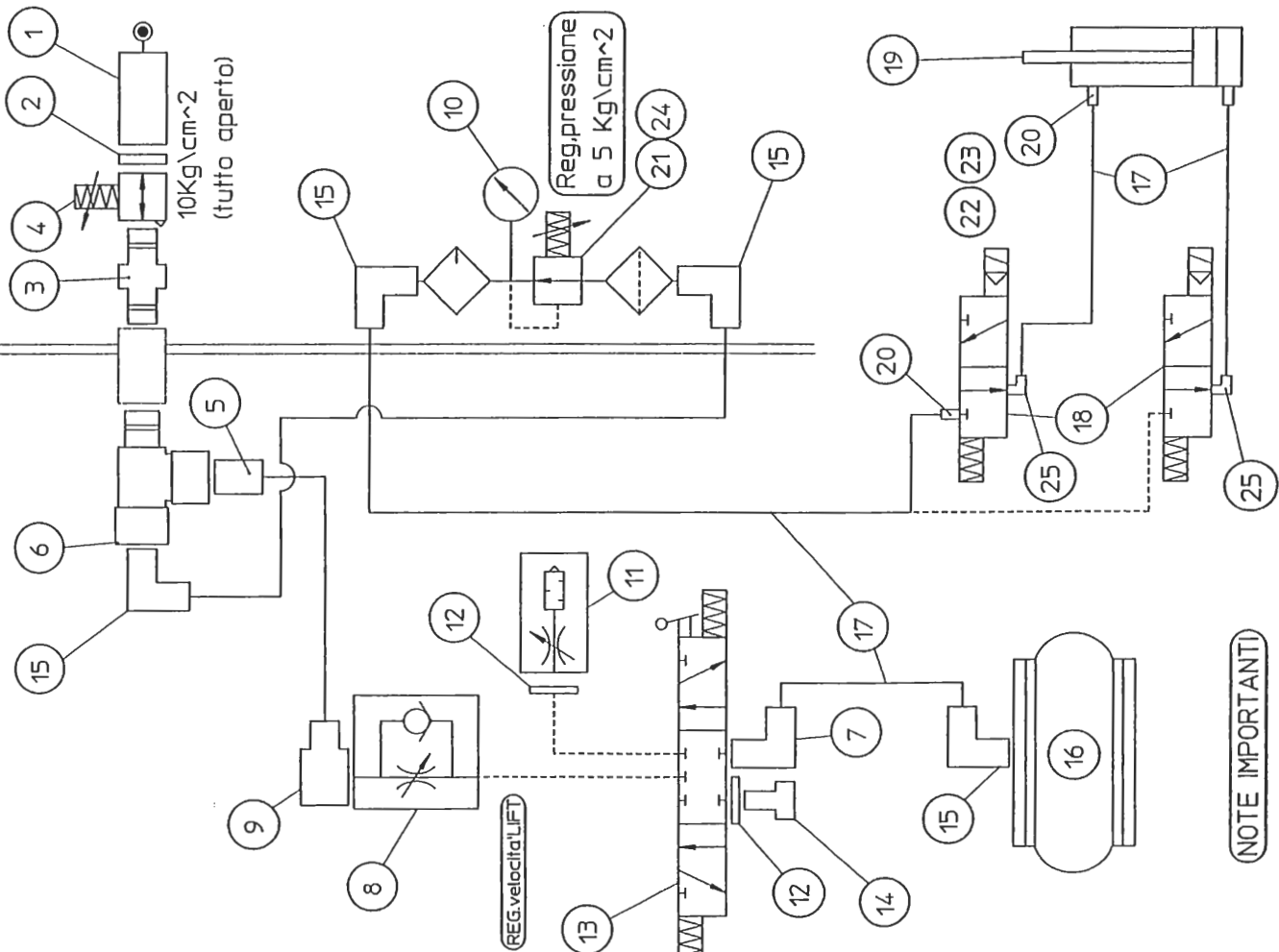
ERR.MAX =

This check-out in particular must be made with a sample wheel whose max unbalance errors due to centering are well known (generally lower than 10 gr. for iron wheels).

25 2	Raccordo ERELV 6\8	172082893	Waircom
24 1	Squadra attacco UZRHS	160014900	Waircom
23 2	Connettore USR102\N9	160110200	Waircom
22 2	Adattatore lum. antif. A05C44 110V	165000014	MPM
22 2	Adattatore lum. antif. A05C45 220V	165000026	MPM
21 1	FRL-C104-DL		CAMOZZI
	FRXL-1\4-MW1226030	164000010	METAL WORK
20 3	Raccordo ERED 6\8(S6510-6-1\8)	172079492	Waircom (CAMOZZI)
19 1	Cilindro HB DCB 35x30	161035030	Waircom
18 2	Elettrovalvole 110V 50\60Hz	16SP33942	PNEUMAX
	Elettrovalvole 220V 50\60Hz	16SP33941	PNEUMAX
17 1	Tubo RILSAN 6\4 calibr. L=3000	179004006	
16 1	Cilindro TORPRESS 110-88820	161900110	PIRELLI
15 4	Raccordo EREL6\4 (S6500-6-1\4)	172082894	Waircom (CAMOZZI)
14 1	Tappo TTE8	170001310	Waircom
13 1	Comando pneumatico 368-905	162368905	CAMOZZI
12 2	Guarnizione GFV8	170001309	Waircom
11 1	Regolatore portata URS8\3	163025062	Waircom
10 1	Manometro MM 0\12	164004200	Waircom
9 1	Raccordo EROL6\8 (6610-6-1\8)	172080592	Waircom (CAMOZZI)
8 1	Reg. portata+guarn. MVU-704-1\8	163007040	CAMOZZI
7 1	Raccordo EREL6\8 (S6500-6-1\8)	172082892	Waircom (CAMOZZI)
6 1	Raccordo T MFF1\4 S2070	171002070	CAMOZZI
5 1	Raccordo ERED 6\4 (S6510-6-1\4)	172079494	Waircom (CAMOZZI)
4 1	Micro reg.di pressione M004-R00	164000014	CAMOZZI
3 1	Nipplo S2500 1\4	174000201	CAMOZZI
2 1	Guarnizione GFV4	170001408	Waircom
1 1	Innesto RG4\12\9	173010901	Waircom

POS. PEZZI	DENOMINAZIONE	CODICE	NOTE
Questo disegno e' proprieta' esclusiva della CEMB che ne vieta la riproduzione e la comunicazione a terzi. Esso dovra' essere restituito a fine consultazione. La Societa' tutela i propri diritti a norma di legge.			
A			CLIENTE : CEMB
B			MACCHINA : C211
C			GRUPPO : MACCHINA
D			CODICE GRUPPO : 46AS33576
DENOMINAZIONE : Schema pneumatico			

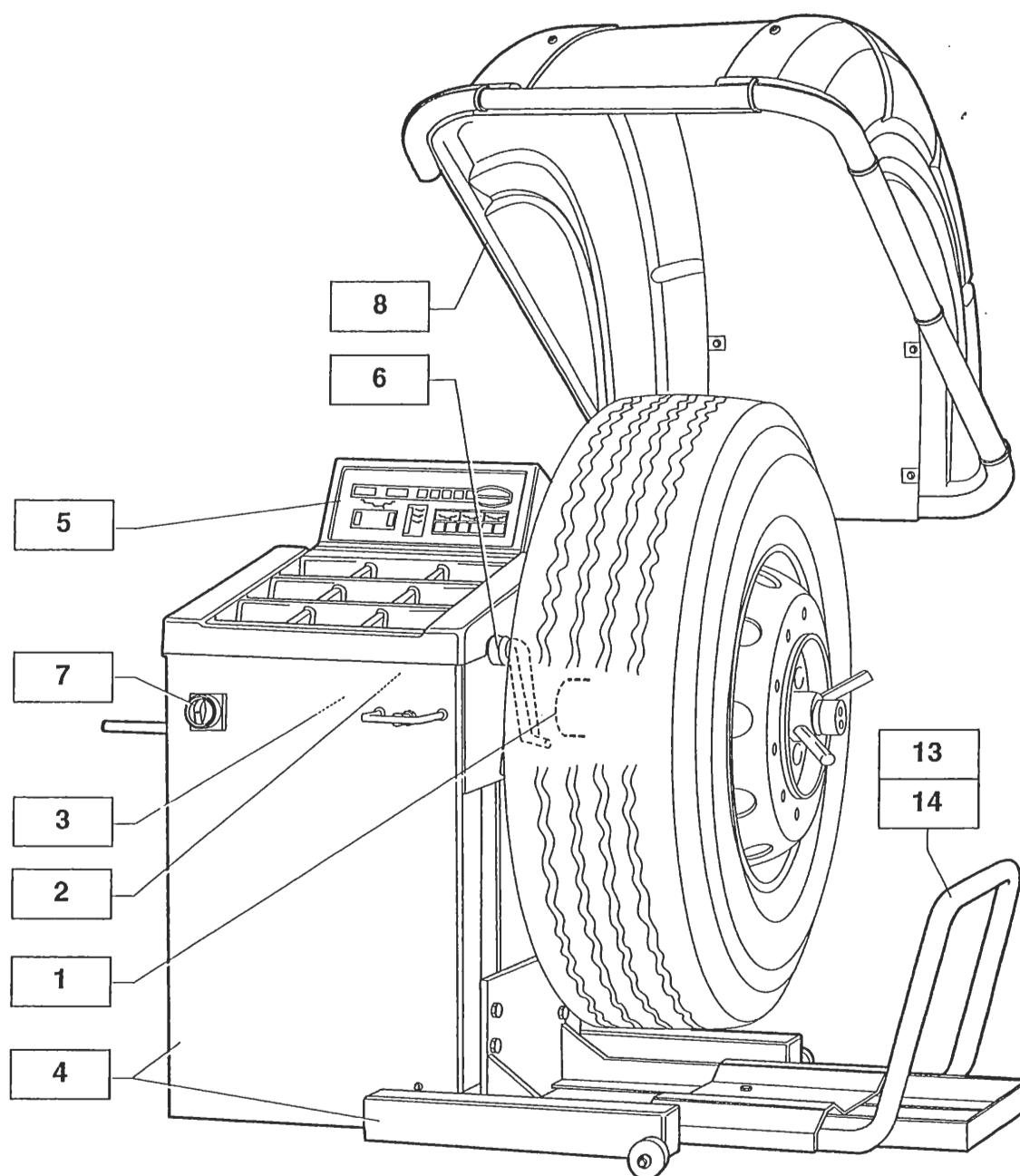
parete posteriore Carter



CEMB
Costruzioni Elettro Meccaniche
Ing. Buzzi & C. - S.p.A.

NOTE IMPORTANTI

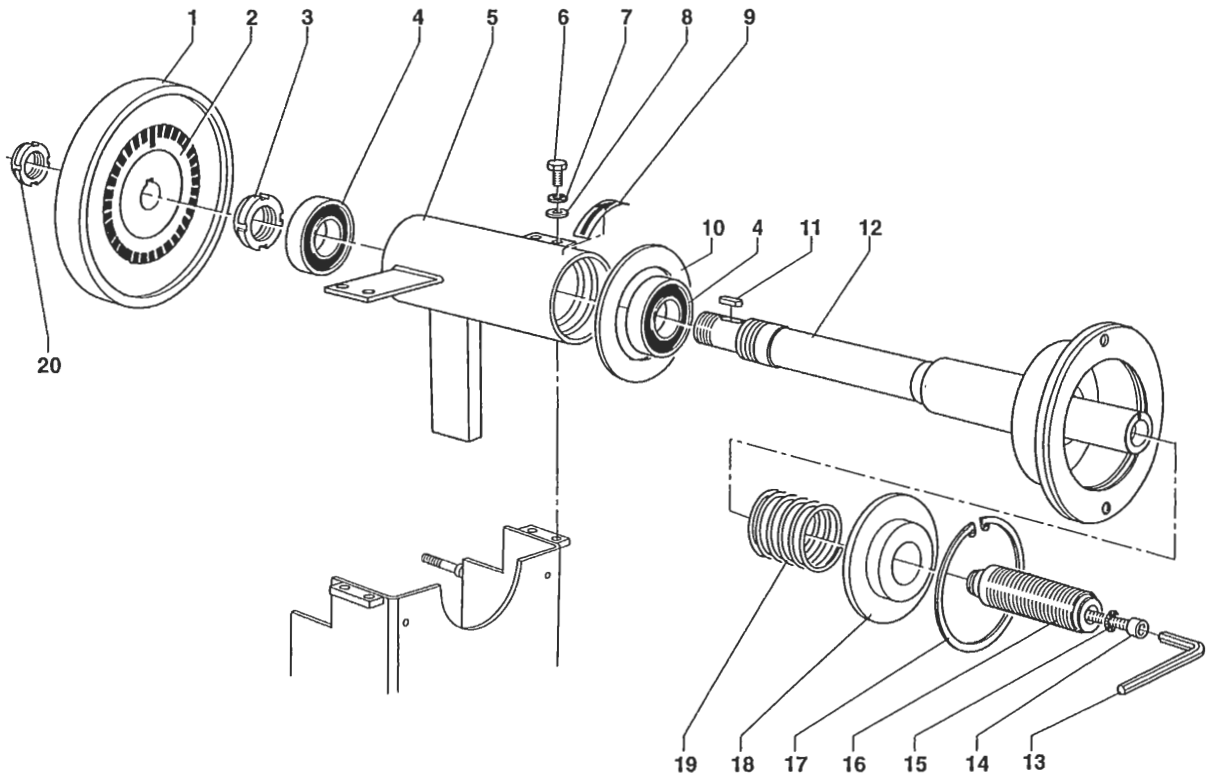
DIS. N. 16SP33464P



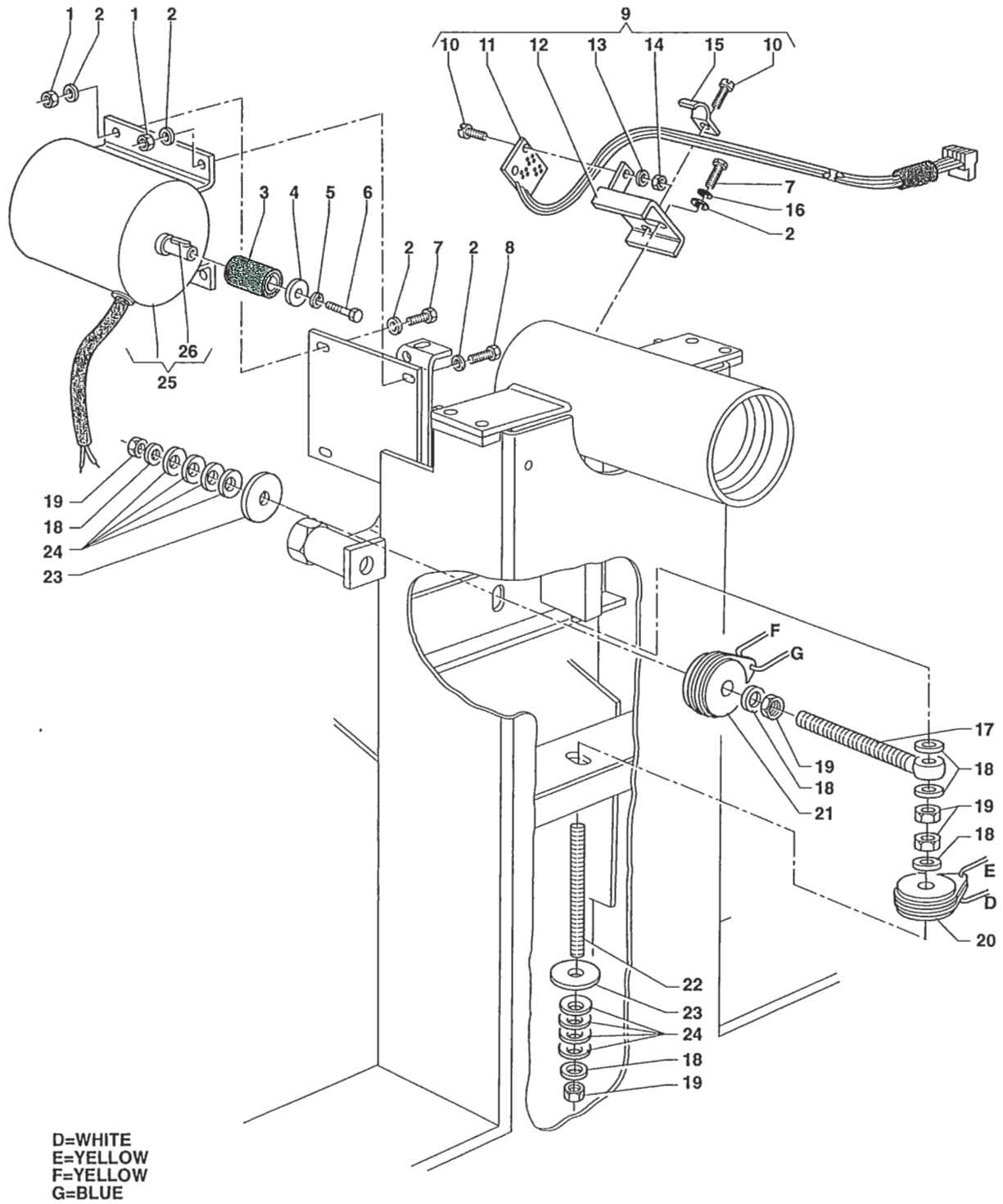
D0123-1	0123-1	1	MANDRINO	SHAFT ASSEMBLY
D0125-2	0147-2	2	MOTORE+DATORE DI FASE+ TRASDUTTORI PIEZO	MOTOR+POSITION PICK-UP+ PIEZO TRANSDUCER
D0125-3	0125-3	3	FRENO	BRAKE
D0147-4	0147-4	4	BASAMENTO	CASING
D0147-5	0147-5	5	BASAMENTO	CASING
D0147-6	0147-6	6	CALIBRO AUTOMATICO DISTANZA	AUTOMATIC DISTANCE GAUGE
D0147-7	0147-7	7	POTENZA	POWER UNIT
D0113-8	0147-8	8	PROTEZIONE RUOTA	WHEEL GUARD
D0125-13	0125-13	13	LIFT	LIFT
D0113-14	0113-14	14	LIFT	LIFT

* Particolari reperibili in commercio

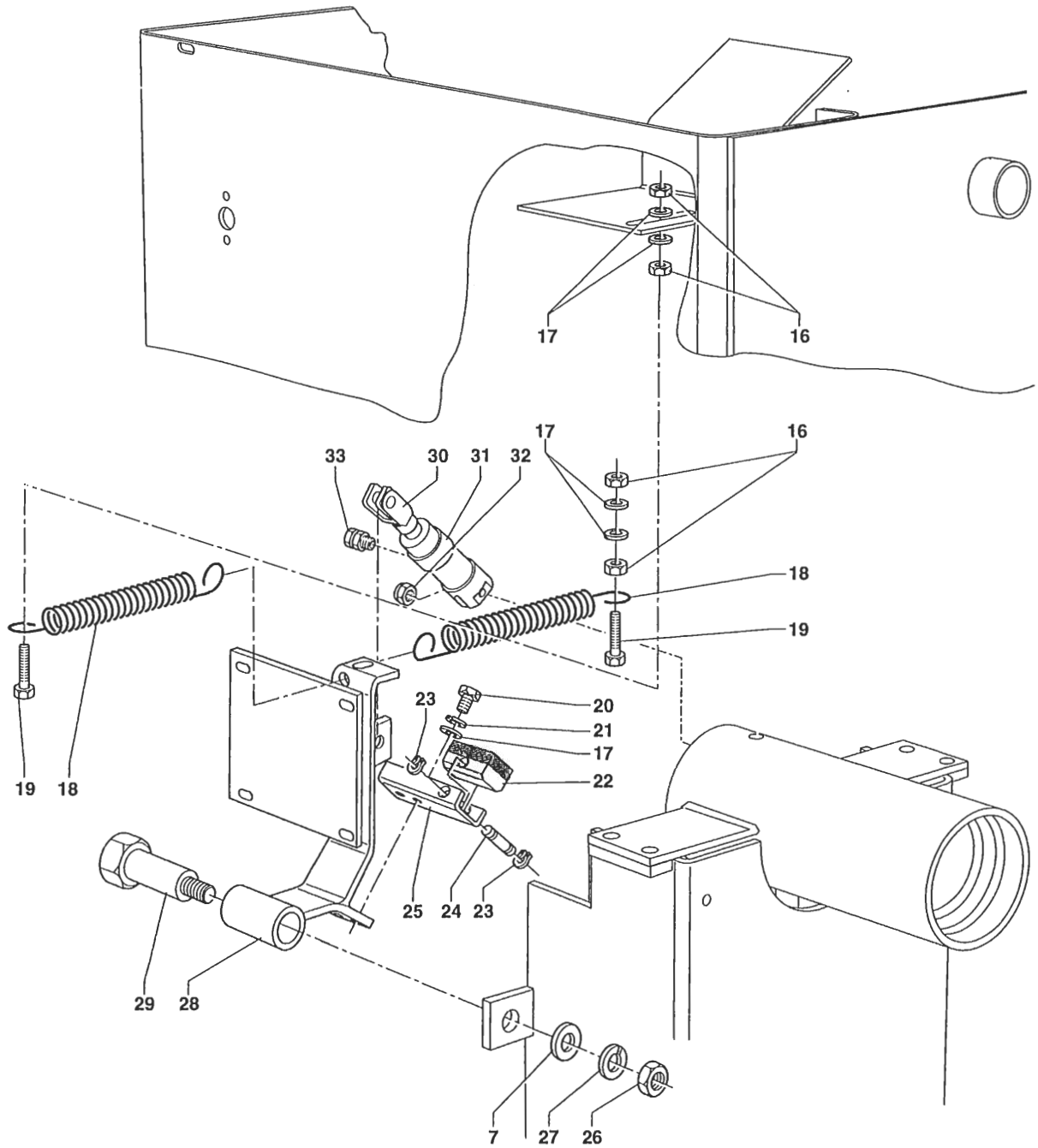
* Parts on the market



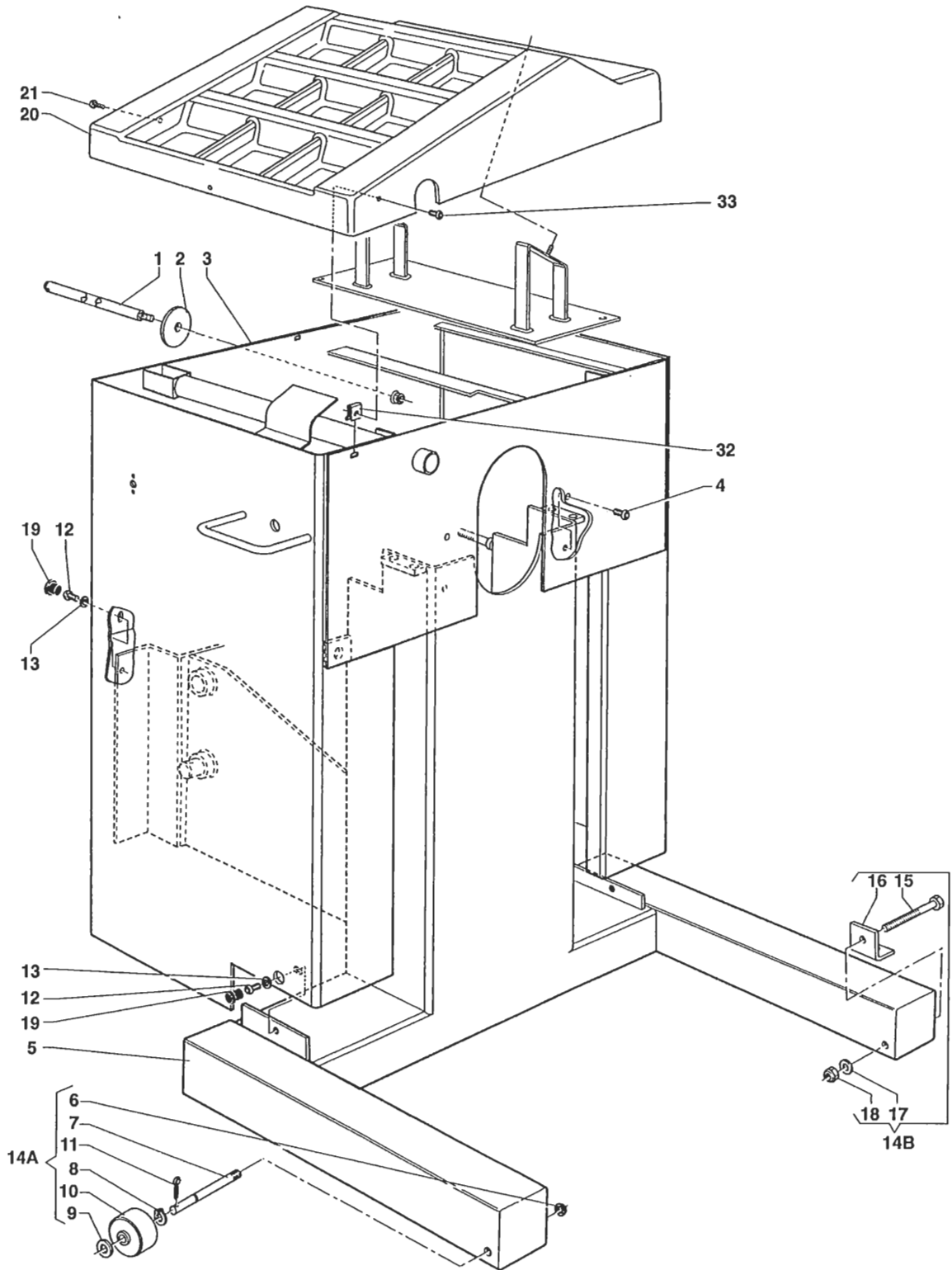
N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	42FM42698		11	348056025	*			
2	04FM38621		12	42FM43622				
3	323333040	*	13	114008002	*			
4	020620803	*	14	312120137	*			
5	42FM32440		15	325047011	*			
6	311220119	*	16	42FM45813				
7	325046010	*	17	344200118	*			
8	325035010	*	18	42FP41056				
9	040010101		19	181198630				
10	04FM40848		20	323333030	*			



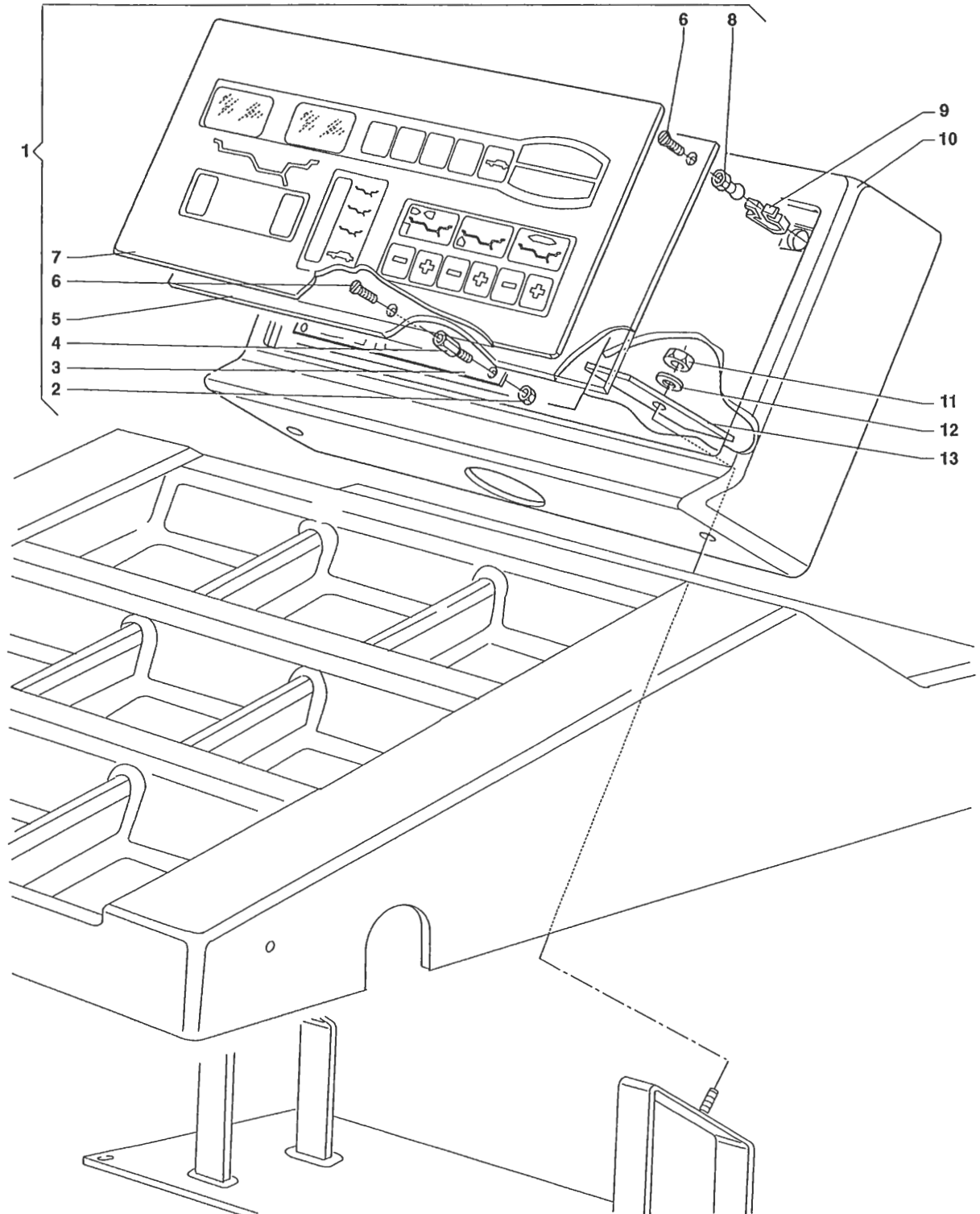
N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	321232006	*	11	67M38954M		21	940701233	
2	325035006	*	12	42SD39775		22	105110165	
3	07FG33406		13	325035003	*	23	326035011	*
4	42FG32429		14	321232003	*	24	345122515	*
5	325046004	*	15	420610639		25	501054293	230V/50-60 Hz
6	311120039	*	16	325046006	*	25	502054193	115V/50-60 Hz
7	311220071	*	17	105114744		26	348016015	*
8	311220073	*	18	325035010	*			
9	86SD44369		19	321212010	*			
10	314231018	*	20	940701232				



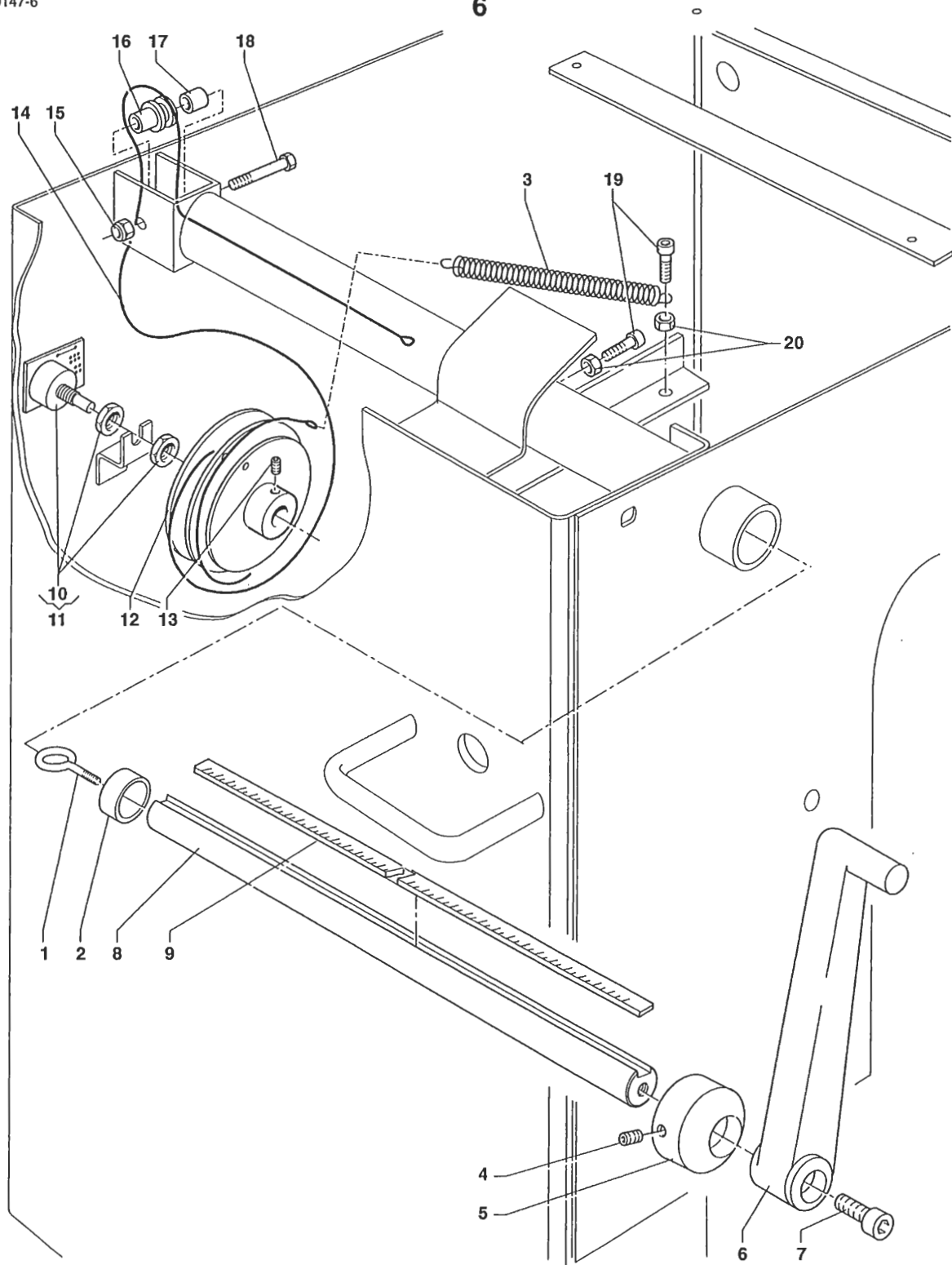
N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
7	325035012	*	25	42FB37117				
16	321232006	*	26	321232012	*			
17	325035006	*	27	325046012	*			
18	182185730		28	42FG37691				
19	311220073	*	29	42FG33402				
20	311220071	*	30	160000193	*			
21	325046006	*	31	161035030	*			
22	42FB37113		32	321233008	*			
23	341000006	*	33	172079492	*			
24	42FB37116							



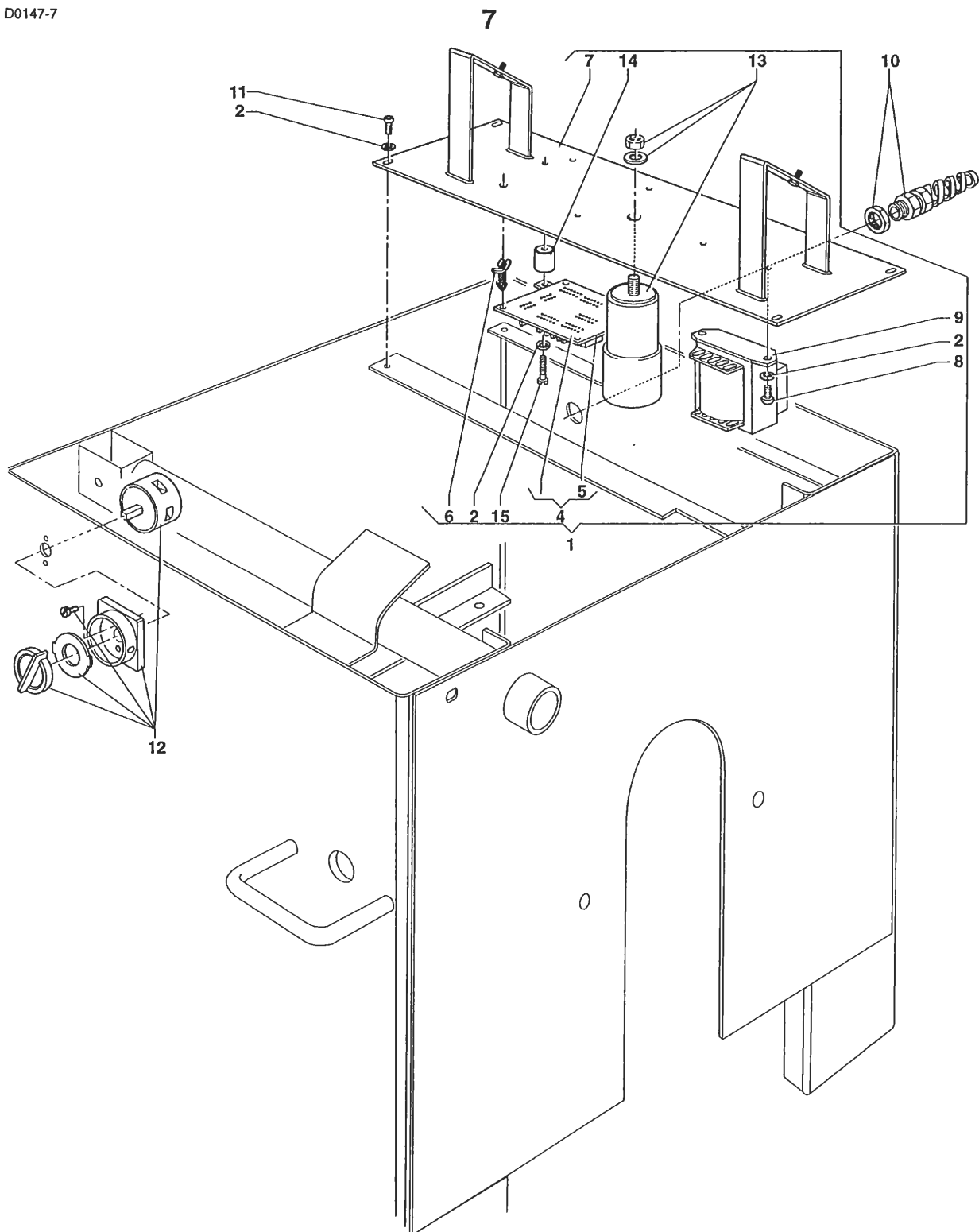
N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	105245420		10	152065123	*	18	321233010	*
2	140212960		11	337110010	*	19	213005623	*
3	42BV45222		12	317224068	*	20	14FB45223	
4	317224093	*	13	325035006	*	21	314931069	*
5	42BV45966		14A	46FB46704		22	42FB43112	
6	323333012	*	14B	46FB46703		23	14FB39696	
7	42FB45697		15	311120131	*	32	329007043	*
8	341000012	*	16	42FB41412		33	314931071	*
9	325035012	*	17	325035010	*			



N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	86PR33822		11	321232006	*			
2	321232003	*	12	325046006	*			
3	86SC33821		13	42FB35204				
4	527034980	*						
5	052983102							
6	315231015	*						
7	05PR33399							
8	329007663	*						
9	329004434	*						
10	143298321							

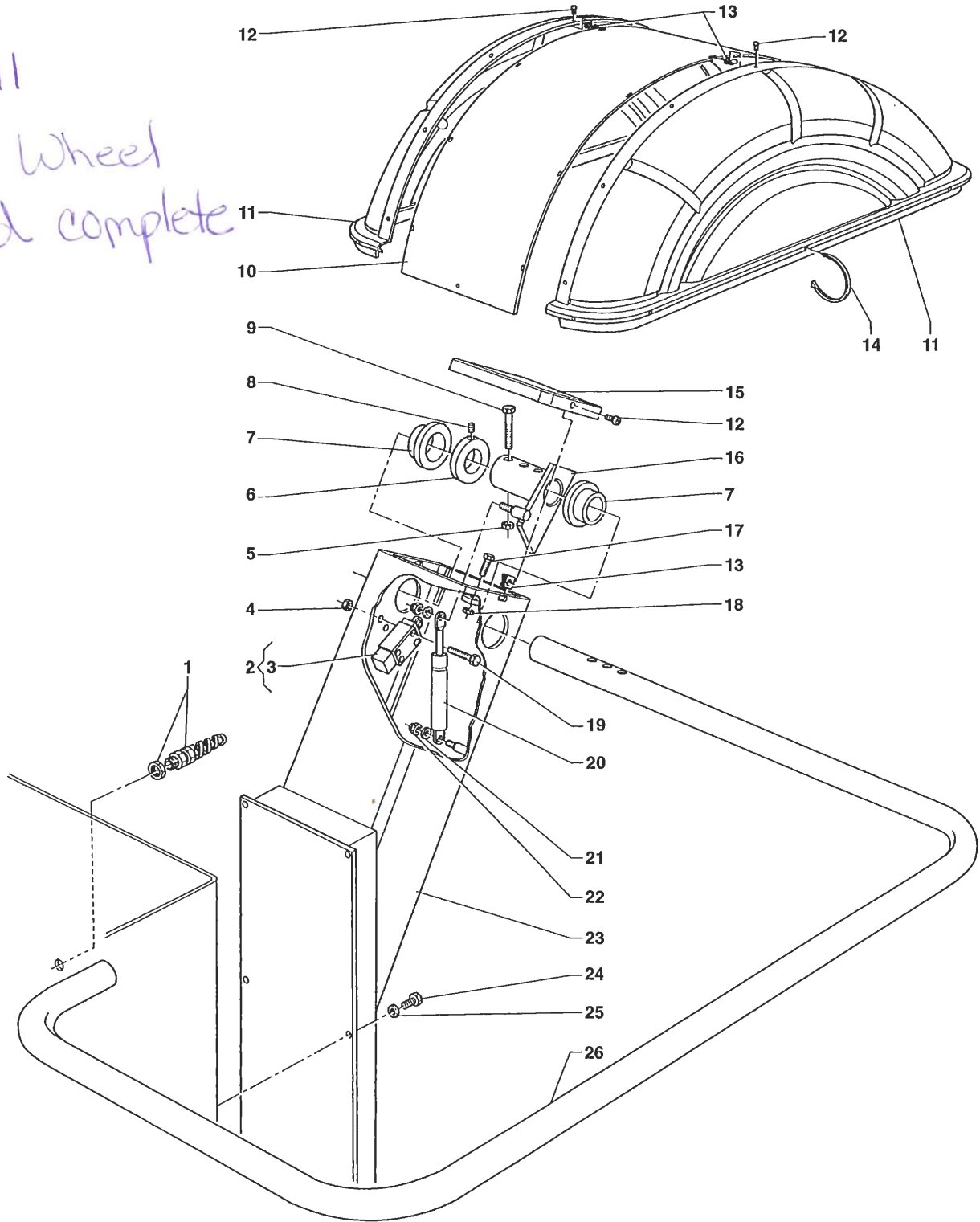


N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	105005030	*	11	86SB35583				
2	21FC32443		12	217025965				
3	182185750		13	319216034	*			
4	319216031	*	14	523000018				
5	940102388		15	321233006	*			
6	217027833		16	217021283				
7	312120071	*	17	420230157				
8	42FC32488		18	311120078	*			
9	040142902		19	312120034	*			
10	588020312		20	321232004	*			

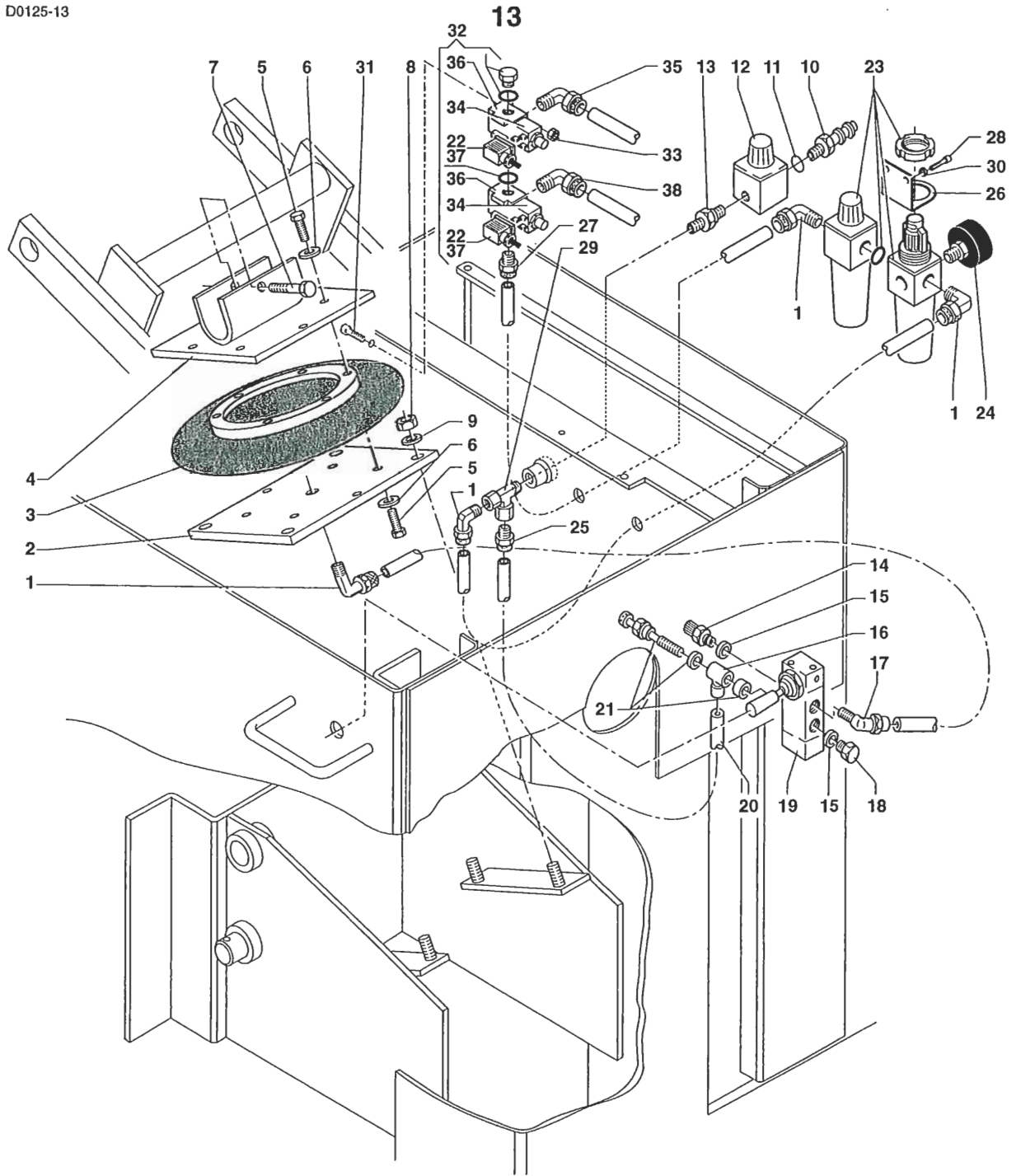


N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	86SZ45288	230V	10	526003246	*			
1	86SZ45289	115V	11	314931069	*			
2	325035004	*	12	511231002				
4	86SC33823		13	568001458	14MF (230V)			
5	681002000	*	13	568003558	35MF (115V)			
6	527006175	*	14	420627865				
7	42SZ45284		15	314231040	*			
8	317232034	*						
9	611000308	30VA (230V)						
9	611000307	30VA (115V)						

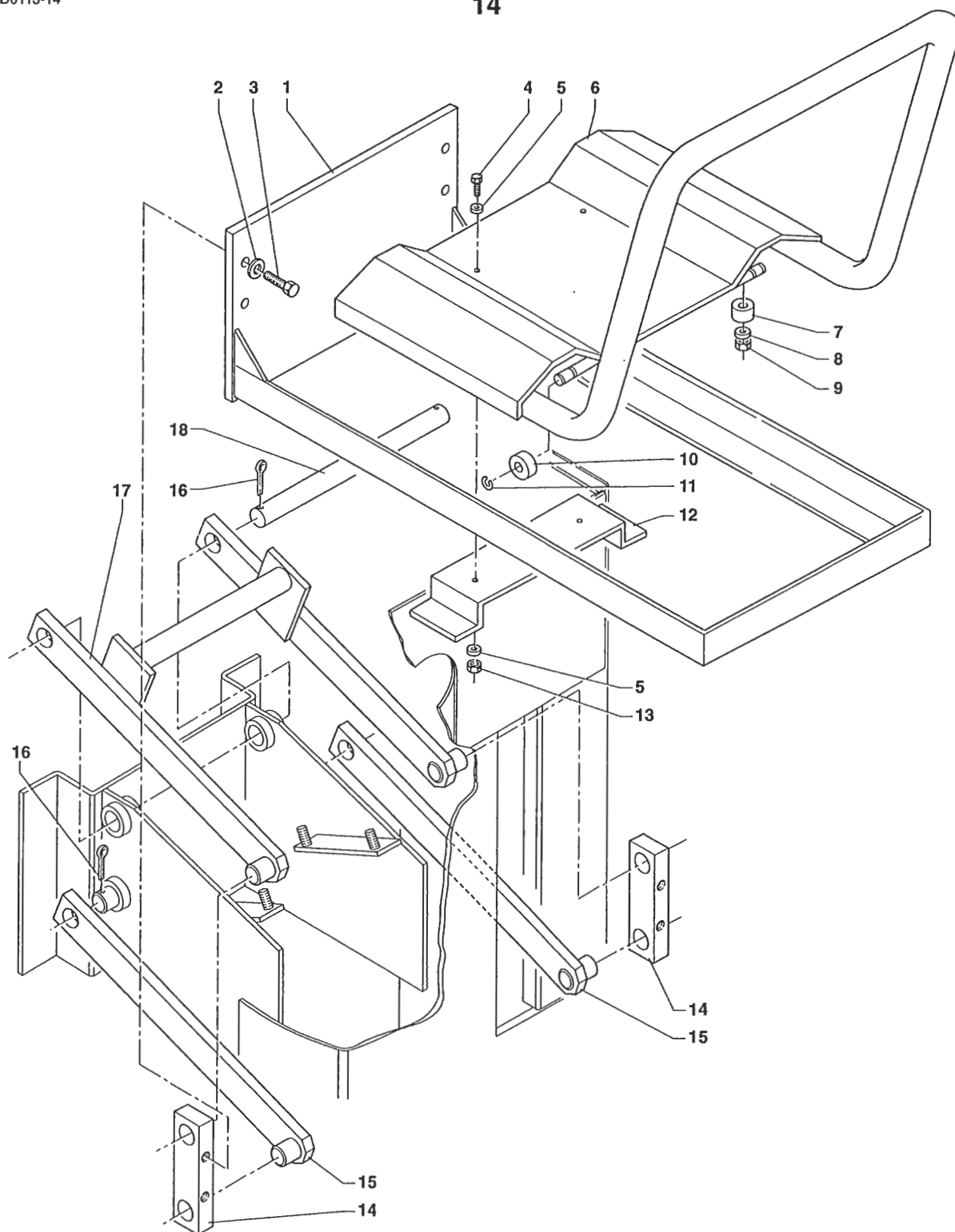
C-211
 Need Wheel
 Guard complete



N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	526003237	*	11	14FW31322		21	325035008	*
2	86SB33997		12	317232034	*	22	321233008	*
3	517140515		13	329007043	*	23	42FW33446	
4	321232004	*	14	523031916	*	24	312120070	*
5	321212010	*	15	14FW33850		25	325035006	*
6	42FW31326		16	42FW33448		26	42FW38517	
7	21FW31325		17	311220095	*			
8	319216068	*	18	321232008	*			
9	311120128	*	19	311120042	*			
10	14FW38518		20	18FW31346	*			



N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	172082894	*	15	170001309	*	28	312120034	*
2	420228104		16	172080592	*	29	171002070	*
3	161900110	*	17	172082892	*	30	325035004	*
4	42FL33902		18	170001310	*	31	314232018	*
5	311120093	*	19	162368905	*	32	16SP33941	230V/50-60 Hz
6	325035008	*	20	179004006	*	32	16SP33942	115V/50-60 Hz
7	311120100	*	21	163007040	*	33	321232003	*
8	321232010	*	22	165000026	230V	34	160007221	230V/50-60 Hz
9	325035010	*	22	165000014	115V	34	160007222	115V/50-60 Hz
10	173010901	*	23	164000010	*	35	172082893	*
11	170001408	*	24	164004200	*	36	165051024	*
12	164000014	*	25	172079494	*	37	160110200	*
13	174000201	*	26	160014900	*			
14	163025062	*	27	172079492	*			



N.	CODE	DATA	N.	CODE	DATA	N.	CODE	DATA
1	42FL32466		11	341000012	*			
2	325035012	*	12	420224163				
3	311120147	*	13	321232006	*			
4	311220071	*	14	42FL33900				
5	325035006	*	15	42FL33901				
6	420228001		16	337110025	*			
7	420424165		17	42FL33904				
8	325035008	*	18	420419938				
9	321232008	*						
10	217024160							

Adaptors FI

Ø 40

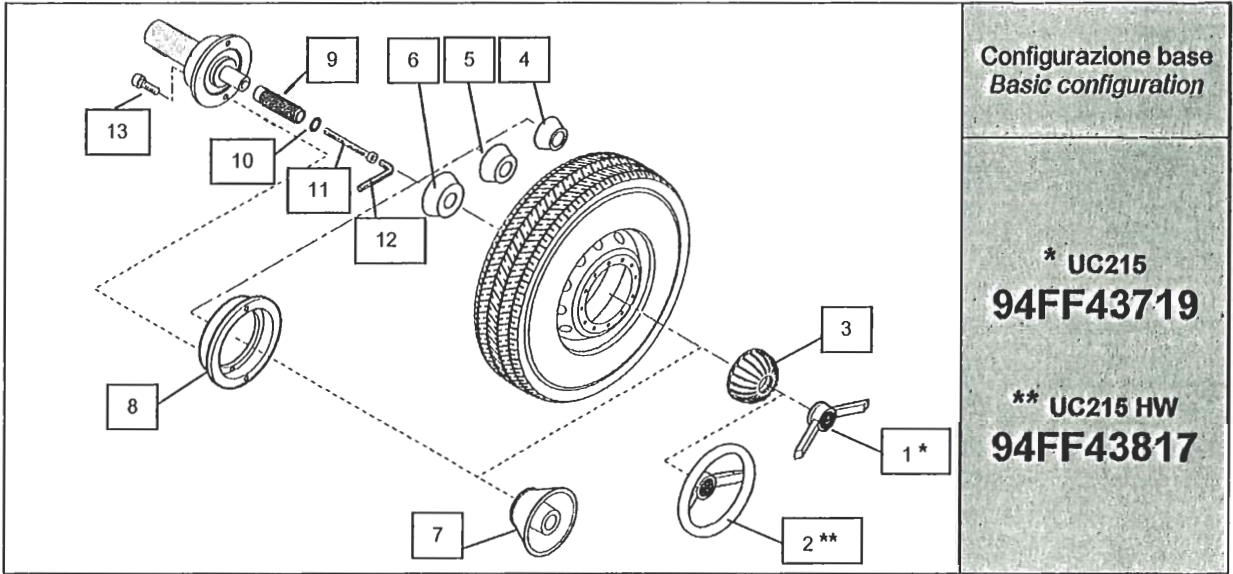
Universal adaptors for trucks

UC 215

Ø 40

UC215

Flangia a coni per autocarri ed autovetture
Cone adaptor for trucks and cars



CARATTERISTICHE GENERALI

- Per equilibratrici con corpo flangia a coni incorporato nell'albero della macchina, completo di molla precaricata
 - Con coni in acciaio temperato e albero rettificato
 - Per bloccaggio di ruote con foro centrale vettura e camion
- 2** consigliata quando non viene montato il carter di protezione

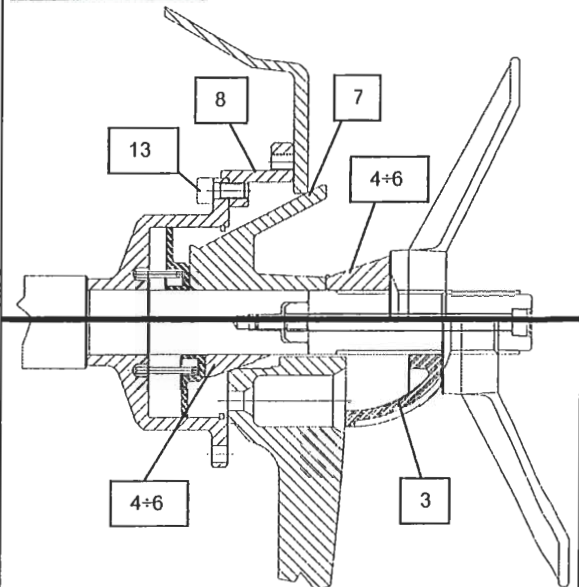
GENERAL FEATURES

- For balancers with cone adaptor body incorporated in machine shaft and pre-load built-in spring
 - With hardened steel cones and ground shaft
 - To lock car and truck wheels with central hole
- 2** recommended when wheel guard is not used

Ref.	Code	Data
1 *	40FF43726	G40 Winged lockring
2 **	41FF43728	GM40 Winged lockring + handwheel
3	40FF43730	Hollow sleeve
4	40FF43714	A1 cone Ø 43+69
5	40FF43715	A2 cone Ø 60+81
6	40FF43716	A3 cone Ø 79+110
7	40FF43717	5L cone Ø 97+170
8	40FF43745	G40 disc
9	42FM45813	Threaded end
10	325047011	Washer Ø 11/16
11	312120137	Screw M10x160 UNI5931
12	114008002	8 mm Allen Wrench
13	312120119	Screw M10x20 UNI5931

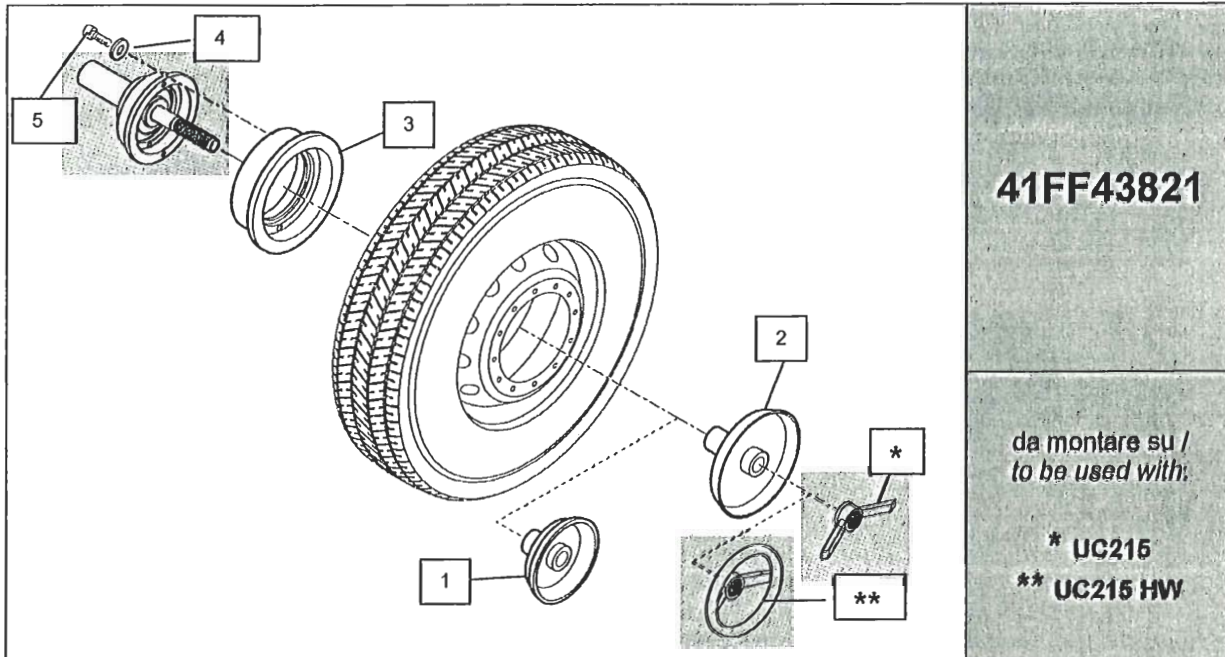
EXAMPLES

LIGHT TRUCKS



GARS

Kit di centraggio
Centering kit



41FF43821

da montare su /
to be used with:

- * UC215
- ** UC215 HW

CARATTERISTICHE GENERALI

- Adatto per tutte le ruote di autocarro
- Per bloccaggio di ruote con foro centrale

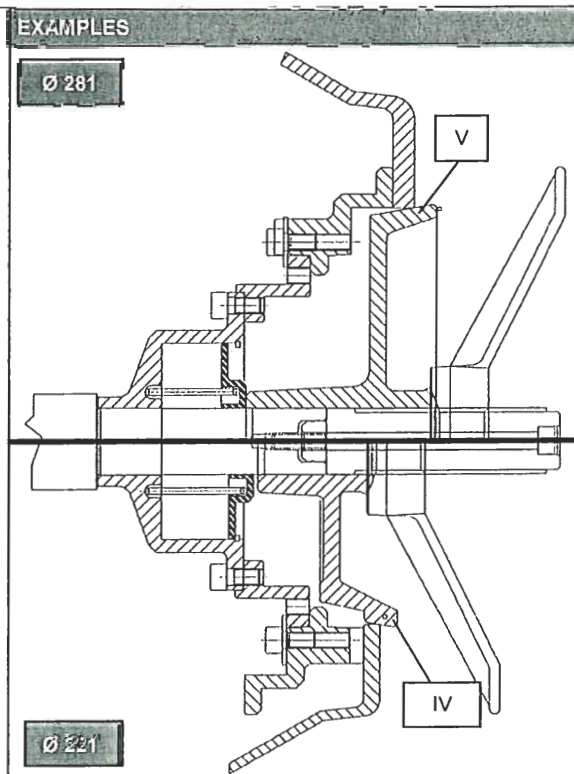
** consigliata quando non viene montato il carter di protezione

GENERAL FEATURES

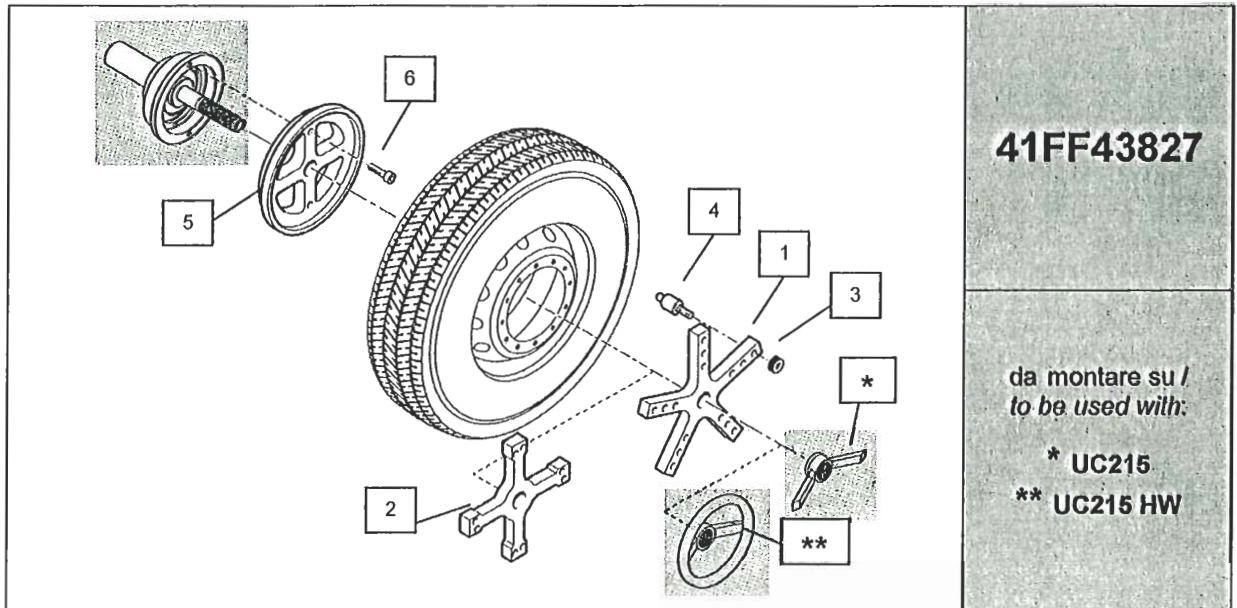
- Fit for all trucks wheels
- To lock wheels with central hole

** recommended when wheel guard is not used

Ref.	Code	Data
1	40FF43748	IV cone Ø 202/221
2	40FF43747	V cone Ø 281
3	940010105	GG disc
4	326035011	Flat washer Ø 11/30/2.5 UNI 6593
5	312120119	Screw M10x20 UNI 5931



Kit di centraggio
Centering kit



41FF43827

da montare su /
to be used with:

* UC215

** UC215 HW

CARATTERISTICHE GENERALI

- Adatto per tutte le ruote di autocarro con centraggio della ruota sul mozzo
- Ottimo per bloccaggio di ruote con foro centrale usurato o deformato
- La centratura precisa è assicurata dalle colonnette (4) quando entrano nei corrispondenti fori sul disco e si appoggiano sulla flangia di centratura (5). Le colonnette vanno inserite nelle crocere (1) o (2) nei fori interessati. Serrare la crociera con la ghiera in dotazione (*) o (**)

** consigliata quando non viene montato il carter di protezione

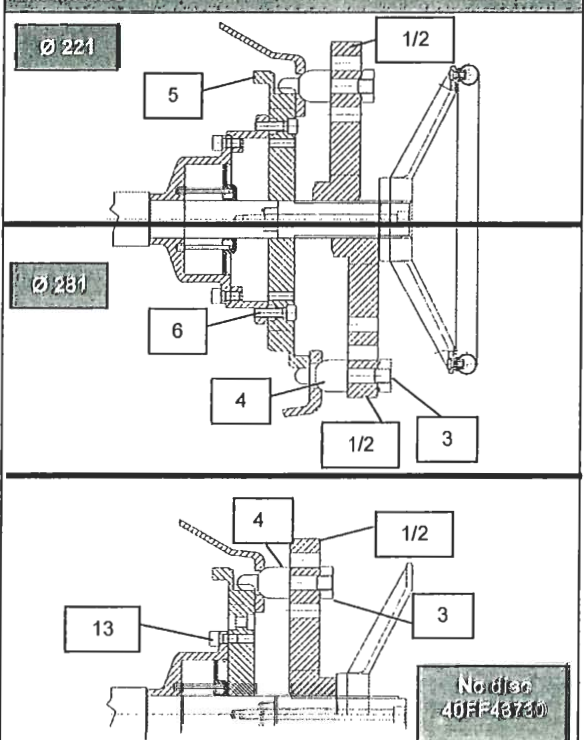
GENERAL FEATURES

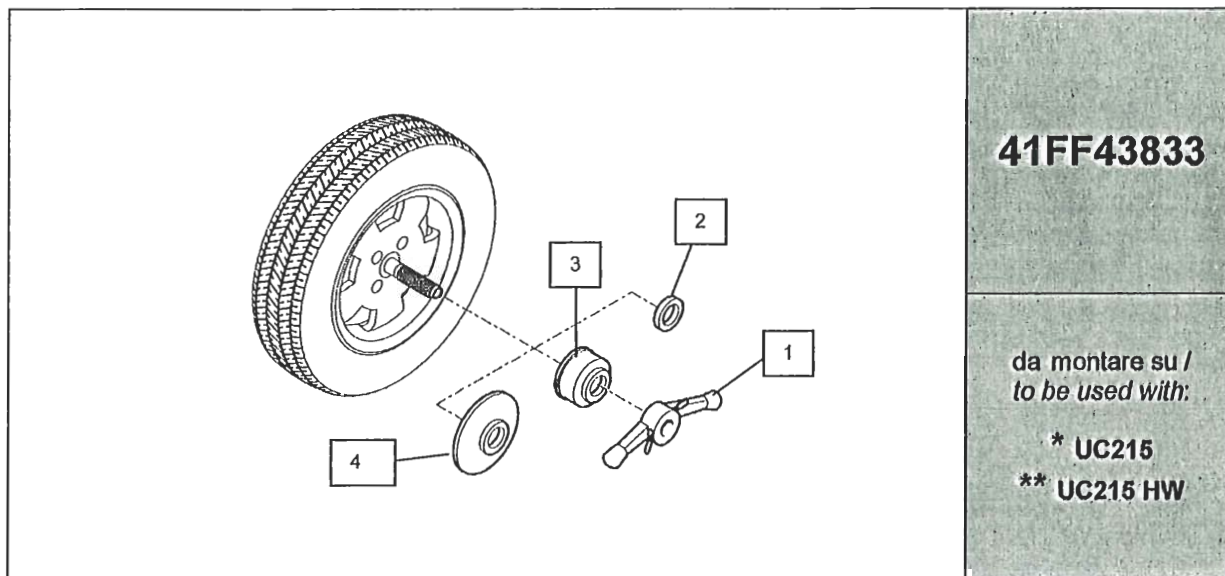
- Fit for all trucks wheels with centering of the wheel on the hub
- Excellent to lock wheels with worn or deformed central hole
- An accurate centering is provided for by means of pins (4) entering the matching holes on the disc and leaning on the adaptor (5). Pins are to be inserted in adaptor bodies (1) or (2) in the appropriate holes. The adaptor body is to be tightened through the ring in the fitting kit (*) or (**).

** recommended when wheel guard is not used

Ref.	Code	Data
1	40FF43829	4 arm adaptor body
2	40FF43830	5 arm adaptor body
3	40FF44995	Nut
4	40FF43831	Centering stud
5	40FF43832	Centering adaptor
6	312120122	Screw M10x35 UNI 5931

EXAMPLES



Kit Pro-grip**Ø 40x4****Option****Kit di serraggio rapido per vettura**
Quick-locking kit for cars**41FF43833**da montare su /
to be used with:

* UC215

** UC215 HW

CARATTERISTICHE GENERALI

- Per bloccaggio di ruote in lega (4)

GENERAL FEATURES

- To lock wheels with alloy rims (4)

Ref.	Code	Data
1	40FF43846	Pro Grip lockring 40x4
2	40FF43847	Pressure ring
3	40FF43848	Standard sleeve
4	40FF42047	RLH sleeve

10 - ERRORS

Various abnormal conditions can arise during machine operation. When detected by the microprocessor, they appear on the monitor as:

Err.

-5-

ERROR	MEANING
1	No signal of rotation. Could be caused by faulty position transducer or by something preventing the wheel from turning.
2	During the measurement spins, wheel speed had dropped to below 60 r.p.m. Check encoder functioning (see 11) and repeat the launch.
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 performed without adding the reference weight or else there is a break in the force transducer cable.

10.1 - INCONSISTENT UNBALANCE READINGS

Sometimes after balancing a wheel and removing it from the balancing machine, it is found that, upon mounting it on the machine again, the wheel is not balanced.

This does not depend on incorrect indication of the machine, but only on 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 centre line.

If the wheel has been mounted on the adapter with screws, it could be possible that the screws have not been correctly tightened, i.e. crosswise one by one, or else (as often occurs) holes have been drilled on the wheel with too wide tolerances.

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

If, after balancing, the wheel is found to be still out-of-balance when refitted on the vehicle, this could be due to the unbalance of the car brake drum or very often due to the holes for the screws on 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 (For example, see our models L36, L38/2).

11 - SELF DIAGNOSTICS

When **<T** + **F** are pressed together, a test is enabled for the correct operation of the displays and

LED's of the PC board after the end of which the wording **POS.** appears on the left display. At this point, correct operation of the position sensor can be checked by looking at the positioning LED's regarding the outside:

- When the wheel is moved slowly in the direction of rotation of the machine, the AUTO LED should start flashing while the ALU-S LED should remain steady.
- When the wheel is moved slowly in the opposite direction, the AUTO LED should start flashing while the ALU1 LED should remain steady.
- When switching from reset, the wording " **0** " should appear on the right display.
- Press **F**.
- A number appears on the RIGHT display, which is useful for calibrating the rim distance gauge (only for specialized personnel).
- Press **F**.

12 - ROUTINE MAINTENANCE (SEE EXPLODED DRAWINGS) (Non specialized personnel)

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

12.1 - TO REPLACE THE DRIVING PULLEY

- Remove the head and the weight shelf being careful not to pull away the electrical cables.
- Unscrew the pulley mounting screw in order to replace the pulley.
- Check supply pressure of the spinner device (see 3.2.1).
- Excessive pressure will cause premature damage of the rubber.

12.2 - TO REPLACE THE BRAKE PAD

Back-off the two screws fastening the worn brake pad to the motor mounting brake. Securely fix the new brake pad by tightening the screws.

12.3 - TO REPLACE THE FUSES

Remove the weight shelf in order to gain access to the power supply board on which two fuses are installed. If the fuses need replacement, use ones of the same current rating. If the fault persists, contact the Technical Service Department.

12.4 - MAINTENANCE OF THE SPECIAL PNEUMATIC CIRCUIT

It is important to periodically clean the compressed air filter and check that there be sufficient lubricating oil. The bowl should be filled 3/4; to top up, use mineral oil of medium viscosity (30 cSt at 20° C) (WAIRSOL, LXOL grade). Normal oil flow rate is one drop every 10 operations.

N.B.: DRAIN FREQUENTLY ANY CONDENSATE BUILT UP IN THE FILTER BOWL VIA RELATIVE VALVE.

NONE OF THE OTHER MACHINE PARTS REQUIRE MAINTENANCE.

13 - RECOMMENDED SPARE PARTS LIST (References on the exploded drawings)

CODE	DESCRIPTION
182185730	Balancing spring
07FG33406	Rubber covered driving pulley
42FB37113	Complete brake pad
020620803	Bearing 6208-2Z Ø 40/80/18
67M38954M	Position pick-up board c/w cable
182185750	Spring, rim distance gauge 18575P
05PR33399	Display panel
511231002	Switch KL 1002 + Q 555
86PR33822	Complete panel
86SC33821	Computer board
86SC33823	Power board
681002000	Fuses DM 5x20 2A
86SB35583	Cable with DISTANCE potentiometer + board
162368905	Pneumatic control 368-905

SPECIAL PARTS FOR 230V MACHINES

86SZ45288	Complete power board
568001458	Capacitor 14MF 450V Faston
165000026	Illuminated anti-interference adapter
16SP33941	Set of solenoid valves 230V 50/60 Hz
160007221	Coil MB58 230V 50/60 Hz
611000308	Transformer 30VA (230V)

SPECIAL PARTS FOR 115V MACHINES

86SZ45289	Complete power board
568003558	Capacitor 35MF 450V Faston vite/screw M8
165000014	Illuminated anti-interference adapter
16SP33942	Set of solenoid valves 15V 50/60 Hz
160007222	Coil MB57 115V 50/60 Hz
611000307	Transformer 30VA (115V)

SPECIAL MAINTENANCE

(only for specialized personnel)

14 - TO CHANGE SUPPLY VOLTAGE

(See recommended spare parts lists and power layout diagram)



Machine **C211** can run on 110/115V - 50/60 Hz or 220/240V - 50/60Hz.

To change the supply voltage, proceed as follows:




- 1) Replace the motor.
- 2) Replace the entire power board or else modify the board as follows:
 - A) Replace the capacitor.
 - B) Connect, to contact T1 on the power board, the primary conductor of the transformer corresponding to the required voltage (Red for 230V - White for 115V)
 - C) Replace the set of solenoid valves.



15 - SELECTION OF MACHINE PARAMETERS


(for references regarding keys and buttons, see figures 10a - 10b - 10c)

Press  +  as when carrying out self-calibration; when the position LED's stop flashing, instead of performing the spin, press the following within 5 seconds and in the correct sequence:






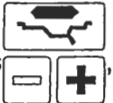
After pressing  and  the displays go out. After pressing  the current fixed distance



[DF] appears: change with  and 


Press  to pass on to modify value "I".

The right display shows the current value (in %) while the left display shows the wording "I" and symbol

"—" if the correction is negative; otherwise "—" if it is positive. Change with  and 

When button  is pressed, the value "S" appears on the right display. To modify it, press 

 To end, press 

N.B. When  is pressed during any phase of setting the three parameters, the system interrupts such function and automatically sets the machine parameters with their default values.

Default values of the configuration : **DF = 130** **I = 0** **S = 330**

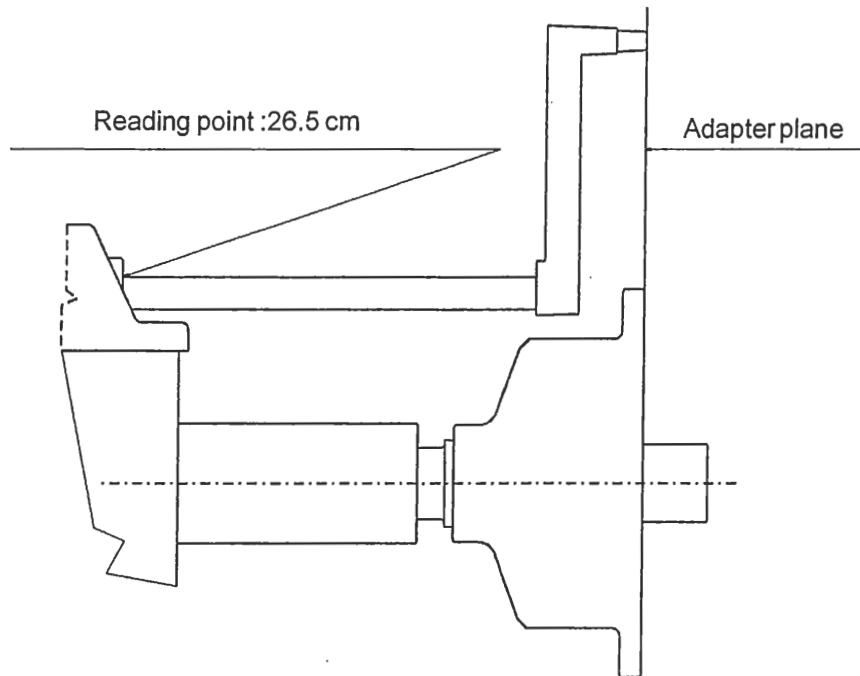
After changing the machine parameters, repeat the self-calibration.

N.B. There is a special chart inside the machine giving the values on the basis of which the machine has been factory tested.

16 - CHECKING OF THE RIM DISTANCE GAUGE

Check that the ruler used for measuring the DISTANCE of the wheels reads 26.5 cm as measurement of the distance from the adapter plane. If the graduated scale is changed, position it with the line indicating 26.5 at the fixed index limit (reading point) when the gauge tip coincides with the adapter plane.

Fig. 17



17 - CALIBRATION OF THE DISTANCE POTENTIOMETER

- Remove the weight shelf and refit the tip on the gauge rod.
 - Back-off the screws fastening the pulley on the potentiometer shaft.
 - Select the rim distance gauge number from SELF-DIAGNOSTICS (11).
 - The number varies when the distance gauge is moved and represents a reference for calibration of the potentiometer.
 - With the gauge fully retracted, turn the potentiometer shaft keeping the pulley still until the highest possible number is read.
 - Decrease by two numbers, then retighten the screws to secure the pulley on the shaft
- Press **F**
- Perform SET UP (9.2).

18 - ASSEMBLY OF THE PIEZO MEASURERS

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.
2. Remove nuts 1 and 2 with relative cup springs and washers.
3. Back-off screws 3, 4 and 5 then disassemble the various parts.
4. 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 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 (by half a turn with the spanner if necessary).

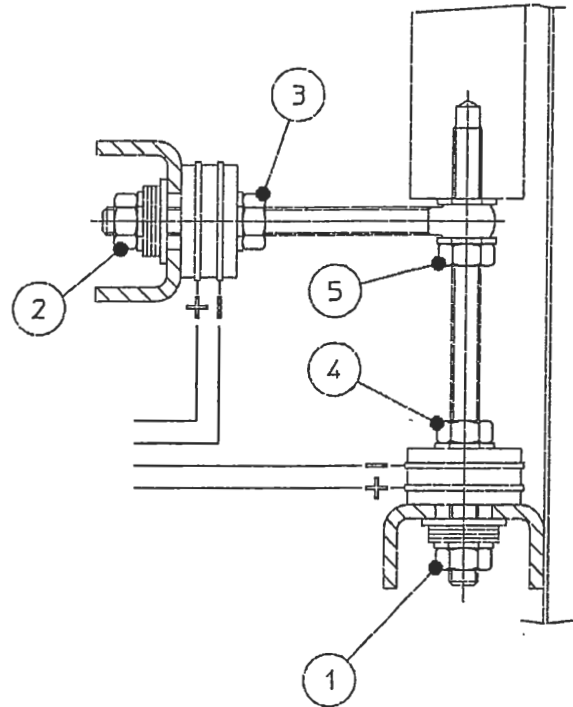
6. Refit the washers, cup springs and nuts 1 and 2. Tighten the nuts fully in order to fully regain the elasticity of the cup springs, then loosen them by half a turn. This will automatically ensure correct preloading on the piezo (a torque wrench can be used set to 400 kg. cm.).

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 50 Mohm).

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

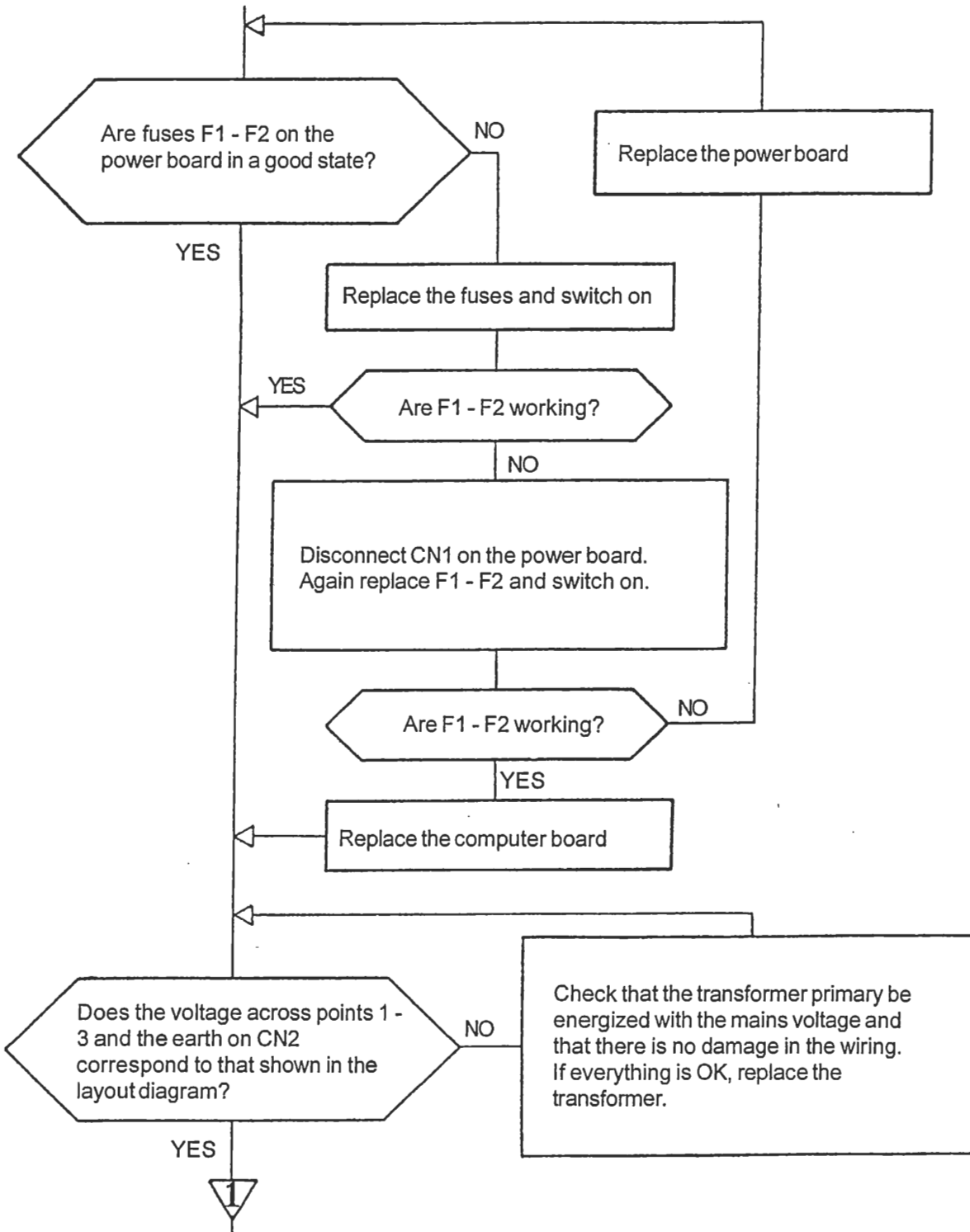
Fig. 18

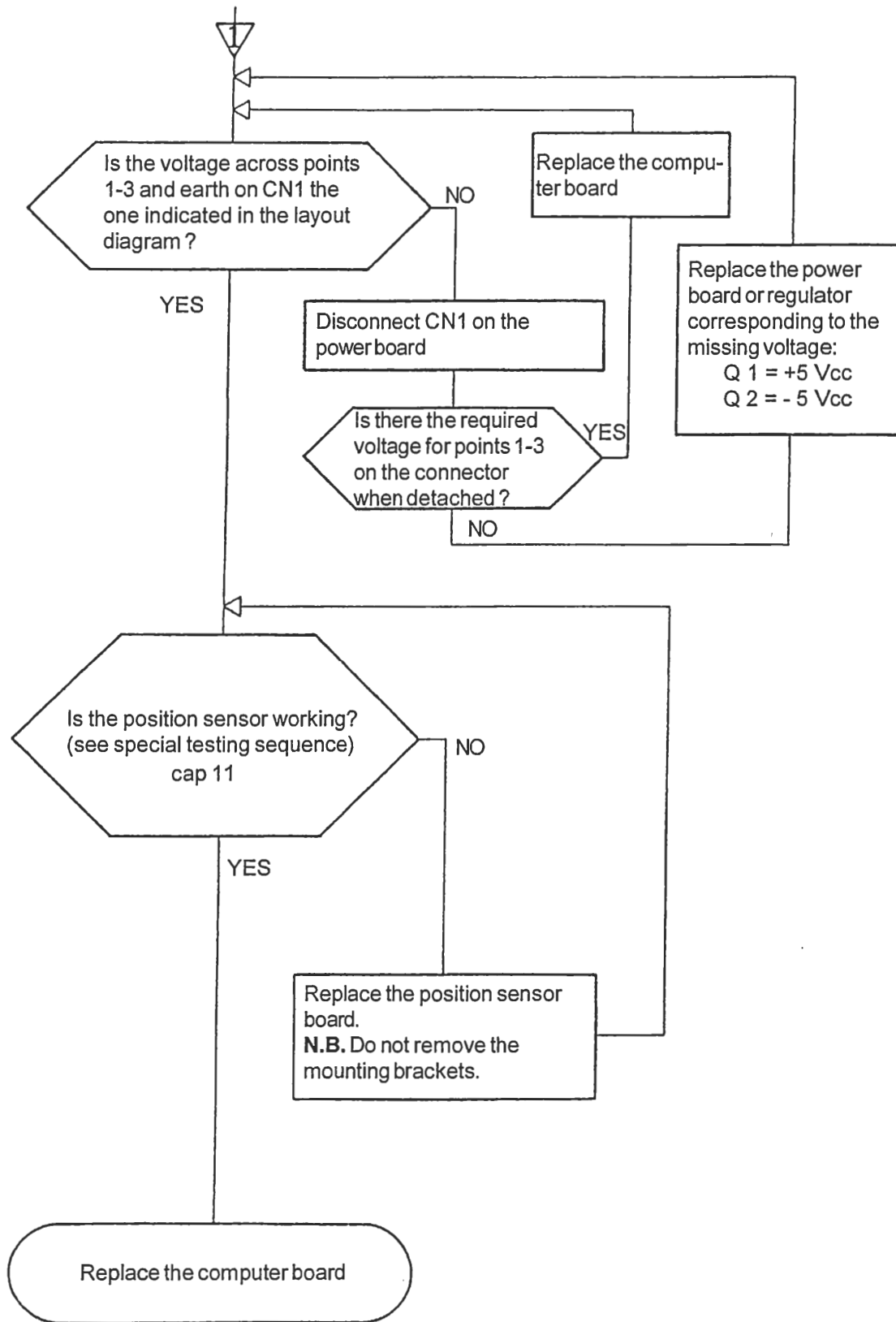


yellow
blue
yellow
white

19 - LOGIC TROUBLE SHOOTING SEQUENCE

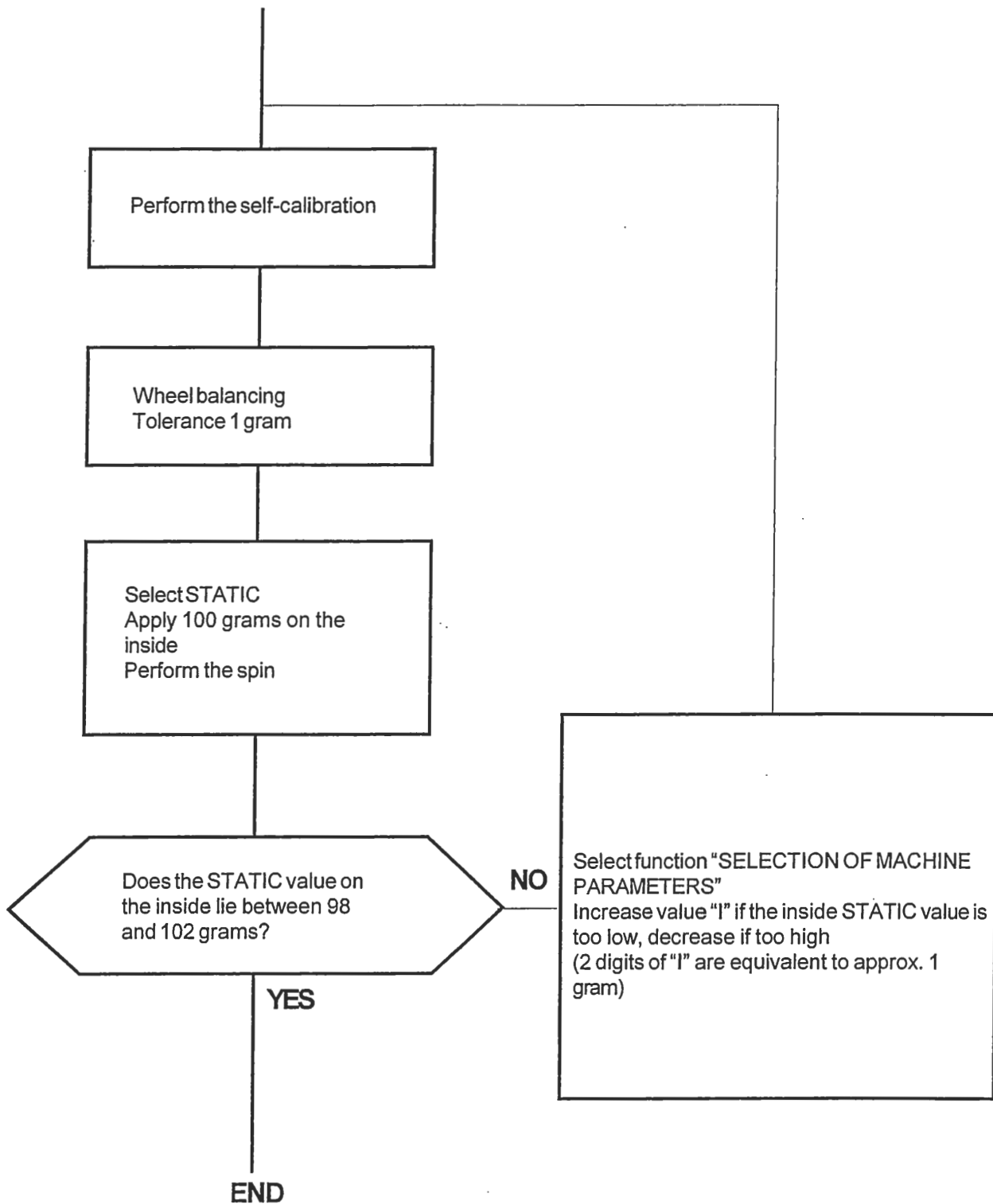
- N.B.** Before carrying out any test, disconnect the solenoid valves on the contactors. Reconnect only at the end of testing. When the power or computer board requires replacement, repeat the self-calibration of the balancing machine.
- N.B.** When the computer board is replaced, preset the machine parameters indicated on relative nameplate.



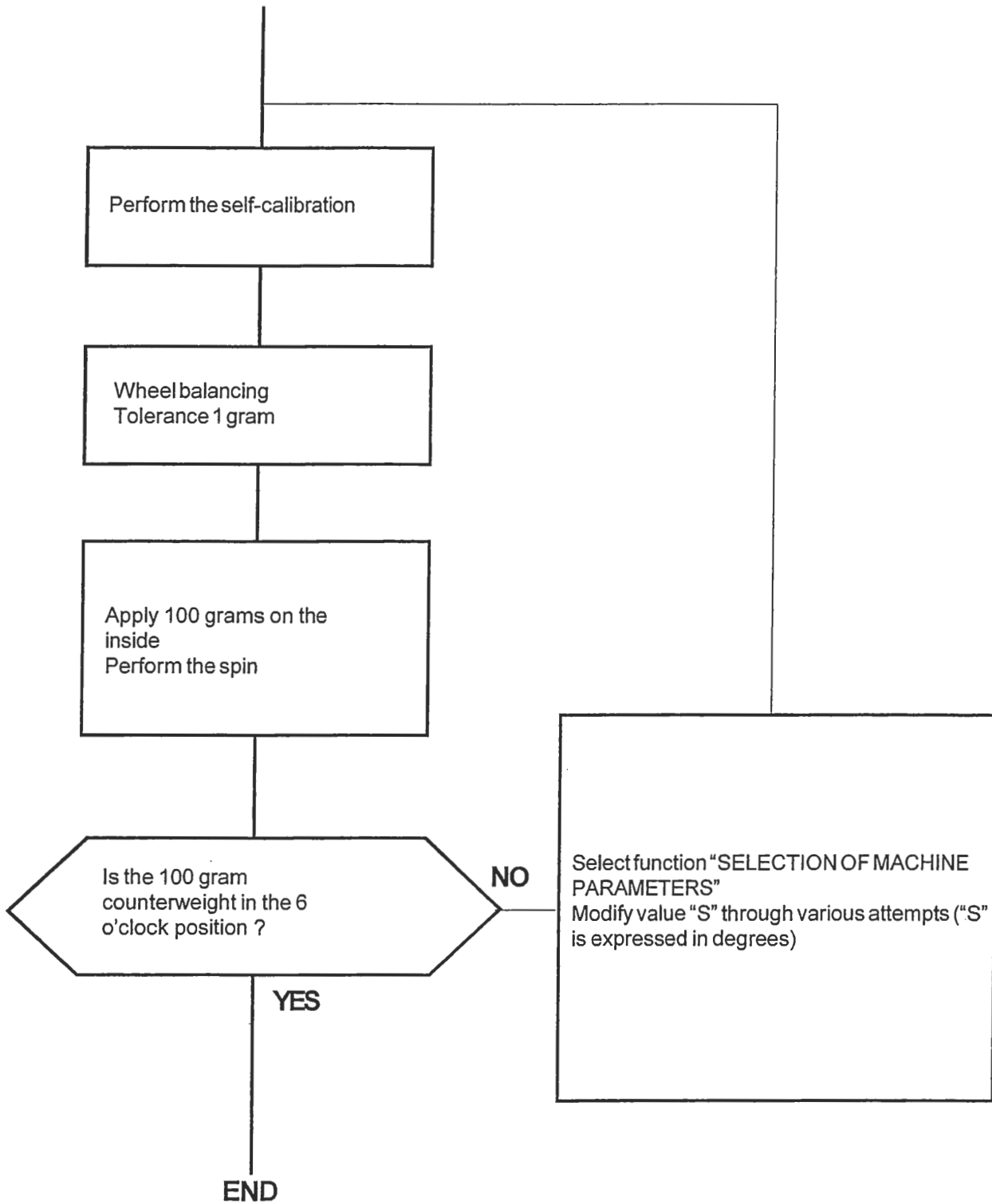


19.1 - CHECKING AND CALIBRATION OF THE STATIC VALUE (STI)

(Perform with car wheel of average size)

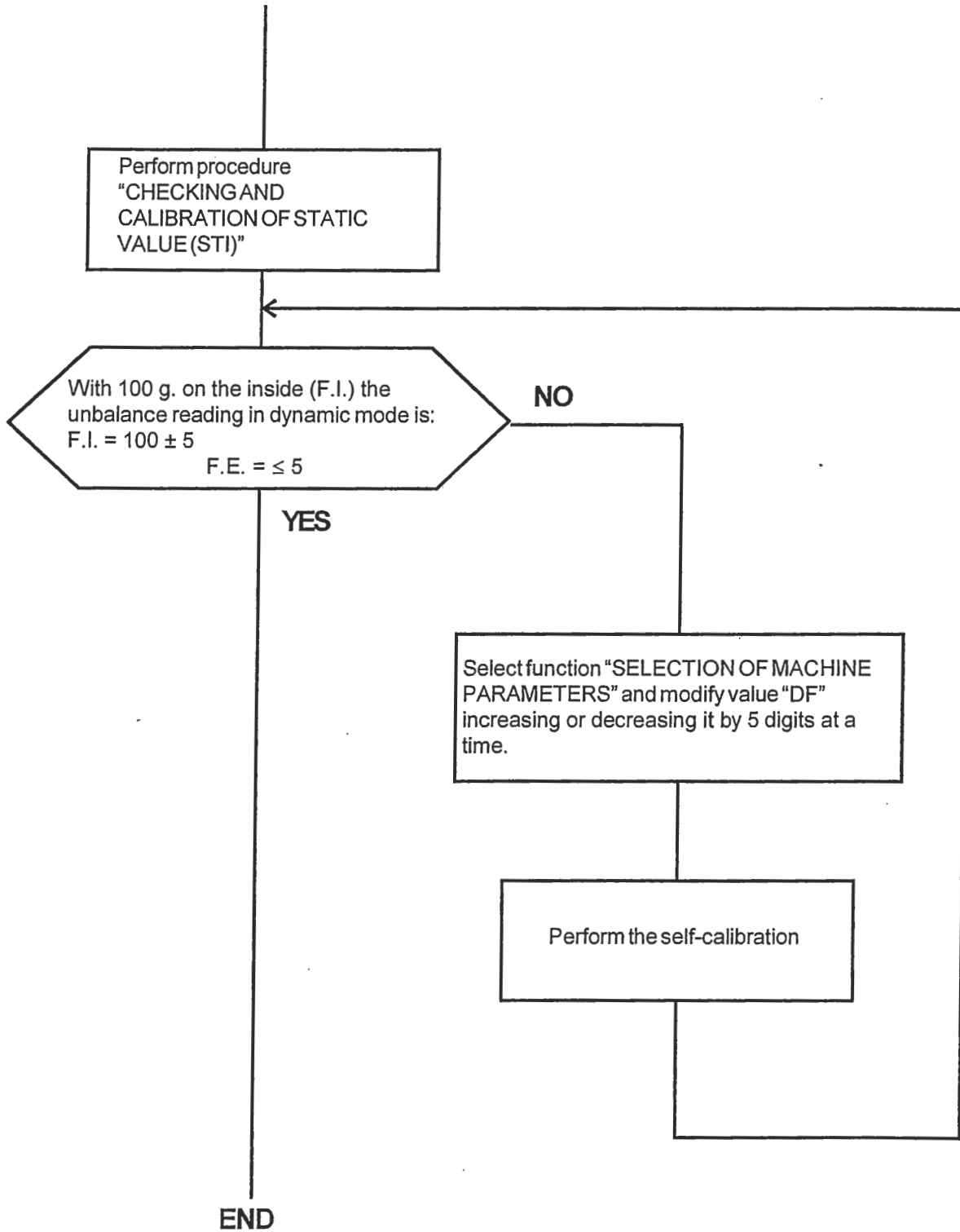


19.2 CHECKING AND CALIBRATION OF UNBALANCE POSITION (Perform with car wheel of average size)



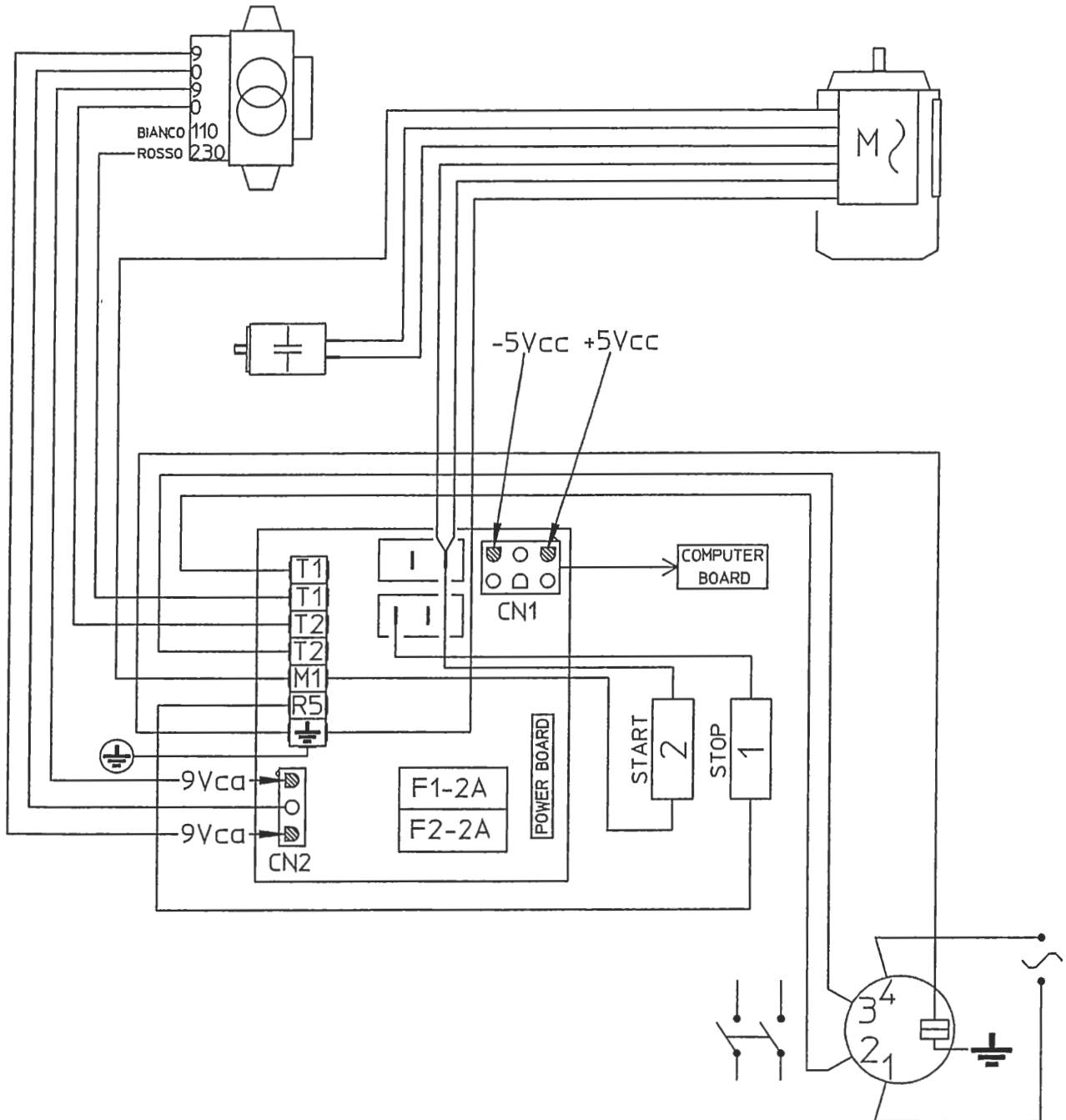
19.3 - CHECKING AND CALIBRATION OF FIXED DISTANCE VALUE (DF)

(Perform with car wheel of average size)



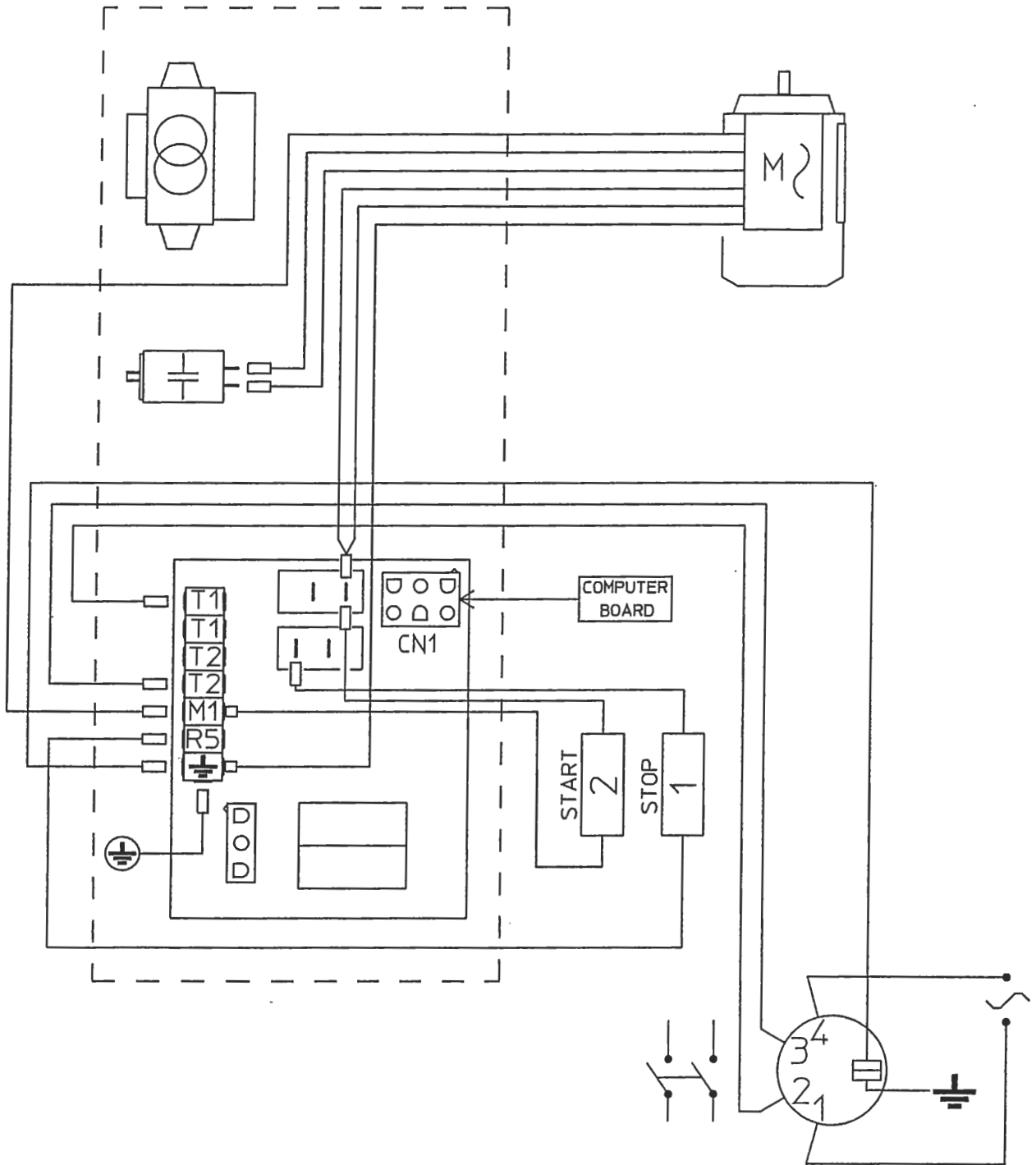
20 - POWER SUPPLY LAYOUT DIAGRAM (230V connection)

Fig.19



21 - POWER SUPPLY LAYOUT DIAGRAM (Check voltage)

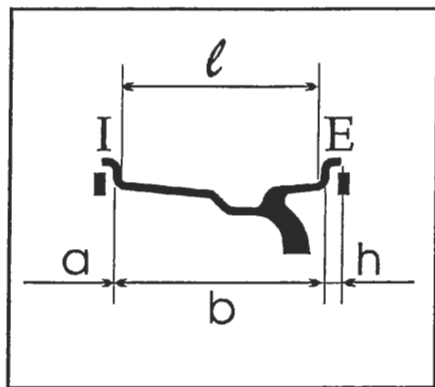
Fig. 20



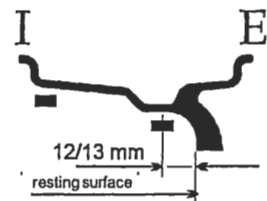
22 - WHEEL MEASUREMENT AND PRESETTING ON THE BALANCING MACHINE

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 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 centres of gravity of the corrective weights.

Consider a typical rim: size "ℓ", given as width by the rim manufacturer, differs from the measurement of the distance between the correction planes for the rim thickness and physical dimensions of the counterweight, whose centre 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 $2 \times h = 6 \text{ mm}$ 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 a good rule to add ¼ 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 centre of gravity of the counterweight as seen above.



ALU 1
 $a = a \text{ preset} + \frac{3}{4}"$
 $b = b \text{ preset} - 1 \frac{1}{2}"$
 $d = d \text{ preset} - 1"$



ALU 2
 $a = a \text{ preset} + \frac{3}{4}"$
 $b = \text{distance of adapter surface} - \frac{1}{2}" - a$
 $d_I = d \text{ preset} - 1"$
 $d_E = d \text{ preset} - 2 \frac{1}{2}"$



ALU 3
 $a = a \text{ preset}$
 $b = \text{distance of adapter surface} - \frac{1}{2}" - a$
 $d_I = d \text{ preset}$
 $d_E = d \text{ preset} - 2 \frac{1}{2}"$



ALU 4
 $a = a \text{ preset}$
 $b = b \text{ preset} - \frac{3}{4}"$
 $d_I = d \text{ preset}$
 $d_E = d \text{ preset} - 1"$

NB :
 I = INSIDE
 E = OUTSIDE

23 - HOW TO CHECK FUNCTIONING AND ACCURACY

Further to some notices informing us of defects and unaccuracies not clearly traceable, we are explaining hereunder the procedure how to check functioning and accuracy to help us to detect problems.

FIRST CHECKS

Accurate wiping of adapter and cones
Spring cover sliding
Shaft end blocking

GAUGE CALIBRATION (use an average size iron wheel i.,e. 14" x 6" ± 1") - See 11-16-17)

DIST:

Calibrate gauge and check accuracy.
Tolerances: DIST.= 5 mm

CALIBRATION (see 9)

Use the same wheel as for gauge calibration
Set accurate measures, in manual mode if necessary
Make self-calibration

CHECKING MACHINE CALIBRATION

Make 10 spins without loosening the wheel and detect MAX oscillations

F.I. (Inner side)= F.E. (Outer side)= (tolerance ± 2)

Put 100 gr. on FE first and then on FI using an accurately balanced wheel) Detect rates

F.I.= F.E.= POS.E.= F.I.= F.E.= POS.I.=

(tolerance 3%)

CHECKING THE ADAPTER

Turn a fine balanced wheel upside down (180°) and detect unbalance rates

ERR.MAX =

This check-out in particular must be made with a sample wheel whose max unbalance errors due to centering are well known (generally lower than 10 gr. for iron wheels).