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P200

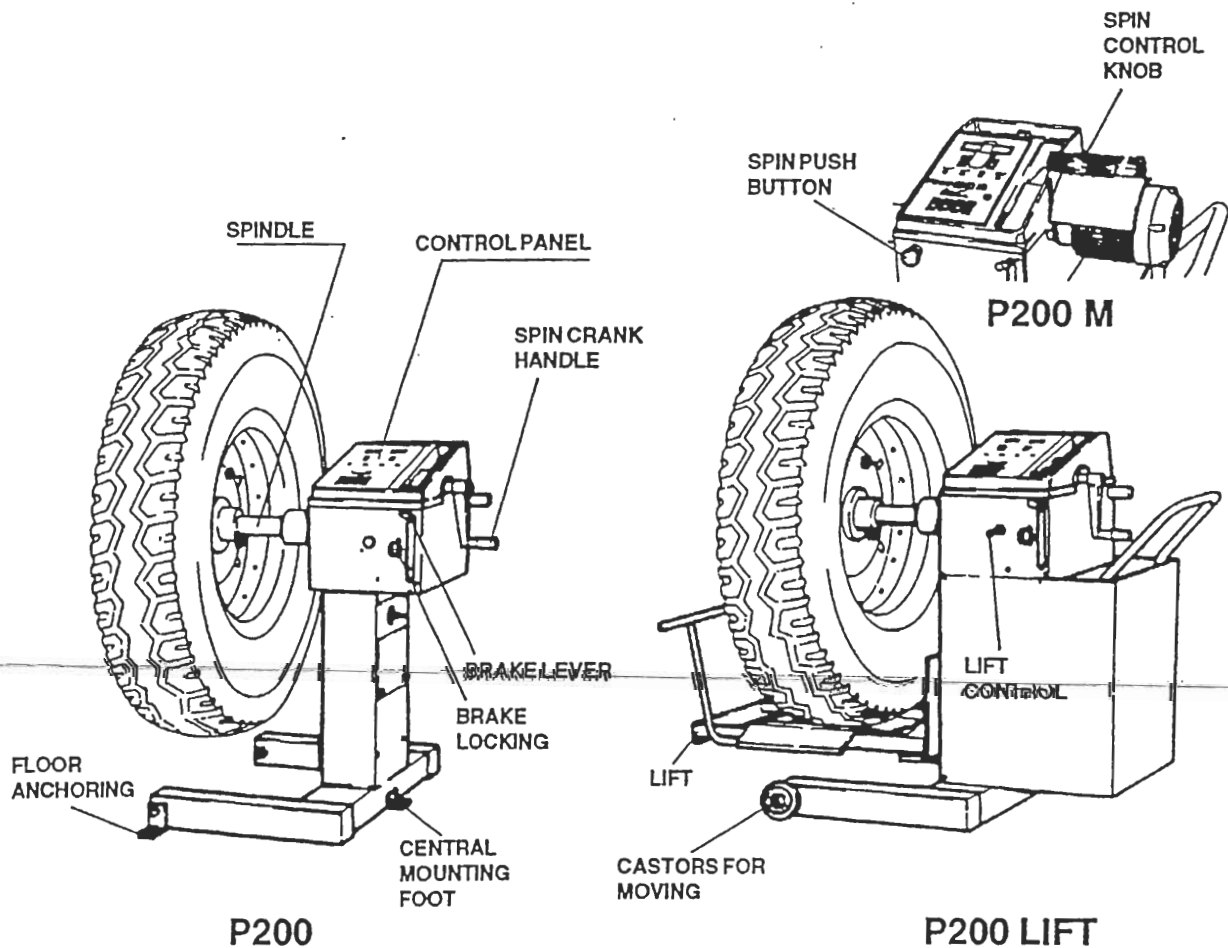
(Series F)

Balancing machine for truck, bus and car wheels

with manual spin or motor-driven spin

Nr. 1064 - 1995.10

Operating and Maintenance Instruction Manual



MANUFACTURING REVISION + UP-DATING

MODEL : P200

SERIES : from E to F FROM TO

Program version :

Software up-dating :/...../.....

.....

.....

MODIFICATIONS:

- New computer board (SMD).
- Weight-tray cover with drillings suitable for fitting SMD board.
- The push-button board cable is longer than the previous type.

Due to the different drillings and push-buttons cable, SMD computer board is not interchangeable with that of previous series.

MANUFACTURING REVISION + UP-DATING

MODEL : P200M

SERIES : from C to D FROM TO

Program version :

Software up-dating :/.....

.....

.....

MODIFICATIONS:

(The same as for P200 from E to F).

CONTENTS

PAGE

1 - DESCRIPTION OF THE BALANCING MACHINE	5
1.1 - GENERAL	5
1.2 - TECHNICAL DATA	5
1.3 - USER RECOMMENDATIONS	6
1.4 - STANDARD SAFETY DEVICES	6
2 - HOISTING AND INSTALLATION	7
3 - ELECTRICAL CONNECTION	7
4 - ADAPTER MOUNTING	7
4.1 - EXAMPLE OF MOUNTING RAPID ADAPTER R200	7
5 - WHEEL MOUNTING	8
6 - CONTROL PANEL	8
7 - PRESETTING OF DIMENSIONS	9
7.1 - OPTIONAL FUNCTIONS	10
8 - WHEEL BALANCING	11
8.1 - MEASUREMENT OF UNBALANCE	11
8.2 - RECALCULATION OF UNBALANCE	11
8.3 - P200M (OPTIONAL)	11
8.4 - STATIC - ALU	12
8.5 - SPECIAL FUNCTION "ALU S"	12
9 - OPTIONAL MEASUREMENT OF RADIAL RUN-OUT AND ECCENTRICITY OF THE TYRE	13
10 - SELF-CALIBRATION	14
10.1 - FOR CAR AND TRUCK WHEELS	14
10.2 - FOR TRUCK WHEELS ONLY	14
11 - ERRORS	15
11.1 - INCONSISTENT UNBALANCE READINGS	15
12 - ROUTINE MAINTENANCE	16
12.1 - TO REPLACE FUSES	16
12.2 - ADAPTERS	16
12.3 - "P200M" REPLACEMENT OF DRIVER PULLEY	16
 SPECIAL MAINTENANCE (Only for specialist personnel)	 17
13 - RECOMMENDED SPARE PARTS LIST	17
14 - TO CHANGE SUPPLY VOLTAGE	17
15 - HANDLING OF MACHINE PARAMETERS	18
16 - CHECKING OF DISTANCE GAUGE	18
17 - TESTING OF POSITION SENSOR	18
18 - ASSEMBLY OF THE PIEZO MEASURERS	19
19 - LOGIC SEQUENCE IN TROUBLE SHOOTING	20
19.1 - CHECKING AND SETTING OF STATIC VALUE (STI)	22
19.2 - CHECKING AND SETTING OF UNBALANCE POSITION	23
20 - PROCESSOR PC BOARD LAYOUT	24
21 - WHEEL MEASUREMENT AND PRESETTING OF THE BALANCING MACHINES	25

- EXPLODED DRAWINGS OF BALANCING MACHINES WITH LIST
- ADAPTER CHARTS FOR CARS AND TRUCKS
- ENCLOSURES: WIRING DIAGRAMS

1 - DESCRIPTION OF THE BALANCING MACHINE

1.1 - GENERAL

The machine is designed for precision balancing of truck, bus, and cars wheels, weighing up to 200 kg. The machine is available in version **P200** with manual wheel spin and in version **P200M** with electrically driven wheel spin. Model **P200** can be provided with a 12 Vd.c. power supply (optional).

The machine can feature a built-in air lift mounted on castors in order to facilitate clamping of the wheel on the adapter and to ensure greater mounting accuracy.

Technical features

Version with manual spin

- Wheel spin for truck wheel through crank handle with **reduction gear**.
- Wheel spin for smaller wheels with front crank handle or else crank handle with reduction gear or else by simply pushing the tyre tread with the hand.

Version with motor-powered wheel spinner (P200M)

- Wheel spinning is powered by a single phase electric motor and it actuated by shifting a lever then pressing the start push button.

For both versions:

- Powerful **lever-operated drum brake**.
- Brake can be locked for easier wheel mounting.
- Measurement can be made with any speed of rotation, therefore it is not necessary to wait to reach a preset speed.
- The amount of unbalance and relative position are displayed on digital displays after just one measuring spin.
- Easy selection of static balancing only or for balancing light alloy wheels of unusual shape (1 STATIC function and 2 ALU functions). Furthermore the unique ALU S function allows calibration to be performed for special light alloy wheels with direct presetting of the measurements.
- Self-calibration of the machine can be easily and quickly carried out with any wheel, even if not balanced.


1.2 - TECHNICAL DATA

— Max wheel weight	200 Kg
— Max power consumption	50 W P200 500 W P200M
— Standard power supply	220/240 V single phase (or 110 V)
— Balancing accuracy	1 gr
— Min/max balancing speeds	42/200 r.p.m.
— Rim diameter	from 10" to 26" or from 265 to 615 mm
— Rim width	from 1.5" to 20" or from 40 to 510 mm
— Cycle time	8 to 20 sec
— Net weight (add 20 kg for version with motor)	81 Kg without lift 152 Kg with lift
— Overall dimensions of machine	800 x 850 = 930 (h) without lift 1400 x 850 = 930 (h) with lift and motor
— Sound pressure level in cycle	< 70 d B (A)
— Operating temperature range	from 0 to 50°C
— Min/max compressed air pressure LIFT version	from 8 to 10 kg/cm ²

- UNBALANCE DISPLAY PITCH:

CARS = 5 g (0.25 oz)

TRUCKS = 50 g (1 oz)

When  is pressed, the unbalance is displayed with pitch: 1 g for CARS
10 g for TRUCKS

- UNBALANCE DISPLAY THRESHOLD:

CARS = 5 g

TRUCKS = 50 g

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 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 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.

Caution: *if the machine is left idle for more than two minutes, the system automatically switches off all displays and the LED's apart from the car/truck selector LED which starts flashing. To return to normal operation conditions, press any push button or move the wheel.*

1.4 - STANDARD SAFETY DEVICES

VERSION P200 - P200 LIFT

- This version meets ISO standard 7475 cat. A (without guard) as regards flying of objects from the wheel (low speed of rotation and no motor).

VERSION P200M

- Two-hand control for the wheel spin. During the wheel spin, the operator is forced to stay in side position away from the wheel.
- Low speed of rotation.

2 - HOISTING AND INSTALLATION

To hoist the machine, lever the base only with the 3 support points. Under no circumstances, apply force to other points such as the spindle, head or accessory shelf.

Check that the balancing machine rests on the floor at the three points. There is no need to anchor the machine to the floor for correct operation.

3 - ELECTRICAL CONNECTION

WARNING: Electrical connection must be made by specialized personnel. Connection to the single phase mains must be between phase and neutral; under no circumstances between phase and earth (ground). Earthing is essential for correct machine operation.

CEMB declines all responsibility in the event of incorrect connection.

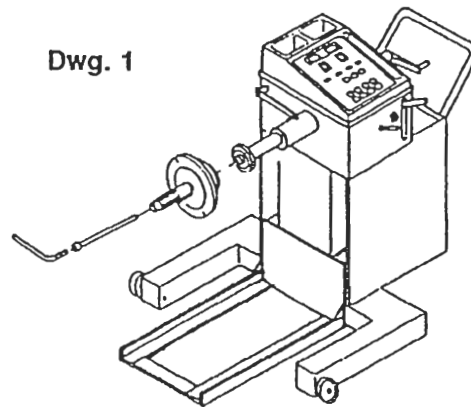
Before connecting the machine to the mains through relative cable, check that the mains voltage matches that shown on the nameplate at the back of the balancing machine. Rating of the electrical connection should be on the basis of the machine electrical power consumption (see nameplate).

- The machine mains supply cable should be fitted with a plug conforming to current regulations.
- It is advisable to provide the machine with its own electrical connection incorporating a suitable circuit breaker.
- When connection is made directly to the main control panel, without using any plug, it is advisable to padlock the main switch of the balancing machine so that its use is limited only to authorized personnel.

4 - ADAPTER MOUNTING

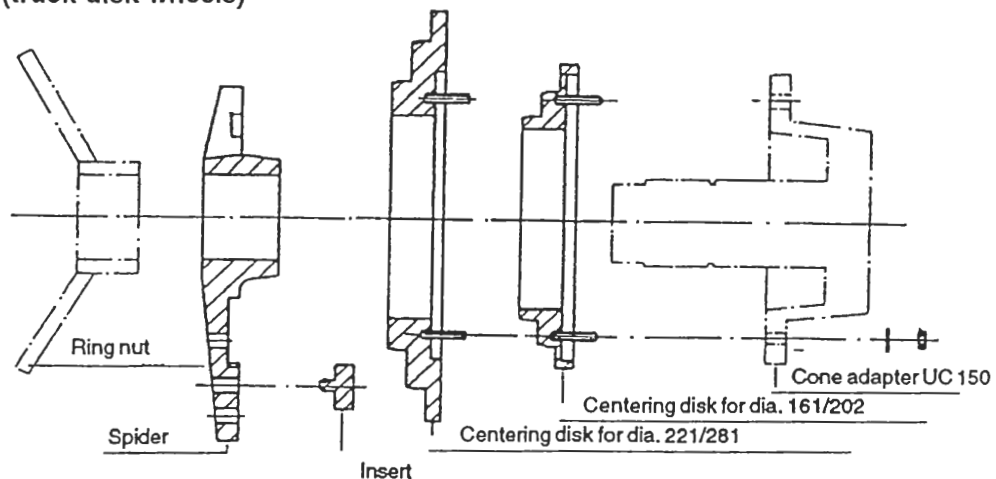
- Before mounting the adapter, clean the centering zone on the shaft.
- For truck adapters, mount the special centering fitting on the spindle.
- The machine can operate with all the CEMB adapters whether for trucks or cars.

Dwg. 1



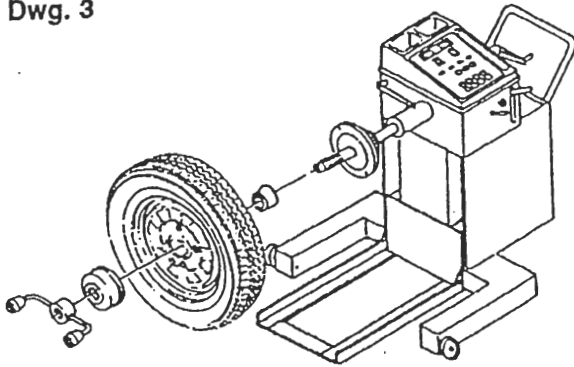
4.1 - EXAMPLE OF MOUNTING RAPID ADAPTER R200 (truck disk wheels)

Dwg. 2



5 - WHEEL MOUNTING

Dwg. 3

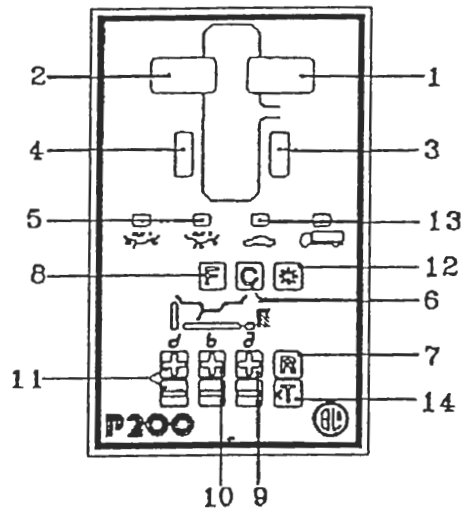


- Carefully clamp the wheel; incorrect centering inevitably causes unbalance.

N.B.: FOR GREATER DETAILS CONCERNING THE USE OF ALL THE VARIOUS TYPES OF ADAPTERS, SEE SPECIAL ADAPTER BROCHURES.

6 - CONTROL PANEL

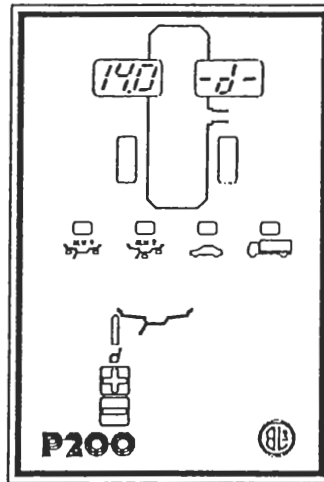
Dwg. 4



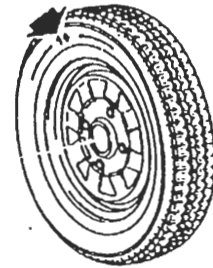
- 1 = Digital display, AMOUNT OF UNBALANCE, inside
- 2 = Digital display, AMOUNT OF UNBALANCE, outside
- 3 = Indicator, POSITION OF UNBALANCE, inside
- 4 = Indicator, POSITION OF UNBALANCE, outside
- 5 = Indicators, correction mode selected
- 6 = Push button for selecting g/ounce - mm/inch; self-calibration
- 7 = Push button, recalculation and self-calibration
- 8 = Push button, correction mode selection
- 9 = Push buttons, manual DISTANCE input
- 10 = Push buttons, manual WIDTH input
- 11 = Push buttons, manual DIAMETER input
- 12 = Push button, car - truck selection
- 13 = Indicator, car - truck selection
- 14 = Threshold push button

7 - PRESETTING OF DIMENSIONS

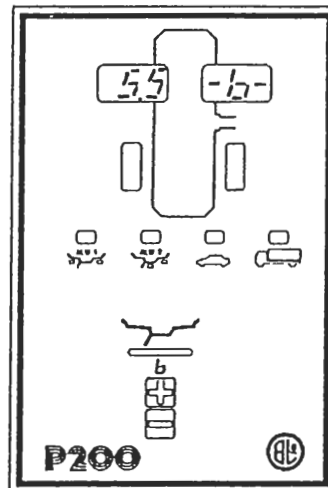
- Preset the nominal diameter shown on the tyre



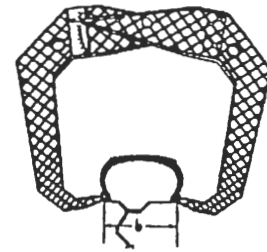
DWG. 5: DIAMETER



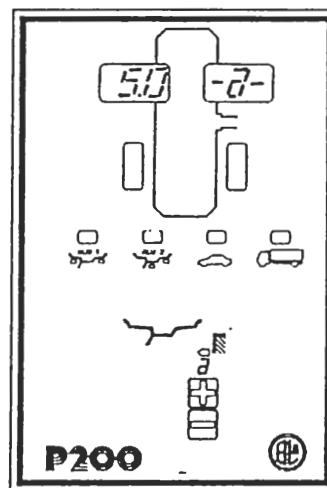
- Preset the nominal width which is generally given on the rim, or else measure width "b" with a gauge.



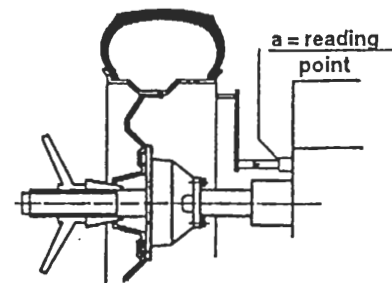
DWG. 6: WIDTH



- Preset distance "a" of the inside of the rim.



DWG. 7: DISTANCE



7.1 - OPTIONAL FEATURES

PRESETTINGS MEMORIZED ALSO WHEN MACHINE IS SWITCHED OFF:

C + **+a** + **-a** → - UNIT of measurement of unbalance
grams ounces

PRESETTINGS LOST WHEN MACHINE IS SWITCHED OFF:

C + **+b** →
or
C + **-b** → - UNIT OF MEASUREMENT OF width mm/
inch (from "PRESETTING OF
DIMENSIONS" by selecting WIDTH)
N.B. In inches each time machine is
switched on.

C + **+d** →
or
C + **-d** → - UNIT OF MEASUREMENT OF width mm/
inch (from "PRESETTING OF
DIMENSIONS" by selecting WIDTH)
N.B. In inches each time machine is
switched on.

DISPLAY OF UNBALANCE:

F → (Normal) Dynamic → Static → Alu... → Dynamic

C + **F** → (Rapid) Static → Dynamic

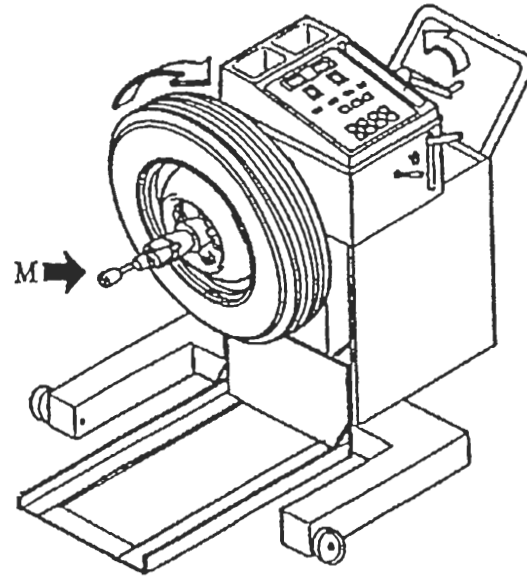
C + **F** → (Rapid) ALU → Dynamic

8 - WHEEL BALANCING

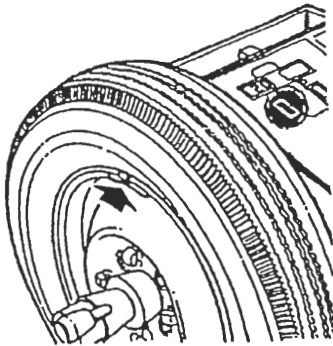
8.1 MEASUREMENT OF UNBALANCE

Dwg. 8

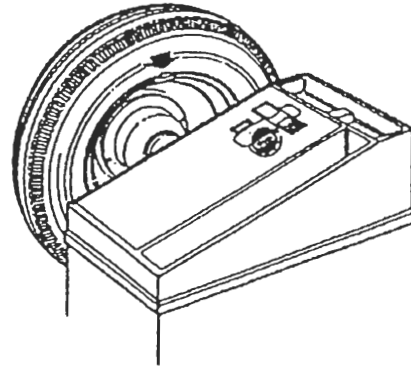
- a) Spin the wheel with crank handle M (for light-weight wheels) or with crank and reduction gear for other wheels.
- b) The wheel spin can be interrupted after the displays go out; measurement can be made at any speed as soon as the wheel stops accelerating.
- c) When the displays show the values, brake the wheel with relative lever. (Wait at least 2 seconds before a new spin). Displays 1 and 2 show the amount of unbalance. Displays 3 and 4 indicate through LED's the correction position. When all the LED's light up, it means that the corrective weight should be placed at the top in the 12 O'clock position.



Dwg. 9: POSITIONING AND CORECTION ON THE OUTSIDE



Dwg. 10: POSITIONING AND CORRECTION ON THE INSIDE



8.2 - RECALCULATION OF THE UNBALANCE

- Preset the new dimensions following the procedures described above.
- Without repeating the spin, press **R**
- The new recalculated unbalance values are displayed.

8.3 - OPTIONAL FEATURE P200M

Wheel spin is motor-driven.

The operator is obliged by the position of the controls to stand in a definite place and to use both hands when the wheel starts to turn.

Push the motor backwards gripping relative knob.

Keep pushing the motor and press the **[START]** push button with the other hand.

When the displays go out, release the controls; the power is thus disconnected and the motor stops.

8.4 - STATIC - ALU

The available ALU functions can be selected on the measurement screen. They show where to place the corrective weights in positions differing from the normal ones.

Press push button **F** select the required function. For each function, the microprocessor quickly calculates and memorizes on unbalance displays 1 - 2. the real values of the compensation weights corrected on the basis of the corrective weight position.



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



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



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



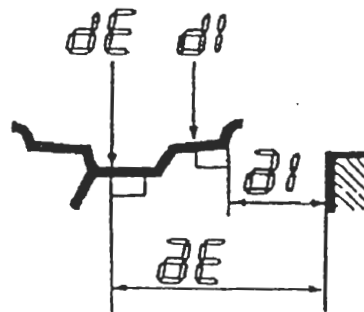
ALU 2 - Balancing of alloy rims with hidden application of the outer adhesive weight.

8.5 - SPECIAL "ALU S" FUNCTION

This function is used for unusually shaped alloy rims where "ALU2" is not able to guarantee sufficient accuracy.

- Select ALU S on the measurement screen by pressing [F] until LED's ALU1 - ALU2 both light up together, then switch to the dimension presetting screen.
- Display one of the dimensions "a", "b" or "d".
- Measure the sizes according to the following scheme:

Dwg. 12



Selection	Parameter selected	Parameter presetting push buttons
[F] + [+a] or [F] + [— a]	al	± a
[F] + [+b] or [F] + [— b]	ae	± b
[F] + [+d] or [F] + [— d]	dl (Nominal)	± d

N.B.: parameter **dE** is = 0.8 **dl** by default. To change it, press [< T] + [+d] or [< T] + [— d] to select it and the preset the required value usings keys ± d.

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

The system automatically calculates the distance between the centre of gravity of the two weights for correcting the unbalance by considering the width of the weights to be 14/15 mm.

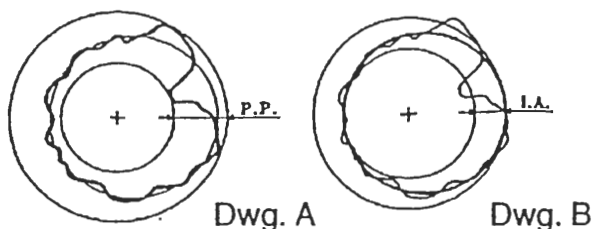
To display the unbalance associated with the preset dimensions, press **R** ; the system will automatically proceed to recalculate the unbalance, otherwise it will perform the new spin.

9 - OPTIONAL MEASUREMENT OF RADIAL RUN-OUT AND ECCENTRICITY OF THE TYRE

The much enlarged figures show the outer tyre surface and axis of wheel rotation.

Dwg. A shows measurement of the total Peak-to-Peak eccentricity defined as the maximum radial deviation of the tyre surface.

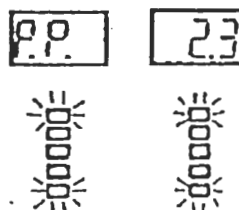
Dwg. B shows measurement of the eccentricity of the 1st harmonic, i.e., the eccentricity of that circle which "recopies" the tyre shape, by averaging the local deviation of the tyre from the round shape.



Obviously the P.P. measurement is normally greater than that of the 1st harmonic. Tyre manufacturers generally supply two different tolerances for the two eccentricities.

Total eccentricity

- Position the measurer roller on the outer part of the tyre (on the tread).
- Press [C] + [*]. The wording "Ecc" appears on the right display.
- Slowly turn the wheel anti-clockwise (when turned in the opposite direction, the message "ERR-4-" appears on the display and measurement is interrupted. To restart measurement, again press keys [C] + [*].
- on the left display [P.P.]
- on the right display the maximum deformity value (Peak-to-Peak) of the tyre.
- Turn the wheel slowly until the external LED's light up: the wheel will be positioned with the maximum point of projection at top.



Eccentricity of the 1st harmonic

After measuring the total deformity, measurement of the eccentricity of the 1st harmonic can be made, i.e., that measurement which indicates whether the eccentricity of the tyre can be corrected by turning the tyre on the rim.

- Press key **F** to read the eccentricity of the 1st harmonic. [I.A.] appears on the left display while the right display gives the eccentricity of the 1st harmonic expressed in mm e.g. [1.5].
- If this value is very low (<0.5 mm) it means there is no possibility of correction. If, instead, it is above the required tolerance, the eccentricity of the rim can be measured and the total eccentricity of the 1st harmonic can be improved by proceeding as follows:
- Mount the special tool on the measurer arm and position the roller inside the rim in the vicinity of the tyre bead. The measurement made in this way is only accurate for press formed rims. For light alloy rims turned on the lathe, remove the tyre and operate with the roller from the outside.
- Press **C** The wording [E.i] appears on the left display.
- Press the roller lightly against the rim and keep it in contact.
- Move the wheel as when making measurements on the tyre.
- After a few revs. the following appears:
- [rE%] on the left display
- a value e.g. [80] on the right display, which indicates the possible % reduction of the eccentricity of the 1st harmonic.
- Turn the wheel by hand until the external LED's light up: mark the tyre at the highest point.
- Again turn the wheel until the internal LED's light up: mark the rim in the highest point.
- Turn the tyre on the rim until the two signs coincide. The eccentricity of the 1st harmonic will be reduced by the percentage read on the display.

N.B. : To return to the unbalance measurement function, press **R**.

10 - SELF-CALIBRATION

For machine self-calibration, proceed as follows:

10.1 - FOR CAR AND TRUCK WHEELS

- 1 **Mount an average size car wheel on the shaft.**
- 2 Preset the exact dimensions of the wheel mounted. **Caution!!** Presetting of incorrect dimensions can 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!.
- 3 First press push button **C** . While keeping it pressed, press also **R** until the positioning LED's pass from flashing to being steady.
- 4 Release the push buttons and turn the wheel until all displays go out. Then wheel can then be released. (The self-calibration spin can also require a couple of minutes. **It is important not to knock the wheel during this spin or else accelerate again after being released**, otherwise it is not possible to perform the self-calibration and the machine will stop with an error message).
- 5 At the end of the first spin, the following message appears on the display "Add 100 (Add 3.5)" while the outside positioning LED's flash. At this point add a weight of 100 grams (3.5 oz) on the OUTSIDE in any angular position.
- 6 Without pressing any other push button, again bring the wheel up to speed (until the display with the wording 'Add 100' goes out). Likewise this spin can require a couple of minutes. Leave the wheel to rotate freely until the wording "END CAL" appears. At the end of this operation, the machine will be calibrated. Remove the master weight from the wheel and with a new spin, proceed to balance the mounted wheel.

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.

10.2 - USE FOR TRUCK WHEEL ONLY

It does not matter whether car wheel (if car adapter is available) or truck wheels are used. With truck wheels, it is recommended to preset the wheel dimensions with great care especially the width and distance to be referred to the centre of gravity of the counterweight to be applied.

The procedure is identical to that described for car wheel, except for:

- 1) Select "truck wheels".
- 2) At the end of the first spin, add a master weight of 350 grams (12 oz).

11 - ERRORS

Various abnormal conditions can arise during machine operation. If detected by the microprocessor, they appear on the display with the wording "ERR:" followed by a number with one of the meanings listed below:

ERROR	MEANING
1	Could be caused by faulty position transducer, or something preventing the wheel from turning or else too slow speed of rotation.
2	During the measurement spins, wheel speed had drop to below minimum (90 r.p.m. for CARS - 42 r.p.m. for TRUCKS)
3	Wheel unbalance too high or incorrect calibration.
4	Wheel turning in opposite direction.
6	Faulty operation. Displayed when machine is switched on. Replace the PC board. After replacement, proceed to re-calibrate.
7	Faulty self-calibration values.
8	Error during self-calibration. Could be due to the second spin made without adding reference weight, or else by a break in the transducer cable.

Other error indications are given by the LED "ALU2" during measurement.

When the wheel has been brought up to speed, a rapid flashing of this LED means the speed of rotation is too high; the machine will wait for the speed to fall, LED ALU2 will go out and the measurement will be made. If during the measuring spin, there is a random flashing of the above LED, the system is in a dwell status, probably due to a knock received by the machine. However, the measurement is repeated automatically without errors. Errors in balancing can be due to rubbing of the reduction gear on the spindle gear. After spinning the wheel, always allow the crank handle to return to rest position.

11.1 - INCONSISTENT UNBALANCE READINGS

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

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

If the wheel is mounted on the adapter with screws, it could be possible that the screws have not be correctly tightened - they should be tightened one by one crosswise or else (as often happens) holes have been drilled on the wheel with too wide tolerances.

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

If, after balancing, when the wheel is refitted on the vehicle, it is still out-of-balance, this could be due to unbalance of the car brake drum or very often due to the holes for the screws of the rim and drum drilled sometimes with too wide tolerances. In such case a readjustment could be advisable using the balancing machine with the wheel mounted (e.g. models L36, L38/2).

12- ROUTINE MAINTENANCE (Non specialized personnel)

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

12.1 - 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.

12.2 - ADAPTORS

- Plastic wheel retainer sleeve (P.N. 2722): keep the inner rubber ring constantly lubricated.

12.3 - "P200" TO REPLACE THE DRIVER PULLEY

- Remove the weight holder shelf being careful not to pull on the electrical cables.
- Back-off the pulley mounting screw and change the pulley.
- After fitting the new pulley, adjust the stroke limit screw so that the pressure exerted on the rubber pulley in the spin position is the minimum necessary to obtain the wheel spin. Too high a pressure (shown by the wedging of the pulley) would cause premature wear of the rubber part.

SPECIAL MAINTENANCE

(Only for specialized personnel)

13 - LIST OF RECOMMENDED SPARE PARTS

(references on the exploded drawings)

Item	CODE	Q.ty	Description
120	940702255	1	Piezo unit STATIC - DYNAMIC
122	093001249	1	Pair of brake jaws ADIGE dia. 140 with springs
123	020620803	2	Bearing 6208-2Z dia. 40/80/18
124	067040208	1	Handle I280/40-M8
125	067130014	1	Handring ELESA MT 130-A14
160	940512218	1	St. position pickup board complete
162	036002030	1	Bushing FIBERGLIDE PA1 - 20.30 ST 35
163	065030106	1	Knob CT/476 30B-M6
204	143204711	1	ABS cover dwg. 20471G
207	181206560	1	Spring for distance gauge dwg. 20656P
208	040115403	1	Graduated strip dwg. 20497P Model 1154
209	050138503	1	Panel dwg. 25744G model 1385
210	940602349	1	Power supply assembly
211	538011194	1	Touch button board dwg. 19198P
225	681002000	2	Fuse 5x20 - 2A
228	511231002	1	Switch KL 1002 + Q555.
231	940513913	1	Processor computer board

P200 LIFT (Specific)

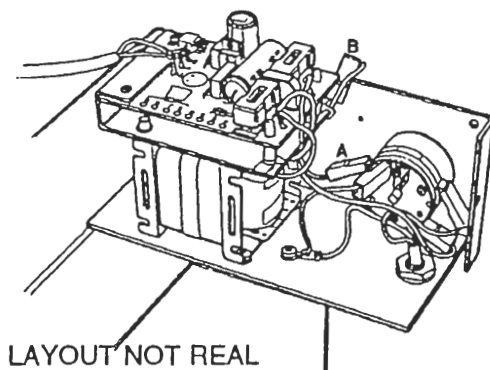
321	162368905	1	Pneumatic control 368-905
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P200M (Specific)

406	020600403	1	Bearing 6004 - 2Z dia. 20/42/12
407	071030015	1	Rubber covered driving pulley dwg. 25233P
408	182224980	1	Motor return spring dwg. 22498P
409	065028698	1	Rubber handle dia. 28 art. 698

14 - TO CHANGE SUPPLY VOLTAGE

Dwg. 13



- Always check the required voltage on the machine nameplate.
- Standard power supply 220 - 240V /50 Hz single phase
- For 110 V power supply, disconnect red cable "A" and replace it by white cable "B".
- The motor also requires to be changed for version P200M.

15 - HANDLING OF MACHINE PARAMETERS

To preset the machine parameters (DF; I, S), press push buttons **C** and **R** as in self-calibration. When the LED's stop flashing, instead of performing the spin, press the following push buttons within 5 seconds and in the correct sequence:

[*] then [+a] then [F]

After pressing [*] and [+a], the displays go out. After pressing [F], the current value of "DF" appears; it can be modified with [+a] and [— a].

Press [*] to switch to modify parameter "I", the current value (in %) appears on the right display, while the wording "In." appears on the left display plus the symbol "—" if the correction is negative or else "∩" if it is positive. Modify with [+a] and [— a]. Press [*]: the value of parameter "S" appears on the right display; modify with [+a] and [— a]. To finish, press [*].

N.B.: when [<T] is pressed during any one of the parameter presetting phases, the system interrupts such function and sets the parameters with basic values.

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

N.B.! The basic configuration values:

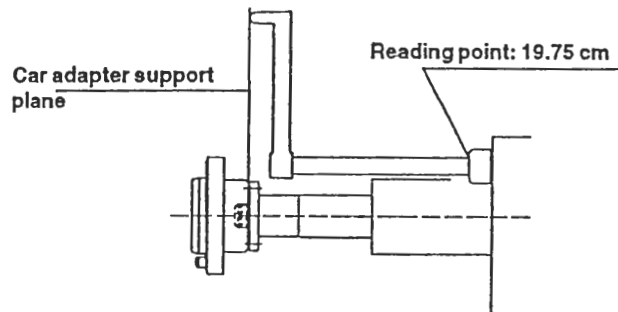
" DF "	= 120
" I "	= +5
" S "	= 330

The values at which the machine is factory set are given on a special nameplate inside the machine.

16 - TO CHECK THE DISTANCE GAUGE

Dwg. 14

Check that with the ruler for measuring the DISTANCE of the wheels reads 19.75 cm as distance of the car adapter support plane. If the graduated scale is changed, position it so as to read 19.75 at the fixed index limit (reading point) when the tip coincides with the adapter support plane.



17 - TO CHECK THE POSITION SENSOR

Dwg. 15

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

1. Make sure that none of the three photocells rub against the phase disk and RESET tooth.

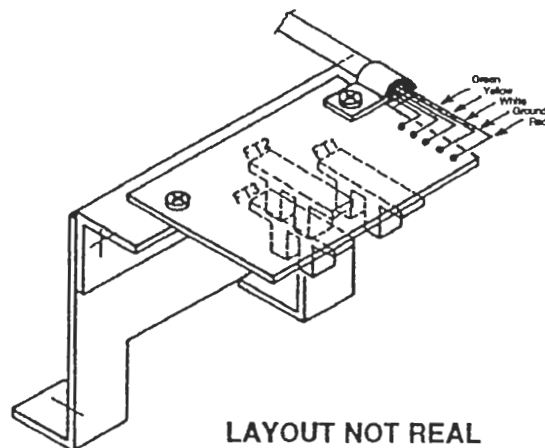
2. Using a voltmeter set to the Vd.c. scale, test the following voltages (the machine should be switched on but without rotation):

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

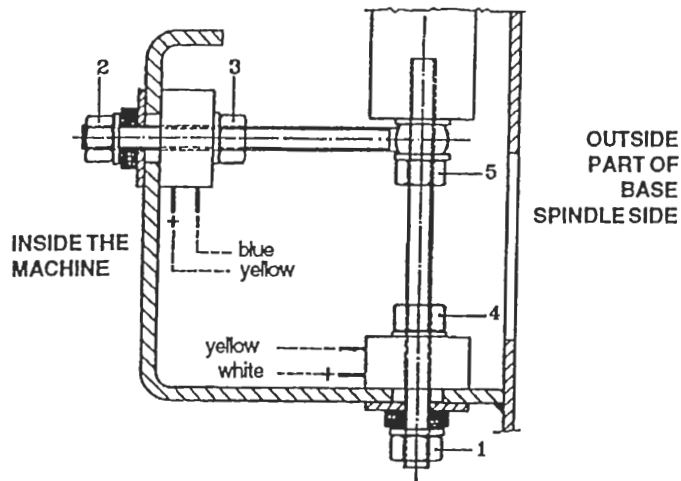
* between earth (ground) and yellow wire (RESET) +4.5 to 4.8 Vdc when the RESET tooth is in photocell TCST 2000 and "0" Vdc when the RESET tooth is outside the photocell.

* 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.



18 - ASSEMBLY OF THE PIEZO MEASURERS



ASSEMBLY INSTRUCTIONS

Dwg. 16

Problems of excessive out-of-phase and compensation sometimes depend on a fault in the piezo measurers.

To replace them, proceed as follows:

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

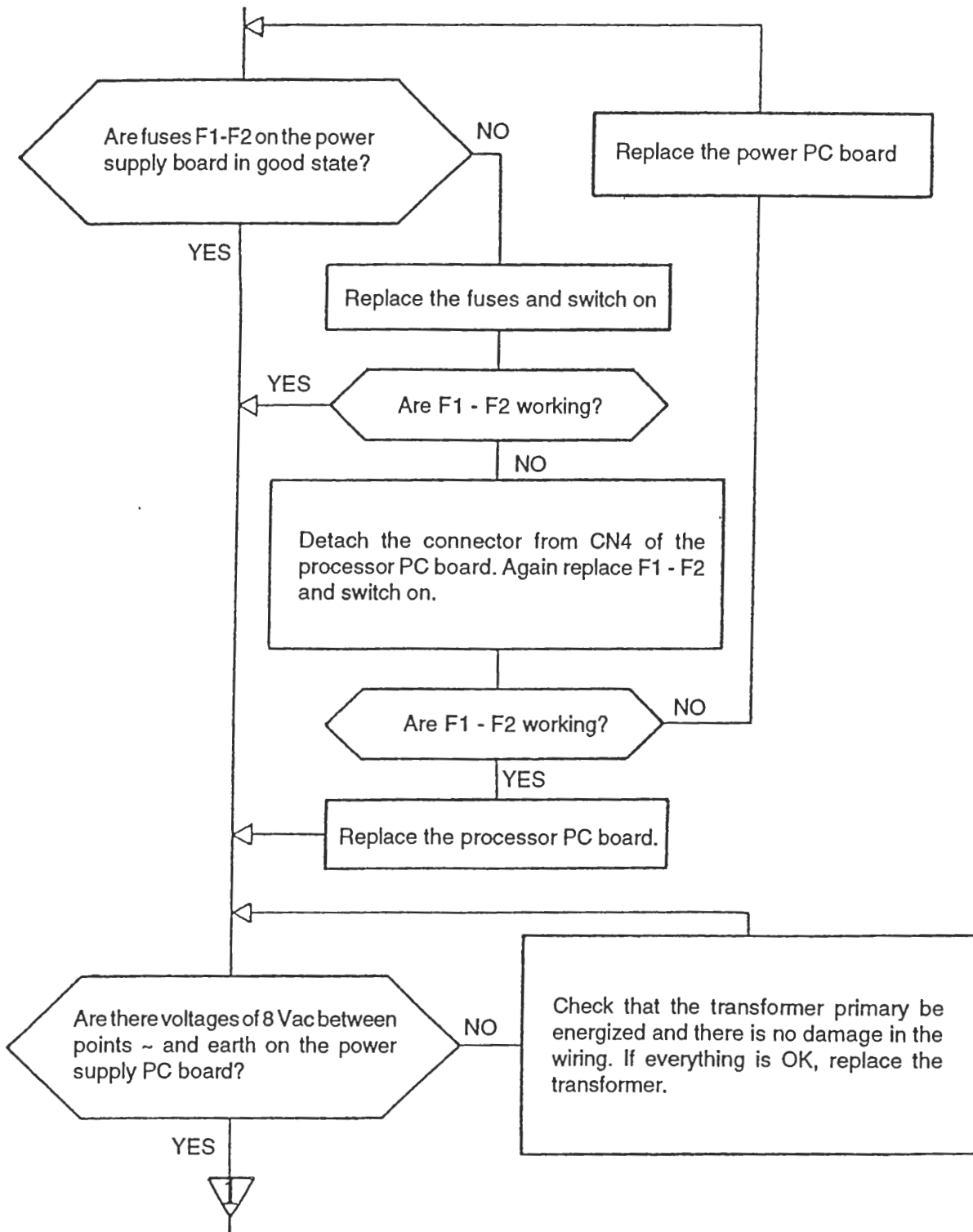
N.B. the piezo units should be mounted in according with the position of the coloured wires shown in the drawing.

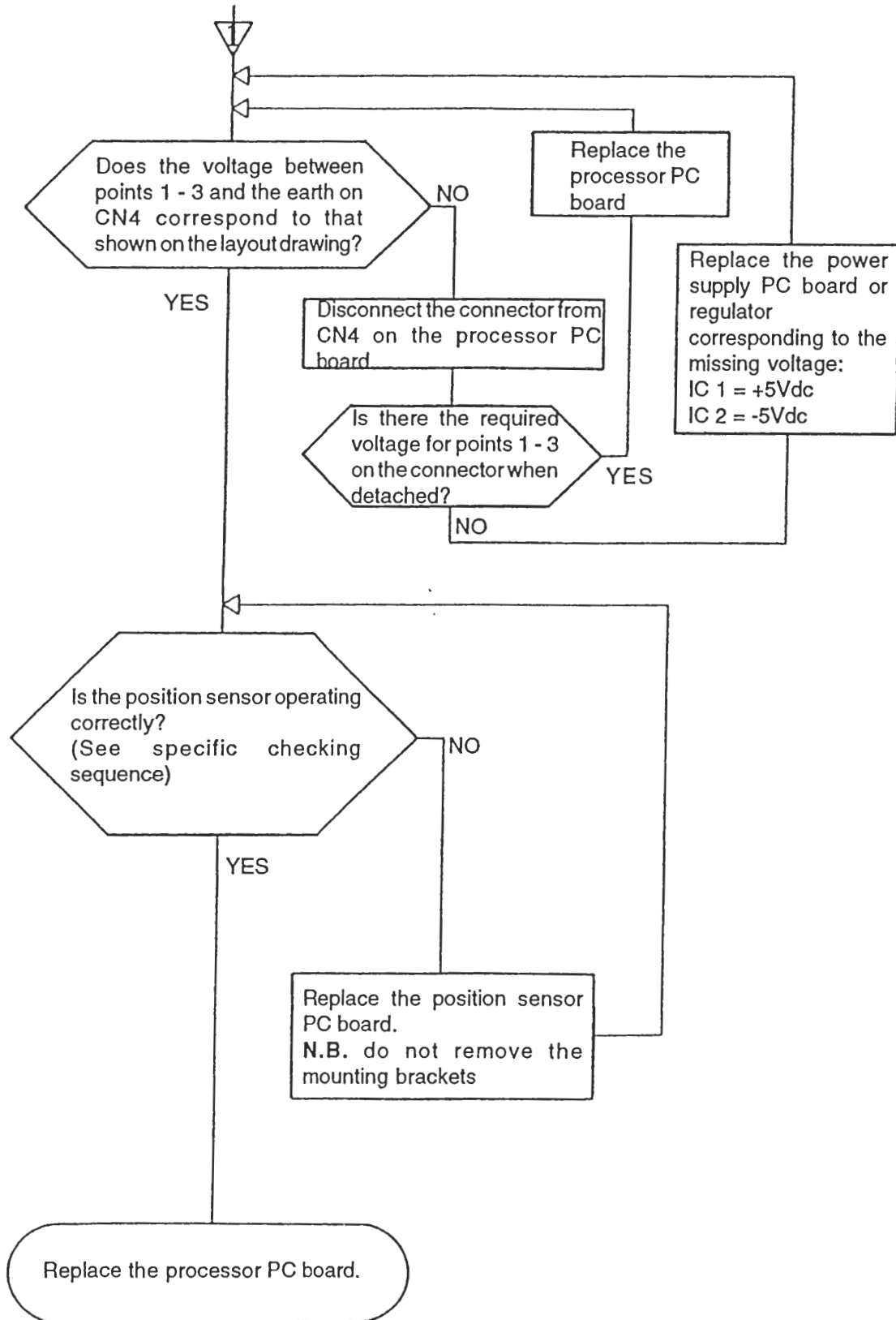
5. Keeping the spindle perfectly aligned, tighten

- nut 5 with a spanner and nuts 3 and 4 by hand (plus half a turn with the spanner if necessary).
6. Refit the cup springs and nuts 1 and 2. Tighten these nuts fully and fully regain the elasticity of the cup springs; then loosen them by half a turn. In this way the correct preloading of the piezo will be obtained (a torque wrench can be used set at 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. Refit the cover and weight holder shelf.

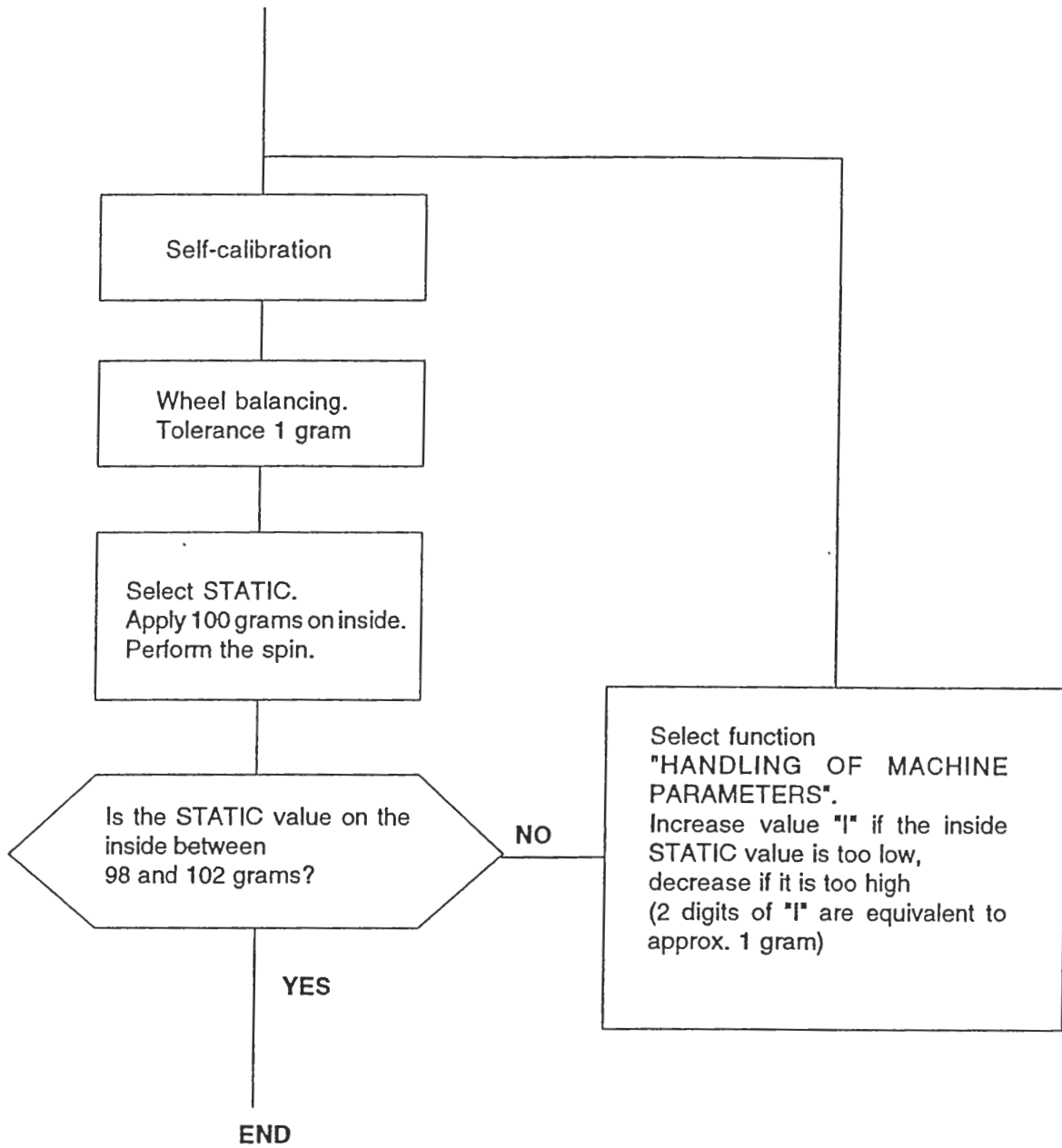
19 - LOGIC TROUBLE SHOOTING SEQUENCE

When PC boards require replacement, repeat the self-calibration operation after having again preset the machine parameters (for references, see dwg. 17).



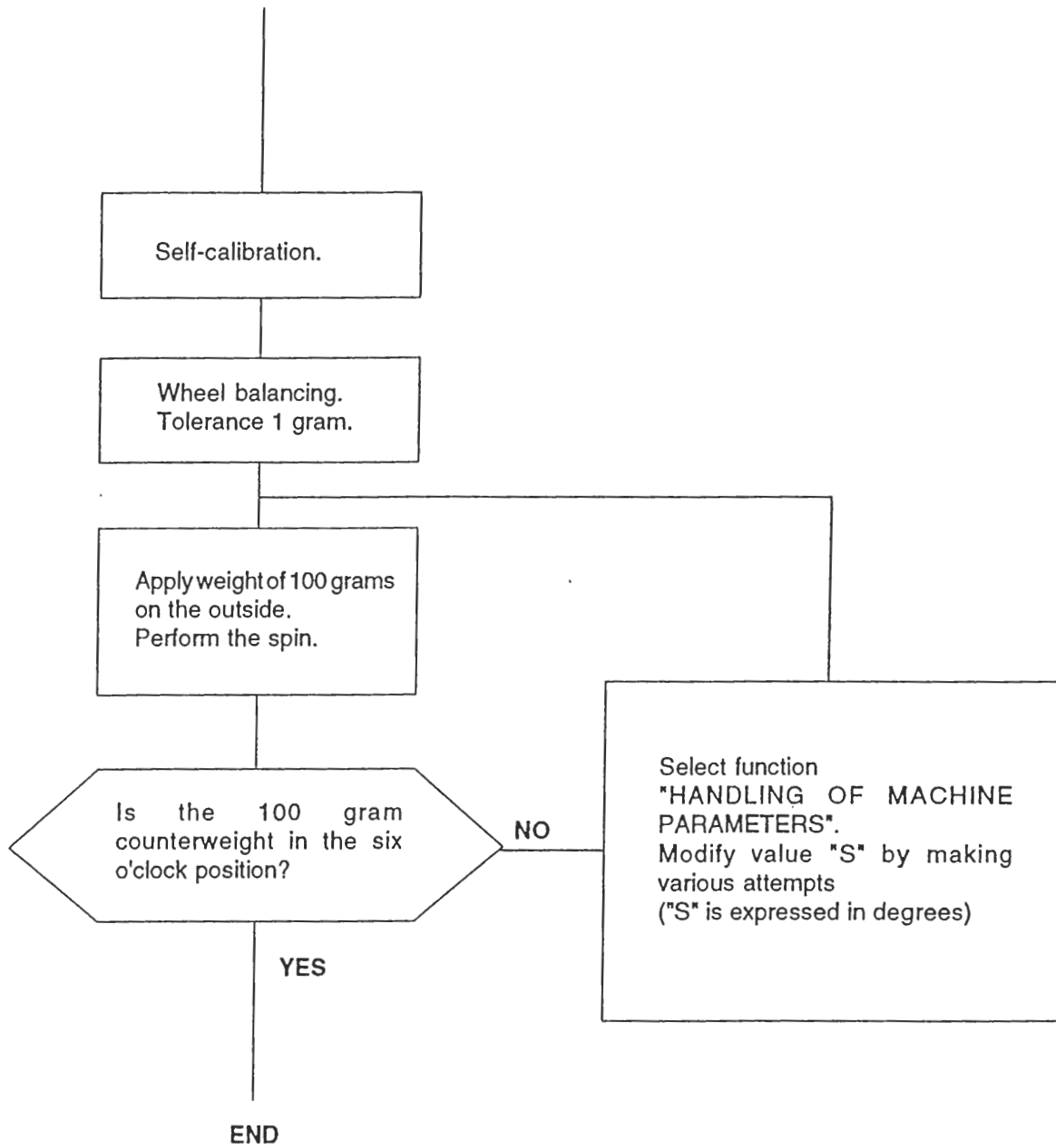


19.1 - CHECKING AND SETTING OF STATIC VALUE (STI) (TO BE PERFORMED WITH CAR WHEEL)



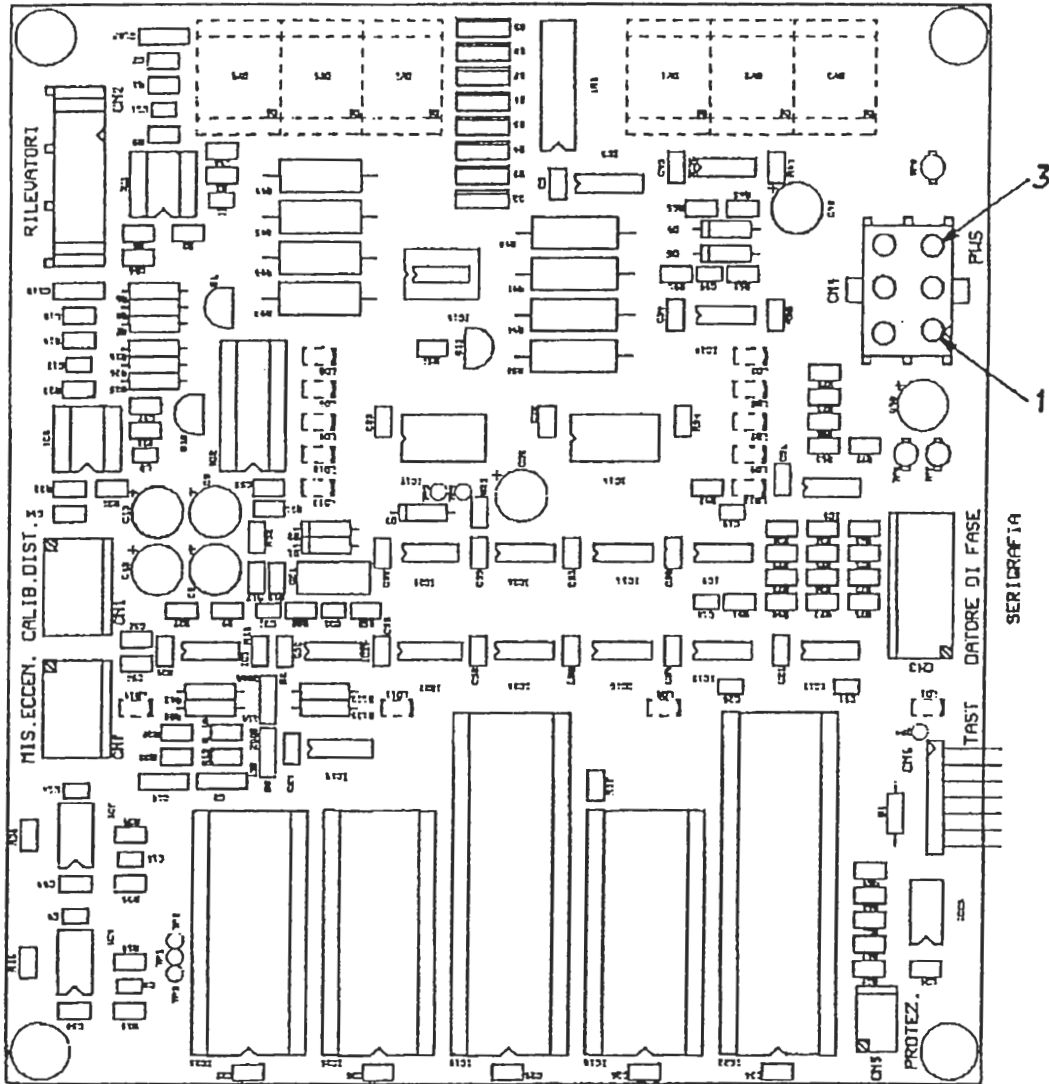
19.2 - CHECKING AND SETTING OF UNBALANCE POSITION

(Perform with car wheel)



20 - PROCESSOR PC BOARD LAYOUT

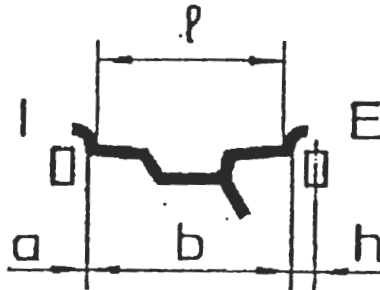
Dwg. 17



21 - WHEEL MEASUREMENT AND PRESETTINGS ON THE BALANCING MACHINES

The need for increasingly more accurate calibration and use of the ALU keys mean that great importance should be attached as to how the rims should be measured and how the balancing machine interprets the preset date.

Hence we shall now describe how the preset dimensions are modified automatically in order to obtain the distances of the correction planes which are defined as through planes for the centre of gravity of the corrective weights.



Consider a typical rim:

Measurement "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 on the edge of the rim.

The balancing machine automatically corrects the measurement by adding $2 \times h = 6 \text{ mm}$ to the measurement.

Measurement "b" made with the gauge is normally more accurate even if very similar to 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 an insignificant distance means that an accurate calibration can be obtained regardless of whether the inner rim width "l" or the outer width "b" is preset.

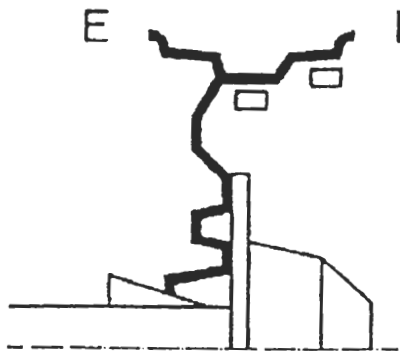
It is a good rule to add 1/4 inch to the value given by the rim manufacturer.

As regards the ALU functions, the machine performs the following approximations in addition to the systematic measurement regarding the centre of gravity of the counterweight as seen above.



ALU 1

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

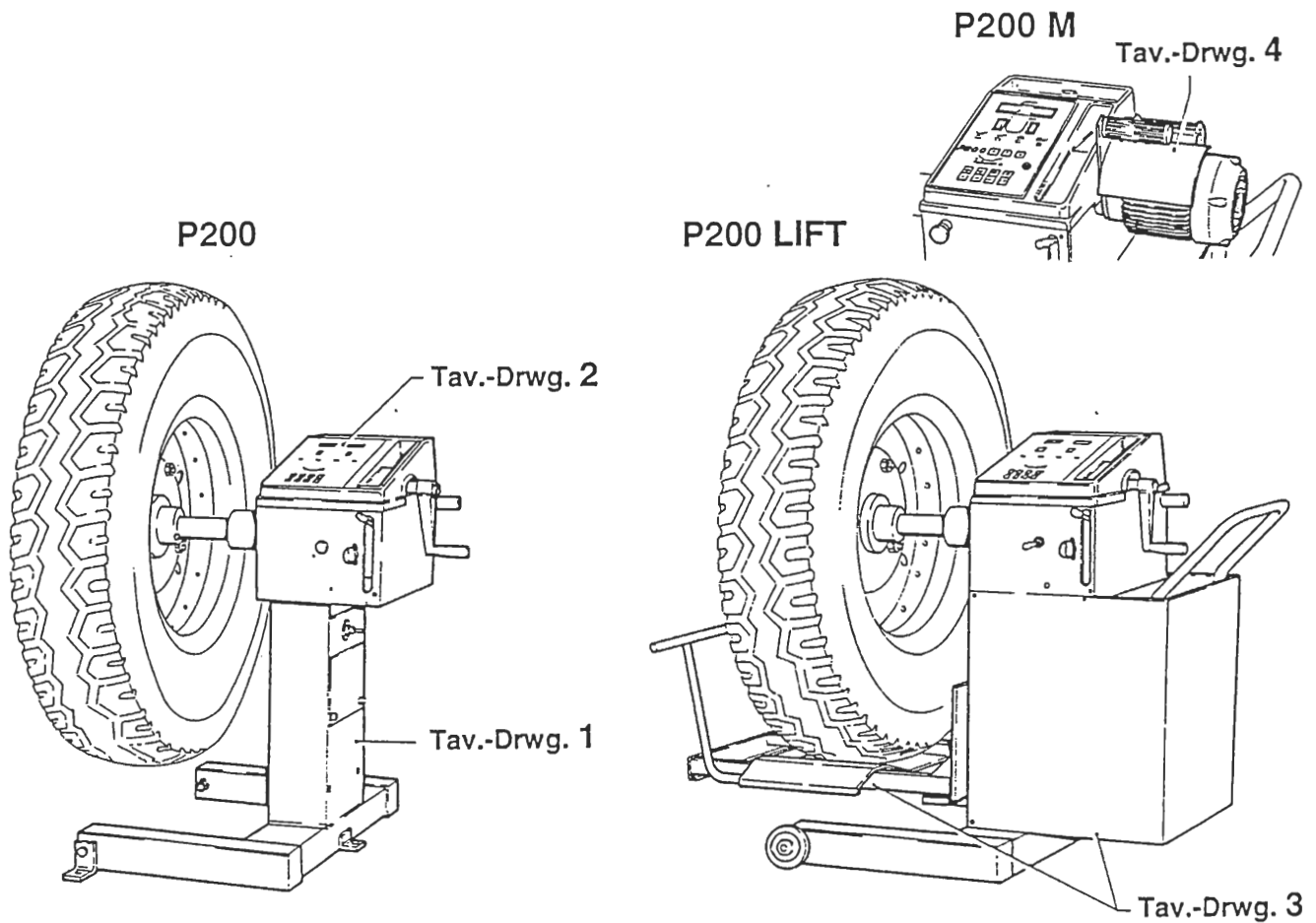


ALU 2

$a = \text{preset } a + \frac{3}{4}''$
 $b = \text{distance of adapter plane} - \frac{1}{2}'' - a$
 $d_i = \text{preset } d - 1''$
 $d_e = \text{preset } d - 2 \frac{1}{2}''$

N.B.: I = INSIDE
 E = OUTSIDE

TAVOLE ESPLOSE EQUILIBRATRICE P200
EXPLODED VIEW OF WHEEL BALANCER P200
(SERIE-SERIES F)

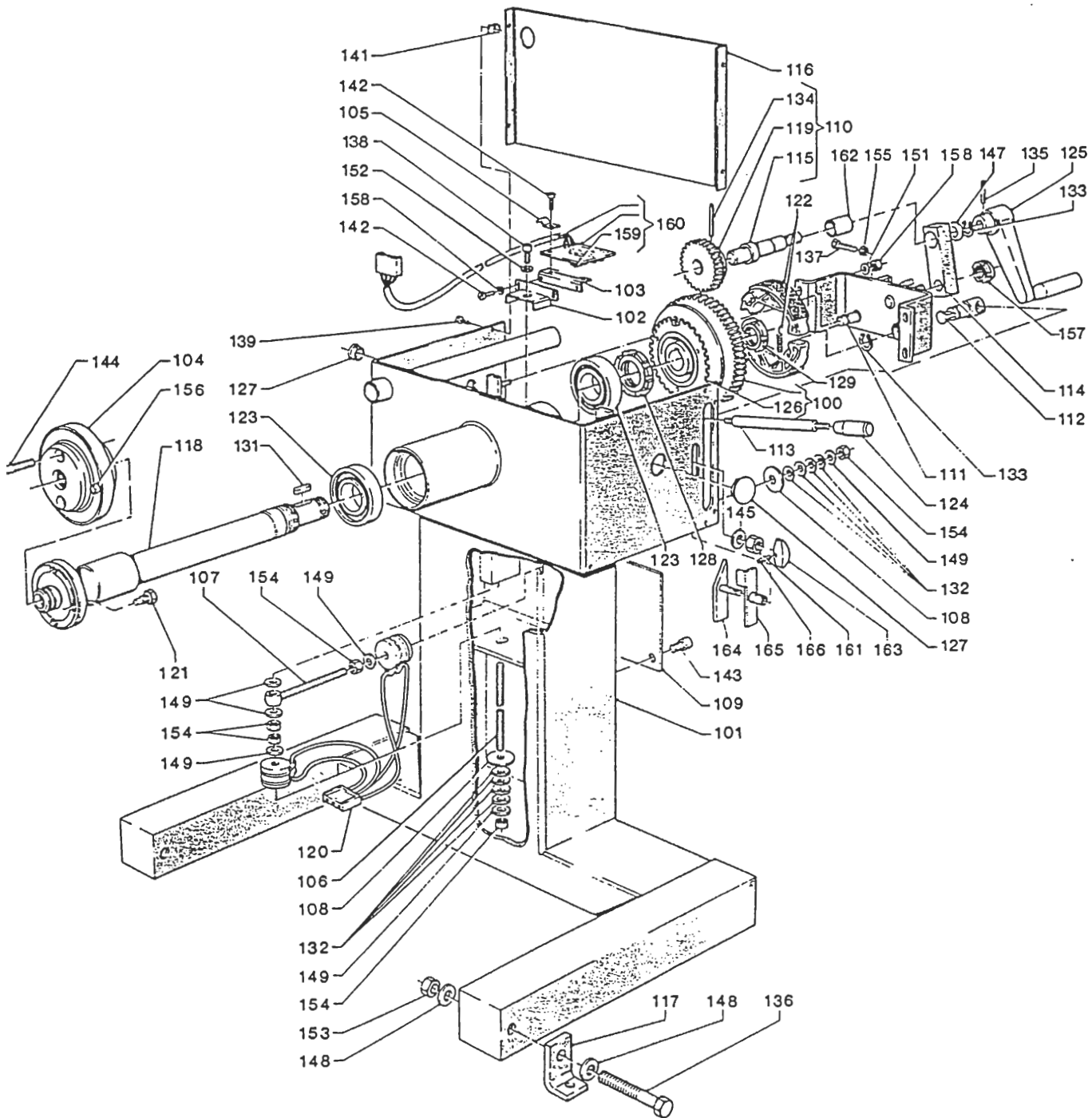


TAV. 1 - BASAMENTO E MANDRINO
DRWG. 1 - CASING AND SHAFT ASSEMBLY

TAV. 2 - TESTATA DI MISURA - CALIBRO DISTANZA
DRWG. 2 - MEASURING HEADSTOCK - RIM DISTANCE GAUGE

TAV. 3 - GRUPPO SOLLEVATORE
DRWG. 3 - LIFT

TAV. 4 - P200 M (OPZIONE)
DRWG. 4 - P200 M (OPTION)



TAV. 1 - BASAMENTO E MANDRINO

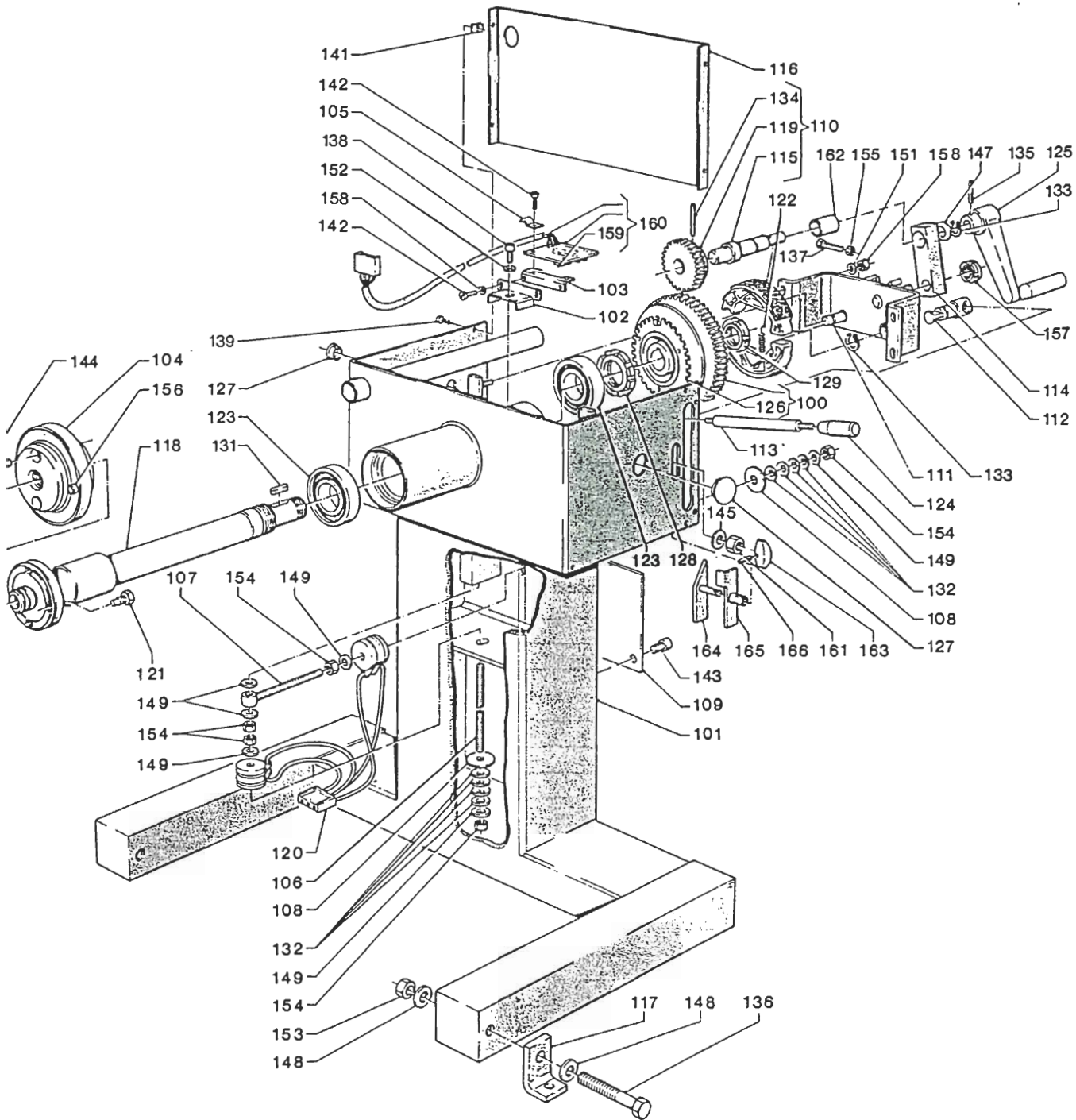
DRWG. 1 - CASING AND SHAFT ASSEMBLY

TAV. 1 - P200 (Series F) - Particolari reperibili in commercio - Parts of the machine

Item	CODE	Q.ty	DESCRIZIONE	DATA	DESCRIPTION
100	940102299	1	Ruota dentata	19909P	Toothed wheel
101	940083685	1	Basamento	28095G	Casing
102	420720659	1	Supporto datore di fase	20659P	Support for position pick-up
103	940102052	1	Sostegno datore di fase	19712P	Position pick-up holder
104	940012891	1	Raccordo flange veicoli industriali	23561P	Adaptor spacer for industrial wheels
105	420610639	1	Fermacavo in alluminio		Cable retainer in aluminium
106	105110165	1	Barra filettata	M10x165 14744P/1	Threaded rod
107	105114744	1	Tirante ad occhio	14744P/2	Eye rod
108	420716593	2	Rondella per molle a tazza	16593P	Washer for Belleville washer
109	940082394	1	Carter mobile inferiore	20540P	Lower mobile casing
110	420420487	1	Perno completo di ingranaggio		Complete gear pin
111	420925232	1	Supporto freno e perno dentato	25232G	Brake support and toothed pin
112	420919917	1	Camma per ceppi freno	19917P	Cam for brake shoe
113	420919918	1	Asta freno	19918P	Brake rod
114	420420489	1	Biella per ingranaggio	20489P	Gear conrod
115		1	Perno per ingranaggio	20487P	Gear pin
116	940082384	1	Carter mobile superiore	20583P	Upper mobile casing
117	420223066	2	Angolare di fissaggio	23066P	Fixing angle
118	940102298	1	Albero	19907G	Shaft
119		1	Ingranaggio	20488P	Gear
120	940702255	1	Gruppo piezo STATICO-DINAMICO		Piezo assembly STATIC-DYNAMIC
121	310218739	2	Vite speciale	M10x20 18739P	Special screw
*122	093001249	1	Coppia ganasce freno con molle	ADIGE Ø 140	Couple of brake jaws with springs
*123	020620803	2	Cuscinetto	6208-2Z Ø 40/80/18	Bearing
*124	067040208	1	Impugnatura	1 280/40-M8	Handle
*125	067130014	1	Manovella	ELESA MT 130 - A14	Handring
126	420720037	1	Disco di fase	20037P	Phase disc
*127	213006253	2	Tappo	Ø 16 DP 625	Plug
*128	323333040	1	Ghiera	GUK M40 x 1,5	Lockring
*129	323333030	1	Ghiera	GUK M30x1,5	Lockring
*131	348056032	1	Chiavetta	8x7x32	Key
*132	345122515	8	Molla a tazza	A25 Ø12.2x25x1.5	Belleville washer
*133	341000020	2	Anello SEEGER	20a UNI 7435	SEEGER ring
*134		1	Spina elastica	Ø 6x50	Elastic connector
*135	335310074	1	Spina elastica	Ø 6x28 UNI 6873	Elastic connector
*136	311120180	2	Vite	TE M14x110 UNI 5737	Screw
*137	311220097	1	Vite	TE M8x35 UNI 5739	Screw
*138	312120068	1	Vite	TCEI M6x10 UNI 5931	Screw
*139	317232034	4	Vite	T½T croce M4x10	Screw
*141	329007043	4	Dado a pinzetta	RAPID NJ 704/3	Clamping nut
*142	314231018	4	Vite	TC M3x10 UNI 6107	Screw
*143	312120143	2	Vite	TCEI M12x20 UNI 5931	Screw
*144	312120068	2	Vite	TCEI M10x60 UNI 5931	Screw
*145	325035012	1	Rosetta piana	Ø 12 UNI 6592	Flat washer
*147	325035020	1	Rosetta piana	Ø 20	Flat washer
*148	325035014	4	Rosetta piana	Ø 14	Flat washer
*149	325035010	6	Rosetta piana	Ø 10 UNI 6592	Flat washer
*151	325035008	4	Rosetta piana	Ø 8 UNI 6592	Flat washer
*152	325035006	1	Rosetta piana	Ø 6 UNI 6592	Flat washer
*153	321232014	2	Dado esagonale	M14 UNI 5588	Hexagonal nut
*154	321222010	5	Dado esagonale per piezo	M10 (R80)	Nut for piezo
*155	321232008	5	Dado esagonale	M8 UNI 5588	Hexagonal nut
*156	331220146	2	Spina cilindrica	Ø 12x32 UNI 6325	Pin
*157	323333020	1	Ghiera	GUK 20x1	Lockring
*158	325035003	2	Rosetta piana	Ø 3 UNI 6532	Flat washer
159	547000370	3	Accoppiatore ottico	TC ST 2000	Photocoupler
160	940512218	1	Scheda datore di fase completa di cavo e spina		Position pick-up board c/w cable and plug
*161	321332012	1	Dado esagonale	M12 h=7 UNI 5589	Hexagonal nut
*162	036002030	1	Boccola	FIBERGLIDE P A1 - 20,30 ST35	Bushing
*163	065030106	1	Manopola	CT/476 30B-M6	Knob

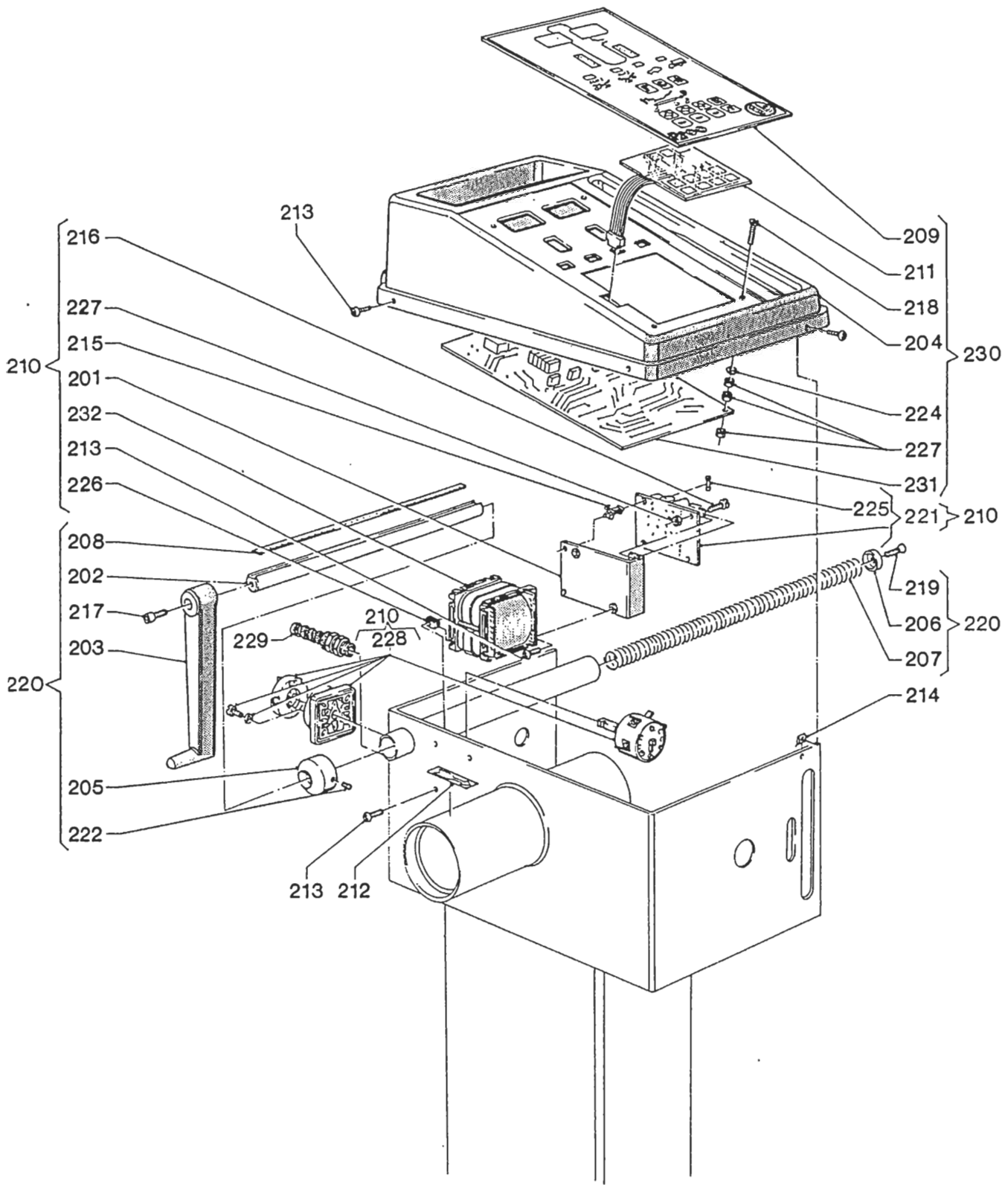
IAV. 1 - P200 (Series F) - Particolari repertori in commercio

Item	CODE	q.ty	DESCRIZIONE	DATA	DESCRIPTION
164	420923185	1	Blocchetto arresto freno	23185P	<i>Brake retaining block</i>
165	420923184	1	Staffa arresto freno	23184P	<i>Brake retaining bracket</i>
*166	335310007	1	Spina elastica	Ø 2x12 UNI 6873	<i>Elastic plug</i>



TAV. 1 - BASAMENTO E MANDRINO

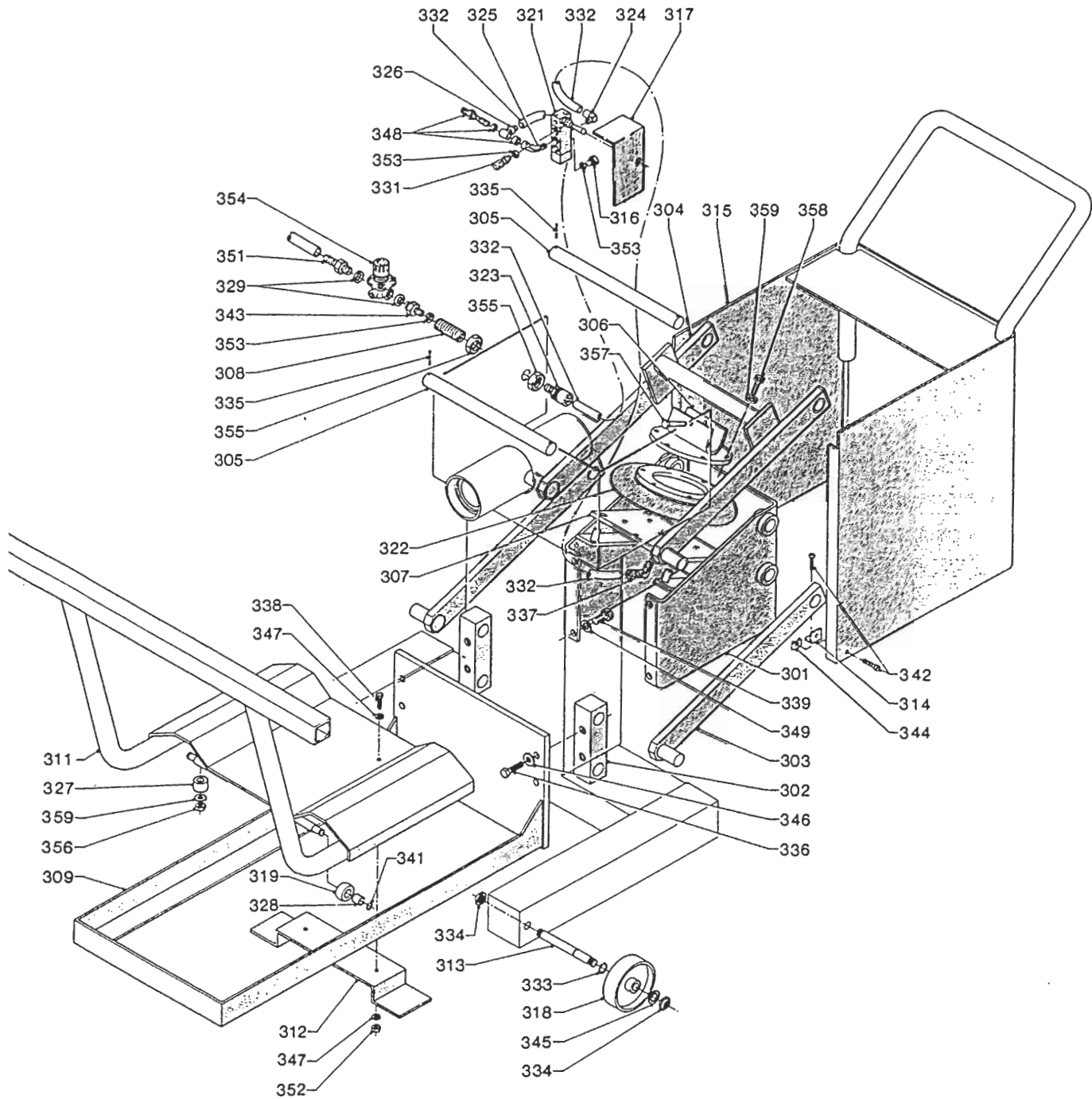
DRWG. 1 - CASING AND SHAFT ASSEMBLY



TAV. 2 - TESTATA DI MISURA - CALIBRO DISTANZA

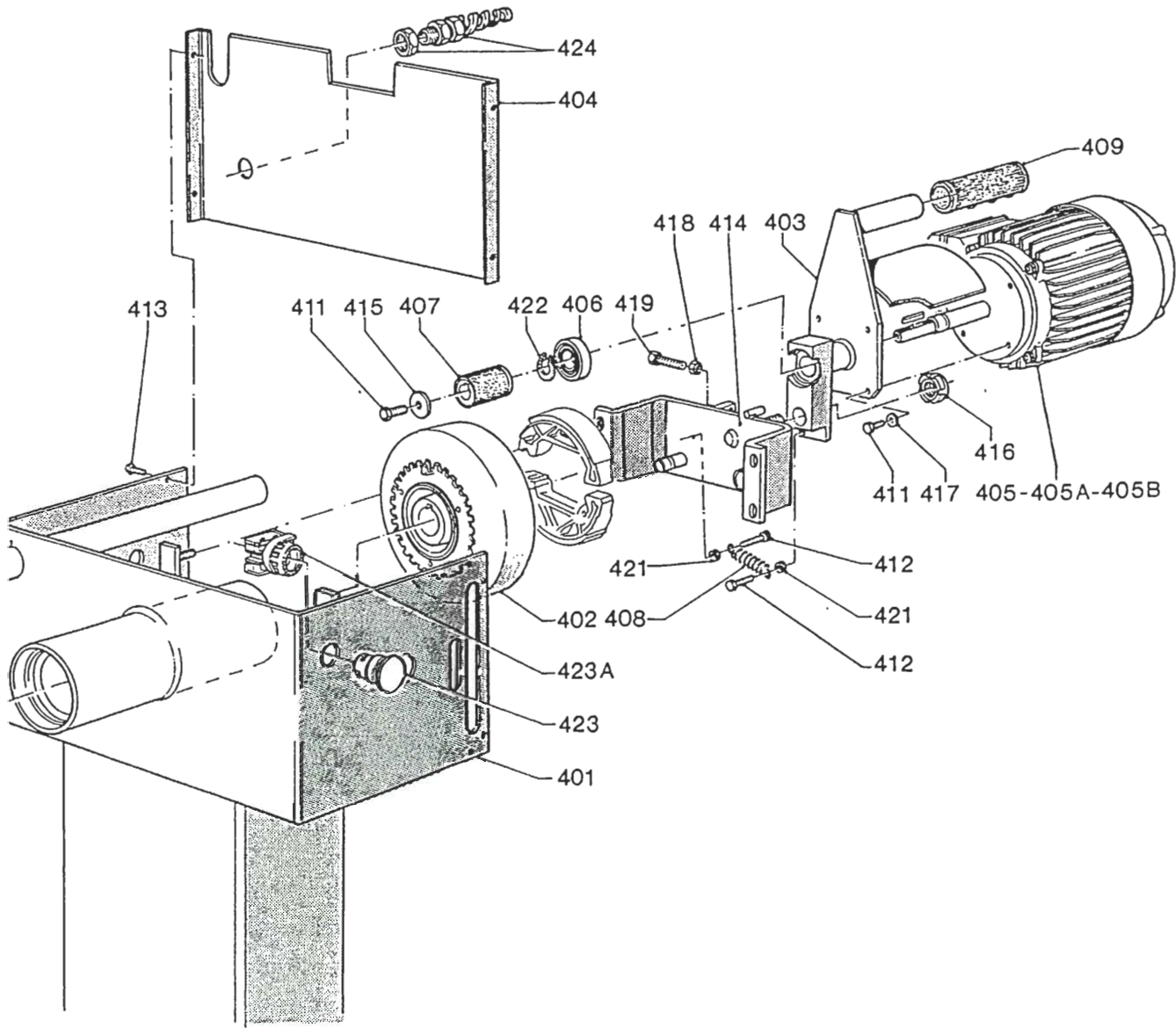
DDWC 2 - MEASURING HEADSTOCK - DIM DISTANCE GAUGE

Item	CODE	Q.ty	DESCRIZIONE	DATA	DESCRIPTION
201	420619747	1	Squadra fissaggio scheda PW	19747P	Board fixing bracket
202	420528096	1	Asta calibro distanza	28096P	Rim distance gauge bar
203	217027833	1	Indice calibro distanza	27833G	Index for distance gauge
204	143204711	1	Testata in ABS	20471G	ABS cover
205	940102388	1	Boccola esterna calibro	20501P	Outer bushing for gauge
206	940102389	1	Boccola interna calibro	20502P	Inner bushing for gauge
207	181206560	1	Molla calibro distanza	20656P	Rim distance gauge spring
208	040115403	1	Fascia graduata	Mod.1154 20497P	Graduated strip
209	050138503	1	Pannello	Mod. 1385 25744G	Lexan panel
210	940602349	1	Gruppo potenza	P200	Power supply assembly
211	538011194	1	Pulsantiera a membrana	19198P	Touch-button board
212	040010101	1	Freccia adesiva senso rotazione		Stick-on arrow (direction of rotation)
*213	317232034	10	Vite	T 1/2T croce M4x10	Screw
*214	329007043	4	Dado a pinzetta	RAPID NJ 704/3	Clamping nut
*215	527006175	2	Distanziale in nylon	per scheda/for cards 37 - 1693 - 1100	Nylon spacer
*216	314231018	2	Vite	TC M3x10 UNI 6107	Screw
*217	312120071	1	Vite	TCEI M6x16 UNI 5931	Screw
*218	315231021	4	Vite NERA	TS M3x16 UNI 6109	BLACK screw
*219	313220072	1	Vite	TSEI M6x20 UNI 5933	Screw
220	460020088	1	Gruppo calibro distanza ruota		Complete rim distance gauge
221	940512124	1	Scheda alimentatore	18558/1	Power supply board
*222	319216031	1	Vite (estremità piana)	STEI M4x6 UNI 5923	Screw (flat end)
*224	325035003	4	Rosetta piana	Ø 3 UNI 6532	Flat washer
*225	681002000	2	Fusibili	DM 5x20 2A	Fuse
*226	329007041	4	Dado	Rapld NJ 704/1	Nut
*227	321232003	14	Dado esagonale	M3 UNI 5588	Hexagonal nut
228	511231002	1	Interruttore	KL 1002 + Q 555	Switch
*229	526003246	1	Pressacavo flessibile	3246 * HEYCO *	Cable circlip
230	940503918	1	Testata in ABS completa di pannello e scheda		ABS headstock c/w panel and complete board
231	940513913	1	Scheda elaboratore		Computer board
232	611018463	1	Trasformatore	30 VA 18463P	Transformer



TAV. 3 - GRUPPO SOLLEVATORE

Item	CODE	Q.ty	DESCRIZIONE	DATA	DESCRIPTION
301	420228101	1	Supporto sollevatore	28101G	Support frame
302	420224161	2	Sostegno anteriore leve	24161P	Lever front support
303	420219936	2	Leva sollevatore	19936P	Lift lever
304	420228102	1	Ponte superiore	28102G	Upper bridge
305	420419938	2	Albero posteriore	19938P	Rear shaft
306	420228103	1	Staffa superiore	28103G	Upper bracket
307	420228104	1	Staffa inferiore	28104G	Lower bracket
308	172017713	1	Raccordo	1/8" 17713P	Connection
309	420224982	1	Sollevatore ruote	24982G	Wheel lifter
311	420228001	1	Carrello per lift	28001G	Carriage for lift
312	420224163	1	Staffa per carrello	24163P	Bracket for carriage
313	420420541	2	Pemo per ruota	20541P	Wheel pin
314	420220645	2	Squadretta fissaggio carter	20645P	Casing fixing bracket
315	420224364	1	Carter sollevatore	24364G	Lift casing
*316	170001310	1	Tappo	TTE8	Plug
317	420223587	1	Protezione sui silenziatori	23587P	Silencer protection
*318	151100154	2	Ruota in ghisa	Art. 69 Ø 100 foro/hole Ø 15	Cast iron wheel
319	420424160	4	Ruota per carrello	24160P	Wheel for carriage
*321	162368905	1	Comando pneumatico	368-905	Pneumatic control
*322	161900110	1	Cilindro	TORPRESS 110 - 88820	Cylinder
*323	172079492	1	Raccordo	ERED 6/8	Nipple
*324	172082892	1	Raccordo	EREL 6/8	Nipple
*325	170003801	1	Raccordo	RLA 8	Nipple
*326	172080592	1	Raccordo	EROL 6/8	Nipple
327	420424165	4	Rotella in Nylon	24165P	Nylon roller
*328	036001215	4	Cuscinetto	P - A1 - 12,15	Bearing
*329	170001408	2	Guarnizioni	GFV4	Gasket
*331	163025062	1	Regolatore	URS 8/3	Regulator
*332	179004006	2m	Tubo RILSAN	6/4 DIN. 74324	RILSAN tube
*333	341000015	2	Anello SEEGER	15e UNI 7435	SEEGER ring
*334	323333015	4	Ghiera autobloccante	GUK 15x1	Self-locking ring
*335	337110025	4	Copiglia	Ø 3x36 UNI 1336	Split pin
*336	311120147	4	Vite	TE M12x40 UNI5737	Screw
*337	172082894	1	Raccordo	EREL 6/4	Nipple
*338	311220070	2	Vite	TE M6x14 UNI 5739	Screw
*339	311220143	4	Vite	TE M12x20 UNI 5739	Screw
*341	341000012	4	Anello SEEGER	12e UNI 7435	SEEGER ring
*342	317232034	8	Vite	T 1/2T croce M4x10	Screw
*343	174000501	1	Nipplo	N 8/4	Nipple
*344	329007043	6	Dado a pinzetta	RAPID NJ 704/3	Clamping nut
*345	326035016	2	Rosetta piana	Ø 16/28/2,5	Flat washer
*346	325035012	4	Rosetta piana	Ø 12 UNI 6592	Flat washer
*347	325035006	4	Rosetta piana	Ø 6 UNI 6592	Flat washer
*348	163007040	1	Regolatore di portata	MVU - 704 1/8"	Adjuster
*349	325047012	4	Rosetta zigrinata	Ø 12	Washer
*351	103010901	1	Innesto	RG 4/12/9	Coupling
*352	321232006	2	Dado esagonale	M6 UNI 5588	Hexagonal nut
*353	170001309	3	Guarnizione	GFV8	Gasket
*354	164000014	1	Microregolatore	M004-R00	Microregulator
*355	311232016	2	Dado esagonale	M16 UNI 5588	Hexagonal nut
*356	311232008	4	Dado esagonale	M8 UNI 5588	Hexagonal nut
*357	311120100	1	Vite	TE M8x50 UNI 5737	Screw
*358	311120093	12	Vite	TE M8x18 UNI 5739	Screw
*359	325035008	16	Rosetta piana	Ø 8 UNI 6592	Flat washer

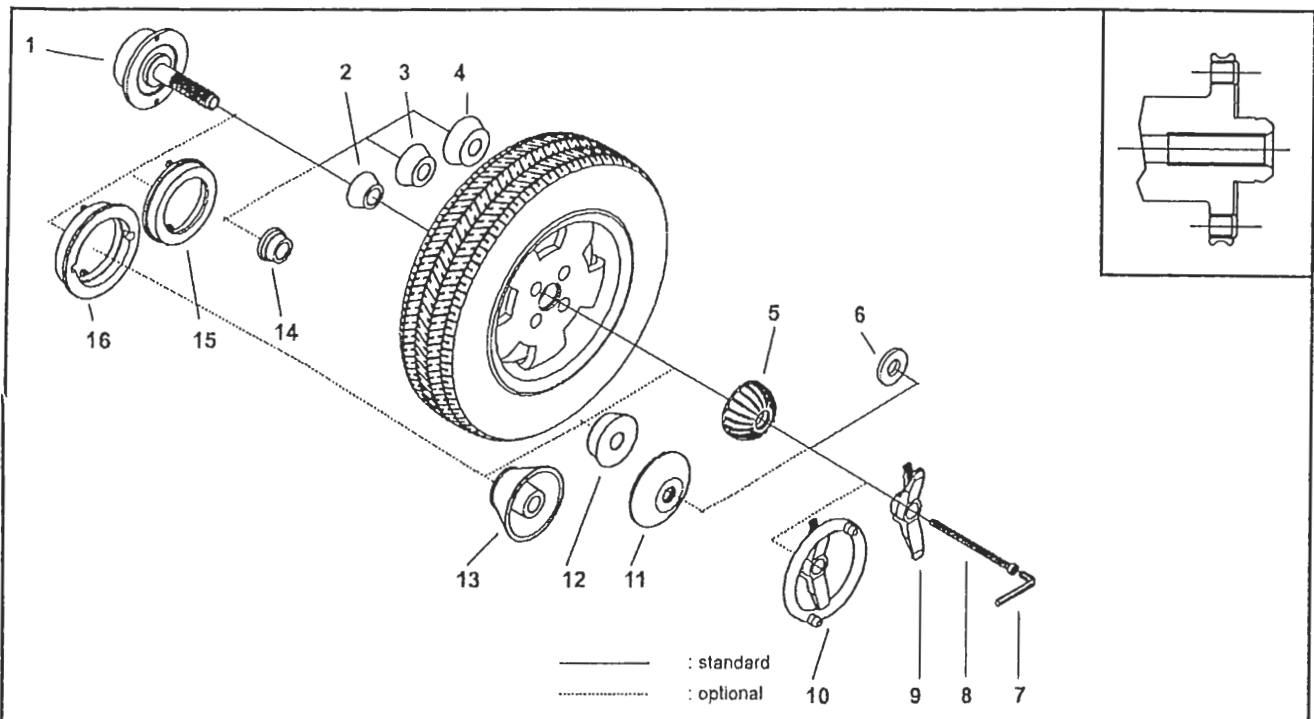


TAV. 4 - (OPZIONE)

DRWG. 4 - (OPTION)

TAV. 4 - OPZIONE P200M (Series D) - Particulari reperibili in commercio - Parts on the market

Item	CODE	Q.ty	DESCRIZIONE	DATA	DESCRIPTION
401	940083685	1	Basamento verniciato	27933P	Painted casing
402	940103101	1	Ruota condotta completa	24634P	Driven wheel complete
403	420224385	1	Supporto motore	24385G	Motor support
404	940083102	1	Carter mobile superiore	24635P	Upper mobile casing
405	501086263	1	Motore monofase	0,32 CV - 6 poll - 220V 50Hz	Single phase motor
405A	502086163	1	Motore monofase	0,32 CV - 6 poll - 110V 60Hz	Single phase motor
405B	502086263	1	Motore monofase	0,32 CV - 6 poll - 220V 60Hz	Single phase motor
*406	020600403	1	Cuscinetto anteriore	6004-2Z Ø 20/42/12	Front bearing
407	071030015	1	Puleggia motrice rivestita di gomma	25233P	Rubber covered driving pulley
408	182224980	1	Molla richiamo motore	22498P	Motor return spring
*409	065028698	1	Manopola in gomma	Ø 28 art. 698	Rubber handle
*411	311220071	5	Vite	TE M6x16 UNI 5739	Screw
*412	311220073	2	Vite	TE M6x25 UNI 5739	Screw
*413	317232034	4	Vite	T ½T croce M4x10	Screw
414	420925232	1	Supporto freno	25232G	Brake support
*415	326035006	1	Rosetta piana	Ø 6,6/24/2 UNI 6593	Flat washer
*416	323333020	1	Ghiera	GUK 20x1	Ring
*417	325035006	4	Rosetta piana	Ø 6 UNI 6592	Flat washer
*418	321232008	1	Dado esagonale	M8 UNI 5588	Hexagonal nut
*419	311220097	1	Vite	TE M8x35 UNI 5739	Screw
*421	321232006	2	Dado esagonale	M6 UNI 5588	Hexagonal nut
*422	341000020	1	Anello SEEGER	20e UNI 7435	SEEGER ring
*423	530090353	1	Pulsante	CEMA P9MEM4RN	Push-button
*423A	530080020	1	Contatto	CEMA 080 BF20V (NA + NA)	Contact
*424	526003246	1	Pressacavo flessibile	3246 * HEYCO *	Cable circlip



CARATTERISTICHE GENERALI

- Per bloccaggio dall'esterno o dall'interno di ruote con foro centrale
- Con molla incorporata e precaricata
- Per equilibratrici con bloccaggio tradizionale
- Flangia di elevata precisione e durata nel tempo
- Coni in acciaio temperato e albero rettificato

GENERAL FEATURES

- For locking wheels with central hole from the inner or outer side.
- With pre-load built-in spring
- For wheel balancers with standard locking
- Adaptor featuring high accuracy and durability
- Hardened steel cones and ground shaft

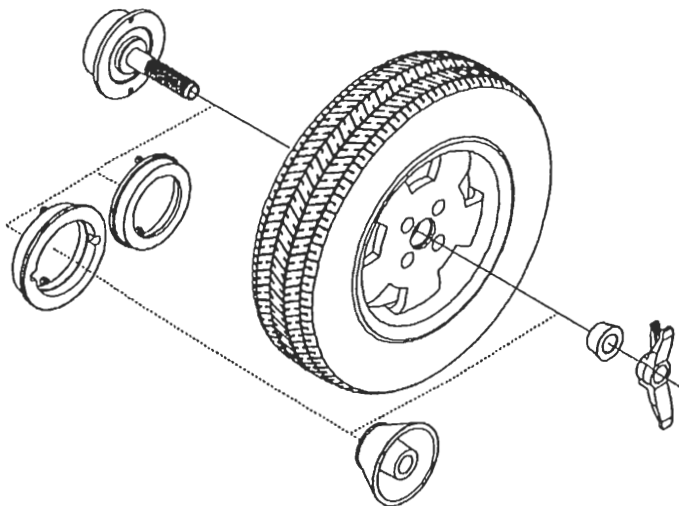
ref.	code	data
	940013983	UCZ36/2 + GP
	940013981	UCZ36/2 + GPM
1	940012156	Corpo flangia <i>adaptor body</i>
2	940013747	Cono <i>cone</i>
3	940013748	Cono <i>cone</i>
4	940013749	Cono <i>cone</i>
5	218226503	Manicotto <i>hollow sleeve</i>
6	218158213	Rondella in nylon <i>nylon washer</i>
7	114012002	Chiave esagonale maschio <i>allen wrench</i>
8	312120189	Vite <i>screw</i>
9+5	940013856	Ghiera rapida <i>quick locking</i>
10+5	940013859	Ghiera rapida con volantino (lancio manuale) <i>- quick locking with handwheel (hand spun)</i>
		12 mm TCEI M14x240 UNI 5931 GP GPM
10	940012977 331220059 331220055 940012975 331220055 940012974 183237600 940013860 312120067	<p>Obbligatorio nei paesi CEE per macchine vendute senza protezione ruota (velocità inferiore a 100 giri/min) <i>Compulsory in EC countries for machines without wheel guard (balancing speed < 100 RPM)</i></p>
	321232006 218295313 217295353 325035006 312120073	
11 opt.	940013665	Manicotto per grandi Ø e cerchi in lega <i>cap for large Ø and alloy rims</i>
12 opt.	940013443	Cono speciale <i>special cone</i>
13 opt.	940010608	Cono <i>cone</i>
14 opt.	940010448	Cono speciale a gradini <i>special stepped cone</i>
15 opt.	940013325	Distanziale <i>spacer</i>
16 opt.	940010537	Disco (da usare con rif. 13) <i>ring (to be used with item 13)</i>
		RL Japan 26168/P Ø 101 + 119 5°/L 16588/P Ø 97 + 170 MT 17162/P Ø 56.5;57;66.5;72.5 WD G/36

opt = optional

04/97

La flangia può essere utilizzata in due modi distinti così da permettere una maggiore praticità e precisione a seconda del tipo di cerchio. In entrambi i casi occorre fissare la flangia al mandrino, con la vite centrale in dotazione.

Adaptor can be used in two different ways allowing to get higher practical use and accuracy according to rim types. In both cases, it is necessary to fix the adaptor to the mandrel by the proper screw.

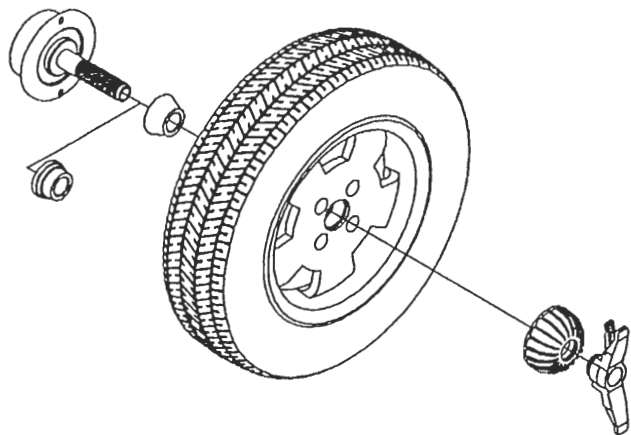


Centraggio ruota dall'esterno :

- montare in sequenza la ruota ed il cono adatto;
- serrare il tutto con la ghiera in dotazione togliendo il manicotto concavo;
- se necessario usare un altro cono qualsiasi in dotazione come distanziale sotto la ghiera.

Wheel centering from the outer side :

- fit the wheel and the suitable cone in sequence;
- lock by the proper lockring, removing the hollow sleeve;
- if necessary, use any other available cone as spacer under the lockring.

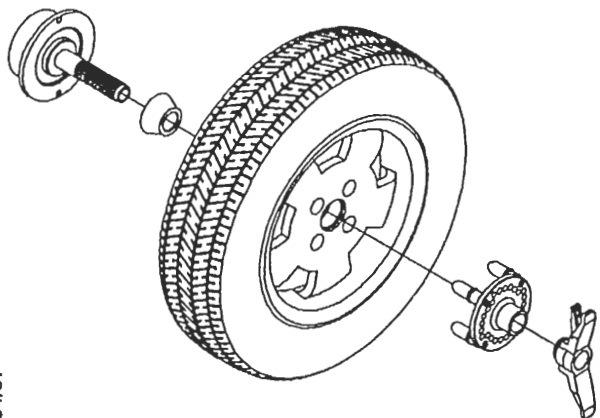


Centraggio ruota dall'interno :

- montare in sequenza il cono adatto con conicità verso l'esterno, la ruota, la ghiera completa di manicotto 5
- il manicotto concavo viene sostituito dalla rosetta in nylon 6 per ruote in lega leggera con mozzo sporgente.

Wheel centering from the inner side :

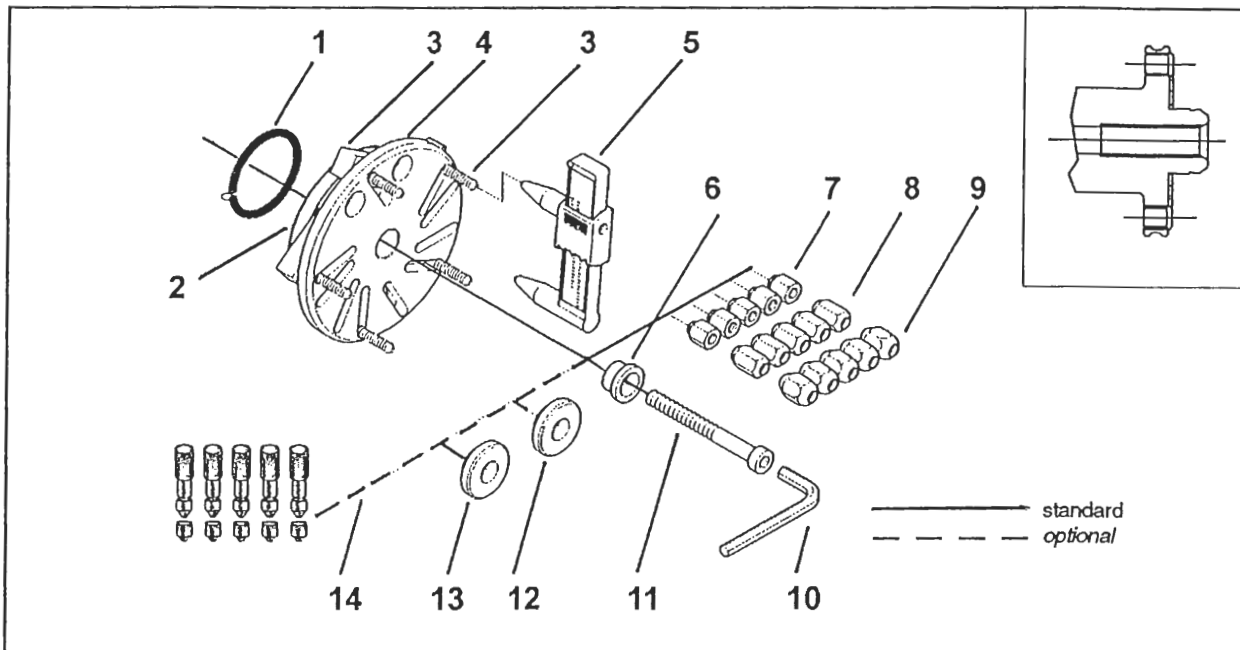
- fit the suitable cone (conicity towards the outer side) and, in sequence, the wheel, the lockring complete with hollow sleeve 5
- the hollow sleeve is replaced by the nylon washer 6 for light alloy rims with protruding hub.



MONTAGGIO CON SR WHEEL FITTING WITH SR ADAPTOR

Il centraggio con colonnette risulta più preciso per ruote aventi imprecisioni nel foro centrale o piano d'appoggio deformato. Per maggiori particolari vedere parte specifica SR.

The centering by studs is more accurate on wheels having uneven central hole or laying surface. Other details on the specific note concerning SR adaptor.



CARATTERISTICHE GENERALI

- Adatte per qualsiasi ruota di autoveicolo a 3,4 o 5 fori su Ø da 95,25 a 172 mm
- Automatica : i perni si dispongono contemporaneamente sul Ø previsto.
- Semplice da trasformare nelle sue versioni, senza smontarla dall'equilibratrice.
- La precisione è molto elevata poiché i perni per il fissaggio delle ruote sono a doppia guida sulle cave e cerniere.

GENERAL FEATURES

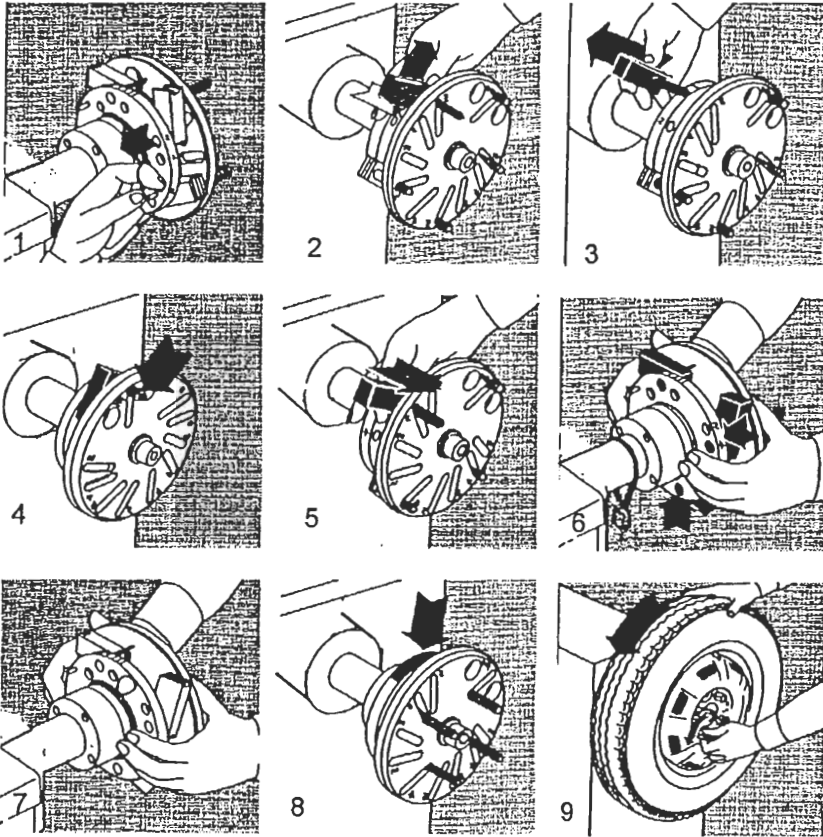
- Fit for any motor-vehicle wheels with 3, 4 or 5 holes on Ø 95,25 up to 172 mm.
- Automatic : all pins fit the foreseen Ø at the same time.
- Simple : its various layouts can be achieved without taking it off the balancing machine.
- High accuracy : the wheel fixing pins have a double guide on the hollows and hinges.

940012506 URM 345

rif.	code	data		
1	182162980	molla ritegno disco	disc retaining spring	dis. 16298/P
2	940010434	disco forato con targhetta Ø	drilled disc with Ø plate	dis. 16296/P
3	940010365	N. 5 bielle con perni	N. 5 pins with studs and bolts	
4	940010364	corpo flangia	adaptor body	
5	940052253	calibro misura forature	pitch device	fori /holes "4008536" (RF)
6	940012252	rondella bloccaggio	locking washer	dis. 20249/P
7	101171640	N. 5 dadi MF per ruote francesi	N. 5 special MF nuts for french wheels	fori/holes Ø 12,65 dis. 17164/P
8	101132050	N. 5 dadi con doppio cono	N. 5 nuts with double cone	60° / 90° dis. 13205/P
9	101132060	N. 5 dadi con cono e bombatura	N. 5 nuts with cone and crowning	60°/Rsf12 dis. 13206/P
10	114012002	chiave esagonale maschio	allen wrench	mm. 12
11	312120176	vite	screw	TCEI M14x70 UNI 5931
optional	940012510	KIT UR3-UR4-UR5 + 1(N.3) + 3(N.12)+5+6+7+8+9+10+11		
	940012507	UR3 + 1 + 3 (N. 3)+5+6+7+8+9+10+11 solo per ruote a 3 (6) fori - only for wheels with 3 (6) holes		
	940012508	UR4 + 1 + 3 (N. 4)+5+6+7+8+9+10+11 solo per ruote a 4 fori - only for wheels with 4 holes		
	940012509	UR5 + 1 + 3 (N. 5)+5+6+7+8+9+10+11 solo per ruote a 5 fori - only for wheels with 5 holes		
12opt.	940012247	KIT A = N. 5 MOZZI/HUBS + 11		
optional	940012248	mozzo per "BX"	hub	Ø 65 dis. 20260/P-1
	940012249	mozzo per "R21"	hub	Ø 60,15 dis. 20260/P-2
	940012250	mozzo per "CX"	hub	Ø 58 dis. 20260/P-3
	940012350	mozzo per AUDI - BMW - VW	hub	Ø57 dis. 20260/P5
	940012251	mozzo per "AX"	hub	Ø 55 dis. 20260/P-4
13opt.	940012444	KIT B = N. 3 MOZZI/HUBS + 11		
opt.	940012447	mozzo per OPEL	hub	Ø 69,5 dis. 21705/P-3
	940012446	mozzo per FORD	hub	Ø 63,3 dis. 21705/P-2
	940012445	mozzo per ALFA ROMEO	hub	Ø 58,5 dis. 21705/P-1
14opt.	940012512	SET N. 5 DADI RAPIDI/RAPID NUTS		

opt = optional

07/96



ISTRUZIONI PER L'USO

Per cambiare la conformazione della flangia seguire le istruzioni riportate in figura.
Per una migliore centratura della ruota serrare i dadi manualmente come indicato in fig. 9 prima del bloccaggio con la chiave.

INSTRUCTIONS FOR USE

In order to change the adaptor setting follow the instructions in the picture.
For a better wheel centering tighten nuts by hand as shown in picture No. 9, before locking them by key.

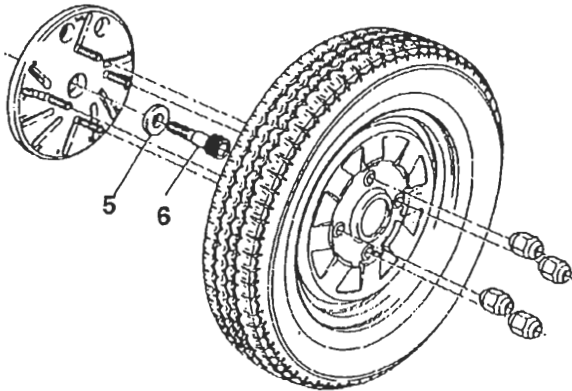


Figura A : ruote con fori svasati.

- Scegliere fra i dadi in dotazione quelli adatti.
- Infilare la ruota sui perni.
- Avvitare i dadi serrandoli manualmente prima del bloccaggio con la chiave per ottenere una migliore centratura.

Figure A : wheels with countersunk holes.

- Choose the suitable nuts in the nut kit.
- Fit the wheel onto the pins.
- Before using the locking key, screw the nuts in by hand to get a better centering.

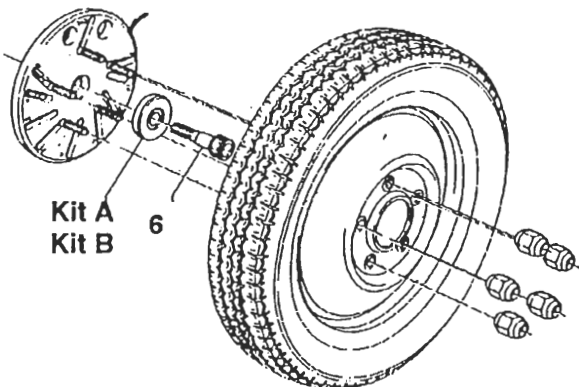
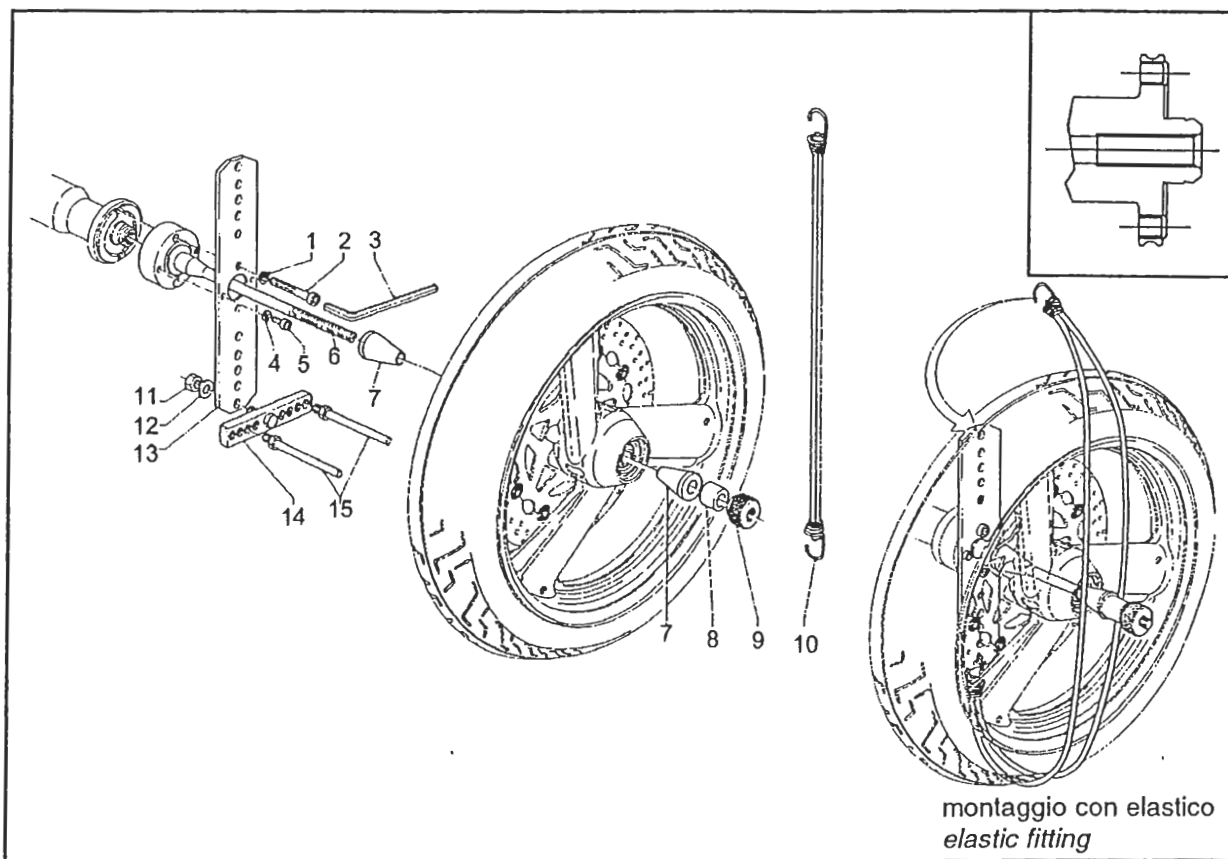


Figura B : ruote con centratura assiale (con mozzo di centraggio cerchio kit A e B)

- Sostituire la rondella sotto la vite di bloccaggio flangia con il mozzo specifico secondo necessità.

Figure B : wheels with axial centering (with rim centering hub) of Kit A and B

- Take off the washer under the adaptor locking screw and put there the special hub according to requirements.
- Center the wheel on the hub and lock the nuts on the bolts.



RMM15

RMM12

rif.	code	Code 940012103 - Ø 15
1	325035010	rosetta piana flat washer Ø 10 UNI 6592
2	312120124	vite screw TCEI M10x45 UNI 5931
3	114008002	chiave esagonale hexagonal key mm. 8
4	325035008	rosetta piana flat washer Ø 8 UNI 6592
5	312120093	vite screw TCEI M8x16
6	940012311	albero shaft Ø 15 20952G
7	940013562	distanziale conico conical spacer Ø 15-25 26916P
7 opt	424116877	distanziale conico conical spacer Ø 15-35 16877P
8	424119871	distanziale spacer Ø 14 19871P
9	424119870	ghiera di bloccaggio lockring 19870P
10	940013796	elastico elastic Ø 6 L=540 28845P
11	321232012	dado nut M12 h=12 UNI 5587
12	32503513	rosetta piana flat washer Ø 13x24 UNI 6592
13	424028831	corpo flangia adaptor body 28831P
14	424115606	piastrina plate 15606P/1
15	424215606	perno mobile movable pin 15606P/4

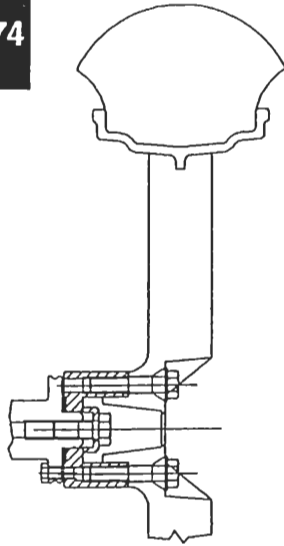
rif.	code	Code 940012102 - Ø 12
1	325035010	rosetta piana flat washer Ø 10 UNI 6592
2	312120124	vite screw TCEI M10x45 UNI 5931
3	114008002	chiave esagonale hexagonal key mm. 8
4	325035008	rosetta piana flat washer Ø 8 UNI 6592
5	312120093	vite screw TCEI M8x16
6	940012310	albero shaft Ø 12 20953G
7	940013561	distanziale conico conical spacer Ø 12-25 26915P
7 opt	424216877	distanziale conico conical spacer Ø 12-35 16877P
8	424119873	distanziale spacer Ø 11 19873P
9	424119872	ghiera di bloccaggio lockring 19872P
10	940013796	elastico elastic Ø 6 L=540 28845P
11	321232012	dado nut M12 h=12 UNI 5587
12	32503513	rosetta piana flat washer Ø 13x24 UNI 6592
13	424028831	corpo flangia adaptor body 28831P
14	424115606	piastrina plate 15606P/1
15	424215606	perno mobile movable pin 15606P/4

opt = optional

08/97

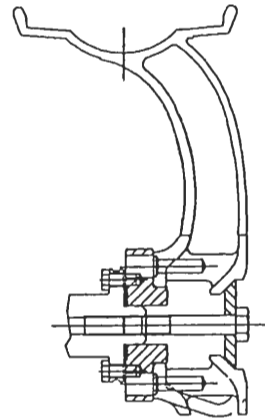
K100/34
Code 940013274

BMW



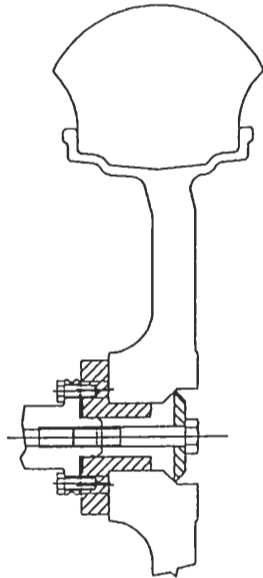
916/34
Code 940014042

Ducati



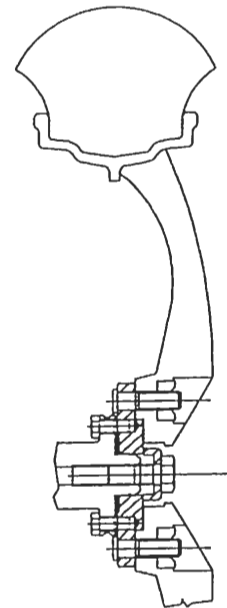
NTV/34
Code 940014043

Honda



VFR/34
Code 940012140

Honda



ADAPTORS WITH CENTERING STUDS

CARATTERISTICHE GENERALI

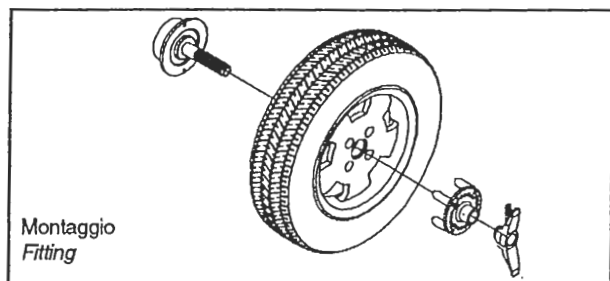
Per bloccaggio rapido e preciso su flange a coni UCZ36/2 di ruote con foro centrale utilizzando i fori di fissaggio alla vettura. Le colonnette di centraggio si inseriscono rapidamente nel disco della flangia con una semplice pressione della mano (senza dover avvitare) e consentono una precisione molto elevata grazie al sistema elastico di recupero dei giochi dovuti ad eventuali imprecisioni del cerchio.

GENERAL FEATURES

For a quick and accurate locking of wheels having central hole on UCZ36/2 cone adaptors, using fixing holes of the vehicle. Centering studs can quickly be inserted in the adaptor disc by simply pressing them by the hand (no need to screw them on) and allow to obtain high accuracy thanks to the elastic system for recovering clearances caused by rim inaccuracies.

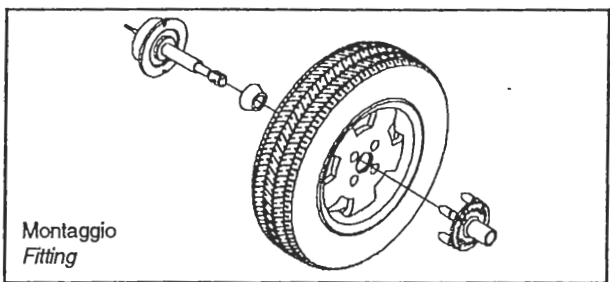
code 940010306	SR4
code 940010308	SR5
code 940012681	SR5/2

Per equilibratrici con bloccaggio tradizionale
For wheel balancers with traditional locking



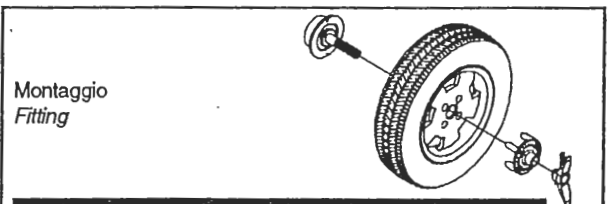
code 940010307	SR4/S
code 940010309	SR5/S
code 940012682	SR5/2-S

Per equilibratrici con bloccaggio pneumatico
For wheel balancers with pneumatic locking

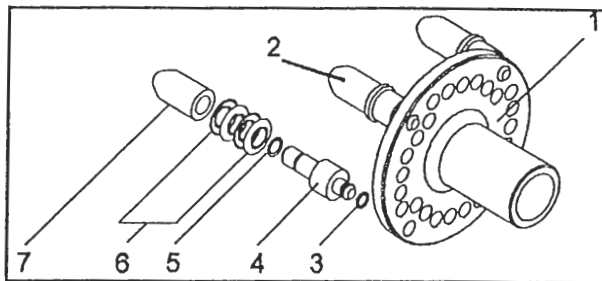


code 940013699	SR USA
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Utilizza colonnette rigide (non elastiche). Si deve usare senza cono su foro centrale. Per furgoni, pick-up, fuoristrada.
It makes use of stiff metal studs (not elastic). It must be used without cone on central hole. For light trucks, pick-ups, off-road vehicles.



N. fori N. holes	O"	O mm	principali marche di vetture main car makes
5	4.0	101.6	US-Cars, Plymouth, Chevrolet, Dodge
5	5.5	139.7	Daihatsu, Ford, Lada, Suzuki
5	6.5	165.1	Rover
6	5.5	139.7	Ford, G.M., Isuzu, Mazda, Mitsubishi, Nissan, Opel, Toyota, Volkswagen
4	6.5	165.1	Dodge, Ford International (8 holes)



rif.	code	data
1	940010310	corpo flangia adaptor body SR4
1	940010311	corpo flangia adaptor body SR4/S
1	940010312	corpo flangia adaptor body SR5
1	940010313	corpo flangia adaptor body SR5/S
1	940012683	corpo flangia adaptor body SR5/2
1	940012684	corpo flangia adaptor body SR5/2-S
2	940012685	colonnetta completa 70 mm complete centering stud
2 opt.	940013732	col.prolungata per cerchi in lega 90 mm longer stud for alloy rims
3	211001081	guamizione gomma OR 108 rubber gasket
4	101183431	pemo 18343/1 pin
5	211020431	guamizione gomma OR 2043 rubber gasket
6	345142810	molla a tazza 14,2x28x1 belleville washer
7	101183432	bussola 18343/2 bush

opt = optional

N. fori / O N. holes / O	principali marche di vetture main car makes	SR4 SR4/S
4 x 98	Fiat - Lancia - Alfa Romeo - Autobianchi - Talbot - Lada - Skoda	
4 x 100	BMW - Opel - Audi - Volvo - Volkswagen - Toyota - Honda - Nissan	
4 x 108	Ford - Audi - Alfa Romeo - Citroën BX - Maserati	
4 x 110	Mazda 323 - Mazda 626	
4 x 114.3	Mitsubishi - Daihatsu - Mazda - Saab - Toyota - Suzuki - Nissan - Ford USA - Honda - Hyundai	
4 x 120	Honda - Mazda	
4 x 130	Volkswagen - Ford Transit - Mercedes	

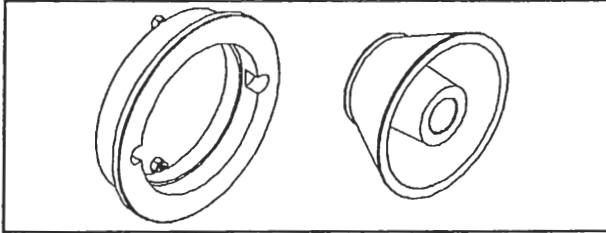
N. fori / O N. holes / O	principali marche di vetture main car makes	SR5 SR5/S
5 x 100	Toyota	
5 x 108	Volvo - Lancia Gamma - Citroën MX	
5 x 112	Mercedes - BMW - Ford - Audi	
5 x 114.3	Mitsubishi - Mazda - Toyota - Nissan - Honda	
5 x 120	BMW - Opel	
5 x 139.7	Volkswagen - Ford Transit - Mercedes	
5 x 160	Ford Transit - Mercedes	

N. fori / O N. holes / O	principali marche di vetture main car makes	SR5/2 SR5/2-S
5 x 98	Alfa 164 - Citroën CX - Thema 8.32	
5 x 118	Ducato - Peugeot - Citroën	
5 x 120.65	Jaguar - G.M.C. - Maserati - Chevrolet	
5 x 127	G.M.C. - Rover - USA Cars - Jaguar	
5 x 130	Mercedes - Audi - Porsche	
5 x 140	Mercedes	

Per modelli : UCZ36/2 - UCZ36S/2
 UCZ36SR2
 For models : UCZ36/2 - UCZ36S/2
 UCZ36SR2

OPZIONI
OPTIONS

Per bloccare dall'esterno ruote con foro centrale $\varnothing 97 \div 170$ mm
 For locking wheels having central hole $\varnothing 97 \div 170$ mm from the outer side

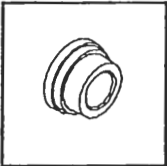


code 940010537 **G/36**

Disco con grani e dadi
 Disc with nuts, washer and bolts.

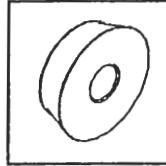
code 940010608 **5°/L**

Cono $\varnothing 97 \div 170$
 Cone $\varnothing 97 \div 170$



code 940010448 **MT**

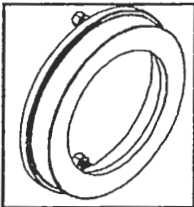
Cono speciale per ruote tedesche
 Special cone for german wheels



code 940013443 **J**

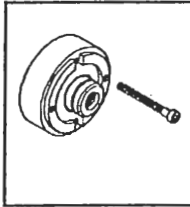
Cono per bloccare dall'esterno ruote con foro centrale $\varnothing 102 \div 118$ (fuoristrada e 4WD)
 Cone for locking wheels with central hole $\varnothing 102 \div 118$ from the outer side (cross-country and 4WD).

$\varnothing 56.5$	Opel
$\varnothing 57$	Audi tutti i modelli / all models - BMW serie 3 - Porsche 924 - Volkswagen Polo, Golf, Derby, Scirocco, Vento, Passat, Santana
$\varnothing 66.5$	Daimler-Benz tutti i modelli / all models
$\varnothing 72.5$	BMW serie 5-6-7-8 - Opel Admiral



code 940013325 **WD**

Distanziale completo di grani, dadi e rosette. Per bloccare ruote molto larghe (fuoristrada e 4WD).
 Spacer complete with nuts, washer, bolts. For locking very large wheels (cross-country and 4WD).



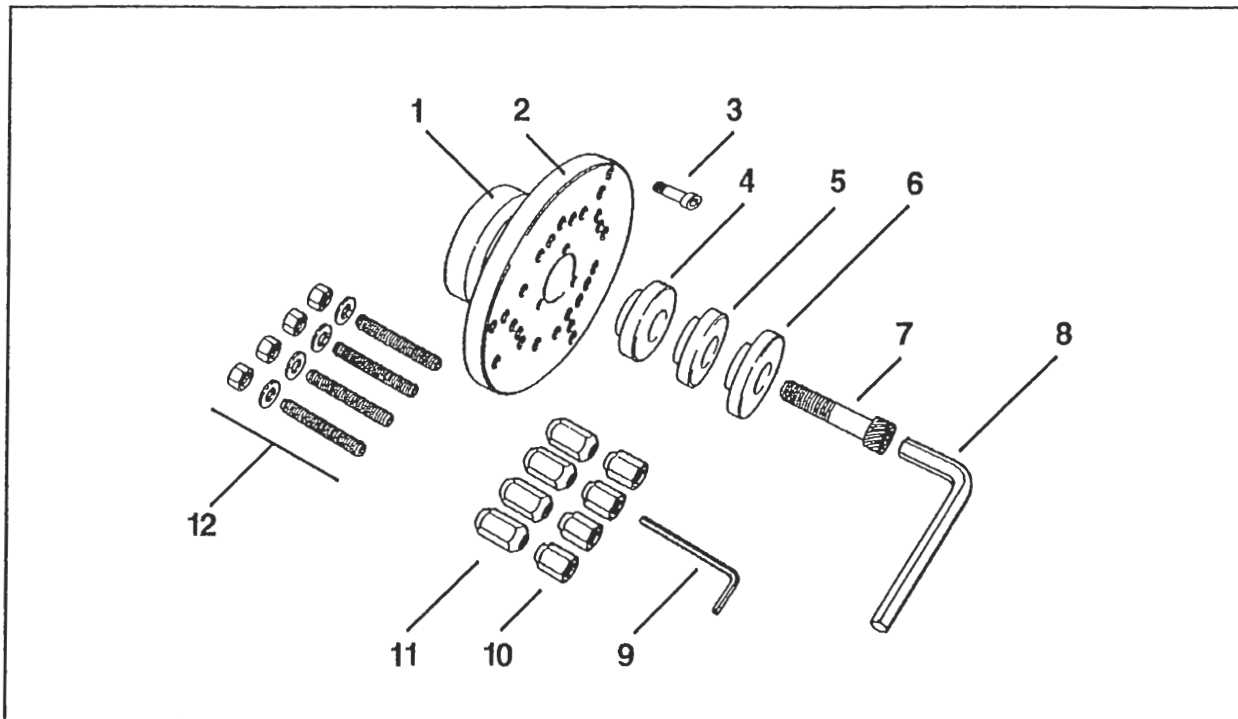
code 940013633 **RS**

Distanziale per allontanare la flangia dal basamento macchina. Serve per montare ruote a profonda imbuitura.
 Spacer to extend distance of adaptor from machine body. For wheels with large offset.



code 940013665 **RL**

Manicotto per ruote in lega
 Hollow sleeve for alloy rims



CARATTERISTICHE GENERALI

- Particolarmente adatta per ruote con foro cieco, unisce la semplicità costruttiva ad un'ottima precisione nell'equilibratura utilizzando i mozzi di centraggio in dotazione (2, 3, 4).
- La flangia può essere utilizzata su tutti i modelli di equilibratrici con albero fisso.

GENERAL FEATURES

- Particularly fit for blind hole wheels, AC adaptor combines its simple constructive features to a very good balancing accuracy using the centering hubs (2, 3, 4) in AC adaptor fitting kit.
- This adaptor can be used on all models of balancing machines with fixed shaft.

940013003 AC

rif.	code	data		
1+2+12	940013052	corpo flangia completo	complete adaptor body	
1	940013004	mozzo	hub	dis. 24298/P
2	940013005	disco	disc	dis. 24290/G
3	940013008	rondella	washer	Ø 58 dis. 24299/P-3
4	940013007	rondella	washer	Ø 60 dis. 24299/P-2
5	940013006	rondella	washer	Ø 65 dis. 24299/P-1
6	312120100	n° 3 viti	n° 3 screws	TCEI M8x50 UNI 5931
7	312120176	vite	screw	TCEI 14X70 UNI 5931
8	114012002	chiave esagonale maschio	allen wrench	mm 12
9	114005002	chiave esagonale maschio	allen wrench	mm 5
10	101171640	n° 4 dadi per ruote francesi	n° 4 nuts for french wheels	MF dis. 17164/P
11	101132050	n° 4 dadi con doppio cono	n° 4 nuts with double cone	Ø 60/90 dis. 13205/P
12	940010436	n°4 viti + dadi + rondelle	n° screws +nuts + washer	STEI M10x70

opt = optional

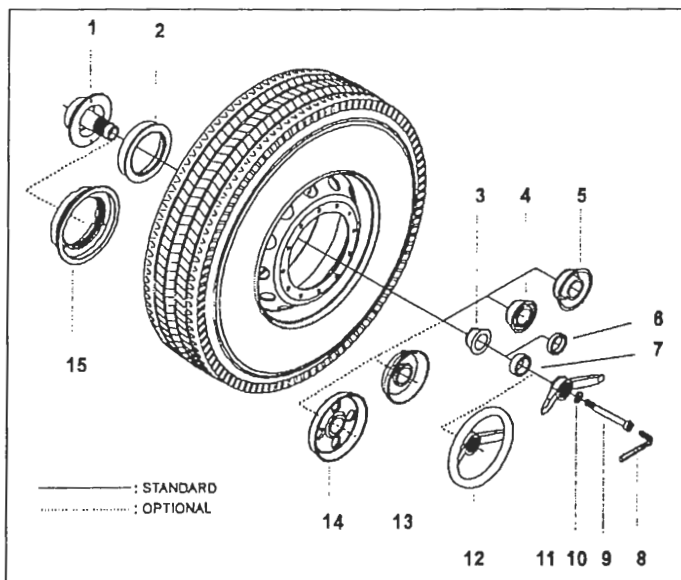
UNIVERSAL ADAPTORS FOR TRUCKS

CARATTERISTICHE GENERALI

- Flangia a coni per ruote autocarro
- Per bloccaggio dall'esterno di ruote con foro centrale.
- Dotazione standard : 3 coni per Ø da 76 a 178 mm ed anello G/175; distanziali e ghiera.

GENERAL FEATURES

- Cone adaptor for truck/buses.
- To lock wheels with central hole, from outside.
- Standard Kit : 3 cones for Ø 76 to 178 mm, G/175 disk and locknut with spacers.

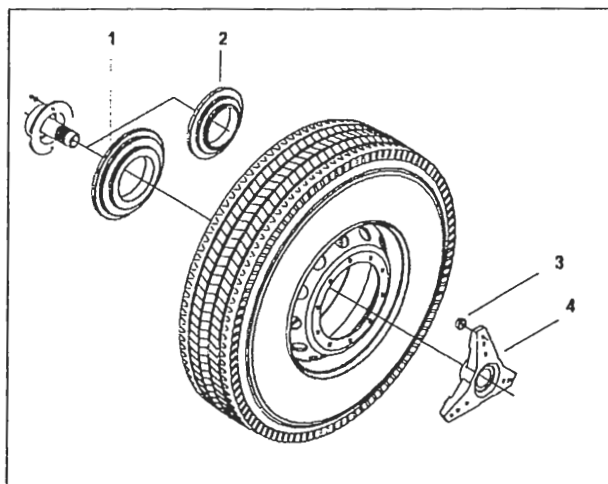


Kit opzionale : per ruote con foro centrale Ø 202-221-281 mm.
 - Tempra-induzione sulle superfici coniche di centraggio.
Optional kit : for wheels having central hole Ø 202-221-281 mm.
 - Induction-hardening on cone surfaces.

940010088 UC 150 *

940013855 UC 150 **

rif.	code	data
1	940010103	corpo flangia <i>adaptor body</i>
2	940010656	disco <i>disk</i>
3	940010006	cono 1° <i>cone 1st</i>
4	940010007	cono 2° <i>cone 2nd</i>
5	940010101	cono 3° <i>cone 3rd</i>
6	940010032	distanziale <i>spacer</i> 20 mm
7	940010033	distanziale <i>spacer</i> 30 mm
8	114019002	chiave esagonale maschio <i>allen wrench</i> 19 mm
9	312120309	vite <i>screw</i> TCEI M24x200 UNI 5931
10	325035024	rondella piana <i>flat washer</i> Ø 24 UNI 6592
11*	940010034	ghiera alettata <i>winged locknut</i>
12**	940013852	ghiera con volantino GM65 <i>locking with handwheel</i> dis. 29267/P
13 opt.	940010035	cono 4° <i>cone 4th</i>
14 opt.	940010106	cono 5° <i>cone 5th</i>
15 opt.	940010105	disco <i>disk</i> GG dis. 12570/G



Kiti di centratura per ruote a disco di autocarri con foro centrale Ø 161/202/221/281

- Adatto per tutte le ruote di autocarro con centraggio della ruota sul mozzo mediante il foro centrale "a tolleranza stretta", viene usato con la flangia a coni UC 150 in alternativa ai coni 4° e 5°, abbinando una estrema precisione nell'equilibratura con un montaggio semplice e rapido.
- Secondo il Ø del foro nel cerchio si fissa al corpo flangia UC 150 il disco di centraggio adeguato (1 oppure 2) come illustrato in figura. La ruota montata sul disco viene tenuta in posizione dalla crociera 4 con tasselli di spinta 3 e bloccata dalla ghiera in dotazione alla flangia a coni.

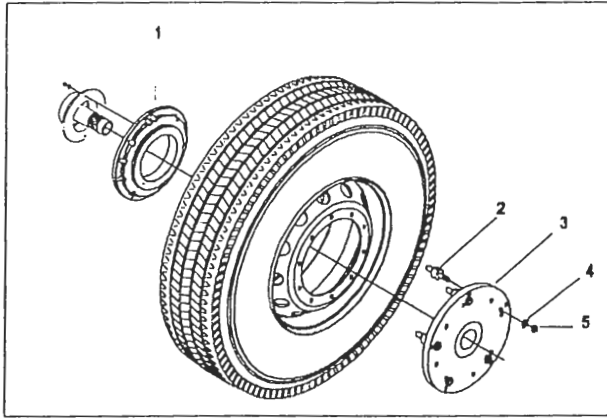
940012303

R200

rif.	code	data
1	940012305	flangia <i>adaptor</i> Ø 221/281 dis. 20808/G
2	940012304	flangia <i>adaptor</i> Ø 161/202 dis. 20807/G
3	940012306	tassello <i>block</i> dis. 20810/P
3a	211001081	guarnizione in gomma <i>gasket</i> OR 108
4	940012307	crociera <i>fixing device</i> dis. 20809/G

Centering kit for truck wheels (disk type) with central hole Ø 161/202/221/281

- Fit for all truck wheels with centering on the hub through the central hole with a "strict tolerance". It is used with cone adaptor UC 150, as an alternative to 4th and 5th cones, and combines a very accurate balancing together with an easy and quick fitting.
- As shown in the picture, it is necessary to fix the proper centering disc (1 or 2 according to the Ø of the rim hole) to UC 150 adaptor body. The wheel, fitted onto the disc, is held by the fixing device 4 with push blocks 3 and locked by the ring in UC 150 adaptor fitting kit.



940013002

SR200

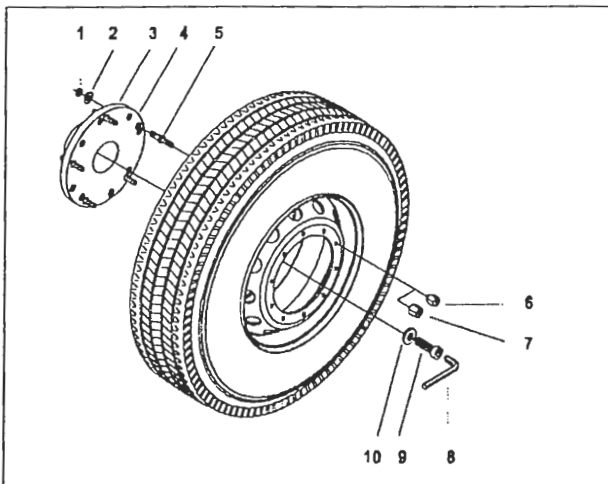
rif.	code	data
1	940012997	flangia di centratura centering adaptor dis.24294/G
2	940013794	colonna pin dis. 28688/P
3	940012998	controflangia completa di boccia adaptor counterpart with bush
4	32503514	rondella piana flat washer Ø 14 UNI 6592
5	321232014	dado nut M14 UNI 5588

Kit di centratura per ruote a disco di autocarri

- Adatto per tutte le ruote di autocarro con centraggio della ruota sul mozzo, viene usato con la flangia a coni UC 150 come illustrato in figura.
- Il disco 1 di centratura consente un comodo montaggio della ruota anche quando il foro centrale nel cerchio è deformato o usurato.
- La centratura precisa è assicurata dalle colonnette 2 quando entrano nei corrispondenti fori sul disco. Le colonnette vanno inserite nella controflangia 3 nei fori interessati (cambio rapido). Serrare la controflangia con la ghiera in dotazione alla flangia a coni.

Centering kit for truck wheels (disk type)

- Fit for all truck wheels with centering of the wheel on the hub; it is used with cone adaptor UC 150, as shown in the picture.
- Centering disc 1 allows an easy wheel fitting even if the central hole of the rim is warped or worn.
- An accurate centering is provided for by means of pins 2 entering the matching holes on the disc. Pins are to be inserted in adaptor counterpart 3 in the appropriate holes (quick change). The adaptor counterpart is to be tightened through the ring in UC 150 adaptor fitting kit.



- La flangia viene centrata e fissata direttamente al mandrino dell'equilibratrice. La ruota viene fissata utilizzando le colonnette periferiche e i dadi in dotazione.
- The drilled adaptor is centered and fixed on machine shaft. The wheel is locked by using the appropriate nuts and bolts.

940010095

AC 150 *

5 fori/holes Ø 275 ±285,75

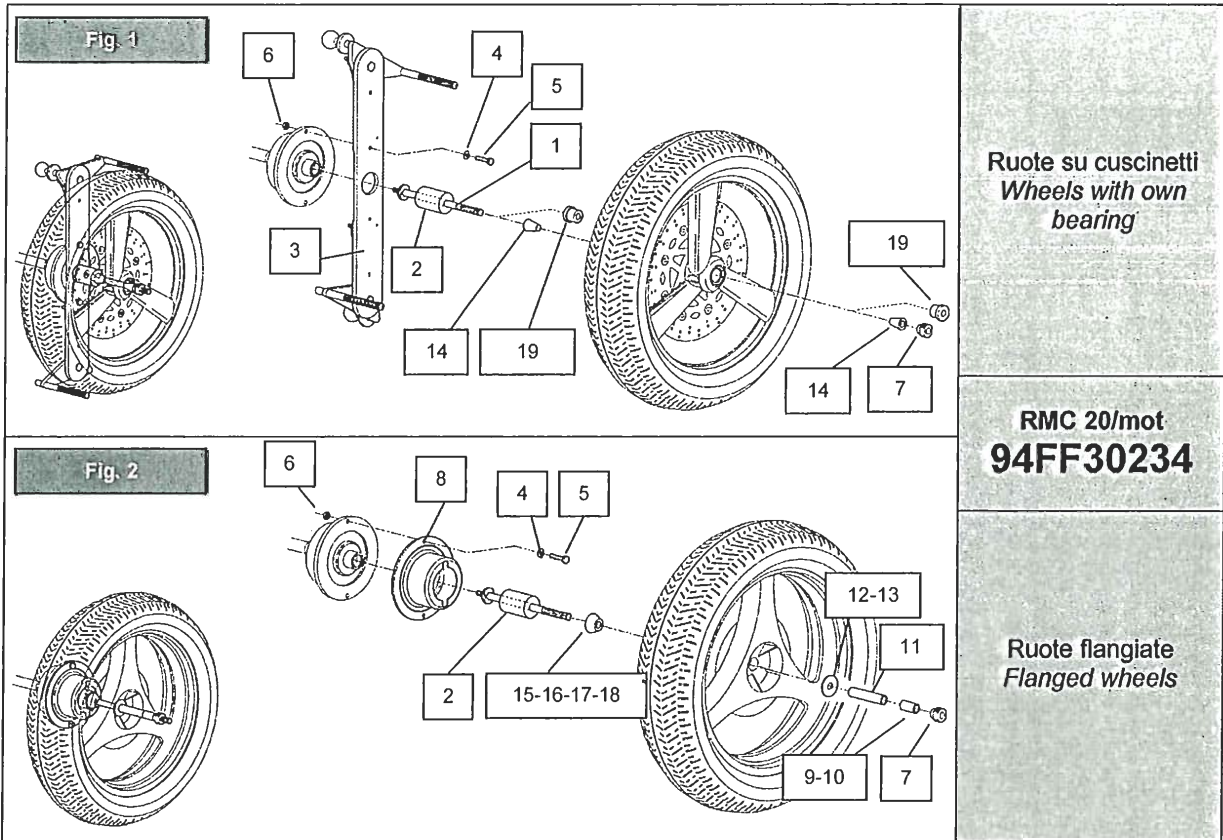
940010096

AC 150/2 **

5 fori/holes Ø 335

rif.	code	data
1	321232016	dado nut M16 UNI 5588
2	325035016	rondella piana flat washer Ø 16 UNI 6592
3*	940010047	flangia senza prigionieri adaptor without bolts Ø 8/275 10/285,75
4**	940010048	flangia senza prigionieri adaptor without bolts Ø 10/335
5	940010054	prigioniero bolt dis. 7786
6	940010056	dado e cono nut and cone RSF 18 80° dis. 14344
7*	940010055	dado e centraggio cilindrico nut with cylindrical centering RSF 22,2 dis. 14346
8	325035024	rondella piana flat washer Ø 24 UNI 6592
9	312120300	vite screw TCEI M24x80 UNI 5931
10	114019002	chiave esagonale maschio allen wrench 19 mm

Flangia per ruote di moto
Adaptor for motorcycle wheels



Ruote su cuscinetti
Wheels with own bearing

RMC 20/mot
94FF30234

Ruote flangiate
Flanged wheels

CARATTERISTICHE GENERALI

- In versione standard centra tutte le ruote con foro centrale passante con diametro da 15 a 35 mm e tutte le ruote flangiate (ad esempio ruote posteriori Aprilia, Ducati, Bmw, Honda, ecc.) con centratura sino a diametro 68 mm. In questo caso è usato un cono (15, 16, 17, 18; Fig. 2) spinto nella zona di centraggio della ruota dalla molla presente nella flangia.

GENERAL FEATURES

- In standard version, it centers all wheels with central through hole having diam. From 15 to 35 mm and flanged wheels (i.e. rear wheels of Aprilia, Ducati, Bmw, Honda, etc.) with centering up to 68 mm diam. In this case, a special cone (15, 16, 17, 18; Fig. 2) pushed onto wheel centering area by adaptor spring is available.

Ref.	Code	Data
1	40FF29925	shaft Ø 15 L=231
1opt	40FF46706	shaft Ø 15 L=270 (only for 42" wheel guard for Harley Davidson)
2	40FF29926	spring pusher Ø 15
3	41FF29924	complete bracket
4	325035008	flat washers 8.4x17 UNI 6592
5	311120096	screws TE M8x30 EN24014
6	321232008	nuts M8 EN24032
7	40FF29950	lockring Ø 15
8 fig.2	40FF29943	counterflange
9÷11 fig.2	40FF29931	spacer Ø 15 L=20
	40FF29932	spacer Ø 15 L=40
	40FF31377	spacer Ø 15 L=95
12÷13 fig.2	40FF31376	disc Ø 15-45
	40FF31649	disc Ø 15-64

Ref.	Code	Data
14÷18	40FF29927	cone Ø 15-25 C1
	40FF51119	cone for Yamaha R1-R6 Ø 25-30 C2
	40FF29929	cone for BMW Ø 30-40 C3
	40FF31650	cone for Aprilia AF1, Honda NTV, Ducati 916 Ø 40-60 C4
	40FF29944	cone for Honda VFR, Yamaha GTS 1000 Ø 54-68 C5
OPT	41FF51299	COMPLETE KIT OF CENTERING BUSHES
19	40FF38833	For Yamaha, Honda, Kawasaki, Aprilia, Suzuki, Gilera Ø 15 B7 L=20
	40FF38834	For Moto Guzzi Ø 16 B6 L=20
	40FF38835	For Yamaha, Suzuki, KTM Ø 17 B5 L=25
	40FF49378	For Harley Davidson Ø 19,05 B8 L=25
	40FF38836	For Yamaha, Honda, Kawasaki, Laverda, BMW, Triumph, KTM, Aprilia, Moto Guzzi, Suzuki Ø 20 B4 L=30
	40FF38837	For Yamaha, Honda, Kawasaki, Aprilia, Suzuki, Gilera Ø 22 B3 L=30
	40FF38838	For Kawasaki Ø 25 B2 L=30
40FF31651	For Yamaha Ø 28 B1 L=30	