CE

Wheel balancing machine

Model TROLL 2162

OPERATING INSTRUCTION

„UNI-TROL" Sp. z o.o.
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Wheel balancing machine

Model TROLL 2162

Serial number

Year

MANUFACTURER

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01-932 Warsaw, POLAND
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AUTORIZED SERVICE

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PACKING, TRANSPORTATION AND STORAGE

ATTENTION
All operations concerning packing, lifting, moving, transporting and unpacking must be carried out by qualified personnel only.

Packing

The balancing machine is sent as a complete piece of equipment (quick-change holder, protective screen, balancing machine).
The balancing machine can be packed in a few different ways:

- pallet + stretchy foil + carton box
- pallet + stretchy foil
- pallet + carton box

Transportation

The package can be lifted or displaced by means of fork-lift or pallet trucks. Once the cargo arrives at its destination, it is recommended to check if its contents have not been damaged during transportation. Is also recommended to check the conformity of the delivery with its bill of lading. In case of non-conformity or transportation damages it is necessary to inform, without delay, the responsible person or carrier about it.
Moreover, the loading should be done with extreme precautions and consideration.

Storage

The equipment should be stored in a dry and dust-free room.

INTRODUCTION

WARNING

This manual is intended for manufacture personnel licensed to service the balancing machine (operator) and those who carry out current maintenance; Before starting any operations concerning the balancing machine or the package, you should read carefully the manual.

This manual contains important information concerning:

PERSONAL SECURITY of the operators and maintenance personnel, BALANCING MACHINE OPERATION.

Manual

This manual is an integral part of the balancing machine and should always accompany the machine even if it is going to be sold.

The manual must be kept in the neighbourhood of the machine in a place of easy access.

Servicing and maintenance personnel must be able to consult the manual rapidly at any moment.

ATTENTION:

T IS STRONGLY ADVISED TO READ CAREFULLY AND REPEATEDLY CHAPTER THREE IN WHICH VERY IMPORTANT INFORMATION AND WARNINGS CONCERNING SAFETY IS CONTAINED.

Directive 98/37/CE
Directive 89/336/CEE
PN-EN 292-1/2000, PN-EN 292-2/2000, PN-EN 50081-1/1996, PN-EN 50081-2/1996
PN-EN 50082-1/1999, PN-EN 50082-2/1997, PN-EN 294/1994, PN-EN 349/1999
PN-EN 60204-1/2001, PN-EN 61204/2001, PN-EN 61293/2000, 62/2002
PN-EN 983/1999

ATTENTION:

Lifting, transportation, unpacking, assembly, installation, putting in motion, preliminary adjustment and testing, maintenance repairs, technical inspections, transportation do not require the presence of the service personnel but must be carried out with extreme precaution.

The producer does not bear any responsibility for personnel injuries or vehicle and other objects damages if any of the above mentioned operations have been performed not according to the service manual or the balancing machine was used in an improper way.

In the manual only the aspects of the servicing and security which can help operators and servicing personnel in a better understanding of the construction and working of the balancing machine and to allow them to use it the best way possible were enumerated.

To understand the vocabulary used in the manual, operators must possess specific experience in servicing, maintenance, repairs, workshop works and ability to correctly decode all drawings and descriptions contained in the manual. Operators must also know general and detailed safety requirements obligatory in the installation country.
The word "operator" used in this manual should be understood in the following manner:
OPERATOR: a person licensed to service a balancing machine.

SAFETY

WARNING

This chapter should be read carefully because it contains important information concerning hazards for operators and other persons who use the balancing machine in an inappropriate way.

Below there are explanations concerning hazards and dangers which can occur during the balancing machine operation and maintenance. General and detailed precautions serve to avoid potential hazards.

WARNING

The balancing machine TROLL 2162 was designed for the balancing of motor-car wheels and delivery truck wheels in one measurement cycle. Any work with the balancing machine should be preceded by comprehensively reading and understanding this manual.
All other balancing machine applications are not allowed. In particular the balancing machine is not intended for:
- balancing other elements
- operation other than wheel balancing

ATTENTION

The producer does not bear any responsibility for personnel injuries or vehicle and other objects damaged in case of improper or unauthorized use of the balancing machine.

ATTENTION

Anyoperation of the balancing machine is not allowed withoud priorclosing of the whell protective screen. Not satisfying the above-MENTIONED RECOMMENDATIONS CAN PROVOKE SERIOUS HUMAN INJURIES AND IRREPAIRABLE BALANCING MACHINE DAMAGES AND ALSO WHEEL DAMAGES.

General precautions

It is required that the operator and the maintenance technician observe safety rules obligatory in the country of installation.
Besides, the operator and the maintenance technician must observe the following principles:
- to work always in stations defined and described in this manual
- to read inscriptions concerning safety which are placed on the balancing machine and those contained in this manual.

Inscriptions concerning safety are shown in this manual:

Danger– indicates a hazard in being in the proximity of which can provoke serious injuries

Warning– indicates dangerous situations and/or manipulations which can provoke significant or minor injuries.

Caution– indicates dangerous situations or/and manipulations which can provoke minor human injuries or/and damages to the balancing machine, wheel or other objects.

Risk of electric shock– specific inscription located in those places of the balancing machine where the risk of electric shock is particularly high.

Hazards for personnel
In this paragraph potential hazards for the operator are described or other persons finding themselves in the proximity of the balancing machine and who use it in an inappropriate way.

It should always be remembered that any operation on the balancing machine must be preceded by closing of the protective screen (for balancing machines rotating over 120 rotations/minute).

Impact risks
There exists a risk of hitting against some parts of the balancing machine.
With the protective screen open personnel must observe all precautions to avoid hitting against machine parts.

Risk of wheel easing
Before the balancing machine start, it should be checked if the wheel is properly fixed in its holder.

ATTENTION

IT IS FORBIDDEN TO EVER UNSCREW THE WHEEL DURING MACHINE WORK.

IT IS FORBIDDEN TO EVER LEAVE THE MACHINE WORKING WITHOUT SUPERVISION

Risk of skid

This hazard can be caused by floor contamination with grease in the proximity of the balancing machine.

THE AREA UNDER THE BALANCING MACHINE AND ITS NEAREST SURROUNDINGS AS WELL AS HOLDERS SHOULD BE KEPT CLEAN.
All oil stains should be removed immediately.

Risk of electric shock
Hazard of electric shock can occur in those balancing machine areas where electric cables are laid.

Use of water sprayers, vapour sprayers (high pressure washing units), dissolvers and paints is not allowed in the neighbourhood of the balancing machine and in particular they should not be in contact with the control desk.

Hazard caused by poor illumination
The operator and the maintenance technician must have the possibility to check if all areas of the balancing machine are properly and uniformly illuminated according to the regulations obligatory in the installation place.

Risk of balancing machine defect during work
To produce a reliable and safe balancing machine, the manufacturer applied suitable materials and manufacturing techniques that are necessary for this type of equipment. Nevertheless the balancing machine should be operated according to the producer's recommendations. Technical inspections (after guarantee period) and other maintenance works described in chapter 11 "MAINTENANCE" should be carried out with specified periodicity.

IMPORTANT

All operation of the balancing machine contrary to its function causes the danger of seriousdamagesor accidents.That is why it is so crucial to scrupulously observe all recommendations contained in this manual concerning operation, maintenance and safety.

DO NOT START THE MACHINE BEFORE READING CAREFULLY THESE INSTRUCTIONS

1 . APPLICATION AND TECHNICAL DATA

TROLL -2162 balancing machine is designed for dynamic balancing of car and van wheels in a single measurement cycle.

TECHNICAL DATA:

- wheel diameter	10" - 26 "
- wheel width	2" - 20"
- accuracy of unbalance indications	1 g
(for changer wheel)	10 g
- accuracy of unbalance location signal	3 stages
- measurement time	7 s
- machine weight	abt 200 kg
- overall dimensions without wheel guard without carriage, with chuck installed	1000 x 750 x 950 mm
- balancing machine overall dimension with cariiage installed and wheel guard	11400 x 1400 x 1300 mm
- balancing machine overall dimension with carriage installed and wheel guard up	1400 x 1500 x 1750 mm
- wheel weight	up to 200 kg
- drive motor rating	0,37 kW
- spindle speed (during measurement)	120 r.p.m.
- power supply	3 x 380 V/ 50 Hz
- pneumatic supply	0,8 - 1,0 MPa

The balancing machine TROLL 2162 is equipped with a speach synthetiser, emitting confirmations of each operation performed and suggesting procedures for whel balancing. Indications quantity and position unbalance take reading on monitor measurement.

2 . INSTALLATION

TROLL -2162 balancing machine should be installed in a closed, dry room, heated during autumn / winter season. The machine should be installed on a hard and levelled floor. The balancing machine should be installed on three rubber pads, suppiled with the machine which should be inserted under the three flat feet welded to the machine base.

INSTALLATION

WARNING

These operations can be executed by persons who were earlier trained in servicing the equipment described in this manual. To avoid possible balancing machine damages or danger of causing human injuries it is necessary to observe below the mentioned instructions. Make sure that nobody is within the working area of the machine.

Installation requirements

The balancing machine has to be installed at safe distance from walls, columns and other equipment.

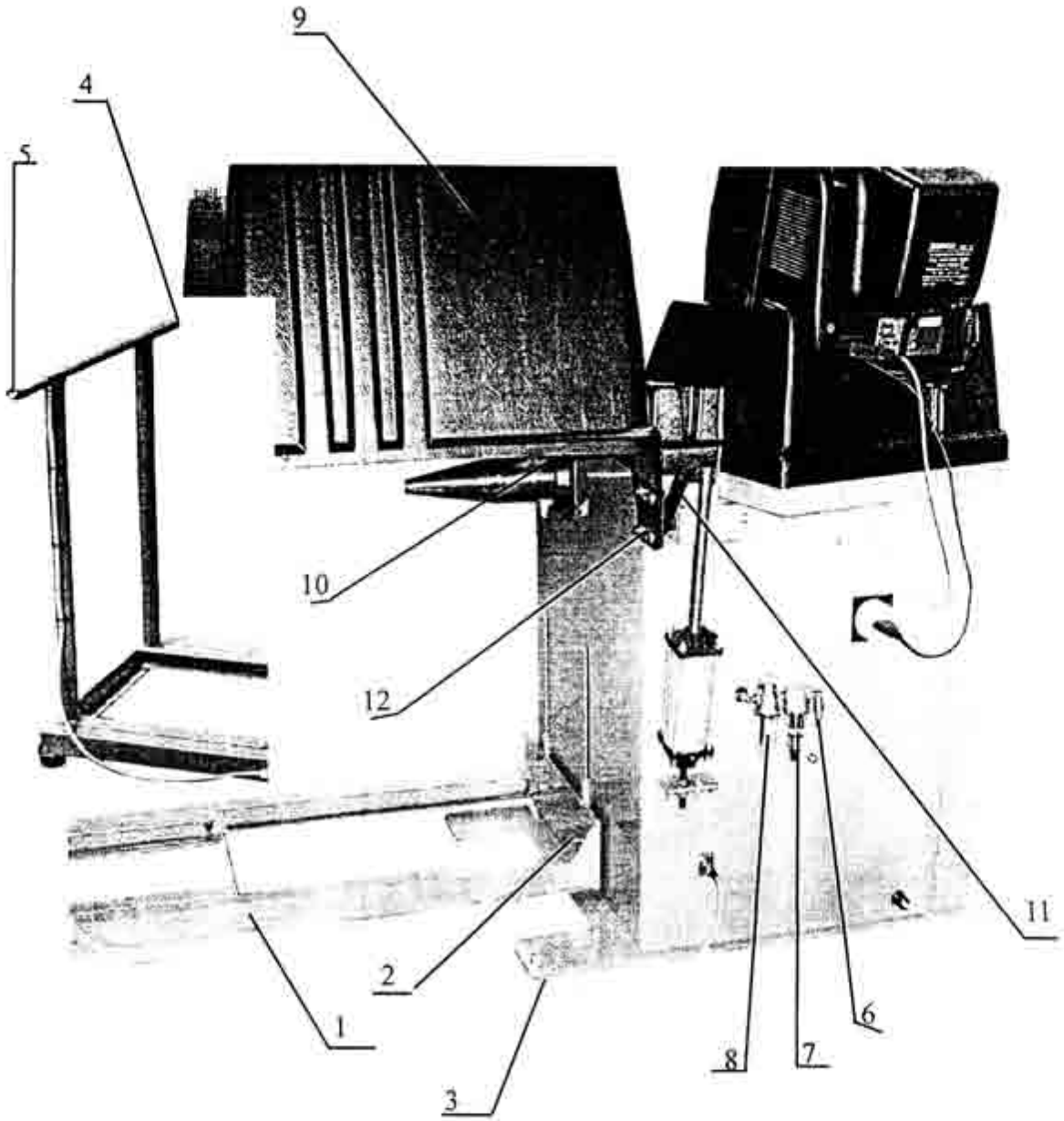
The room must be equipped with an electric current source and a compressed air installation. The balancing machine can be positioned on any foundation, provided it is perfectly horizontal.

All parts must be uniformly illuminated with light, of which the intensity assures safe completion of all regulation and maintenance works specified in this manual. The presence of shady places, light reflections or dazzling light is unacceptable and all situations which could lead to eye fatigue.

Illumination must be installed according to the regulations obligatory at the installation place (it is the responsibility of the light installation contractor).

Before starting the installation it is recommended to unpack all parts and check if they are not damaged.

All matters concerning displacing and lifting were discussed in chapter "Packing, transport, storage"



1. Trolley of lift
2. Bolts (M10x30) with washers
3. Connection cord with plug
4. Button of position of trolley (up or down)
5. Button of position of trolley (up or down)
6. Air supply connection
7. Air filter
8. Lubrificator
9. Cover of wheel
10. Eye of cover
11. Collar of axle of cover
12. Wrench-head bolts M8 with washers

Fig. 1

2.1 Carriage Installation (fig 1)

Set - up carriage against balancing machine side. Ajdust carriage feet height so that holes in carriage coincide with holes in flats, protruding from balancing machine housing. Bolt carriage to balancing machine with both „2" (M 10 x 30) with 10.5 mm dia. washers. Connect cable with plug „3" fixed to the carriage to socket in the back wall of the balancing machine. Unlock undercarriage which should move along carriage guide ways.

2.2 Mounting of cover of wheel (acc. pic. 1)

- unscrew a bolt (14) from collar (11)
- unscrew 4 pcs bolts (12) from eye of cover (10)
- undo a nut (15) from pin of shock absorber (13)
- the axle of collar (11) insert at the hole of top bracket of shock absorber and screw a nut (14). Simultaneously screw a nut (15) a lower bracket of shock absorber (13).
- screw the nuts (12) of cover
- the nuts (15) adjust a height of clamping of shock absorber adequate to horizontal position a cover of wheel.

2.3. Fitting Balancing Machine Fixture (fig.2)

Before mounting the fixture clean thoroughly with a clth taper surfaces of spindle „1" and fixture „2". Install fixture so that markers „3" on spindle dowel and fixture are in the position shown in Fig. 2

NOTE:
Thorough cleaning of taper surfacecs and appriоprate position of fixture in relation to spindle (markers coinciding) is one of preconditions of correct wheel balancing.

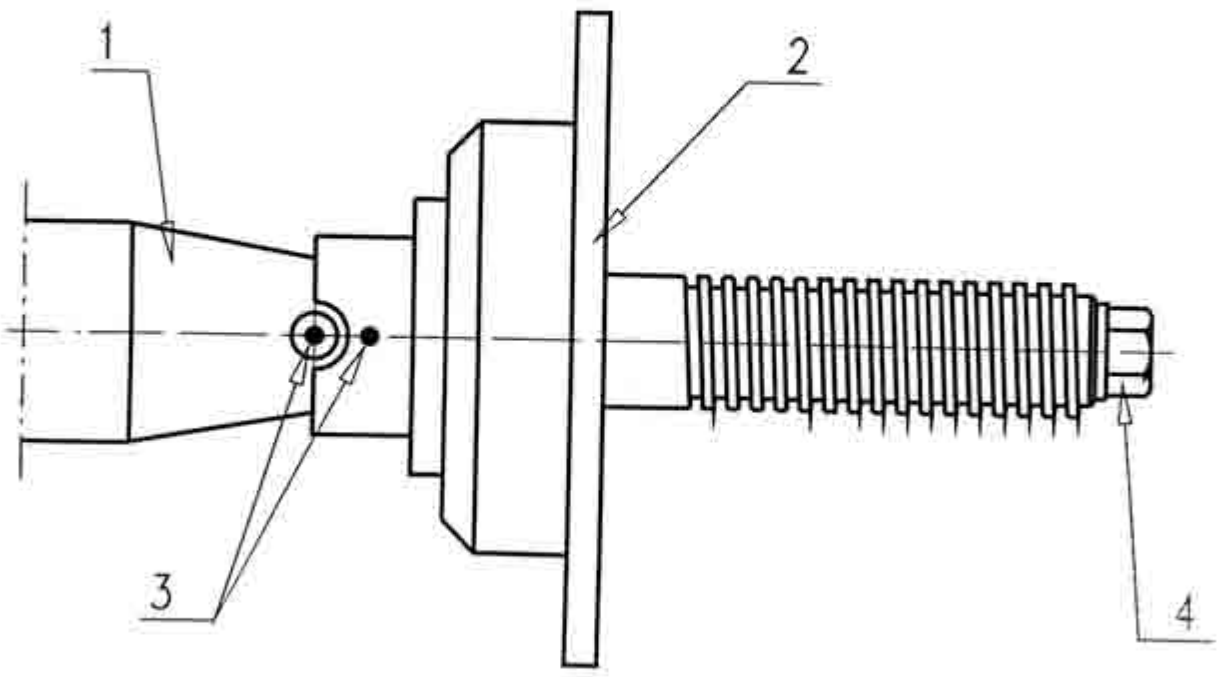


Fig. 2 Fixture balancing machine

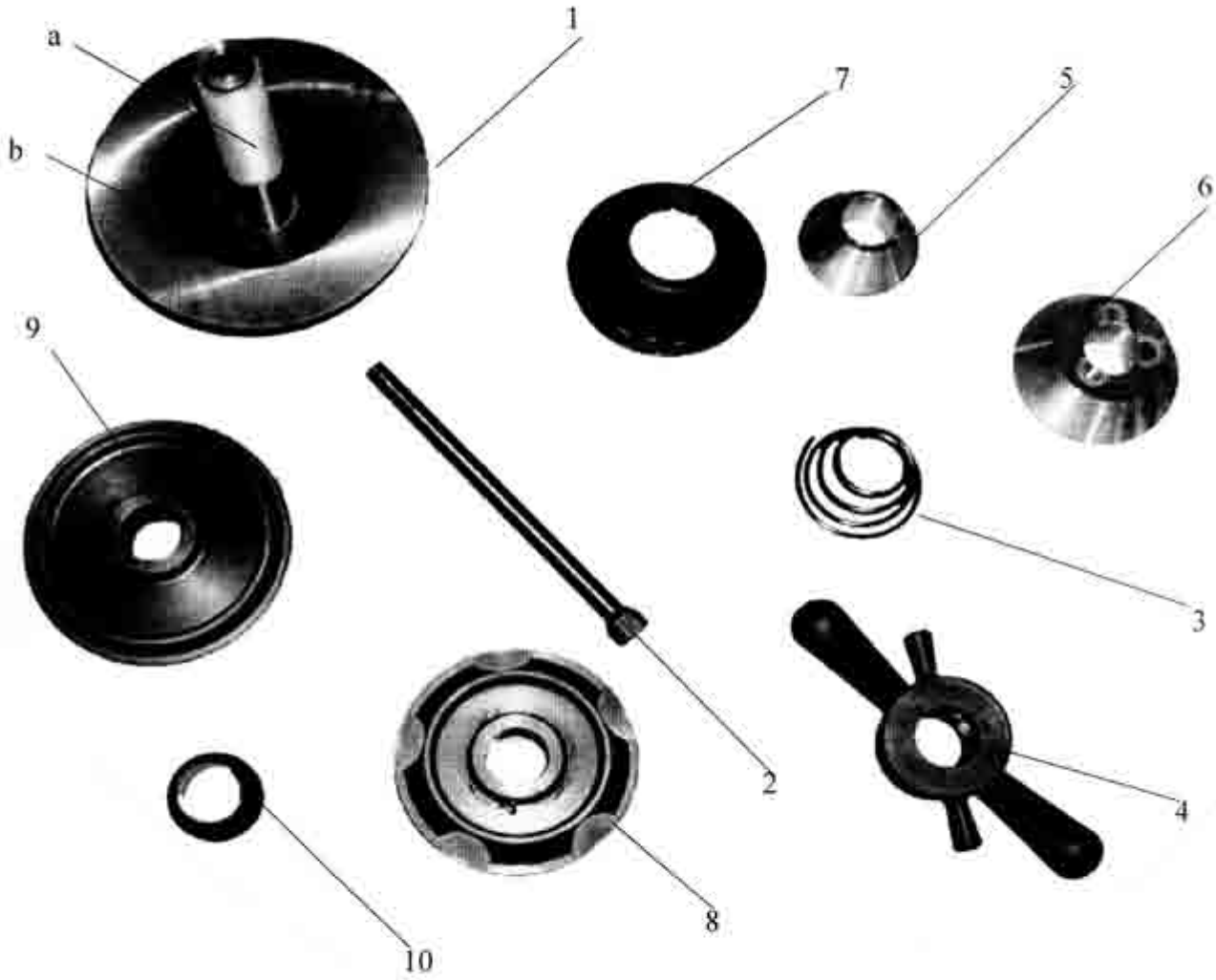
2.4 Mounting the Wheel on the Balancing Machine

Wheels with a central hole are mounted is a central fixture, supplied as standard equipment with-the balancing machine. This fixture is to be fitted to the balancing machine spindle as decsribed in item 4 below.

NOTE: It is recommended to wash the wheel prior to mounting on the balancing machine to prevent distortion of measurement by mud particles.

2.4.1 QUICK - RELEASE FIXTURE

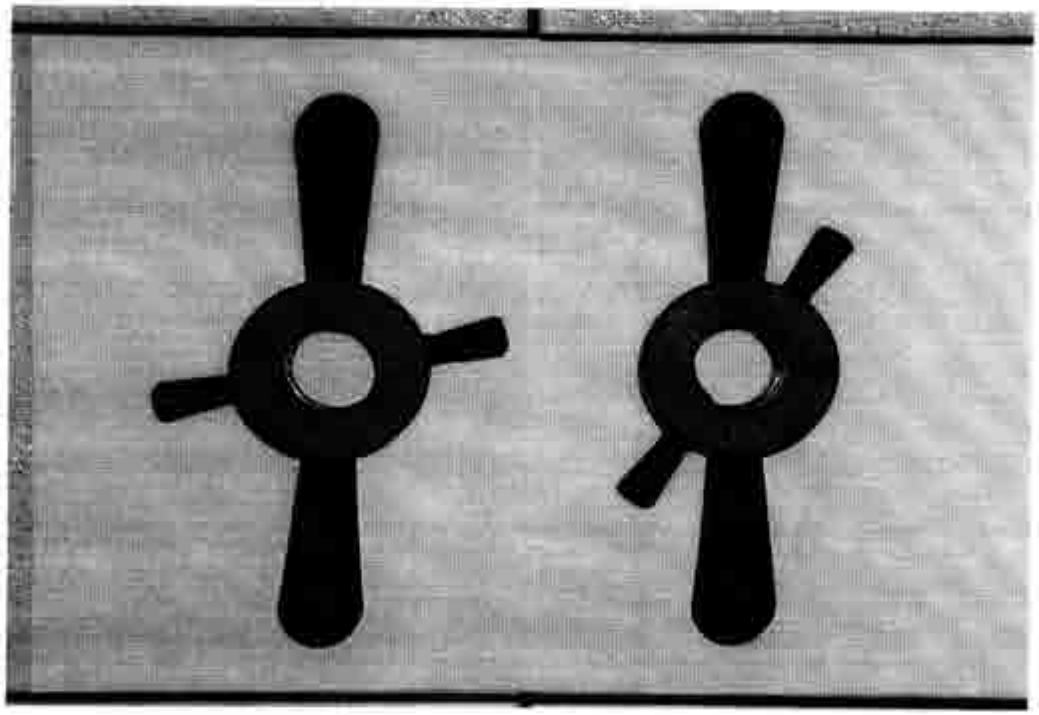
Type QUICK - TROL quick release fixture is intended for mounting car on a van wheels, with central hole wheel rims, on balancing machines..
FIXTURE COMPONENT PARTS (Fig.3):



1 – holder (a – root, b – flange)
2 – screw for fastening the holder to the balancing machine
3 – spring
4 – clamp nut
5 – centring cone number 1
6 – centring cone number 2
7 – nut clamp
8 – centring disk number 1 (with double cone)** 120 – 140 mm
9 – centring disk number 2 (with double cone)** 140 – 160 mm
10- centring cone number 3**

(**) - accessories

Clamp nut



Drawing 4 **L POSITION (play)** **D POSITION (clamp)**

A clamp nut lever turns in relation to the nut body; within limits determined by the cut-out in the nut body (L and D positions).
In L position (play), the nut can be easily shifted along the thread of the holder's root.
In D position (clamp), the nut can be screwed along the thread of the holder's root.

Mounting Wheel in Fixture

Slide wheel on fixture bolt and suspend it by the edge of central hole centering taper detent. Set nut lever in position RELEASE and push nut against wheel, as far as it will go. Resting thumb on nut pin (as shown in Fig.5) move lever to the right, to position CLAMP and tighten nut, preesing the whell against fixture disc.

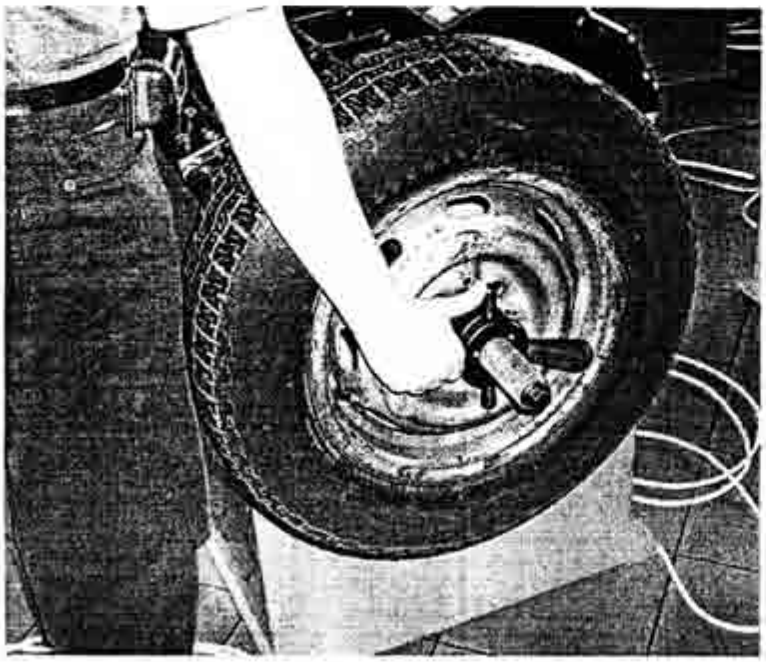


Fig.5. Tightening nut

in order to remove wheel from fixture, rest index finger on nut pin (as shown in Fig.6) and loosen nut by one half turn. It may be then slid off the rod and the wheel may be removed from fixture.

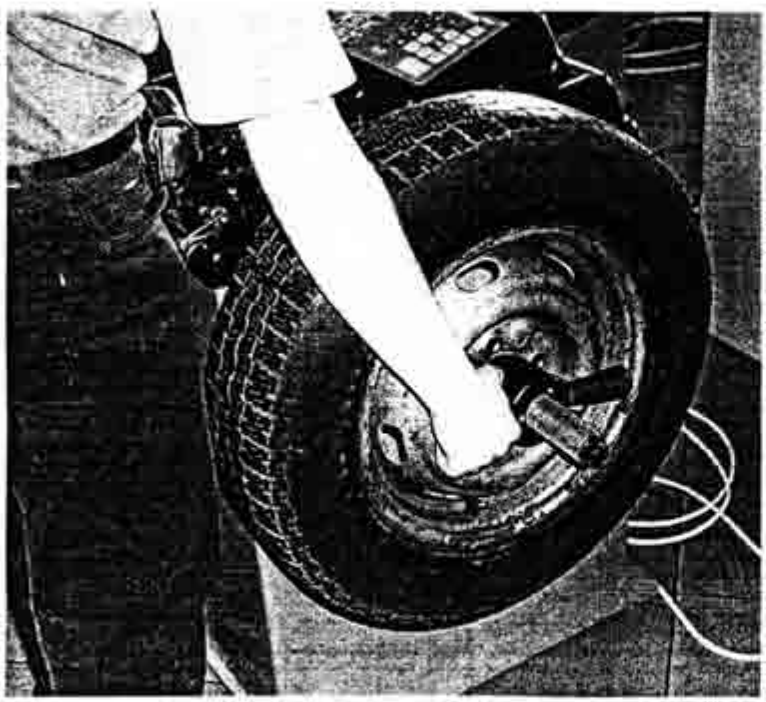


Fig. 6 Loosening nut

This desing of the fixture and its equipment allow to mount wheels of different wheel rim shapes and different central hole diameters. In this respect the user has the following options.

1. to user taper No. 1, 2
-with centering from the inside of wheel rim
- fixture nut should have pressure ring in place. (Fig 7)
2. to user taper No. 1, 2
-with centering from the outside of wheel rim (as shown in Fig.8
- nut wthout pressure ring.
3. to use centering disc No. 1 or 2 (as shown in Fig 9)
- nut without pressure ring.

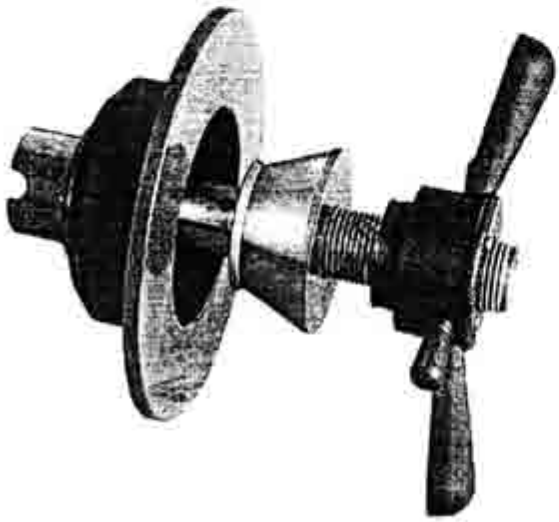


Fig.7

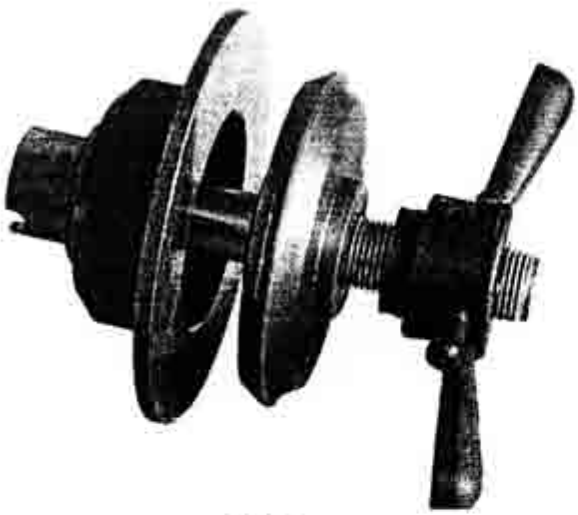


Fig.8

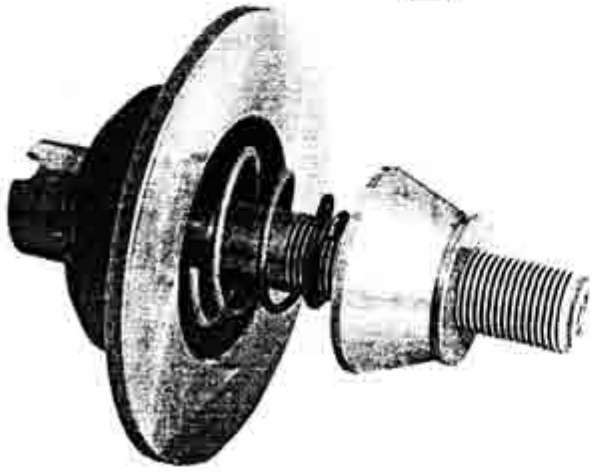


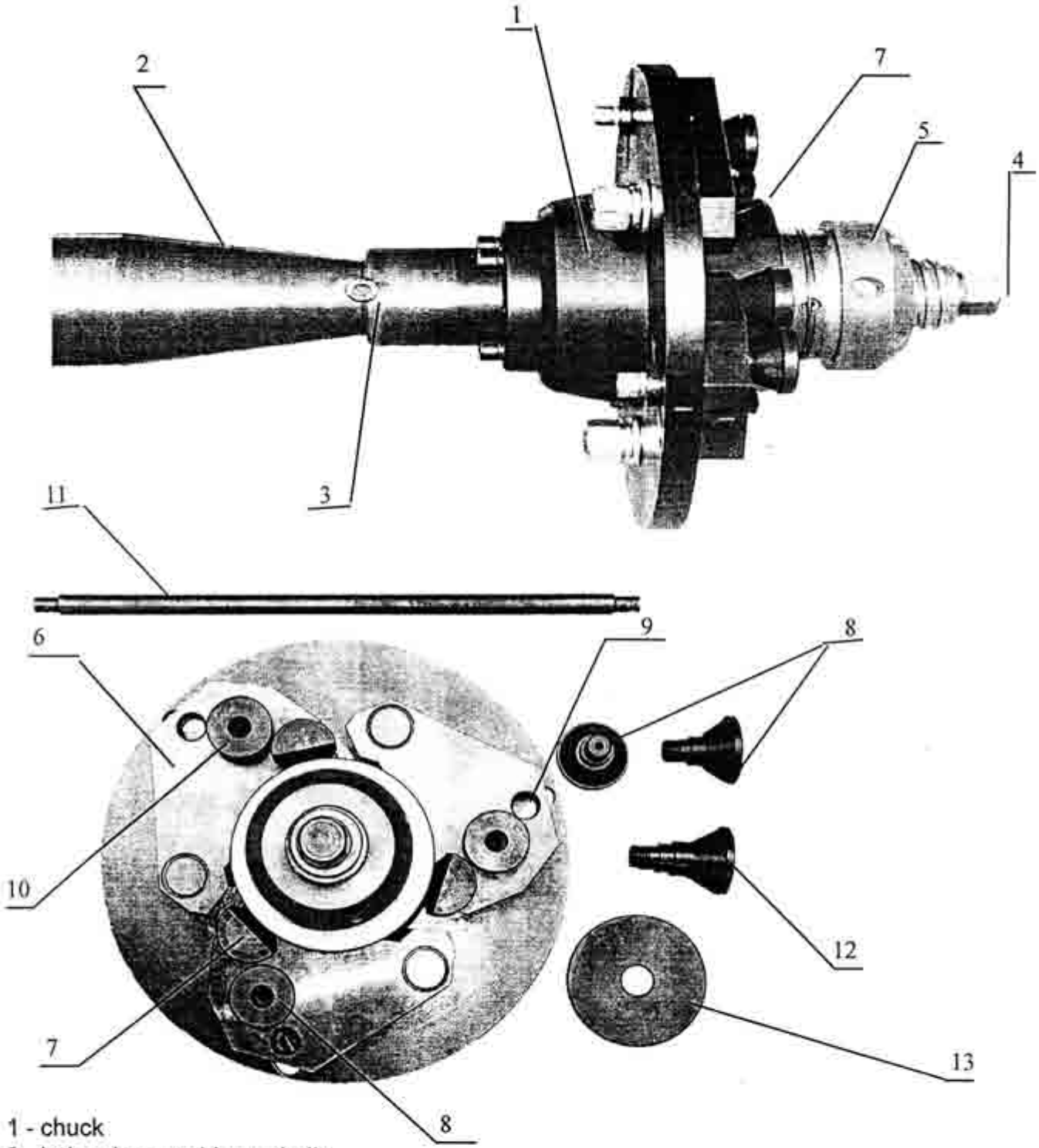
Fig. 9

Removing Nut Pressure Ring

Fig. 10

While centering discs and 1, 2, and 3 tapers are used for mounting the wheel, if centered from the outside of wheel rim, remove pressure ring from the nut.
In order to remove the pressure ring from the nut, pull the pressure ring axially so that it falls off the detent . To install pressure ring push it onto nut detent.

2.5. Installing Chuck for truck Wheels (fig 11)



1 - chuck
2 - balancing machine spindle
3 - spindle pins
4 - chuck mounting bolt, to spindle
5 - wheel clamping unit
6 - swing discs
7 - set of permanent pins
8 - set of replaceable pins
9 - and 10 - mounting holes for replaceable pins
11 - bar for tightening nut "5"
12 - set of repleceable pins for light alloy wheels
13 - shims increasing wheel supporting surface to be fitted togheter with pins „12"

2.6. Conecting - up the machine to power supply

NOTE:
The balancing machine is provided with a four conductor power cable.
The conductor with YELLOW - GREEN insulation, connected to the balancing machine housing, is a PROTECTIVE conductor.

The other three conductors are PHASE conductors.

A CHILLED BALANCING MACHINE MAST NOT BE CONNECTED TO THE MAINS BEFORE TWO OR THREE HOURS, NECESSARY FOR DRYING ELECTRONIC COMPONENTS AND TO REACH ROOM TEMPERATURE . FAILURE TO DO SO MAY CAUSE SERIOUS DAMAGE TO THE BALANCING MACHINE.

2.7. Connecting to Commpressed Air Supply (Fig 1)

Connect supply line „6" to the system situated on the back wall of the balancing machine. Switch machine supply on with switch „14". By depresing buttons „4" or „5" located on r.h. and l.h. carriage handrail lift of lower the carriage.

NOTE:
Top up periodically oil in compressed air oiler (item 8 Fig 1). For this purpose unscrew transparent reservoir at the bottom of the oiler, fill it with oil and srew to oiler body. use mineral oils free water and acids of 2 - 4 E at 50 C. hydraulic oil 20 is recommended. In the case of contamination of reservoir inside wash it with water and soap and flush with pure water.
Dirt in air cleaner (item 7 fig) may reach 5 mm level below edge of the hood, visible inside strainer glass bowl.
During filter operation dirt is removed from the strainer by unscrewing the plug at the bottom of the strainer or automatically - controlled by reservoir pressure after previous removal of drain plug.
Filter cartrige should be periodically washed with petroleum spirit and blown with compressed air. Wash strainer bowl, after unscrewing it from filter body with water and soap and rinse with pure water.

2.8. Installation and Connection of Monitor

Particular description in monitor instruction.

2.9. Test Start of Balancing Machine.

In order to check for correct electrical connection of the balancing machine, perform steps described in item 4.1. and then depress „START" key.

A CHILED BALANCING MACHINE MAST NOT BE CONNECTED TO THE MAINS BEFORE TWO OR THREE HOURS, NECESSARY FOR DRYING ELECTRONIC COMPONENTS AND TO REACH ROOM TEMPERATURE. FAILURE TO DO DO MAY CAUSE SERIOUS DAMAGE TO THE BALANCING MACHINE.NOTE:
Follow switching sequence as below :
1- switch TV on and set AUDIO - VIDEO mode
2- switch balancing machine with master switch.

3. CONTROL PANEL DESCRIPTION (Fig 12)

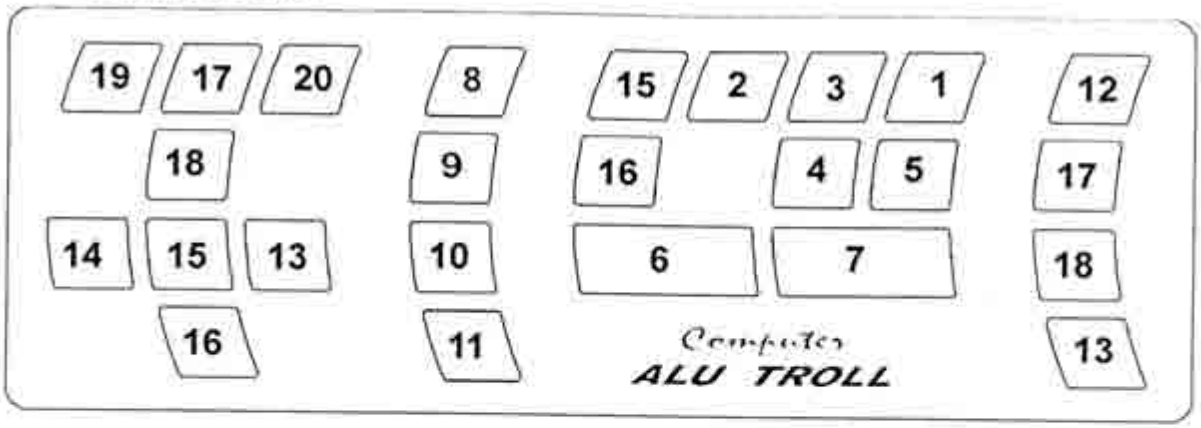
Announcements emitted by the balancing machine after depressing a particular push - button are given in barckets

1-Push - button for setting distance from wheel inside correction plane [DISTANCE]
2-Wheel width setting push - button [WIDTH]
3- Wheel diameter setting push - button [DIAMETER]
4- Key for selection of programme for different weight fixing methods [WHEEL TYPE CHANGE]
5- Lock out threshold selection key [THRESHOLD CHANGE]
6- Machine drive off key
7- Machine drive on key [CAUTION START]
8- Reset push - button [NEW MEASUREMENT]
9- Key for inititing current unbalance value recording [UNBALANCE CONVERSION]
10- Printer start key
11- Auxiliary key
12- Balancing machine memory initiating key [MEMEORY READOUT]
13- Subrotine input key
14- Subrotine output key
15- Parameter change key - increase
16- Parameter change key - decrease
17- Cursor up key
18- Cursor down key
19- Cursor left key
20- Cursor right key
21- Balancing machine master switch
22- Socket to connect cabel - lenght shield

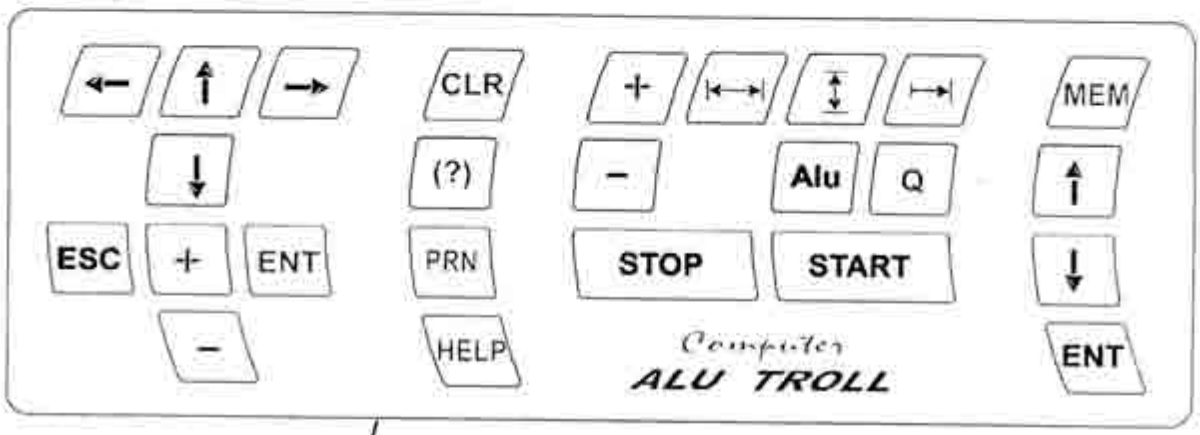
Full list announcements emitted by the balancing machine

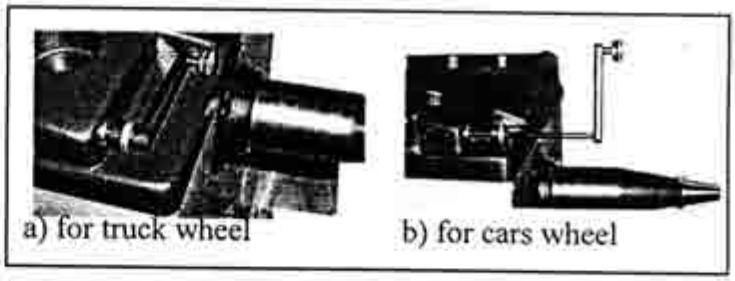
- SYSTEM TEST
- SYSTEM OPERATIVE
- ATTENTION START
- THRESHOLD CHANGE
- CHANGE OF WHEEL RIM TYPE
- CALIBRATION
- WRONG CALIBRATION
- WHEEL BALANCED
- WHEEL UNBALANCED
- MEMORY READOUT
- NEW MEASUREMENT
- UNBALANCE CONVERSION
- CLOSE SHIELD
- ACCELERATION ERROR
- BRAKING ERROR
- WIDTH
- DISTANCE
- DIAMETER
- REDUCE WEIGHT
- INCREASE WEIGHT
- SHIFT LEFT
- SHIFT RIGHT

Buttons number



Keyboard





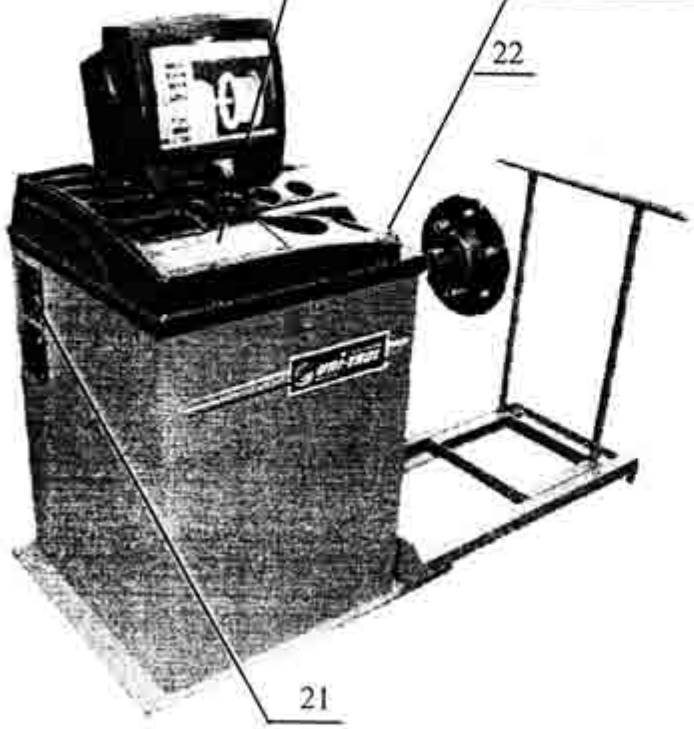


Fig. 12

4. OPERATING BALANCING MACHINE COMPUTER

4.1. SWITCH BALANCING MACHINE COMPUTER

Switch machine master switch on, as well as monitor power supply switch. Balancing machine will emit announcement [SYSTEM TEST] and them [SYSTEM OPERATIVE]. Atest pattern shall appear on monitor screen and then an advertisingimage. After depressing any key of the keyboard (fig 12) the computer will be set in [UNBALANCE MEASUREMENT] subroutine and the image shown in (fig 14) will appear on the monitor screen.

If during the inspection test, key ESC (item.14 fig.12),is depressed,system test will be interrupted and advertising image display procedure will be interrupted. The computrer will be immediately set in [UNBALANCE MEASUREMENT] subroutine.

4.2. SELECT MEASUREMENT PROCEDURE

After depressing the key ESC computer is set in SELECT PROCEDURE programme and image, shown in Fig 13 will appear on the screen.

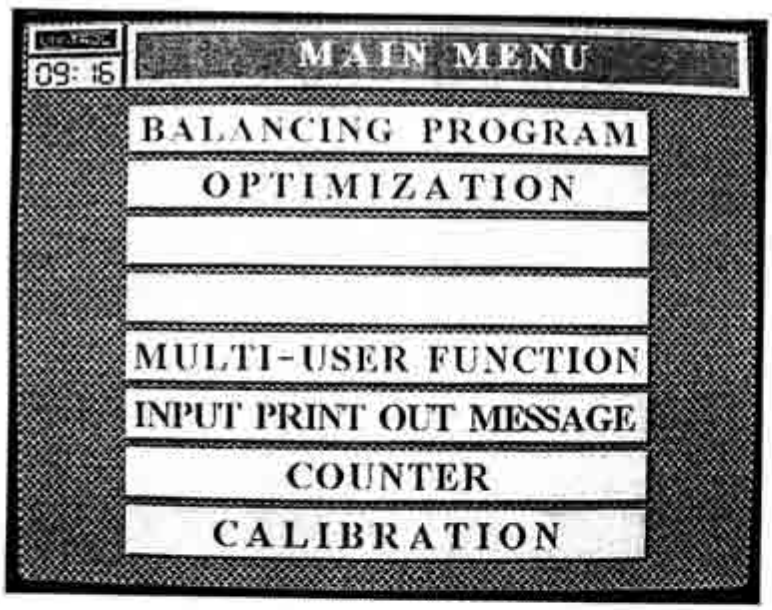


Fig 13

Entry into respective subroutine is effected by depressing keys.Input to respective subroutine is effected by guiding the cursor to an appropriate position (box with appropriate subroutine and depressing the key ENT. Cursor guiding - by depressing keys ↑ ↓.

Output from respective subroutine - by depressing the key ESC.

SELECT PROCEDURE will appear on the screen, shown in Fig.13

4.3. UNBALANCE MEASUREMENT

Cursor guiding by depressing keys ↑ ↓ an position UNBALABCE MEASUREMENT (Fig 14) and push button ENT . The computer will set in the subprogramme UNBALANCE MEASUREMENT, the monitor will show the screen as per figure .After this subprogramme has been initiated , the cursor will always point item 5 (Q - cut - off threshold).

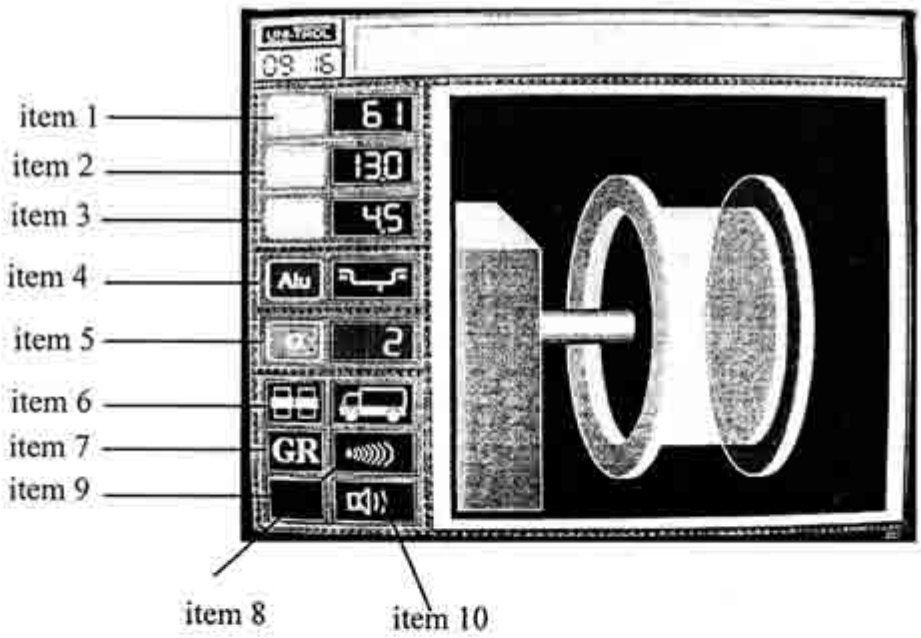


Fig 14

4.3.1 Entering DISTANCE parameter manualy.

Guide cursor to position.1 (fig.14) over depressing key  or keys 17, 18, 19, 20 (fig.12). The machine will emit [DISTANCE] announcement.
Wheel distance setting should be dtermined as follows:
a) after the positioner has been moved to the rim edge and than back to the start position a number will be shown which is in a proportion to the positioner move (see fig.15a)

NOTE:

The positioner must not be in the protruded position during the balancing machine switch - on and the computer reset. Otherwise the distance measurements will be false as the computer reads the positioner is position during switch - on as the zero position.
b) in case the distance should be entered without using the positioner the following should be done: (look fig.15 b)
- measure with a rule distance L between balancing machine wall and the rim of the wheel mounted in wheel chuck (measurement in centimetre)s
- calculate the value DISTANCE according below formulas:
- - for car wheal:
DISTANCE = (L-2,5) x 4
- - for truck wheal:
DISTANCE =[(L-2,5) x 4 - 40]

4.3.2 Entering „DIAMETER" parameter manually.

Guide cursor to position 2 (fig.14)over depressing key  or by means of arrow. The machine will emit [DIAMETER] announcement.

Depressing keys  or  the value of this parameter is from 10 to 26 inches.

4.3.3 Entering „WIDTH" parameter manually.

Guide cursor to position „3" (fig 14)  or by means of arrow. The machine will emit [WIDTH] announcement.

Depressing keys  or  the value of this parameter is from 2 to 20 inches

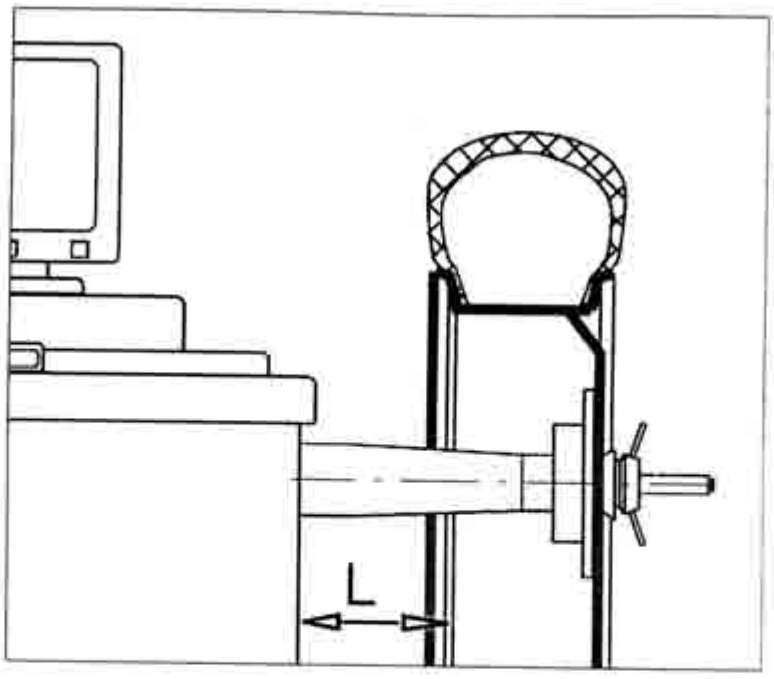


Fig 15b. L - DISTANCE

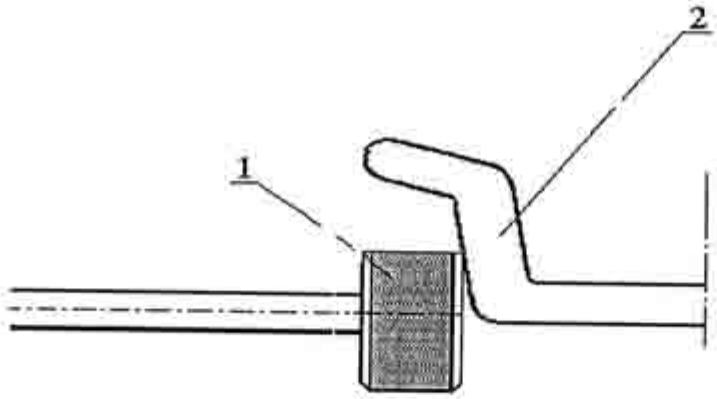


Fig 15 a

4.3.4 Balancing Programm Selection (irrespective of start) Guide cursor to position 4 (fig.14) over depressing key Alu or by means arrow. The balancing machine will emit [WHEEL TYPE CHANGE].

alternative 1

balancing through tapping weights on both wheel rim edges

alternative 2:

balancing trough sticking weights

alternative 3:

balancing trough tappingone weight on the inside balancing edge and sticking another on the inner wheel rim plane

alternative 4:

balancing trough sticking one weight on the inside balancing plane and tapping another on the outer wheel rim edge

alternative 5:

static balancing (for very thin wheel rims, with one weight). Not recommended for car wheels

alternative 6:

balancing trough sticking weights inside wheel rim

alternative 7:

balancing through tapping one weights on inside correction plane and sticking another inside wheel rim

4.3.5 Entering Cut - Off Threshold Value

Guide cursor to position 5 (fig.6) over push - button Q or by means of arrow. The balancing machine will emit [THRESHOLD CHANGE].

Push- button + or − cut - off is changed 3,5 or 9 gr for „car wheels"
30,50 or 90 gr for „truck wheels"

4.3.6. Voice Volume Adjustment

Guide cursor by means of arrow to position 8 (fig.14). Over push button + or − we change voice volume adjustment.

4.3.7 Change of Measurement Pattern

Guide cursor by means of arrows to position 6 (fig.14) and push - button ENT .
Measurement pattern, shown in Fig16 will be displayed on monitor screen.

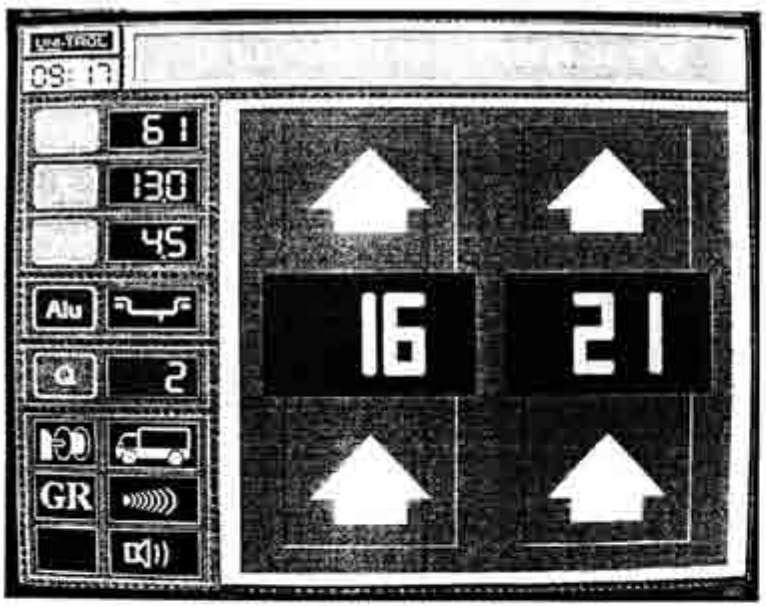


Fig.16

Return to previous measurement pattern is effected by guiding the cursor to item 6 and push - button ENT .

4.4. SETTING EDIT

Enter SELECT PROCEDURE subroutine by pressing key ESC .

Guide cursor keys ↑ ↓ to position SETTING EDIT (Fig13).

Push - button ENT . The computer will be set in SETTING EDIT suroutine and image shown in Fig 17 will be displayed on monitor screen.

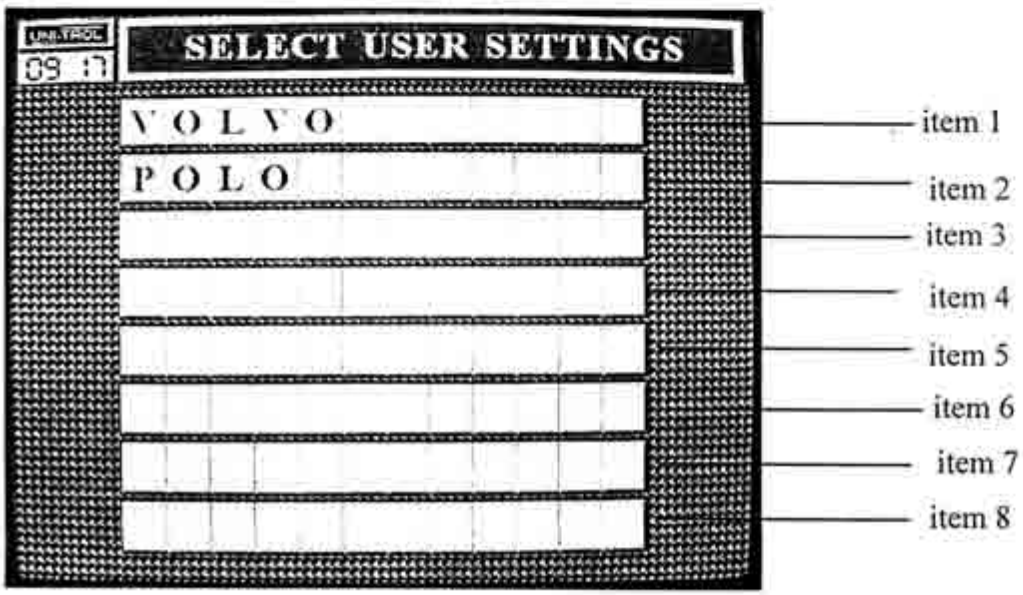


Fig 17

Computer has the capability of recording and storing parameters of eight different, most frequently balanced, wheels.

4.4.1 RECORDING PARAMETERS IN MEMORY

Guide cursor keys ↑ ↓ to position where data of a particular wheel are to be recorded.

Example: recording wheel data of VOLVO car in position 1 (Fig.17):

Push - button ENT. Computer will be set in DETERMINE SETTING VALUES subroutine and image shown in Fig 18 will appear on the screen.

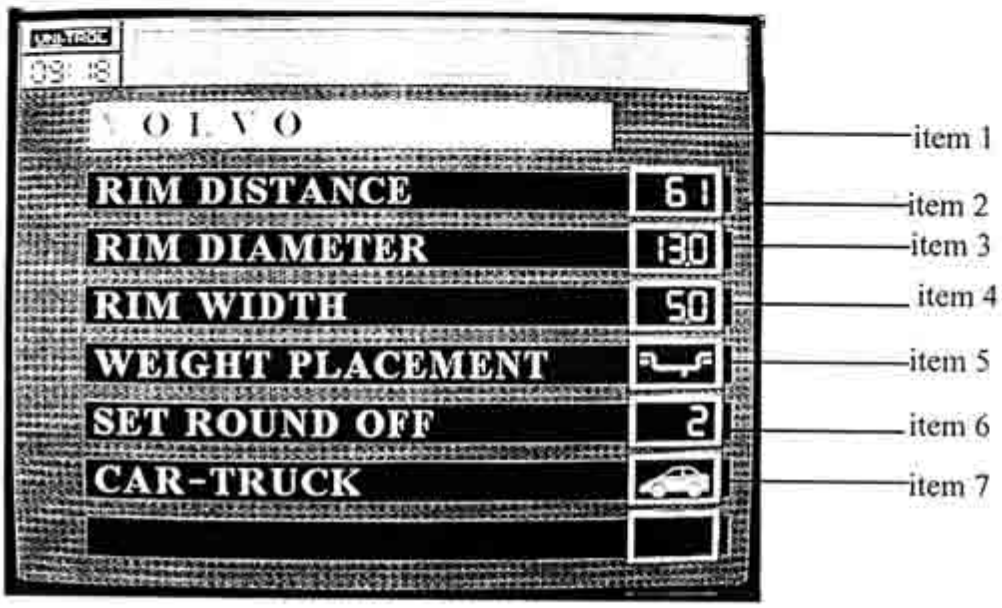


Fig 18

Guide cursor keys ↑ ↓ to position 1 (Fig.16), with keys , ← → and then set cursor in box first from the left. Push - buttons + − so as to have letter P appear in this box. By means key → enter subsequent box and key + so as to have letter O appear. Following this procedure complete the word VOLVO

Guide cursor keys ↑ ↓ to position 2 and by means of keys + − determine DISTANCE value appropriate for the particular wheel type.

In silimar manner, programme WHEEL DIAMETER in pos.3, WHEEL WIDTH in pos.4, WHEEL TYPE in pos.5 and MEASUREMENT ACCURACY in pos.6.

By pushing button ESC this data are entered to computer memory what is conform by announcement MEMORY RECORDING. On monitor screen image shown in Fig 16 will appear with name VOLVO

4.5. MEASUREMENT COUNTER

Enter SELECT PROCEDURE subroutine by pushing button ESC . Guide cursor with keys ↑ ↓ to position MEASUREMENT COUNTER and press ENT. The computer will be set in MEASUREMENT COUNTER subroutine and image, shown in Fig.19 will appear on monitor screen.

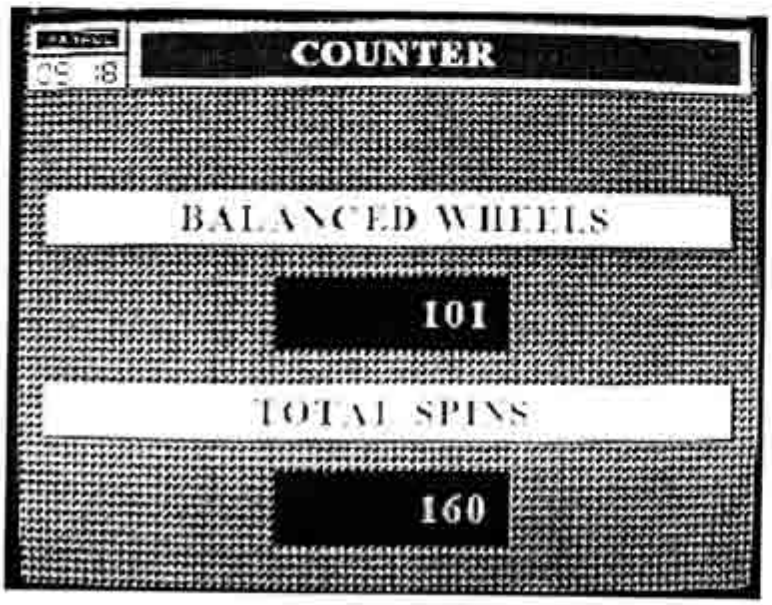


Fig 19.

4.6. HEADING EDIT

Input to PROCEDURE SELECT subroutine by pushing button ESC .

Guide cursor with keys ↑ ↓ to position HEADING EDIT (Fig rys.13)and push button ENT . The computer will be set up in HEADING EDIT position and image shown in Fig.20 will be displayed on monitor screen.

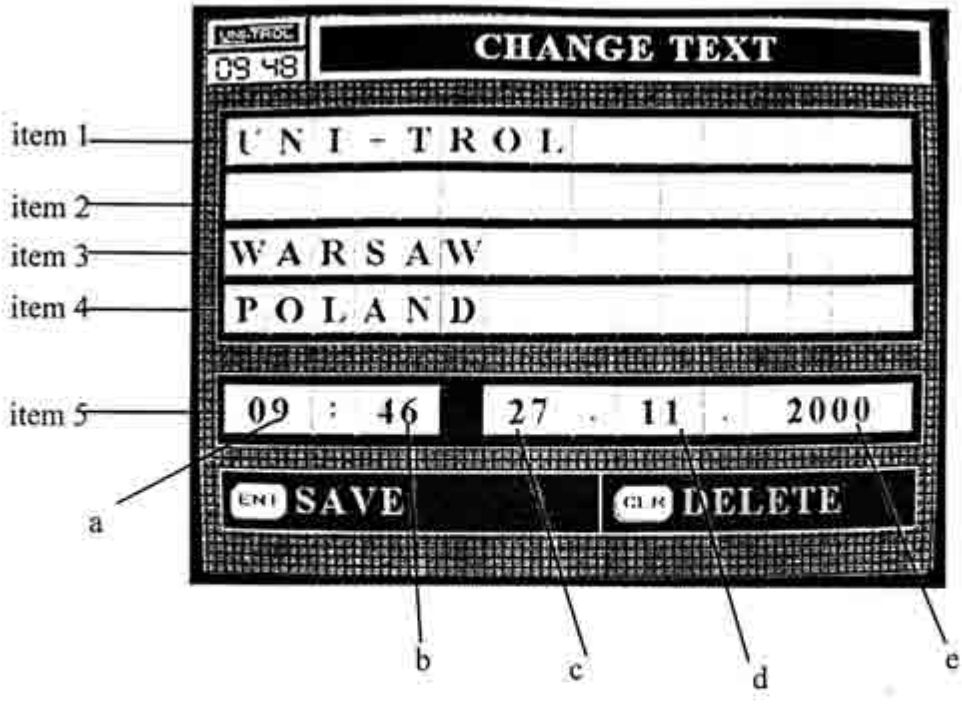


Fig 20

Recording heading edit

Buttons ↑ ↓ guide cursor to position from 1 to 4 (Fig.20).

Buttons ← → guide cursor on box to position from 1 to 4.

Buttons + − choice box and setting any letter or figure.

In positions from 1 to 4 enter name of the works (name, adress, phone).

After settingin each position, store them in memory by pushing button ENT . Output from respective subroutine by pushing button CLR .

Setting time

Push button ↓ guide cursor to position 5a (Fig.20).

Buttons + − set hour

Push button → guide cursor to position 5b.

Buttons + − set minutes.

Setting data

Setting data is similar to setting time
Set date in c - month in d - year in e.

4.7. THE CHANGE OF UNIT OF UNBALANCING

Buttons ↑ ↓ guide cursor to position from 7 Fig.14. Push - button ENT we change of unit of balancing on [GR] or [OZ].

4.8. BLOCKING MACHINE'S AXLE

In the purpose a blocking of axle in requested position the operator will to press simultaneously the button „STOP" and the button „+".Unblocking - to press simultaneously buttons „STOP" and „-"

5. WHELL BALANCING INSTRUCTIONS

The wheel balancing machine should be set in UNBALANCE MEASUREMENT. The procedure have been written in points 4.2. and 4.3..

5.1. Mounting the wheel on the balancing machine

Wheels with a central hole are mounted in an adapter with quick nut, supplied as standard equipment. The adapter should be mounted on the machine's axle as described in point 2.3 .

Attention: Suitable is the washing of wheel before mounting on balancing machine. Impurities can distort a results of measurements.

Before install the wheel on the adapter is necessary take of the nut and cone. Next put on the adapter's axle
in sequence: the wheel , the cone (small or big - dependly how is diameter of hole in rim) and quick nut. To press the quick nut as soon as possible and to handtight as wheel will be install surely.

5.2. Entering measuring settings

Machine is destined for car and truck wheels. The operator shall choice the mode CAR WHEEL according to point 4.3.1.

The balancing is in practice a definition the value of unbalancing and the places of unbalancing for inside and outside of wheel. Wheels have got a different geometric forms and for adequate and synonymous measurements the machine's operator must set adequate values parameters of wheel: WIDTH, DIAMETER and DISTANCE.

5.3. Setting mode of rim

For wheels balanced traditionally, by nailed weigts on the edges of rim is necessary to choice a alternative no.1. For alloy rims is necessary to choice alternatives 2, 3, 4, 6 or 7 . The way of settings is described in point 4.3.5..

5.4. Setting cut-off threshold value

For wheels balanced traditionally, by nailed weigts on the edges of rim, the accuracy of balancing shall be 5 gramms (more precision balancing isn't possible sometimes f.e. when run-out is big value or the rim has deformed a central hole). We recomend the using an accuracy 5gramms. For this threshold the value of unbalancing from 0 to 4 gramms will be show as 0 (zero).
For wheels with aloy rims we recomend the using an accuracy 3 gramms.
The way of setting of cut-off threshold is described in piont 4.3.6..

5.5. ENTERING MEASUREMENT SETTINGS FROM COMPUTER MEMORY (MANUAL START ONLY)

If a wheel whose parameters were recorded in the computer memory ealier, is to be balanced, then push - button MEM .

Computer will be set in [MEMORY READ OUT], and image shown in Fig.21. will appear on the screen.

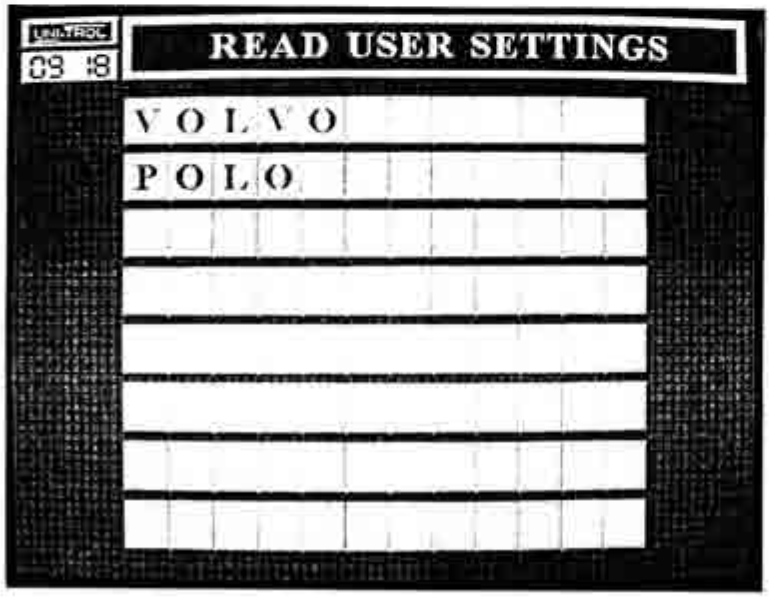


Fig.21.

Guide cursor keys ↑ ↓ to position , when setting particulars dane wheel balancing. Pushing button ENT enter parameters of the whell as correct measurements settings. The computer will be set in UNBALANCE MEASUREMENT

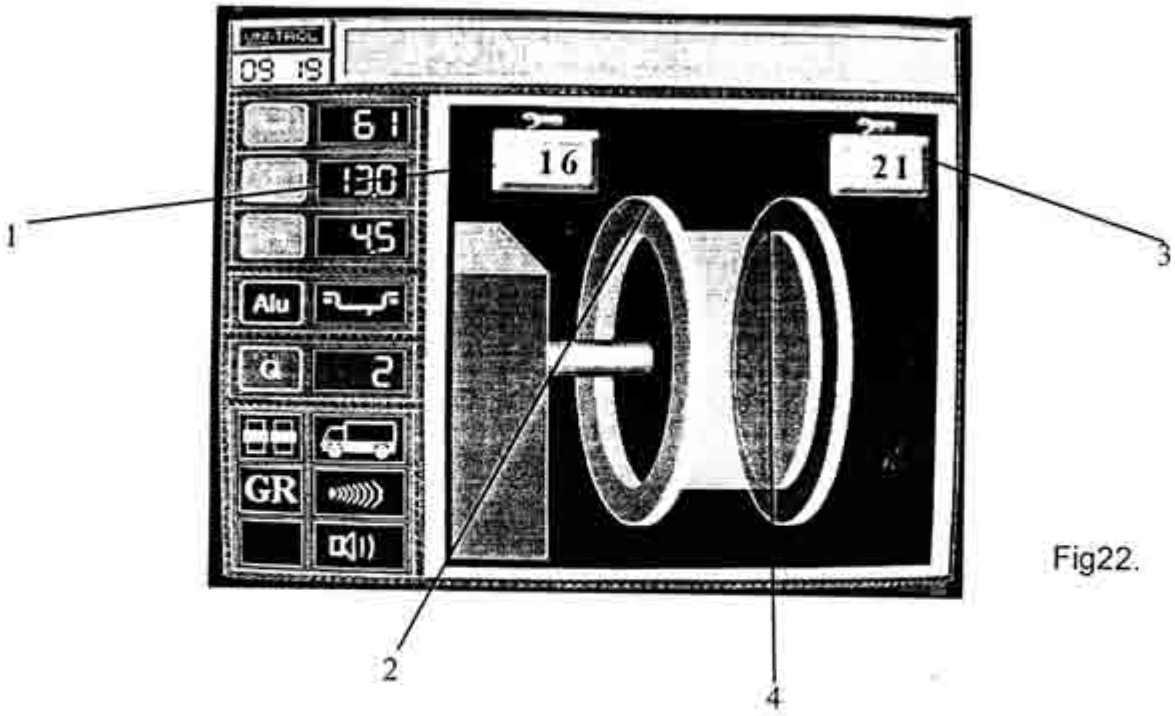


Fig22.

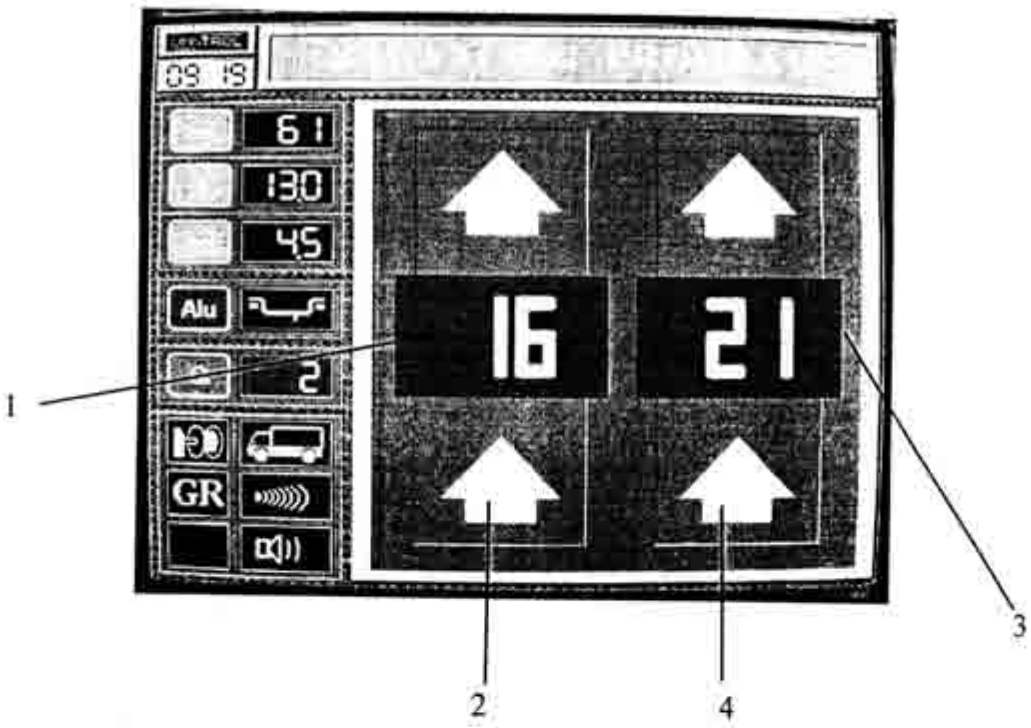


Fig23.

Please remember:

Whatever is displayed on displays „1" and „2" (Fig 22 and 23) applicable to inside correction plane i.e.dotyczy whell rim edge closer to balancing machine housing and whatever is displayed on displays „3" and „4" is applicable to outside correction plane i.e. wheel rim edge closer to fixture nut

Value of 16 displayed on display „1" an displayed on display „3" value 21 to the inner edge of the rim in order to balance the wheel, that means for the purpose of liquidate unbalance on inside balancing plane (left side) nailed the weight a 15 g and on outside plane (right side) nailed the weight 20 g.

After opening the shield rotating the wheel in either direction direction and watching display (fig 15) locate the point of unbalance for that plane. For this wheel position tap a 25g weights at the top of the inside of wheel rim.
In a similar way, look for the point of unbalance for inside correction plane . In moment audio signal stop the wheel and fix a 80 g weight at the top pointon the outside of wheel rim.

After fixiing weights of specific weight and in soecific location make a recheck.Theoretically, on displays „1"and „3' two zeros should be displayed meaning that resiude unbalance does not exceed 5g according to the assumed cut - off threshold. In practice it does not have to be so. Why?

Firstly - balancing weights irrespective of type are made to some weightc tolerance.

Secondly - the balancing machine measures the unbalance value to 2g and the unbalance location to 3.

Thirdly - a balancing weights is not a concetrated mss but has a certine lenght proportionate to its mass. Therefore it is easy to make a positioning error when fixing the weight (shifting the weight in relation to the top point or wheel rim indicated by the balancing machine.

Case 1 :

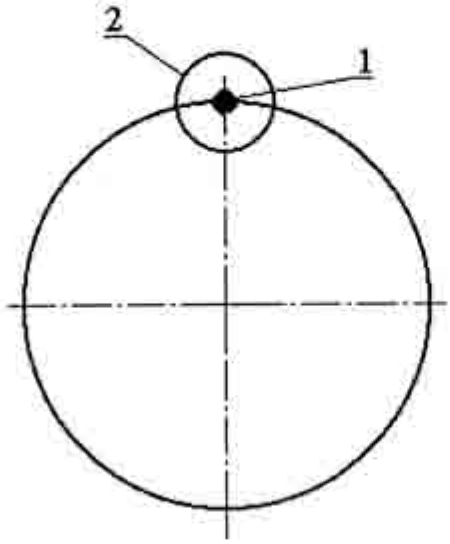
A zero is shown on both displays and the balancing machine announcend [WHEEL BALANCED]. This means that the wheel has been balanced to 5 g, as we operated at the cut - off threshold.
Push- button Q (item.5 Fig.1) and (?) (item 9 fig. 1)and setting cut - off threshold at 2g level we can fin whether we have balanced the wheel to 2g. This will be the case if zeros are sidplayed on both displays. If the appears 3 on one display and 4on the other one this will mean that the wheel has been balanced to 4g. After depressing push - button „Q" and setting again the cut - off threshold at 5g level zeros will reappear on the displays.

Case 2:

After balancing a wheel the following resultswere obtained :
- displays „1" (inside correction plane) - 6
- displays „3"(inside correction plane) - 7

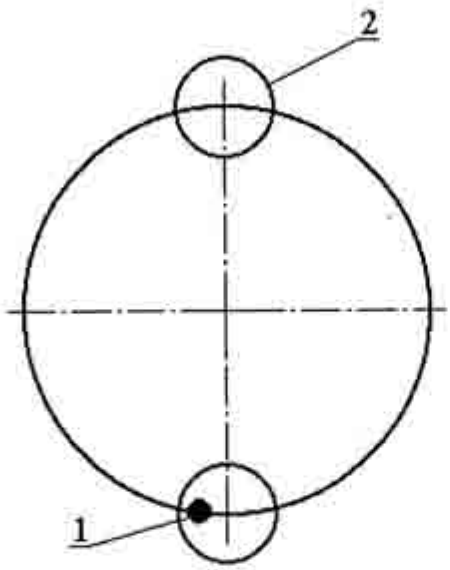
Further operations comprise positioning the wheel according to the new location of unbalance (for each correction plane) The balancing machine may emit the following announcements.

- **[INCREASE WEIGHT]** if the new location of unbalance coincides with the old one or is lose to it.



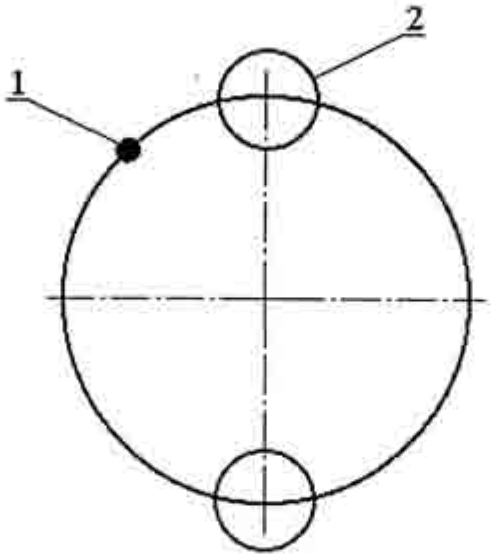
1-weight 2- new correction plane

- **[REDUCE WEIGHT]** - if the new location of unbalance is directly opposite the weight fixed previously or is close to this point.



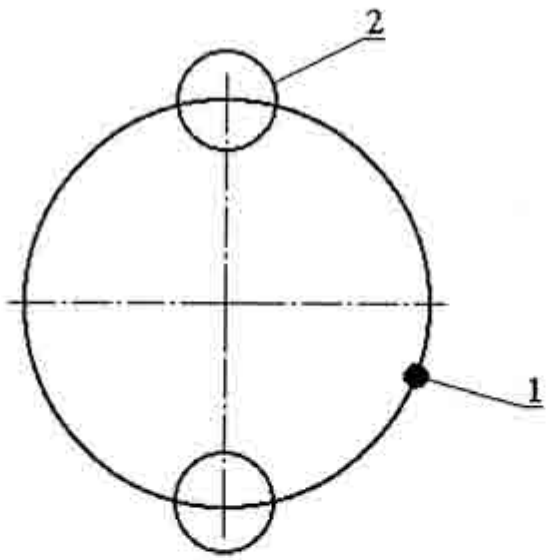
1-weight 2- new correction plane

- **SHIFT LEFT]** - (i.e. anticlockwise) - if the weight previously fixed is to the right of the new correction point.



1 - weight 2 - new correction point

- **[SHIFT RIGHT]** - (i.e. clockwise) - if the weight previously fixed is to the left of the new correction point.



1 - weight 2 - new correction point

It is difficult to determine precisely by what distance a weight should be shifted in order to correct such residue unbalance. This depends on the size of weight fixed and also on the unbalance value to be corrected. In general terms, a larger weight requires less shift correction and also a small reside unbalance requires a small shift correction.

NOTE :
If zero (no unbalance) is displayed on display „1" there will be not loacation display on display „2" . The same applies to displays „3" and „4" .
It may happen that in subsequent measurement of wheel unbalance at cut - off threshold set at e.g. 5g, the results will be as follows :
- first measurement : 0
- second measurement : 5g
- third measurement : 0
- etc..

These results are not no errors. The unbalance value is for sure close to the nominal value of 5g cut - off threshold set and therefore 0 or 5 appear alternatively. For 10g threshold the results may be 0 or 10.

5.6. BALANCING LIGHT - ALLOY WHEELS

Light - alloy wheels are balanced by means of stick - on weights or combination of stick - on and studded weights. Set appopriate balancing programme according to the method of fixing weights (see item 4.3.5.) .

NOTE :
Measurement settings are entered as for studded weights. these are geometrical dimensions of the whell rim. Selection of appoprite balancing method (e.g. both weights stick- on) results in the balancing machine taking into account the change in weight fixing points - on respective correction planes different from those resulting from the entered data.

Stick - on weights must not be removed and replaced. Therefore after unblance value has been displayed stuck always a weight 5 -10 g lighter than that indicated by the machine. After second measurement this unbalance may be corrected by sticking another small weight (e.g. 5 g) at the new balance point as indicated by the machine. In such way possible position correction by shifting the weights is avoided which in the case of stick -on weights is not possible.

5.7. NEW MEASUREMENT

If after a recheck we find that the wheel has been balanced with sufficient accuracy on one of the displays e.g. number 6 is displayed instead zero. (at 5g cut- off threshold) then before commencing a new measurement (for another wheel) the values of previous unbalance must be erased from the machine memory. Otherwise the balancing machine will treat the new measurement as a subsequent recheck of the wheel previously balanced. To erase, use push- button CLR . After depressing the push - button the balancing machine will announce [NEW MEASUREMENT].

5.8. „CONCEALED WEIGHT" PROGRAMME

„Concealed weight" programmeis used in balancing spoke wheels when on the outboard correction plane the point of unbalance is sittuated in the space between spokes and it is desired that the weight is invisible from outside the wheel. By means of this programme, the unbalance value shown on display "3" (Fig.16)
may be split between two balancing weights to be stuck at the back of two spokes, situated at the least distance from the point of unbalance.

Procedure for „Concealed Weight" programme:

1. Select version 6 or 7 of the balancing programme (as per item 4.3.5)

2.Enter measurement settings [WIDTH, DIAMETER, DISTANCE] for a particu;ar wheel type and start with key the measurement cycle of the balancing machine.

3. After the wheel is stopped correct the unbalance in the inboard correction plane, indicated on display „1" in the usual way, as described in items 5.5. and 5.7.

4. Unbalance in the outboard correction plane shown on display „3" is to be corrected with two weights according to the following procedure :

a -guide cursor keys ↓ and ← on symbol 3P (item.9 fig.24)

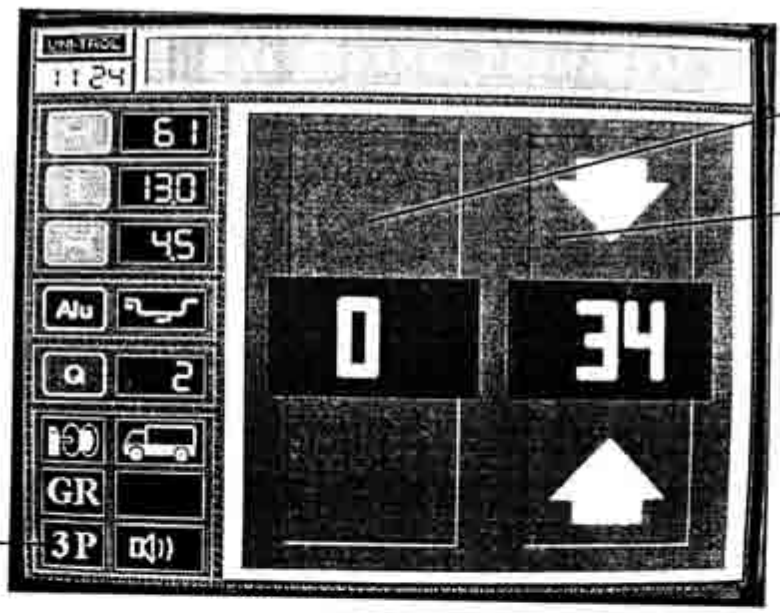


Fig.24.

b -push - button ENT . Measurement pattern shown in Fig.25 will appear on monitor screen

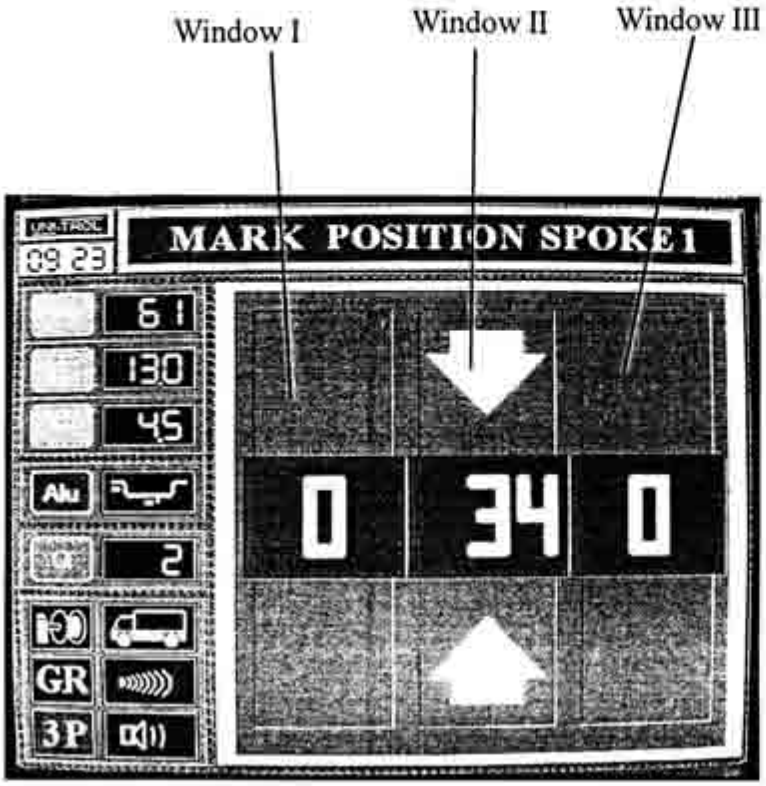


Fig.25.

c - rotate the wheel until arrows in box II change colour to green and a signal is sounded. Balancing machine computer shows this wheel position as34gunbalance point situated at the tompost point of the wheel rim.

d - from this position rotate the wheel anticlockwise until the nearest spoke reaches vertical position and depress key + .The machine computer will remember this wheel position as the fixing point of the first weight and at the same time subsequent measurement pattern will appear on monitor screen as shown in Fig 26.

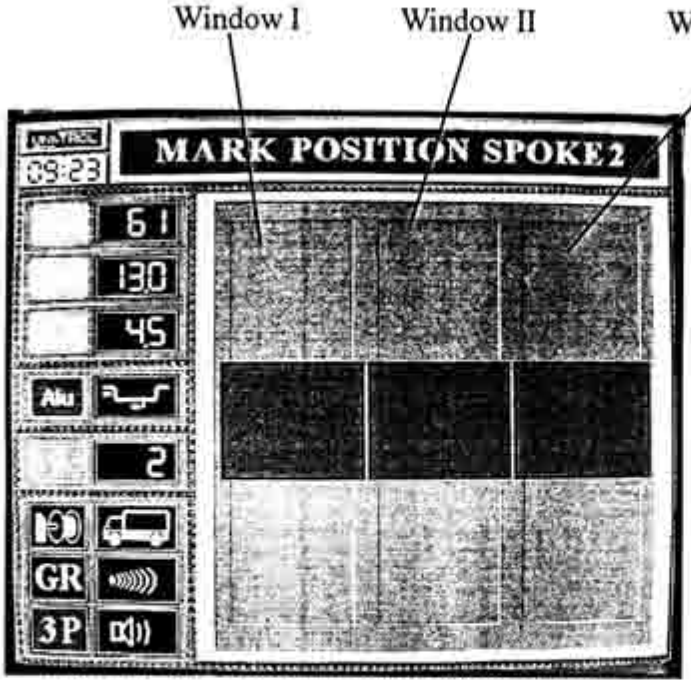


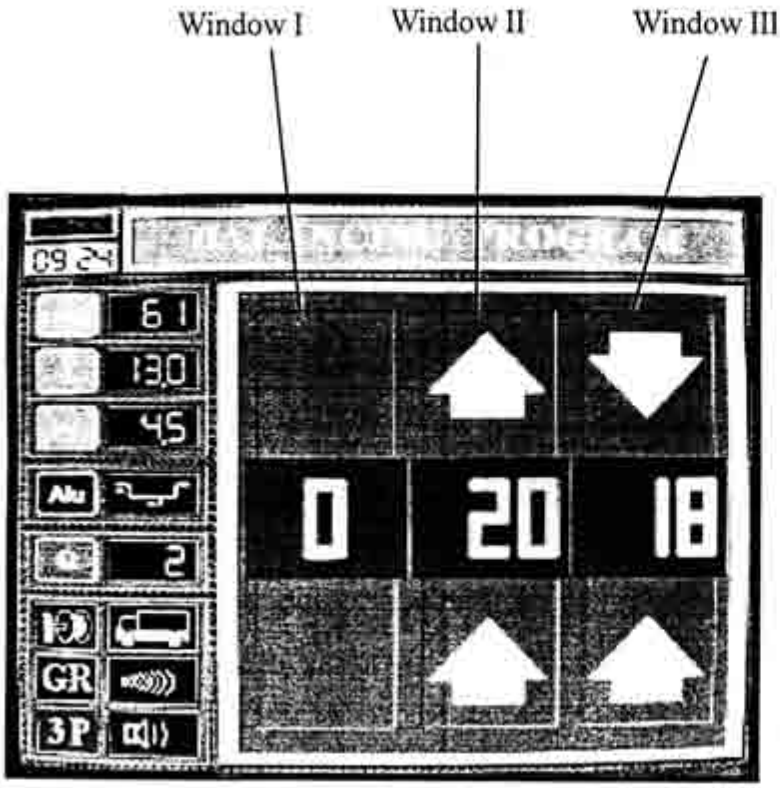
Fig 26

e - rom this position rotate the wheel clockwise until the nearest spoke reaches vertical position and depress key + . Machine computer will remember this wheel position as the fixing point of the second weight and on the monitor screen a subsequent measurement pattern with three windows will appear as shown in Fig.27.

Window I - indicates size and position of balancing weight in the inboard plane

Window II - indicates size and position of the first weight in outboard correction plane fixed behind the first spoke as determined in item c.

Window III - Indicates size and position of the second weight in the outboard correction plane fixed behind the second spoke as determined i item **d**



Window II interpretation:
correction slug weighs 20 grams;
to find the spoke behind which the slug should be hidden, you have to turn the wheel in the direction indicated by arrows.

Window III interpretation:
correction slug weighs 18 grams;
arrows are turned to the centre, meaning that the slug should be placed in the upper part of the rim, behind the spoke which is in vertical position

Fig 27.

NOTE :

If performing operations described in items 4c and 4d the wheel is rotated by mistake, in the same direction balancing machine computer will indicate the fixing point of the second weight on the opposite side of the wheel. If however the same spoke is located twice letters **ddd** will appear in windows II and III which always indicate an error in performance of the balancing programme.
In both cases „ Concealed Weight" programme mast repeated from the beginning.

To return to the starting point depress key (?) (unbalance conversion) - and the machine will return to the image shown in Fig 27 or depress key START .

5.9. MULTI USER FUNCTION

Balancing machine is equiped erasable memory destined for some user. They can writing and reading easy parameters of wheel the servicing car.
For the purpose of parameters balanced wheel to memory of machine, user should carry out below options.

1. Press and hold down push - button STOP and simultaneously MEM . On the screen should appear the inscription „ Select user settings" - pic 8.

2. With the aid of push - buttons ↑ or ↓ operator select memory resserved for him F.E. pos. 7

3. Press push - button ENT . On the screen should appear inscription „Fix" - pic 9.
Inlines 2 - 6 had wrote parameters balanced wheel which were transfered from balancing program.

4. With the aid push - buttons ↑ or ↓ operator select position 1 and should wrie according to procedure yours characteristic data F.E. first name.

REMARK :

User can input to memory a characteristic data with the aid a program „MULTIUSER FUNCTION" as show in point.

5. Press button ESC . Machine should generated message „ Input to user memory" and on the soreen should appear inscription : Balancing programm" with all changed parameters of wheel.

REMARK:

Recall parameters of wheel from memory is possible according to point 5.5

6. CALIBRATION

The balancing machine has a self - calibration system allowing the user to tune the machine himself. Calibration is to be performed if inccorectindications are suspected (due to ageing of electronic components temperature effects , shocks in transport etc.)

Calibration should be performed as follows:

Select test a car wheel of know parameters and if possible, of small unbalance and mount it in the balancing machine fixture. Enter diameter and width data in machine memory, using apporiate push - buttons on balancing machine keyboard. Enter distance by means of edge finder pushing it against wheel rim edge. Set cut - off threshold to minimum value i.e. 2g.
May be automatic start.

2. Tab a weight of 80 g anywhere on the outer edge of wheel rim.

3. Push - button START or automatic start . The measuring cycle ends with automatic braking of the balancing machine spindle and display „1" 0 and display „2" 79 or 80. (Fig.28).

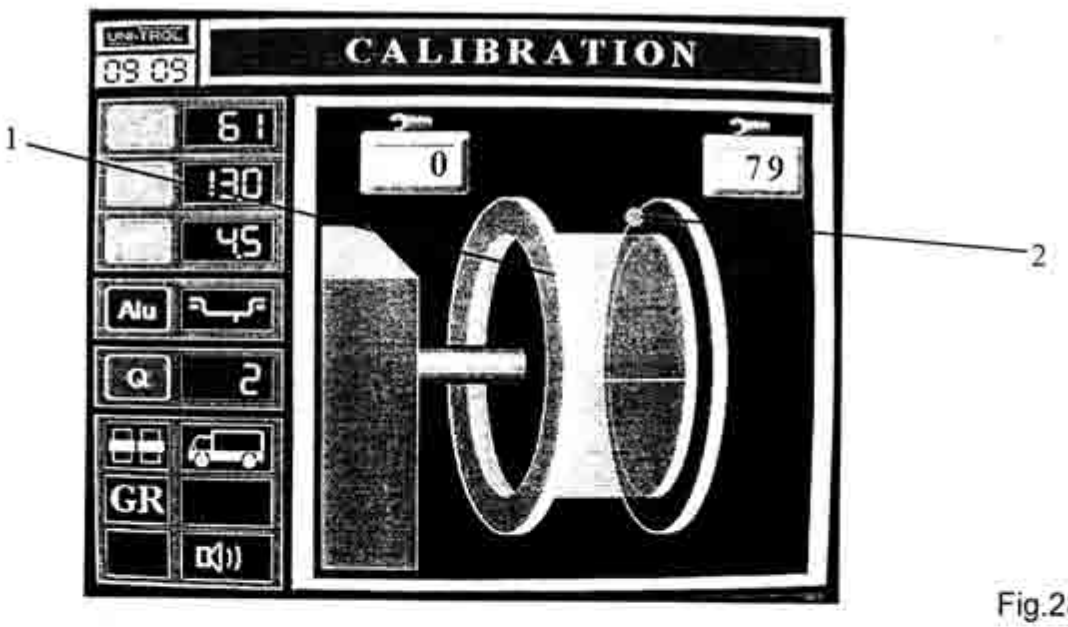


Fig.28.

NOTE:
Apperance of different values means an error in calibration. The cause may be e.g. substantial unbalance of the wheel used for testing. In such - case you have to shift a weight of 80g by 180 (tab it as opposite in relation to its former position - of course, on the outer edge of wheel rim) and repeat the process of calibration.

4. Remove the weight of 80 g. Set balancing machine computer in subroutine UNBALANCE MEASUREMENT and push - button 

. switch on the balancing machine drive in order to check the extent of unbalance of the tested wheel.
Appearance of zero and outside balancing planes means that the wheel used for calibration was balanced and the entire calibration process should be considered completed.

5. If reaching according to item 4 proves an unbalanced condition balance the wheel so that 0g is displayed for both balancing planes and then repeat the balancing process according to items 2 and 3 and check wheel balance according to item 4.
- 0 and 79 or 0 and 80 after test according to items 2 and 3
- 0 and 0 after checking test wheel balance according to item 4 .

NOTE :

A precondition for correct - calibration and correct indications of the balancing machine is its installation in a dry and dust - free room. Like any measuring wquipment built with the use of processor systems it has poor moisture resistance. Moisture in the equipment will not result in lasting damage, but will cause merely indication errors. Therefore in the case of abnormal measurement results such as high three - figure unbalance values of a car wheel or substantial indication differences in susequent measurements of the same wheel it is absolutely necessary to dry the main electronic board of the balancing machine. Removal of the cover and drying the main board with e.g. a hair dryer does not make the warranty invalid. Moisture most frequently appears during changing weather conditions (auttum / winter and winter / spring seasons) therefore special care should be taken to ensureproper operating conditions for the balancing machine.

Calibration for truck wheels

The balancing machine has a self - calibration system allowing the user to tune the machine himself. Calibration is to be performed if inccorectindications are suspected (due to ageing of electronic components temperature effects , shocks in transport etc.)

Calibration should be performed as follows:

Select test a car wheel of know parameters and if possible, of small unbalance and mount it in the balancing machine fixture. Enter diameter and width data in machine memory, using apporiate push - buttons on balancing machine keyboard .Enter distance by means of edge finder pushing it against wheel rim edge.

2. Tab a weight of 200 g anywhere on the outer edge of wheel rim.

3. Push - button START or automatic start . The measuring cycle ends with automatic braking of the balancing machine spindle and display „1" 0 and display „2" 199 or 200. (Fig.29).

Fig 29

NOTE:
Apperance of different values means an error in calibration. The cause may be e.g. substantial unbalance of the wheel used for testing. In such - case you have to shift a weight of 200g by 180 (tab it as opposite in relation to its former position - of course, on the outer edge of wheel rim) and repeat the process of calibration.

4. Remove the weight of 200 g. Set balancing machine computer in subroutine UNBALANCE MEASUREMENT and push - button 

. Switch on the balancing machine drive in order to check the extent of unbalance of the tested wheel.
Appearance of zero and outside balancing planes means that the wheel used for calibration was balanced and the entire calibration process should be considered completed.

5. If reaching according to item 4 proves an unbalanced condition balance the wheel so that 0g is displayed for both balancing planes and then repeat the balancing process according to items 2 and 3 and check wheel balance according to item 4.
- 0 and 199 or 0 and 200 after test according to items 2 and 3
- 0 and 0 after checking test wheel balance according to item 4 .

NOTE :

A precondition for correct - calibration and correct indications of the balancing machine is its installation in a dry and dust - free room. Like any measuring wquipment built with the use of processor systems it has poor moisture resistance. Moisture in the equipment will not result in lasting damage, but will cause merely indication errors. Therefore in the case of abnormal measurement results such as high three - figure unbalance values of a car wheel or substantial indication differences in susequent measurements of the same wheel it is absolutely necessary to dry the main electronic board of the balancing machine. Removal of the cover and drying the main board with e.g. a hair dryer does not make the warranty invalid. Moisture most frequently appears during changing weather conditions (auttum / winter and winter / spring seasons) therefore special care should be taken to ensureproper operating conditions for the balancing machine.

7. WHEEL TRUCKS BALANCING MACHINE

7.1. (see item 2.4.)
7.2. Mounting wheel in fixture

Lift the casing „9" and move away to the maximum the driving trolley „1" from the wall of the balancing machine. Put the whell on the trolley. Lift the trolley pressing the buttons „4" and „5" so the opening in the wheels band is in the bolt axle of balancing machine. Push the trolley close to the balancing machines wall so the wheel is placed on the holder. Screew the ut „5" on holders thread (fig 3) in the way that the bolts of raised plates „6" touch the edges of the central opening of the band. Put the bar „11" (fig 3) in one of the openings in the nut „6" and tighten the nut.

7.3.(see item 5.3.)

7.4 (see item 5.6.)

7.5. (see item 5.7.)

8 . NOTES ON OPERATION

Weight should be finally hammered to the wheel rim edge after the whell has been balanced and removed from balancing machine fixture.
In the case of major unbalance in one plane - e.g. 90g and a minor one in another plane - e.g. 10g, we recommended to fix a 90g weight only and to repeat the measurement as it may happen that after balancing the „worse" plane the unbalance value of the other plane will drop below 10g value, measured previously.
If the unbalance is more than 100g fix a large weight (e.g. 80g, 90g, 1000g) and shift it several centimetres from the point indicated by the balancing machine. Then repeat measurement and fixc additional small weights of masses indicated by the balancing machine.Then repeat measurement and fix additional small weights of masses indicated by the balancing machine.

Balancing machine spindle end and fixture should be preserved with machinery oil or other mineral oil.

In transport never grip the balancing machine by the spindle.

9. WARRANTY

All repairs (if any) and adjustments are performed by the manufacturer. Repairs carried out by the buyer will entail loos of warranty.

CHAPTER 6 ADDITIONAL REMARKS

The balancing slugs should be finally hammered onto the rim edge, after the wheel has been balanced and taken off the balancing machine holder.
In case of a large imbalance in one plane, for example 90g, and a small imbalance in the second plane, for example 10g, we advise to hammer only a 90g slug and repeat the measurement which could show that after the "worse" wheel plane has been balanced, the imbalance value on the second plane will fall below the previously measured value of 10g.
If the imbalance is larger than 100g then you should hammer a large slug (for example 80g, 90g, 100g) and displace it by a few centimetres aside of the point indicated by the balancing machine. Then conduct another measurement and hammer onto the rim some additional small slugs having the weight indicated by the balancing machine.

In case of momentary electrical interference you should reset the computer by pressing the

button, holding it down and pressing simultaneously the

button, or by disconnecting the balancing machine power supply, with a master switch. The spindle tip and the holder of the balancing machine should be lubricated with machine oil or any other mineral oil.

ATTENTION
The holder should be kept clean. It concerns in particular the surfaces of the centring cones, the disk and the internal cone of the root, because they have the principal influence on the precision with which the wheel is positioned in the holder and the holder is positioned on the balancing machine spindle i.e. on the precision of the wheel imbalance measurements.

During transportation you should not grab the balanci ng machine bythe spindle.

GUARANTEE

All eventual repairs and adjustments should be carried out by the producer. Machine repairs carried out on your own, within the guarantee period but without consulting the producer's service, would cause the loss of guarantee.

The producer reserves himself the right to introduce changes and improvements in his products, which could cause incompatibilities with the information included in this instruction manual.
In case of any doubt, please contact us by telephone or e-mail.

CHAPTER 7 MAINTENANCE

Maintenance should be conducted by experienced personnel having a deep knowledge concerning the principles of the balancing machine operation. During the maintenance process you should observe all precautions in order to avoid any accidental balancing machine start. The master switch should be set in position 0. You should also observe all instructions given in chapter 3 "Safety".

Periodical maintenance

In order to keep the balancing machine in a good operational state you should observe the below mentioned indications:

DISREGARD OF THESE RECOMMENDATIONS WILL DISMISS THE PRODUCER FROM

ANY RESPONSIBILITY INCLUDED IN GUARANTEE.

1. Clean your balancing machine at least once a month without using chemical washing agents or high pressure spray guns.
2. Check periodically the operational state of your equipment.
3. Periodically lubricate all holders.
4. Once a year check the state of conductors.
5. We suggest to integrate the pneumatic system with the air preparation unit.

WARNING

ALWAYS REMOVE ALL IMPURITIES FROM AROUND THE BALANCING MACHINE !

CHAPTER 8 MACHINE SCRAPPING

ATTENTION

DURING MACHINE SCRAPPING YOU SHOULD OBSERVE ALL PRECAUTIONS DESCRIBED IN CHAPTER 3, APPLIED ALSO DURING ASSEMBLY.

As well as assembly, disassembly also has to be executed by trained staff exclusively.
All metal parts should be utilized as metal scrap. In all cases of machine scrapping, the utilization of all materials has to be conducted according to the rules obligatory in the country of installation.
One should also notice that for tax purposes, effective machine scrapping should be documented in reports and forms conforming to the rules obligatory in the installation country.

Fireprotection
The present machine does not constitute fire hazard. In every case, room in which the balancing machine was installed, has to fulfil requirements of fire protection regulations obligatory in the installation country.
Always keep one or more portable fire extinguishers within reach of operator's hand (operator zone), in order to prevent any fire hazard.

Accident prevention
During lifting/sinking, shifting, installing, assembly and disassembly of the balancing machine, one should observe all precautions provided in regulations concerning accident prevention obligatory in the installation country. Moreover, all regulations concerning fork-lift trucks have to be observed.

CHAPTER 9 DIAGNOSTICS AND TROUBLESHOOTING

ATTENTION
During diagnostics and repairs one should observe all precautions described in chapter 3 "SAFETY" and in chapter 7 "MAINTENANCE".

PROBLEM	POSSIBLE CAUSES	REMEDY
The balancing machine does not generate the control text connections are in good condition	Electrical system defect	Check fuses, check if all electrical - no power supply
The engine works, but the spindle remains motionless	No pneumatic supply, pneumatic system defect	Check supply pressure, check if all pneumatic connections are in good condition
Noisy work of the balancing machine	Low supply pressure, incorrect belt tension	Set the right supply pressure, adjust the belt tension
The spindle of the balancing machine does not stop once the measurement cycle is finished	Transoptor board of the tachometer out of order	Blow through the transoptors with dry air
Unstable, incorrect indications of the distance adjuster	Transoptor board of the adjuster out of order broken teeth of the bar	Blow through the transoptors with dry air, replace the bar
Improper operation of the protective screen	Incorrect tension of the shock absorber"s spring	Adjust the tension of the shock absorber"s belt
Keyboard buttons do not activate all functions keyboard	Poor contact of the keyboard connections to the indicato board and the main board keyboard defect	Check all contacts, replace
Incorrect indications for different wheel mountings	Dirty cone of the spindle, worn out centering cone, damaged nut, replace damaged holder (hit)	Clean dirty elements the cone,replace the nut,replace the holder

WE ALWAYS RECOMMEND YOU TO CONSULT OUR SERVICE

C. SPARE PARTS CATALOGUE

ATTENTION

The replacement of parts or any repairs of the balancing machine require observation of all PRECAUTIONS given in chapter 7 "MAINTENANCE" and in chapter 3 "SAFETY".
One should make full use of all resources in order to:
AVOID ACCIDENTS RESULTING FROM THE BALANCING MACHINE START:
- the master switch should be interlocked in position "0".
- during the execution of all maintenance works, the interlock button should be in possession of the maintenance technician.

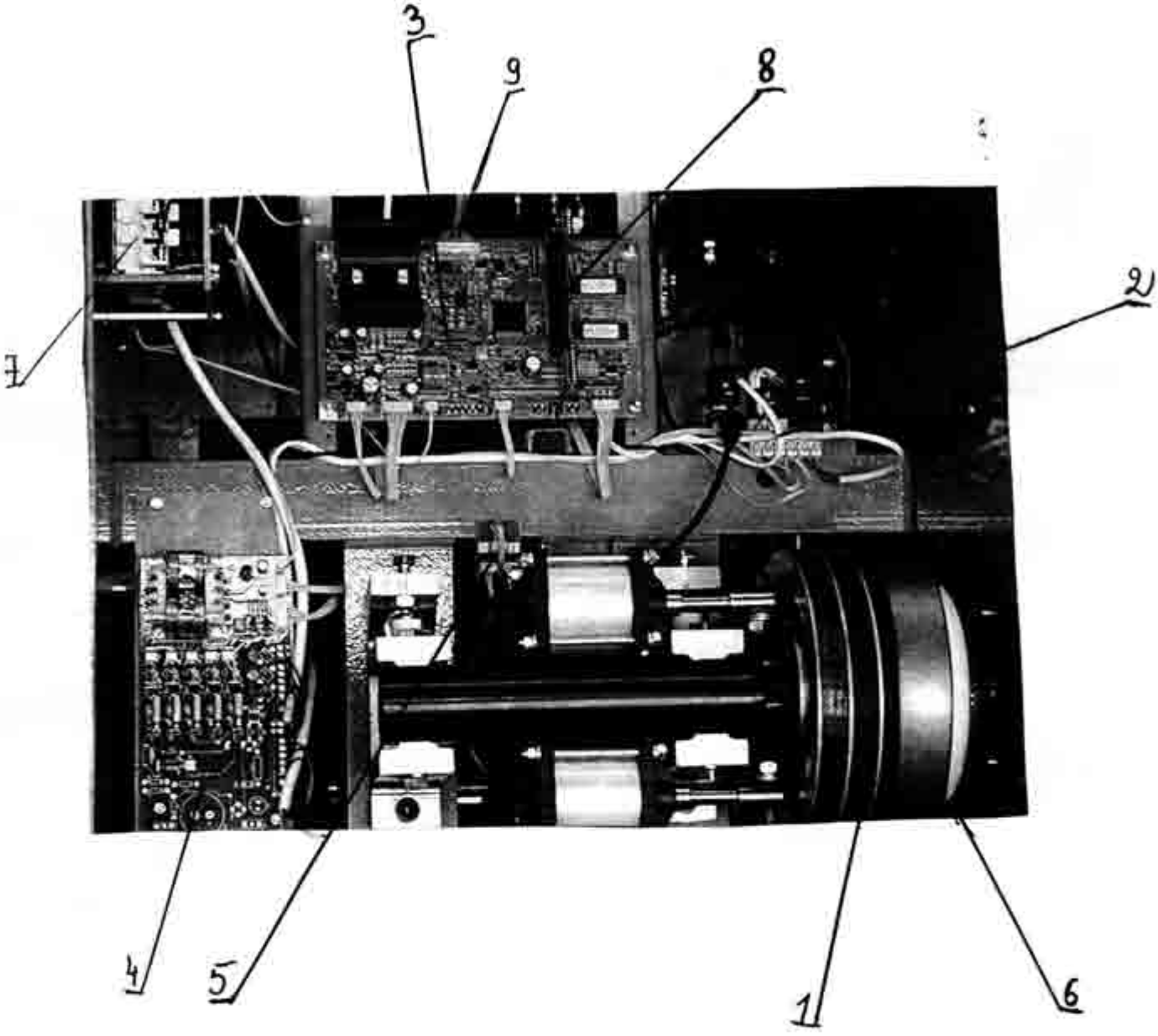
Procedure of ordering spare parts

When ordering spare parts one should exactly specify:
- serial number and production year of the balancing machine,
- needed quantity

The order has to be transferred directly to the producer.

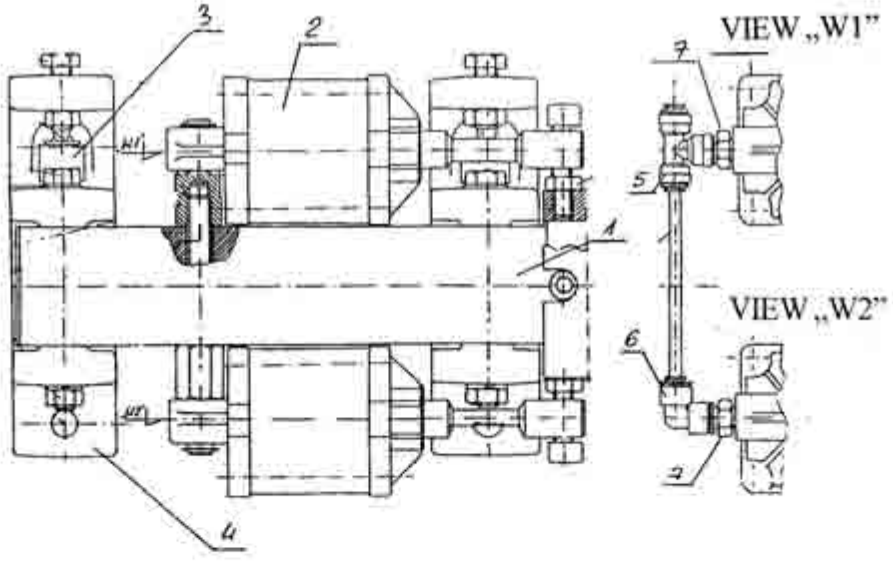
Wheel Balancing Machine

1. Rotation unit	01.00.00
2. Electrovalves unit	02.00.00
3. Main board	PP-G 2162
4. Power board	P-St-C
5. Sensors board	P-Cz-CIE
6. Optocouplers of Tachometer	P-TRO
7. Master swich	05.05.001
8. Video board	TVGA-9000
9. Connection cable with euro-plug	P-P4ET



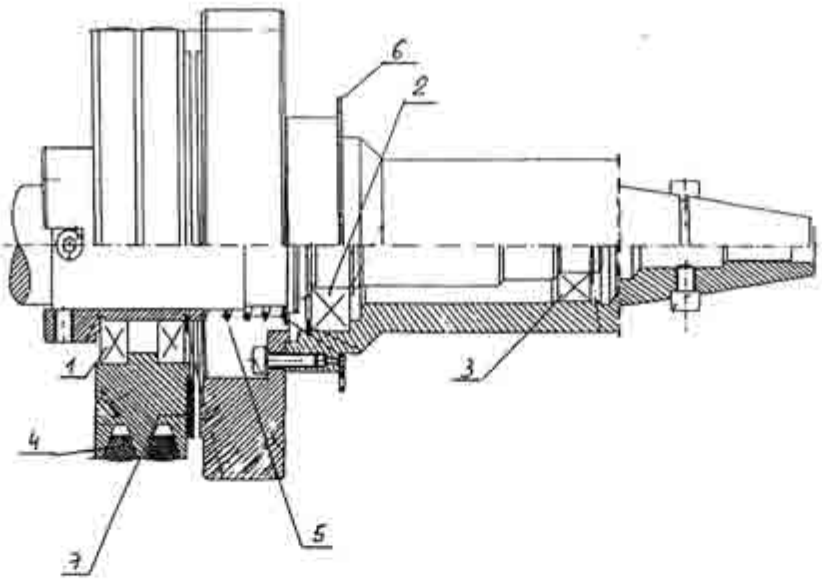
Rotation unit (clutch control assembly) 01.00.00

1. Shaft unit	01.01.00
2. Cylinder	01.02.00
3. Piezo sensor	01.03.00
4. Bracket	06.04.045
5. T-Connection ⌀ 6	07.06.401
6 .Angle connection ⌀ 6	07.06.406
7. Connection ⌀ 6 1/8"	07.06.601



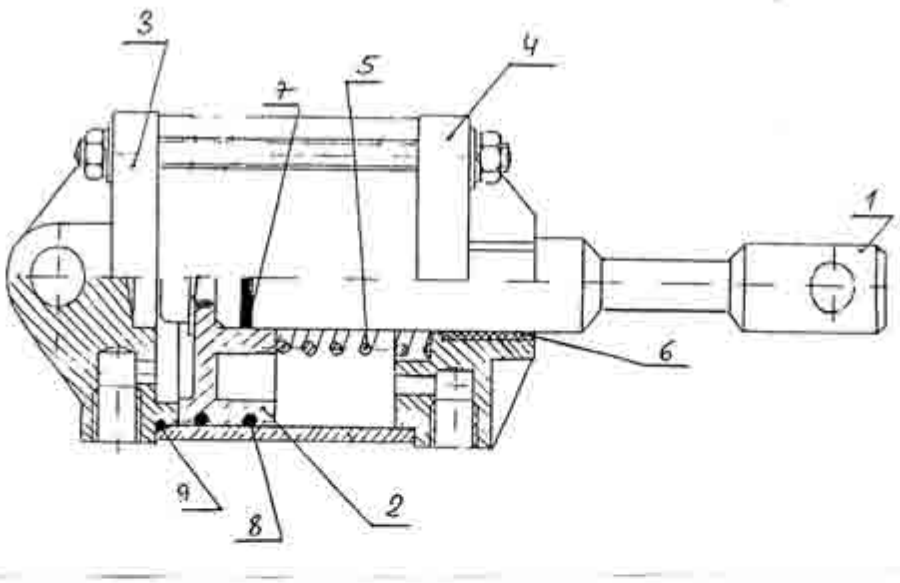
Rotation unit - shaft assembly 01.01.00

1. Bearing 16014	03.08.014
2. Bearing 620822	03.08.208
3. Bearing 620522	03.08.205
4. V-Belt 17 x 1060	05.08.303
5. Spring	06.01.041
6. Code Disk	06.01.122
7. Friction Disk	05.09.153



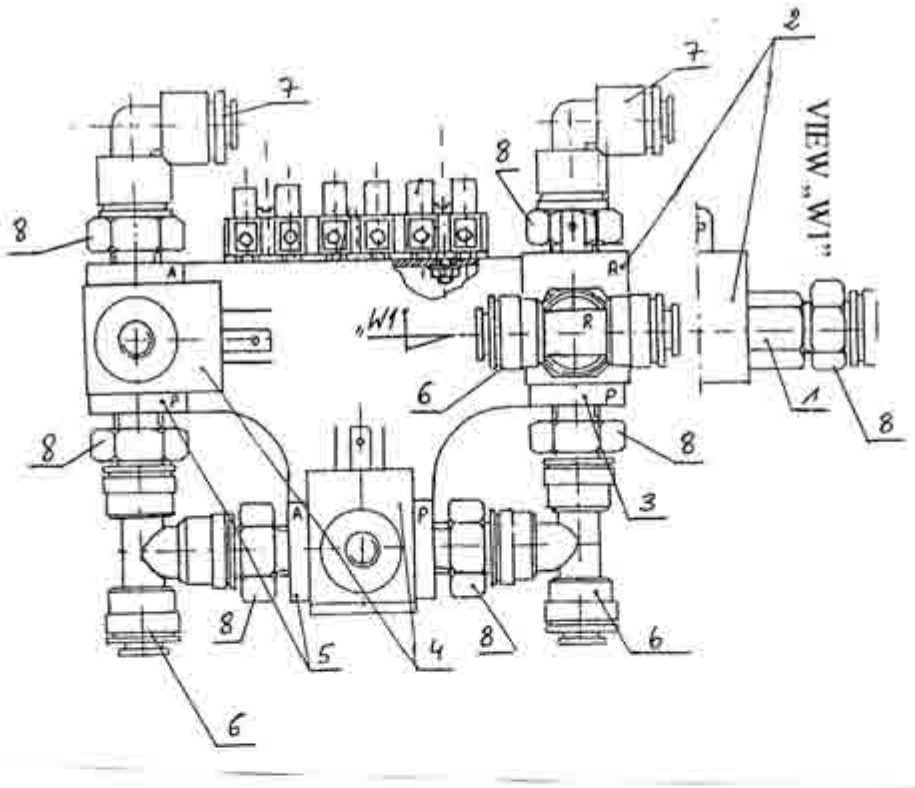
Cylinder of Friction Clutch 01.02.00

1. Piston Rod		01.02.01
2. Piston		06.05.004
3. Frontal Lid		06.04.025
4. Rear Lid		06.04.024
5. Spring		06.01.070
6. Sleeve	1820 BS	03.08.901
7. Oring	14 x 2	03.07.109
8. Oring	57 x 3,5	03.07.156
9. Oring	60 x 2	03.07.161



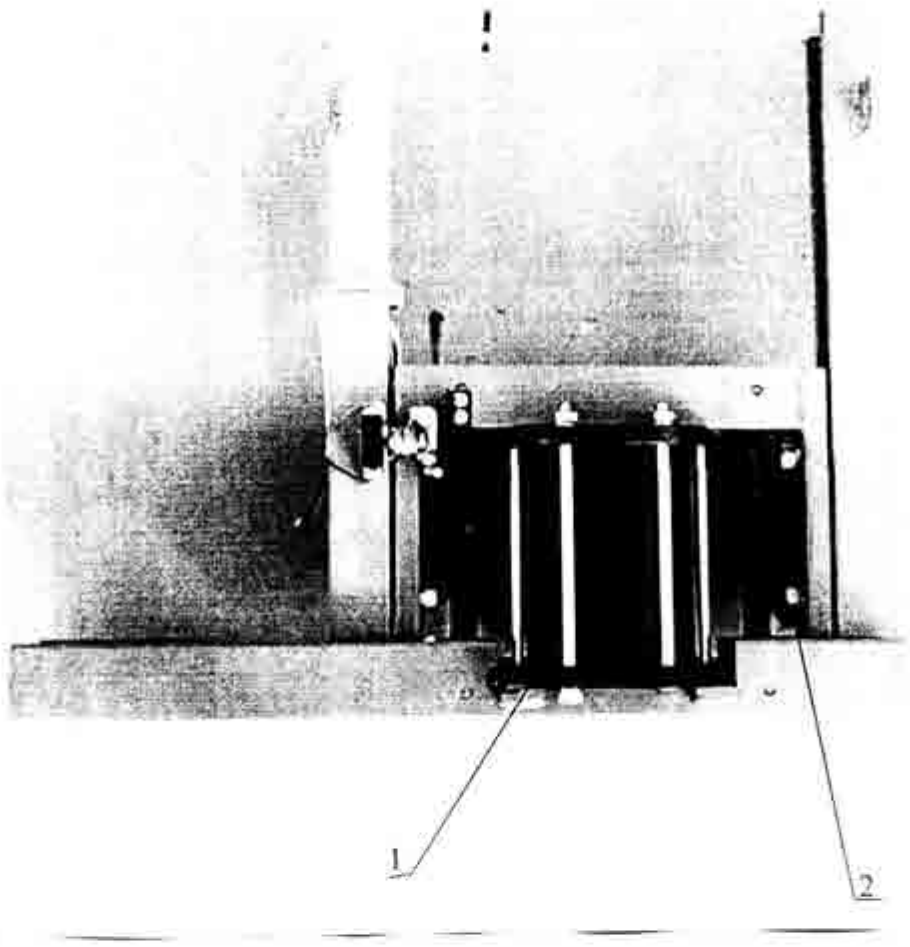
Electrovalves Unit 02.00.00

1. Taper Adapter	02.00.01
2. Coil of electrovavle 67E	07.01.018
3. Elektrovavle A 331	07.01.017
4.Coil of elektrovavle G73V24	07.01.016
5.Elektrovavle A 321	07.01.015
6. T-Connection ø 6	07.06.401
7.Screew elbow ø 6	07.06.406
8.Connection ø 6	07.06.406

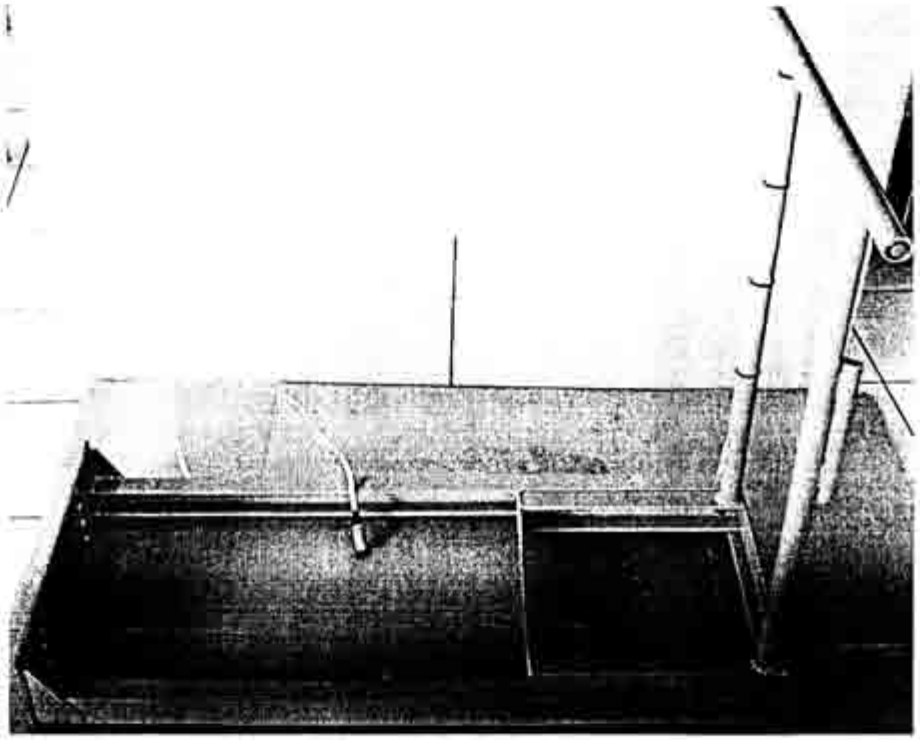


Inner Part of Lift 03.00.00

1. Cylinder of Lift	03.01.00
2. Spring of Lift	06.01.050

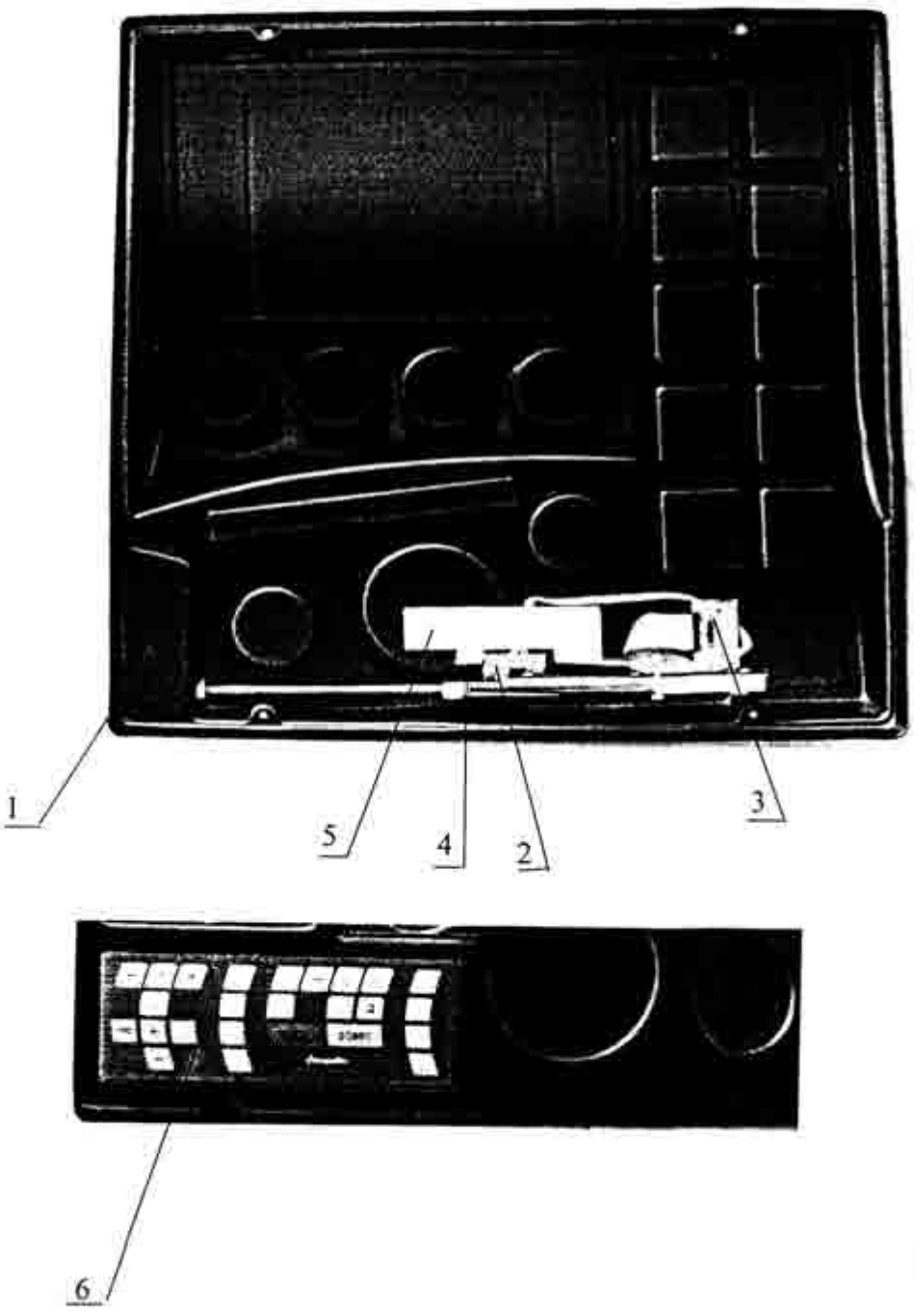


Outer Part of Lift 04.00.00



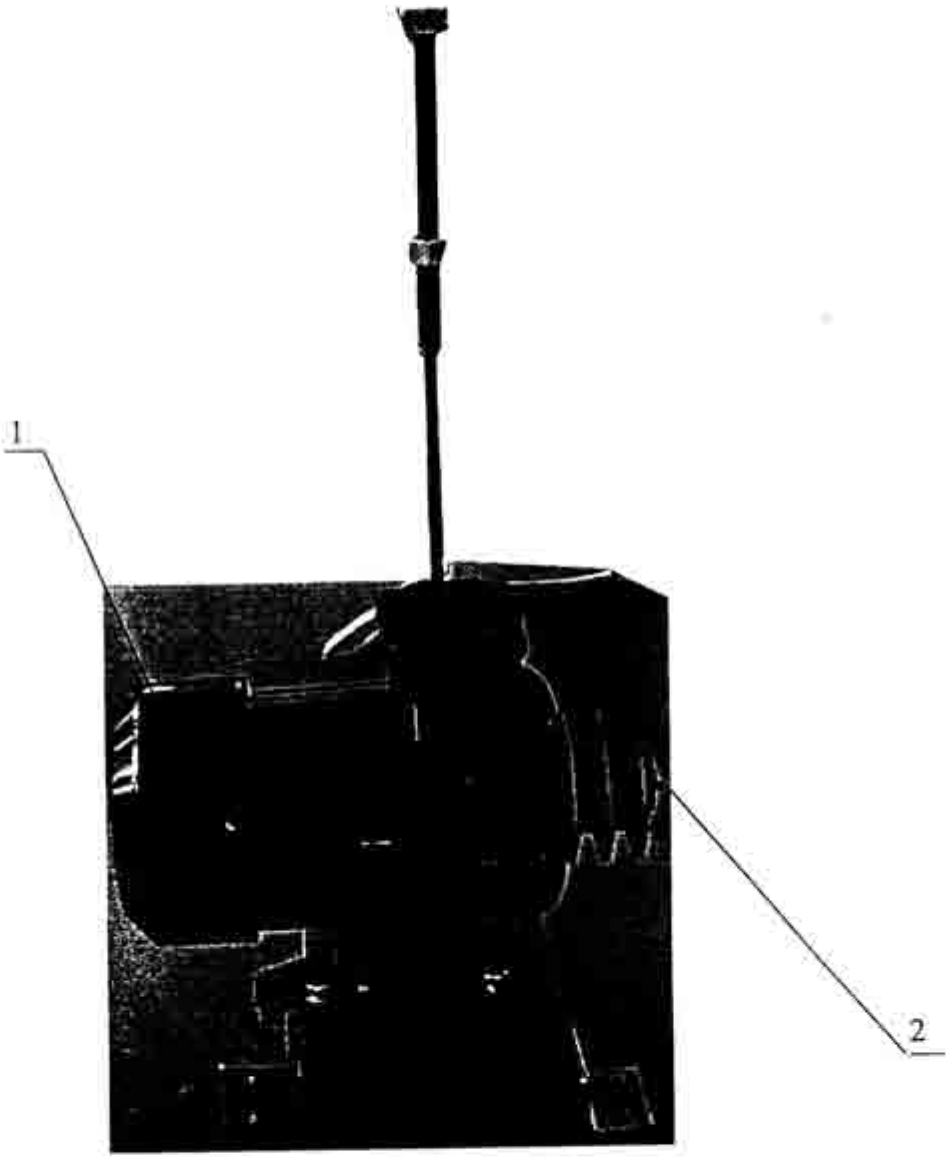
Cover Unit 06.00.00

1. Cover P1	04.00.03-M
2.Photo Couplers of Distance Conroller	P-TRN
3. Board of Keyboard	P-KL
4. Plastic Bracket	06.01.123
5. Bracket	06.01.124
6. Keyboard	06.02.028



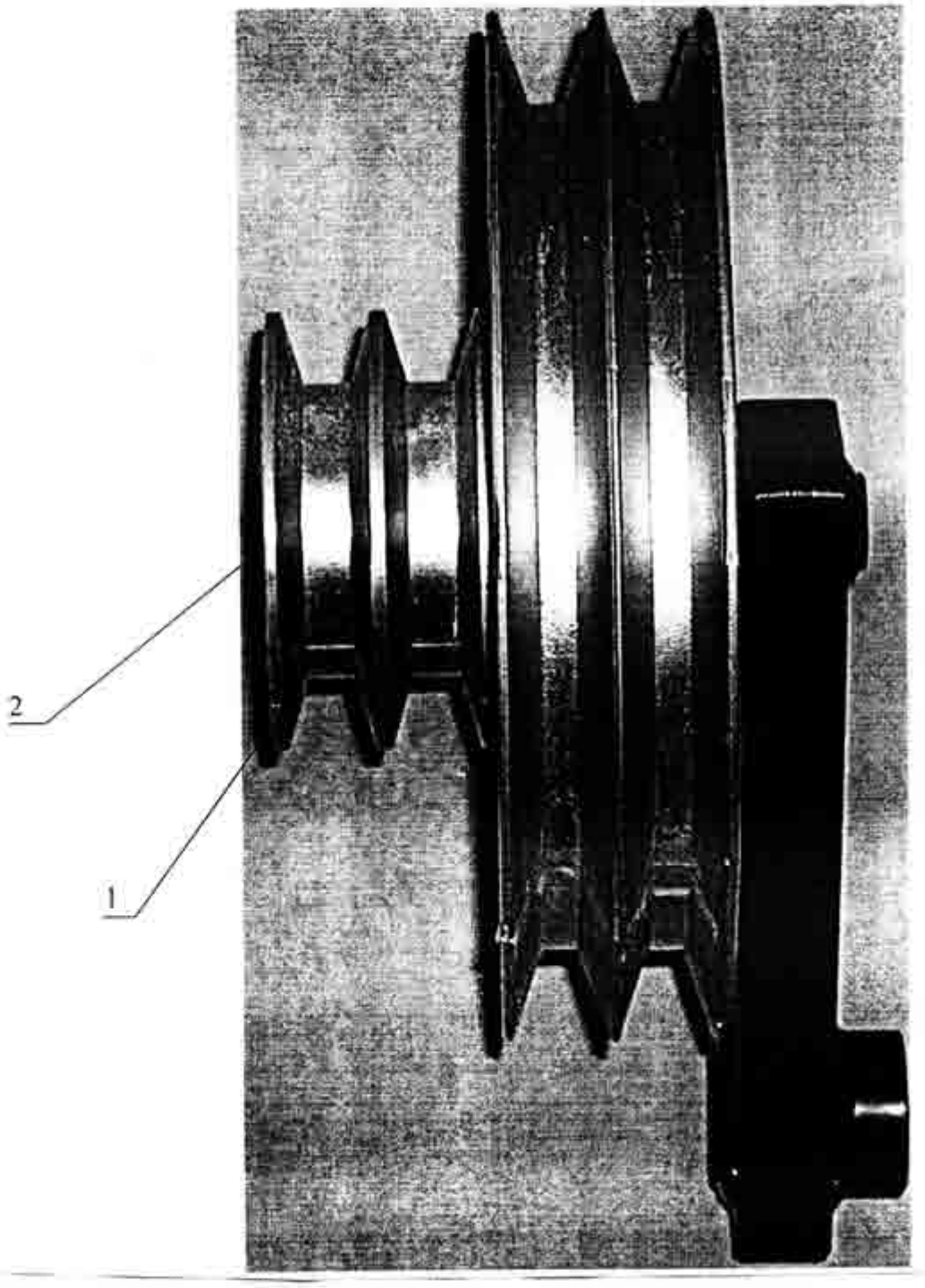
Driving Unit 05.00.00

1. Electric Motor SH 90-85	05.06.004
2. Pulley	06.04.013



Indirect Pulleys Unit 07.00.00

1. Indirect Pulley	06.04.014
2. Bearing 6205	03.08.205



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WHEEL BALANCING MACHINES TYRE CHANGERS EQUIPMENTS FOR TYRESHOPS

Statistic number : 008132994 **Tax number** : 527 - 020 - 52 - 46

CE Conformity Declaration

in accordance with directives : 98/37/CE and 89/336/CEE

We : **Uni-trol Co. Ltd.**
Ul. Estrady 56
01-932 Warsaw
Poland

declare, under our exclusive responsability, that the product

Wheel balancing machine **TROLL 2162**

to which this declaration refers, is in conformity with the following provisions of law :

- **directive 98/37/CE (the safety of machinery);**
- **directive 89/336/CEE and following modifications (the electromagnetic compatibility).**

For verification of conformity with the provisions of law were consulted the harmonized standards or other norms documents :

- PN - EN 292 - 1 / 2000	Basic concepts, general principles for design - Part 1;
- PN - EN 292 - 2 / 2000	Basic concepts, general principles for design - Part 2;
- PN - EN 50081 - 1 / 1996	Generic emission standard, residential, commercial and light industry;
- PN - EN 50081 - 2 / 1996	Generic emission standard, industrial environment;
- PN - EN 50082 - 1 / 1999	Generic immunity standard, residential, commercial and light industry;
- PN - EN 50082 - 2 / 1997	Generic immunity standard, industrial environment;
- PN - EN 294 / 1994	Safety distances to prevent danger zones being reached by the upper limbs;
- PN - EN 349 / 1999	Minimum gaps to avoid crushing of parts of the human body;
- PN - EN 60204 - 1 / 2001	Safety of machinery - Electrical equipments of machines - Part 1;
- PN - EN 61204 / 2001	Low voltage power supply devices dc output - Performance characteristics and safety requirements;
- PN - EN 61293 / 2000	Marking electrical equipments with ratings to electrical supply - Safety requirements;
- 62 / 2002	Electrical accesories;

This declaration is valid for all products which are produced in accordance with the technical documentation which is part of this declaration.

Wiesław Roguski
Chairman of Board

Warsaw, 01.05.2004

"UNI - TROL" .....
Signature