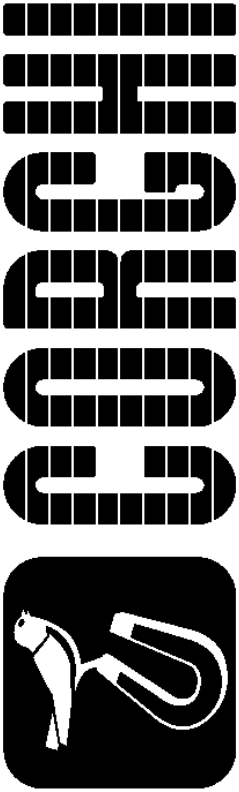

EM 73

Versione 2.0 del 01/96

Italiano Manuale d'uso

English Operator's manual

Français Manuel d'utilisatio

Deutsch Betriebsanleitung

Español Manual de uso

Italiano

English

Français

Deutsch

Español

Elaborazione grafica e impaginazione
Ufficio **P**ubblicazioni **T**ecniche

EM 73 operator's manual

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INTRODUCTION

The purpose of this manual is to furnish the owner and the operator of this Corghi machine with a set of practical and safe instructions for the use and maintenance of the balancer. Follow all the instructions carefully and your balancer will assist you in your work and give lasting and efficient service in keeping with CORGHI traditions.
The following paragraphs define the levels of danger regarding the machine associated with the warning captions found in this manual:

DANGER
Refers to immediate danger with the risk of serious injury or death.

WARNING
Dangers or unsafe procedures that can cause serious injury or death.

ATTENTION
Dangers or unsafe procedures that can cause minor injuries or damage to property.

Read these instructions carefully before powering up the machine. Conserve this manual and all illustrative material supplied with the machine in a folder near the balancer where it is readily accessible for consultation by the machine operator.

WARNING

Adhere to the contents of this manual: Corghi declines all liability in the case of actions not specifically described and authorised in this manual.

NOTE
Some of the illustrations in this manual have been taken from photographs of prototypes; the standard production model may differ slightly in certain respects.
These instructions are for the attention of persons with basic mechanical skills. We have therefore condensed the descriptions of each operation by omitting detailed instructions regarding, for example, how to loosen or tighten the fixing devices on the machine. Do not attempt to perform operations unless properly qualified and with suitable experience. In case of need, please contact our nearest authorised Service Centre for assistance.

TRANSPORT, STORAGE AND HANDLING

- The balancer packaging consists of a wooden crate and pallets. Before installation, the balancer must be transported in its original packing by inserting the forks of a lift truck in the relevant channels in the pallet, making sure that the machine is maintained in the position indicated on the outer packing (fig.1).
- Machine packing dimensions
  - length 1060 mm
  - depth 760 mm
  - height 1150 mm
- Shipping weight with packing 132 Kg
- Ambient conditions in place of storage:
  - relative humidity from 20% to 95%
  - temperature from -10 to +60°C.

ATTENTION

Do not place other items on top of the two packs, as this may cause damage.

After installation, the machine can be moved using the following methods:

- with a crane, using special equipment that holds the machine at the lifting points (fig.1a);
- inserting the forks of the lifting truck under the machine so that the center of the forks correspond approximately to the center line of the cabinet (fig.1b);
- positioning the machine on its original pallet, securing it with the original devices and then lifting the pallet with the lift truck.

ATTENTION

Always unplug the power supply lead from the socket before moving the machine.

WARNING

Never apply force to the spin shaft when moving the machine.

INSTALLATION

WARNING

Take the utmost care when unpacking, assembling, and setting up the machine as described in this heading.
Failure to observe these instructions can lead to damage to the machine and injury to the operator or other persons.
Remove the original packing once you have positioned it as shown on the outside and **keep it intact for possible future transport**.
Choose the place of installation in strict observance of local regulations regarding safety in the workplace.

ATTENTION

If the machine is to be installed outdoors, it must be properly protected by a canopy roof.
Ambient conditions in the place of operation:
- relative humidity from 30% to 95%
- temperature range from 0°C to +55°C

WARNING

The machine must not be operated in explosive atmospheres.
Place the machine in the chosen position and make sure that the surrounding space is commensurate with the minimum clearances indicated in figure 2.
The machine is supplied with a number of separate parts that have to be assembled, following the procedures described below.

Head assembly

- Remove the two brackets that attach the head to the cover;
- turn the head over and insert the pins that protrude from the base of the head, fitting them into the correct holes in the weight-holder cover;
- turn the head anti-clockwise to lock it.

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Guard assembly (fig.3)

- Unscrew the nuts that lock the two bolts on the guard support pin holes and take out the bolts;
- fit the guard tube into the support pin, lining up the two sets of holes
- fit the two bolts into the holes and attach the guard on to the support by tightening up the nuts.

QL pedal control assembly (fig.3a)

- Unscrew the four bolts on the machine base;
- position the pedal on the base, lining up the two sets of four holes;
- lock the pedal by tightening up the four bolts.

The balancer do not necessarily need to be fixed to the ground, although they can be secured with four bolts and pressure plugs after the normal levelling of the machine.
Fit the threaded hub on the spin shaft using the hex wrench.
To terminate the installation procedures, the machine must be calibrated (see section on calibration).

Main operating components (fig.4)

A distance gauge
B rotating display
C display panel with keyboard
D flange-holder
E weight-holder cover
F brake pedal
G master switch
H QL pedal

Display panel (fig.4a)

A Inside plane display (left)
B Outside plane display (right)
C Inside plane position indicator
D Outside plane position indicator
E Keys and leds for selecting and displaying available programs
F Key and led for input of wheel data

ELECTRICAL HOOK-UP

On request, the balancer can be set up by the manufacturer to operate with the power supply available in the place of installation. The set-up details for each individual machine are given on the machine data plate and on a special label attached to the power supply connection lead.

WARNING

All the electrical hook-up operations must be carried out solely by specialized personnel.

- The electrical hook-up is scaled according to the balancer's electrical power input, as specified on the machine data plate.
- A plug conforming to binding regulations must be fitted to the power supply cable.
- The machine must have its own electrical connection with an automatic differential switch set to 30 mA.
- To set the scale of the protection fuses on the power supply line, refer to the general electric lay-out in this manual.
- To prevent the machine from being used by non-authorized personnel, it is advised to unplug the power supply plug when the machine is not being used (switched off) for long periods.
- If the power supply line is connected directly to the main electricity panel, without a plug, a key switch or lockable switch must be fitted, to restrict the use of the machine

to authorized personnel only.

WARNING

A good ground connection is essential for the correct functioning of the machine. NEVER connect the machine ground wire to a gas pipe, water pipe, telephone cable or other unsuitable objects.

COMPRESSED AIR HOOK UP

Only for the QL version

- Hook up to the shop compressed air circuit should insure a minimum pressure of 8 bar. Lower pressure could compromise correct wheel release cylinder operation and thus create problems with removing the wheel from the shaft.
- The machine is fitted with a universal connector and therefore no other special or additional fitting is called for. A high pressure rubber air hose (internal dia. 6 mm; external dia. 14 mm.) should be pushed all the way onto the connected and secured with a screw clamp supplied in the machine kit.

SAFETY REGULATIONS

WARNING

Failure to observe these instructions and the relative danger warnings can cause serious injury to the operator and others. Do not power up the machine before you have read and understood all the danger/warning/attention notices in this manual.
This machine must be used only by qualified and authorised personnel. A qualified operator is construed as a person who has read and understood the manufacturer's instructions, is suitably trained, and is conversant with safety and adjustment procedures to be adhered to during operations. Operators are expressly forbidden from using the machine under the influence of alcohol or drugs capable of affecting physical and mental capacity. However, in the case of drugs prescribed by a qualified physician without contraindications, the operator may be allowed to use the machine. The following conditions are essential:

- the operator must be able to read and understand the contents of this manual;
- make sure the operator has a thorough knowledge of the capabilities and characteristics of this machine;
- keep unauthorised persons well clear of the area of operations;
- make sure that the machine has been installed in compliance with established legislation and standards;
- make sure that all machine operators are suitable trained, that they are capable of using the machine correctly and that they are adequately supervised during their work;
- do not touch power lines or the inside of electric motors or other electrical equipment until the power has been disconnected and locked out.

- read this manual carefully and learn how to use the machine correctly and safely;
- always keep this user manual in a place where it can be readily consulted when working with the machine and consult it whenever you are in need of confirmation or explanations.

WARNING

Do not remove or deface the safety Danger, Warning or Instruction decals. Replace any missing or illegible Danger, Warning or Instruction decals. Missing or damaged decals can be obtained at your nearest Corghi dealer.

- When using and carrying out maintenance on the machine observe the unified industrial accident prevention regulations for high voltage industrial equipment and rotating machinery.
- Any unauthorised alterations made to the machine automatically release the manufacturer from any liability in the case of damage or incidents attributable to such alterations. Specifically, tampering with or removing the machine's safety devices is a breach of the regulations for industrial accident prevention.

ATTENTION

During work and maintenance operations, always tie up long hair and do not wear loose or flappy clothing, ties, necklaces, wristwatches or any other items that may get caught up in the moving parts.

Key to warning and instructions labels

Do not press the Quick Lock device release pedal when the wheel is in motion.

Never apply force to the spin shaft when moving the machine.

Unplug the power supply cable before carrying out maintenance/ assistance work on the machine.

Do not lift up the guard when the wheel is turning.

GENERAL CHARACTERISTICS

- Single spin, fixed position flange balancing machine
- Microprocessor controlled data processing Central Unit
- Unbalance displayed grams and ounces
- Unbalance value detection precision: 1 gram (1/10 oz)
- Slow balancing speed (150 Rpm)
- Full function, built in keyboard
- Automatic wheel clamping system (optional)
- Footpedal brake operating on shaft ass'y
- Automatic start by pushing down on lowered wheel guard
- Handy side flange holder cabinet
- Cover with trays for all types of weights
- Mini-anvil to repair clip weights
- Lighted digital display to show:
  - unbalance weight and position
  - programme selected
- Swivel display unit for optimum readout
- Wide selection of programmes so that the machine is easy to use straight away
- Types of balancing available:
  - Standard — dynamic on both planes
  - Static — on a single plane
  - ALU — 5 different routines for aluminium rims
  - Motorbike dynamic — dynamic on both planes of motor-cycle wheels
  - ALU motorbike — dynamic on both planes of aluminium motorcycle wheels
  - CTS — dynamic for Continental Tyre System wheels
- OPT: programme to reduce road noise by optimizing rim/tyre match
- General utility programmes:
  - Calibration
  - Self-diagnostic (servicing)

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TECHNICAL SPECIFICATIONS

- Supply voltage ..... 110/220V ±10% single-phase
- Power draw 250W
- Balancing speed ..... 150 Rpm
- Average spin time (with 5x14' wheel) ..... 7 sec
- Shaft diameter ..... 38 mm
- Tyre shop temperature ..... 0-50°C
- Machine dimensions (fig.4b):
  - width with guard ..... 1250 mm
  - depth with guard closed ..... 1030 mm
  - depth with guard open ..... 1150 mm
  - height with guard closed ..... 1280 mm
  - height with guard open ..... 1680 mm
- Programming parameters:
  - rim width ..... from 1.5" to 20"
  - rim diameter ..... from 1" to 23"
  - Ma.x. wheel/machine distance ..... 170 mm
  - Max. wheel width (with guard) ..... 400 mm
  - Max. wheel diameter (with guard) ..... 870 mm
  - Max. wheel weight ..... 65 kg
- Automatic clamping air pressure (QL version) ..... min.8 max. 15 bar
- Shipping weight (without accessories): ..... 114 kg
- Noise level when running ..... <70 dB (A)

MACHINE KIT

The following parts are supplied together with the machine:

- Weight clip pliers ..... code 900203841
- Bag of 4 M12 dowels for levelling ..... code 900671357
- Threaded hub (standard versions only) ..... code 900222099
- Threaded hub (QL versions only) ..... code 900237466
- Flange attachment bolt (standard versions only) ..... code 900222101
- QL flange mounting disk (QL versions only) ..... code 900237468
- QL flange attachment bolt (QL versions only) ..... code 900240756
- Wheel width measurement gauge ..... code 900223420
- Weights identification plate ..... code 900437485
- Rubber hose clip (QL versions only) ..... code 900403751
- Hex wrench CH 4 ..... code 900600714
- Hex wrench CH 5 ..... code 900600674
- Hex wrench CH 10 c ..... ode 900600910
- 100 gram weight ..... code 900430573

OPTIONAL ACCESSORIES

Please refer to relevant accessories catalogue.

GENERAL CONDITIONS OF USE

The balancers described in this manual must be used **exclusively** to measure the entity and position of unbalances on motor vehicle wheels, within the limits specified in the "Technical Brief". Furthermore, versions with motor must be provided with a suitable guard, with a suitable safety device, which must be lowered during the spin operation.

ATTENTION

Any use of the machine other than the described use is to be considered as improper and unreasonable.

WARNING

It is forbidden to start the machine without the equipment for blocking the wheel.

ATTENTION

Do not use the machine without the guard and do not tamper with the safety device.

WARNING

Cleaning or washing the machine with compressed air or jets of water is forbidden.
Quick Lock versions and versions with ROD require a compressed air supply of pressure not less than 8 bar. The pneumatic circuit has a pressure limiter/filter, settable to a maximum value of 10 bar.
The WL 150 wheel lift can be used to lift wheels of 150 kg.

ATTENTION

It is strictly prohibited to alter the pressure setting of the relief valves or the pressure limiter.
The manufacturer declines all liability for damage if the valves have been tampered with.

ATTENTION

It is advised not to use only CORGHI original tools for the work.

ATTENTION

Get to know your machine: the best way to prevent accidents and get the best performance out of the machine is to ensure that all the operators know how it works.
Learn the function and location of all the commands.
Carefully check that all the commands on the machine are working properly.
To avoid accidents and injury, the machine must be installed properly, operated correctly and serviced regularly.

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SWITCHING ON THE BALANCER

Turn on the machine with the master on the back of the cabinet (G, Fig.4).
After the beep, and the lamp test, the machine is ready to receive the wheel data.

WHEEL DATA INPUT

Version without automatic gauge

- Press key .
- The machine is ready to receive the **WIDTH** (the corresponding LED will light)
- Measure rim widht with the caliper (Fig.5)
- Change the number shown on the right dispay using the ↑ and ↓ keys until the correct number is set. WIDTH can be input in millimeters or a previous input converted to inches. To do this press. To return to input in inches hit ↵ again. A LED on the panel will light to identify the current unit of measurement (mm or inch).
- Press again to confirm the input and to set up the machine for **DIAMETER**: (the corresponding LED will light)
- Read the rim diameter on the tyre
- Change the number on the right display with the ↑ and ↓ keys until the correct number is shown.
  DIAMETER can be input in millimeters or a previous input converted to inches. To do this press. To return to input in inches hit ↵ again. A LED on the panel will light to identify the current unit of measurement (mm or inch).
- Press key a third time to confirm the input and set up the machine for **DISTANCE** (the corresponding LED will light)
- Move the distance gauge until it touches the edge of the inside rim channel as shown in fig.6 or 6a according to the different terminal available on the gauge.
- Read the machine/rim distance on the ruler
- Change the number shown on the right dispay by pressing the ↑ and ↓ keys until the correct setting is shown.

• **If you hold down the ↑ and ↓ keys the numbers will spool up or down quickly and make data input all the more rapid.**

Once the wheel data have been input correctly press:
- F to display the unbalance (recalculated for the new wheel data);
- START to do a spin.

TA version with automatic gauge

The machine automatically enters the diameter and distance values, whereas the width has to be entered from the keyboard.
- Move the internal automatic gauge into contact with the inside wall of the wheel rim as shown in fig.6.

Make absolutely certain the gauge is positioned correctly so as to ensure accurate reading of data.

- Keep the gauge in contact with the rim until the machine has acquired and displayed the wheel diameter and distance values.
- Return the gauge to its rest position. If an incorrect value is acquired during the measurement stage, return the gauge to its rest position and then repeat the operation.
- Press the  key.
  The machine is now ready to receive the **WIDTH** input.
- Measure the rim width with the caliper.
- Change the width value displayed by pressing the ↑ ↓ keys until the correct number is set.
  The WIDTH may be set in millimetres or a previous input can be converted from inches to millimetres by pressing the ↵ key.

By keeping the ↑ ↓ keys pressed down you can raise or lower previously set values very quickly.

Once the wheel data has been set correctly, press F to display the unbalance (recalculated for the new wheel data) or START to do a spin.

If the automatic gauge does not work, you can enter all wheel data from the keyboard as described in the previous paragraph.

UNBALANCE DISPLAY IN GRAMS OR OUNCES

You can set up the machine to display unbalance values in grams or ounces by pressing the F key and holding it down for about five seconds.

ROUNDING

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When the machine is switched on its default setting is to show the unbalance to the nearest five grams (rounding up or down as necessary) or to the nearest 1/4 ounce if data output in ounces has been set.
In this default setting, the first 4 grams are not displayed since they are regarded as below the operational thresold (the 'Thr' LED on the panel will be lit).
To remove this thresold press F (the 'thr' LED will turn off) and the unbalance will be shown to the last gram (or to the last 1/10 of an ounce if this display made is active).
Each time the F key is press, the machine toggles between thresold ON and thresold OFF.

WHEEL SPIN

A safety device prevents the rotation of the wheel when the guard is open and stops the rotation if the guard is opened during the spinning.

ATTENTION

Never raise up the guard before the wheel has come to a stop.
If, due to a fault in the machine, the wheel keeps spinning permanently, switch off the machine at the master switch or by unplugging the plug from the power supply panel (**emergency stop**).
Then wait until the wheel stops, or apply the brake with the pedal.

BALANCING PROGRAMMES

Before starting a balancing cycle:
- Mount the wheel on the shaft using the appropriate flange
- Remove any balancing weights, stones, dirt or other foreign bodies from the wheel
- input wheel data correctly.

Dynamic balancing (standard)

- Press the ↑ ↓ keys until the LED for DYN balancing programme lights.
- Press ↵ to confirm your choice.

Dynamic balancing mode is the default setting when the machine is switched on.
- Input the wheel data correctly.
- Spin the wheel by pushing down on the guard.

For best balancing results do not rush the machine while it is processing the unbalance signals.
- Wait for the beep signalling that the data processing has been completed.
- Brake the wheel with the pedal brake (F, fig.4).
  The unbalance weights will be shown on display A and B (fig.4a) for the inside and outside planes respectively.
- Choose the first side you intend to balance and turn the lights and you will also hear a confirming beep. The display will flash.
- Put the balancing weight at 12 o'clock.
- Repeat this process for the other side of the wheel.
- Make a test spin to check the accuracy of the balancing. If you do not find it completely to your satisfaction, change the amount of the weight and its position following the suggestions given in the 'balancing check diagram' (fig.7).
  Do not forget that especially when the Unbalance is large, a slight error (a degree or two) in positioning the balancing weight can produce a residual Unbalance of 5-10 g.

Static balancing

A wheel can aso be balanced with a single weight placed on one of its sides on at the centre of the channel. This is what is called static balancing.

Some dynamic Unbalance may still be present (shimmy) and the wider the tyre, the more noticeable this will be.

- Press the ↑ ↓ keys until the LED for static balancing lights.
- Press ↵ to confirm your choice.
- Input the diameter of the wheel (**in Static mode you need only input the diameter**).
- Spin the wheel by pushing down on the guard
- Wait until you hear the beep signalling that the unbalance has been calculated.
- Brake the wheel with the pedal brake (F fig.4). The unbalance weight will appear on the display (B fig.4a).
- Turn the wheel until it the segment at the centre lights to show the correct position has been reached and you hear the beep. The display will also flash when the correct position has been reached.
- Place the weight as indicated at 12 o'clock on either side or at the centre of the rim channel.
- If you decide on the rim channel, remember that the diameter is less than the nominal and for good results, when you input the diameter value, make it 2 or 3 inches less than the nominal.
- Do a test spin following the same procedures as for standard balancing.

Balancing aluminium wheels - Standard ALU programmes

To balance aluminium wheels we usually use self-adhesive weight and these are positioned differently from the clip weights used in standard balancing.
The 5 ALU programmes bear in mind the various positions for the weights (fig.8) and provide correct Unbalance values while maintaining unchanged the wheel **data input** for aluminium rims.

- Press the ↑ ↓ keys until the LED for the ALU programme lights.
- Press ↵ the number of times needed to confirm your choice of ALU programmes (the circle on the panel illustrates the type of weights and balancing planes for each ALU programme.
- Input the wheel **data**.
  If the WIDTH you input is less than 4" or the DIAMETER less than 11", the message Alu Err may appear. This means that the width and diameter input cannot be used for the ALU programme selected.
- Once you have selected the programme you want and have input the wheel data correctly, follow the procedures explained under the sections on Standard Balancing.

Some slight residual Unbalance may remain at the end of the test spin due to the considerable difference in shape found in rims with the same nominal diameters. To counter this, change the amount and position of the weights in accordance with the 'balance check diagram' (fig.7) until you have as accurate a balance status as you can get.

Balancing aluminium wheels - ALU P programmes

In order to reduce the inaccuracy of results that may sometimes occur with the standard ALU programs, especially in the most critical cases (programs ALU 1 and ALU 2), you can use the **programs ALU 1P and ALU 2P**. These can be selected in the usual manner in the ALU program sequence. With these programs you have to set the real

wheel data rather than the nominal values as in standard ALU programs.
This means that four data items have to be entered:
- diameter and distance with respect to the inside wall measured and entered automatically by the appropriate gauge;
- diameter and distance with respect to the outside wall, measured using the gauge (fig.8a) and entered via the keyboard.

Measuring wheel data
- Move the internal automatic gauge to the plane chosen for fixing the inside balancing weight (fig.8b for ALU 1P and fig.6 for ALU 2P).

Make absolutely certain the gauge is positioned correctly so as to ensure accurate reading of data.
- Keep the gauge in contact with the rim until the machine has acquired and displayed the wheel diameter and distance values.
- Return the gauge to its rest position.
- Position the mobile gauge on the right side of the vehicle body using the special attachments (1, fig.8c).
- Extend the telescopic arm until the centre of the weight-holding spring (located at the end of the arm) is at the plane chosen for fixing the outside balancing weight (2, fig.8c).
- Push the sliding arm towards the rim until the spring (located at the end of the arm) rests against the rim itself (3, fig.8c).
- If necessary adjust the position of the telescopic arm so that it is possible to fix the weight onto the chosen plane (check that there are no discontinuities at the centre of the weight-holding spring that might prevent the weight from being fixed on correctly).
- Read off the distance from the vehicle body on the graduated scale (F, fig.8a) located on the telescopic arm, and the diameter on the graduated scale (G, fig.8a) located on the fixed part of the gauge.
- Remove the mobile gauge from the measuring position. In order to retain the measured values make sure you do not change the setting of the moving parts.
- Press the  key.
  The machine is now ready to receive the **EXTERNAL DISTANCE** input.
- Change the displayed value by pressing the ↑ ↓ keys until the display shows the distance you have just read.
- Press the  key again. The machine is now ready to receive the **EXTERNAL DIAMETER** input.
- Change the set value by pressing the ↑ ↓ keys until the display shows the diameter you have just read.

You can display the DIAMETER in millimetres or convert previously set values from inches to millimetres by pressing the ↵ key.

By keeping the ↑ ↓ keys pressed down you can raise or lower previously set values very quickly.

Once you have set the wheel data correctly, press F to display the unbalance (recalculated for the new wheel data) or START to do a spin.

If the automatic gauge does not work, you can enter all wheel data from the keyboard. First enter the external distance and the external diameter as described above, then proceed as follows:

- Press the key again to confirm the previous data. The machine is now ready to receive the **INTERNAL DISTANCE** input.
- Move the internal automatic gauge to the plane chosen for fixing the **inside** balancing weight (fig.8b for ALU 1P and fig.6 for ALU 2P).
- Read off the distance between the wheel and the vehicle body on the graduated scale.
- Change the set value of the diameter by pressing the keys until the number you have read is displayed.
- Press the key again to confirm the previous data. The machine is now ready to receive the **INTERNAL DIAMETER** input.
- Read off the nominal value of the rim diameter on the tyre.
- Change the set value of the diameter by pressing the keys until the number read is displayed.

In ALU 1P you have to set an INTERNAL DIAMETER of one inch less than the nominal value given on the tyre.

You can set the DIAMETER in millimetres or convert previous inputs from inches to millimetres by pressing the key.

Finally press F to display the unbalance (recalculated for the new dimensions) or START to do a spin.

Attaching balancing weights

1. Inside wall

- Turn the wheel until the central position indicator segment lights up.
- Attach the balancing weight shown in the **12 o'clock** position. If the program ALP 1P is running, place the weight at the exact position of the plane chosen when measuring the wheel data. Fig.8b shows the correct position of the weight with respect to the end of the gauge.

2. Outside wall

- Position the balancing weight shown inside the mobile gauge spring (D, fig.8a), making sure that it is centred with the adhesive part outwards.
- Remove the protective paper from the adhesive strip.
- Turn the wheel until the central position indicator segment lights up.
- Position the mobile gauge on the right side of the vehicle body using the special attachments (1, fig.8c).
- If necessary, push the sliding arm towards the rim until the spring (situated at the end of the arm) rests against the rim itself.

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- Press the button E (fig.8a) to make the weight adhere to the rim **which will therefore be correctly fixed in the 9 o'clock rather than the usual 12 o'clock position**.
- Remove the mobile gauge from its case, taking care not to change the setting of the moving parts. This way it can be used for attaching weights to identical wheels.
- Perform a test spin so as to check balancing accuracy.

Balancing motorcycle wheel

Motorcycle wheels can be statically balanced (following the steps outlined in the section on Static Balancing). If you want, you can divide the weight into two equal parts and place a weight on each side of the wheel.
If the WIDTH of the tyre (over 3 inches) is such as to generate considerable unbalance wich cannot be eliminated with static balancing, it may be worthwhile doing a dynamic balancing (on both sides).

- Press the ↑ ↓ keys until the LED for DM balancing lights.
- Press ↵ to confirm your choice.
- Mount the wheel on the shaft using the specific flange.
  ATTENTION: for good results mount the wheel on the flange so that there is no slippage when the wheel is spun or braked since this will give inconsistent results.
- Install the extension (fig.9) on the distance arm.
- Input the wheel data as described previously.
- Balance the wheel following all the steps described under the section on Standard Balancing.

To balance motorcycle wheels dynamically with adhesive weights:

- Press the ↑ ↓ keys until the LED for DM programme lights.
- Press **twice** ↵ to select **ALU MOTO** (the circle on the panel shows the types of weights and planes to be balanced in the various programmes).
- Follow the instructions above for dynamic motorcycle wheel balancing. The Unbalance will be calculated and dispayed for the position you will actually use for the adhesive weight.

Balancing CTS wheel

Special weights are used with these wheels and they are positioned between the tyre edge and the seal ring. The CTS programme makes its Unbalance calculations bearing this position in mind.

- Press the ↑ ↓ keys until the LED for the CTS programme lights.
- Press ↵ to confirm your choice.
- Input wheel data as usual.
- Follow the standard dynamic balancing procedure.

THE OPT OPTIMIZATION PROGRAMME (optional)

This procedure is used to reduce **road** noise (vibrations) to a minimum. Road noise can still be present even after a vey painstaking balancing but it can be reduced by eliminating as much as possible any mismatch between tyre and rim.
Here the professional experience of the tyre specialist comes into play. When you feel that this extra step could be helpful to reduce road noise to a minimum, select this programme.

- Press the ↑ ↓ keys until the OPT programme LED lights.
- Press ↵ to confirm your choice.

Once you have selected this programme the machine will indicate whether it is worthwhile going through the OPT programme. To do this the machine will flash the message:
- Yes OPT if it is worth the effort
- NO OPT if it is not.

This decision is made on the basis of the unbalance found with the last spin made (therefore, the last spin must refer to the wheel on the machine).

You are now ready to move into the first stage of the programme and this will be signalled on the display, if you do not want to continue with this programme, press the ↑ key.

OPT 1

- Mount the **rim without the tyre** on the balancing machine
- Turn it until the valve (or hole) is at 12 o'clock.
- Press ↵ .
- Make the first spin (as instructed by the displays).

At the end of the spin, the programme goes into its second stage.

OPT 2

- Remove the rim from the balancer
- Put the tyre on the rim. Put the tyre on the balancer
- Turn it until the valve is at 12 o'clock (see Fig. 16)
- Press ↵ .
- Make the second spin.

At the end of the spin, the programme goes into the 3rd stage of the OPT programme.

OPT 3

- Turn the wheel until the segment in the middle of the screen lights up to indicate the position
- Make a chalk mark on the **outside wall** of the tyre at 12 o'clock
- Remove the wheel from the balancer
- Turn the tyre on the rim until the chalk mark is opposite the valve (i.e. 180°)

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- Remount the wheel until the valve is at 12 o'clock
- Press ↵ .
- Make the tird spin.

At the end of the spin, the programme goes into its fourth and last stage.

OPT 4

- Turn the wheel until the segment in the centre lights to indicate the correct position
- Make **two chalk marks** on the **outside** wall of the tyre at 12 o'clock. If the screen gave you the message to switch around the tyre as it is mounted on the rim, make these two chalk makes on the **inside** wall of the tyre
- Turn the tyre on the rim (and switch it around if this is called for) so that the two chalk marks are opposite to the valve
- Mount the wheel on the balancer.
- Turn the wheel until the valve is at 12 o'clock
- Press ↵ .
- Make the 4th spin.

When this 4th spin has finished the OPT programme has been completed and the machine will display the weights to be added to balance the wheel.
If you make an error which will negatively affect the end result, the machine will tell you this by displaying a message: Opt Err. This means the entire procedure should be repeated from the beginning.

NOTES

- If you do not want to make the first spin with just the empty rim, you can skip the first phase by hitting the F key immediately after pressing the key for the OPT programme. This will mean that you start by mounting the rim plus tyre on the balancer and carrying out phases 2,3,4 as previously described.
- At the end of the 2nd and 3rd spin you may get the message OUT 1 or OUT 2 on the screen. This means that you are better off abandoning the programme by pressing the ↑ key. The display will then give the weights needed to balance the wheel. This allows you to short cut the programme by accepting the current status without goig all the way. If you want to carry on the end, press the F key and you will continue in the OPT programme.
- At the end of the 3rd spin the screen may suggest switch the tyre around on the rim. If you do not want to or cannot do this, press key F. The screen will display instructions on how to complete the OPT programme without making this switch.

QUICK OPT PROGRAM

In the vast majority of cases this program gives results almost as good as the full OPT program described above, although it requires fewer spins.

Proceed as outlined above in the previous heading with the difference that the first stage of the quick optimization program corresponds to the second stage of the standard program.
You therefore start work with the tyre already on the rim and then proceed with the successive stages.

CALIBRATION PROGRAM

First sensitivity calibration

This program needs to be run whenever the settings appear to be out of tolerance or when the machine requests self-calibration spontaneously by displaying the message "Er1 CAL".

- Select a wheel of **average size and weight, (preferably with a limited unbalance)**, and fit to the shaft.
- Enter the correct geometrical data for the wheel.
- Press the ↑ ↓ keys until the CAL program indicator lights up.
- Press ↵ to confirm selection of the program.
- The machine is now ready to carry out **first sensitivity** calibration and will display the message "CA.1".
- Rotate the wheel to the point denoted by the position indicator and by the appearance of the value "100" (or 3.5" if 'ounce' mode is selected) in the display.
- Attach a 100 g (or 3.5 oz) sample weight to the OUTSIDE of the wheel rim, positioning at 12 o'clock exactly.
- Make a first spin.
- Once the wheel is at standstill, remove the sample weight from the inside plane and rotate the wheel to the point denoted by the position indicator and by the appearance of the value "100" (or 3.5") in the display.
- Attach the 100 g (or 3.5 oz) sample weight once again to the **OUTSIDE** of the wheel rim, at 12 o'clock exactly.
- Make a second spin.

If the calibration program has been completed successfully, this will be confirmed by a beep following the spin. If not, the message "Er3 CAL" is displayed.
The self-calibration program ends with the display showing the unbalance values for the wheel (ignoring the sample weight).

Notes

- Remember to **remove the 100 g (3.5 oz) sample weight** at the end of the procedure.
- The F key can be pressed at any given moment to abort the calibration procedure and return to the program selected previously.
- **THE CALIBRATION DESCRIBED ABOVE IS VALID FOR ANY TYPE OF WHEEL**.

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Second sensitivity calibration

This programme is used to self-calibrate the machine to make it extremely accurate even with **very high Unbalance values** (over 200g of static Unbalance with average size wheels). It should be done when the machine itself calls for by displaying the message "Er2 CAL".

- Select a wheel of **average size and weight, (preferably with a limited unbalance)**, and fit to the shaft.
- Enter the correct geometrical data for the wheel.
- Press the ↑ ↓ keys until the CAL program indicator lights up.
- Press **twice** ↵ to confirm selection of the program.

  The machine is now ready to carry out **second sensitivity** calibration and will signal this with the message "CA.2".
- Follow all the steps outlined above for first sensitivity calibration.

Gauge calibration

This procedure serves to calibrate the automatic gauge potentiometers. It must be carried out when requested by the machine (i.e. when the „Er5 CAL" message appears) or when there is a discrepancy between measured wheel data and the real values.

- Move the internal automatic gauge to its „completely in" position and turn it entirely towards the front part of the machine.
- Press thei ↑ ↓ keys until the CAL program LED lights up.
- Press the ↵ key **three times** to confirm.
- Press F to perform calibration.

  If calibration is successful an acoustic confirmation message is given.

The error message "**Err 20**" indicates that the position of the gauge during calibration is not correct. Position it correctly as described above and repeat the procedure.

DISPLAY MESSAGES

The machine can recognize a certain number of incorrect operation and will signal them with appropriate messages on the displays.

Error display

Er1 CAL Error in first sensivity calibration.
The first sensivity calibration procedure should be done.

Er2 CAL Error in second sensivity calibration.
Second sensivity calibration should be done.

Er3 CAL Calibration has been done without using the 100 g standard weight.
Repeat calibration with the weight.

Er4 CAL First sensivity calibration has been done with a tyre with a too high Unbalance.
Balance the wheel (or at least reduce its Unbalance) and repeat calibration.

Er5 CAL Gauge calibration error.

Carry out gauge calibration.

Err 7 The machine cannot give the data asked for. Do a spin and repeat the request

Err 10 - Internal distance gauge not in rest position (completely in) when the machine is turned on. Turn off the machine, return the gauge to its correct position and turn on again.

- Potentiometer malfunction. Press the  key to disable the gauges and enter the data from the keyboard.

Err 11 Diameter potentiometer malfunction. Press the  key to disable the gauges and enter the data from the keyboard.
Contact technical assistance for help.

Err 20 Gauges not in correct position during calibration.
Move them to the correct position and repeat calibration.

Alu Err Incorrect wheel data have been input for an aluminium wheel balancing programme (ALU). Correct the data.

OPT Err Error made during the OPT procedure (optimization). Repeat from the beginning.

Cr Err Spin made with wheel guard up.

Other messages

CA.1 (GO)		First sensivity calibrating spin
CA.2 (GO)		Second sensivity calibrating spin
GO	**Alu**	Spin with Alu programme
GO	**d15**	Spin with Motorcycle Dynamic programme
GO	**A15**	Spin with Motorcycle Alu programme
GO	**CTS**	Spin with CTS programme
St		Spin with static balancing programme
CCC CCC		Unbalance higher than 255 grams.

USING THE PEDAL BRAKE TO HOLD THE SHAFT IN POSITION

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The pedal brake is only to be used when the machine has stopped and you want to hold the shaft balancing weights on the wheel.

If you have to brake the wheel in an emergency situation while it is been spun by the motor, first hit to disengage the motor and then use the footpedal.

BALANCING ACCESSORY AVAILABILITY STATUS

This check permits you to make sure that wear has not alterated the mechanical specifications of flanges, cones and so on beyond the specified limits.
The test is carried out with a perfectly balanced wheel (to zero without the thresold and showing the first gram). When this wheel is mounted on the balancer, removed and remounted in a differrent position the unbalance weight shown should not be more than 10 grams.
If the unbalance is higher, check all the accessories with care and replace any that show dents, abnormal wear, bent flanges and so on.
Always remember that if you are using a cone to center the wheel on the shaft, you will never get good results if the centre hole in the rim is not perfect, i.e. off center or out-of-round. Results are always better when the wheel is centered with the rim holes.
A last important point: any difference between the way the wheel is mounted on the car and on the balancing machine will generate some unbalance.
This can only be eliminated with 'on vehicle balancing' using a finishing balancer to complement the work of the bench balancer.

USING THE AUTOMATIC CLAMPING DEVICE (only on the QL version)

The balancing machine is used like any other fixed threaded shaft model.

Front cone centering

- Place the wheel on the shaft and slide it forward until it is firmly up against the flange.
- Slide the correct cone along the shaft until it seats in the hole in the rim.
- Press the footpedal to move the threaded shaft towards the outside.
- Slide the spinner along the threaded shaft until it is firmly up against the cone.
- Release the control pedal so that the threaded shaft comes back to its home position and clamps the wheel against the flange.

Rear cone centering

- Slide the spring along the shaft.
- Slide the right cone for the wheel's hole along the shaft.
- Slide the wheel along the shaft until the cone is seated in the center hole.
- Press the footpedal to move the threaded shaft towards the outside.
- Slide the spinner along the threaded shaft until the plastic cap touches the rim. Press it firmly against the rim to preload the spring.
- Release the control pedal so that the threaded shaft comes back to its home position and clamps the wheel against the flange.

Centering with flanges

- Place the flange on the shaft.
- Press the footpedal to move the threaded shaft towards the outside.
- Insert the keep turning it clockwise.
- Release the control pedal so that the keep clamps the flange onto the shaft.

Instructions on the correct use of the QUICK LOCK device

To keep the automatic locking device in a perfect state of efficiency, it is advised to follow the instructions given below:

- Never uncouple the spinner with the wheel clamped. Always unclamp the wheel first, using the pedal.
- Keep the balancer spinner clamps and threaded hub clean, so that the two parts can couple together efficiently. Use diesel oil for cleaning.
- Before releasing the wheel clamping control pedal, always ensure that the spinner clamps are properly coupled in to the threaded hub.
  If you are not sure of the coupling, simply rotate the spinner about half a turn to couple in properly.
- Do not allow the rim disk, especially the edge of the central hole, to get nipped between the mobile threaded hub and the fixed part of the shaft, either during the clamping of the wheel or when the threaded hub goes back to the rest position after an unclamping action.
  To prevent this, it is enough to ensure that the centring cone is correctly positioned in the rim hole during the above operations.

NOTES:

- If in the unlikely event that the control valve jams or an air hose breaks, **the machine continue to be used as a normal balancer with a set position threaded shaft section. This also means that it can continue to work if there is no compressed air supply or problems with the tyre shop compressed air circuit.**
- If an incorrect operation is done, e.g., the wheel is released while still spinning, the lock spinner will still prevent the wheel from coming off the shaft.
  If this kind of mistake has been made, the spin should be cancelled, the wheel reclamped and the spin repeated.
- The **Quick Lock** wheel clamping system is compatible with practically all accessories used on machines without the automatic clamping system.

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TROUBLE SHOOTING

Listed below are faults that the user can remedy if the cause is found to be among those indicated.
Any other defect or malfunction will require the attention of a qualified technician: contact your nearest Corghi service centre.

Machine fails to switch on, with no light showing at the main switch

No power at the socket
➥ Test the mains voltage
➥ Check the electrical power circuit installed in the workshop

Defective mains plug
➥ Check the integrity and efficiency of the plug, and replace if necessary

The mains/battery selector is set to "battery" but the battery is either disconnected or flat
➥ Connect the battery to the machine by means of the cable supplied, and check the charge level

Machine fails to switch on, even with the light showing at the main switch

One of the fuses F1, F2, F3 at the circuit board has blown
➥ Replace the blown fuse

The mains/battery selector is set to "battery" but the battery is disconnected
➥ Switch the selector over to "mains", or connect the battery and check the charge level

Wheel fails to spin when START lever is pulled upwards

The wheel guard is raised
➥ Lower the guard

Machine gives discontinuous unbalance values

The machine has been jolted or destabilized during the spin
➥ Repeat the spin, taking care not to disturb the machine while data acquisition is in progress

The machine is not planted stably on the floor
➥ Verify the stance and adjust the feet, utilizing shims if necessary

The wheel is not properly clamped
➥ Tighten the spinner so that the wheel is firmly restrained

Several spins are needed to balance a wheel

The machine has been jolted or destabilized during the spin
➥ Repeat the spin, taking care not to disturb the machine while data acquisition is in

progress

The machine is not planted stably on the floor
➥ Verify the stance and adjust the feet, utilizing shims if necessary

The wheel is not properly clamped
➥ Tighten the spinner so that the wheel is firmly restrained

The wheel dimensions entered are incorrect
➥ Verify the dimensions and program correctly

The machine is not properly calibrated
➥ Run the calibration procedure

WARNING

Possession of the "spare parts" book does not authorize the user to perform any servicing or repair operation on the machine beyond what is specifically directed in the operator's manual. Users are nonetheless encouraged to provide service technicians with accurate information on any fault or malfunction to the end of minimizing callout times.

MAINTENANCE

WARNING

Corghi declines all liability for claims deriving from the use of non-original spares or accessories.

WARNING

Before making any adjustments or performing maintenance, disconnect the electrical supply from the machine and make sure that all moving parts are suitable immobilised.
Do not remove or modify any parts of this machine except in the case of service interventions.

ATTENTION

Keep the work area clean
Do not clean the machine with compressed air or jets of water.
When cleaning the area take steps to avoid raising dust as far as possible.
- Keep the balancer shaft, the spinner, the cones and centring flanges clean. These components can be cleaned using a brush soaked in naphtha.
- Handle cones and flanges with care to avoid the risk of dropping them and causing damage that would affect centring precision.
- When not in use store cones and flanges in a place where they are protected from dust and dirt.
- The pressure limiter/filter has a semi-automatic condensate drain system. This device opens automatically whenever the compressed air supply to the machine is interrupted. The condensate must be drained off manually (button A fig.9a) when the

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level is higher than the mark X (fig.9a).
- Use ethyl alcohol to clean the level window.
- Calibrate the machine at least once every six months.

DEMOLITION

If the machine is to be scrapped, remove all electrical, electronic and plastic components and dispose of them separately as provided for by local legislation.

RECOMMENDED FIRE-EXTINGUISHING DEVICES

When choosing the most suitable fire extinguisher consult the following table:

Dry combustibles	
Water	**YES**
Fuam	**YES**
Dry chemical	YES*
CO^2	YES*

YES* U*se only if more appropriate extinguishers are not on hand and when the fire is small.*

Inflammable liquids	
Water	NO
Fuam	**YES**
Dry chemical	**YES**
CO^2	**YES**

Electrical fires	
Water	NO
Fuam	NO
Dry chemical	**YES**
CO^2	**YES**

WARNING

The indications in this table are of a general nature. They are designed as a guideline for the user. The applications of each type of extinguisher will be illustrated fully by the respective manufacturers on request.

GLOSSARY

Balancer FLANGE
Disk that mates with the disk of the wheel mounted to the balancer. The flange also serves to keep the wheel perfectly perpendicular to its axis of rotation.

BALANCING CYCLE
Sequence of operations performed by the user and the machine, starting from the start of the wheel spin to the time that the wheel is braked to a standstill after the unbalance signals have been acquired and the relative values calculated.

CENTRING
Procedure for positioning the wheel on the spin shaft with the aim of ensuring that the rotational axis of the wheel is aligned with the centre of the shaft.

Centring FLANGE (accessory)
Device serving to support and centre the wheel. Also keeps the wheel perfectly perpendicular to its axis of rotation.
The centring flange is mounted to the balancer shaft by means of its centre hole.

CONE
Conical components with centre hole which, when inserted on the spin shaft, serves to centre wheels with centre holes whose diameter is between maximum and minimum values.

DYNAMIC BALANCING
Operation in which unbalance is corrected by the application of two weights, one on each side of the wheel.

SELF-CALIBRATION
A procedure whereby suitable correction coefficients are calculated by starting from known operating conditions. Self- calibration improves the measurement precision of the machine by correcting, within limits, calculation errors that may arise due to alteration of the machine's characteristic over the course of time.

SPIN
Procedure starting from the action that causes thee wheel to rotate and the successive free rotation of the wheel.

SPINNER
Device for clamping the wheel to the balancer. The spinner features elements for engaging to the threaded hub, and lateral pins that are used to tighten it.

STATIC BALANCING
In static balancing only the static component of unbalance is corrected. This is achieved by fitting a single weight - usually at the centre of the rim channel. The accuracy of this system increases as the width of the wheel decreases.

THREADED HUB
Threaded part of the shaft that is engaged with the spinner to clamp the wheel. This component is supplied disassembled from the machine.

UNBALANCE
Non-uniform distribution of the wheel mass that results in the generation of centrifugal force during rotation.

DIAGRAMS

General electric layout

Cod. 438776B

A1	Power supply and controls card
A2	Master card
A3	Search card
B1	Internal pick-up
B2	External pick-up
F1	Fuse 3.15A (A1)
F2	Fuse 500mA (A1)
F3	Fuse 500mA (A1)
F1	Fuse 3.15AT (T1)
F2	Fuse 3.15AT (T1)
F3	Fuse 2AT (T1)
L1	Motor coil
L2	Motor brake
M1	Motor
Q1	Main switch
S1	Safety guard microswitch
T1	Power supply transformer
X1	Power supply socket
X2	Separate connection
Z1	Motor filter

General pneumatic layout

Cod. 438637

1	Quick coupler - female
2	Regulator filter
3	Gauge Ø40
4	3 way, 2 position valve
5	Silencer filter
6	Throttle connection
7	QL single acting cylinder

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Italiano Illustrazioni e schemi

English Illustrations and diagrams

Français Illustrations et schémas

Deutsch Bilder und Zeichnungen

Español Ilustraciónes y esquemas

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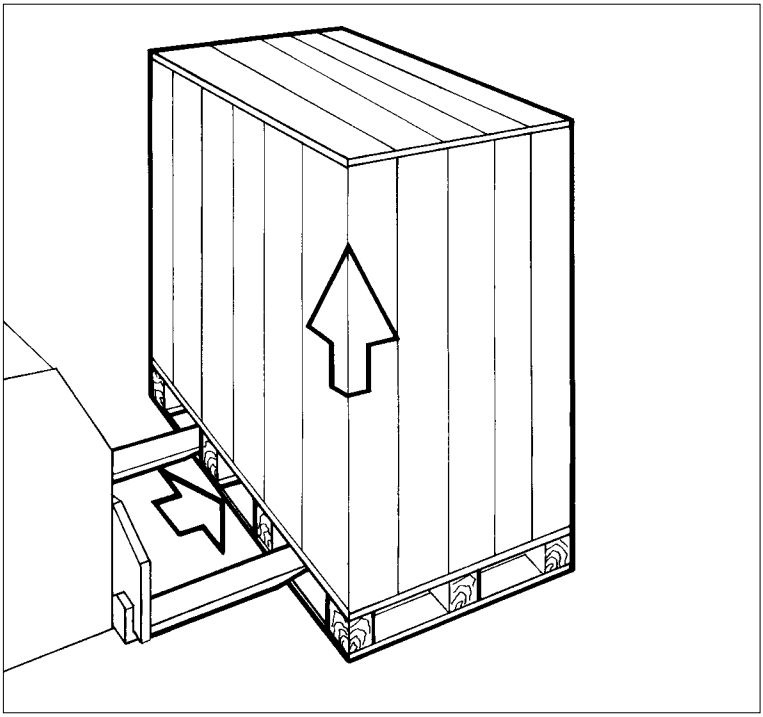

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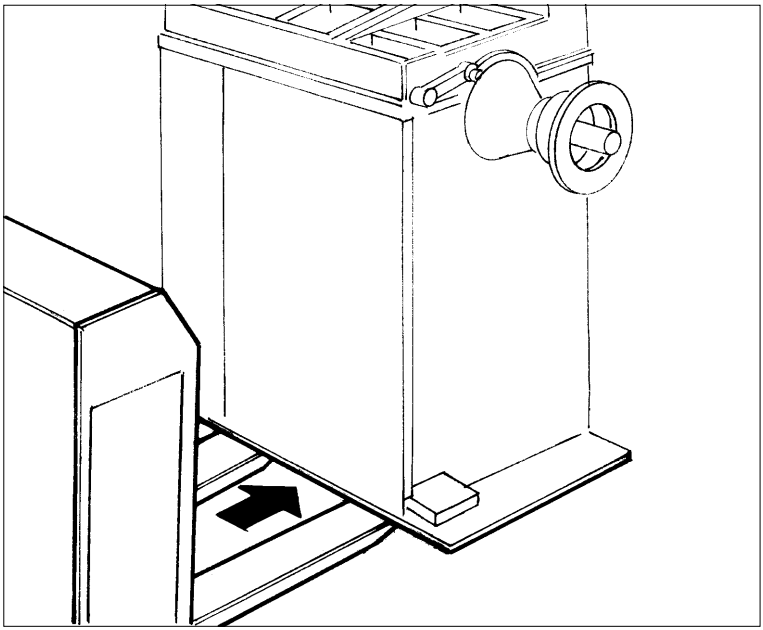

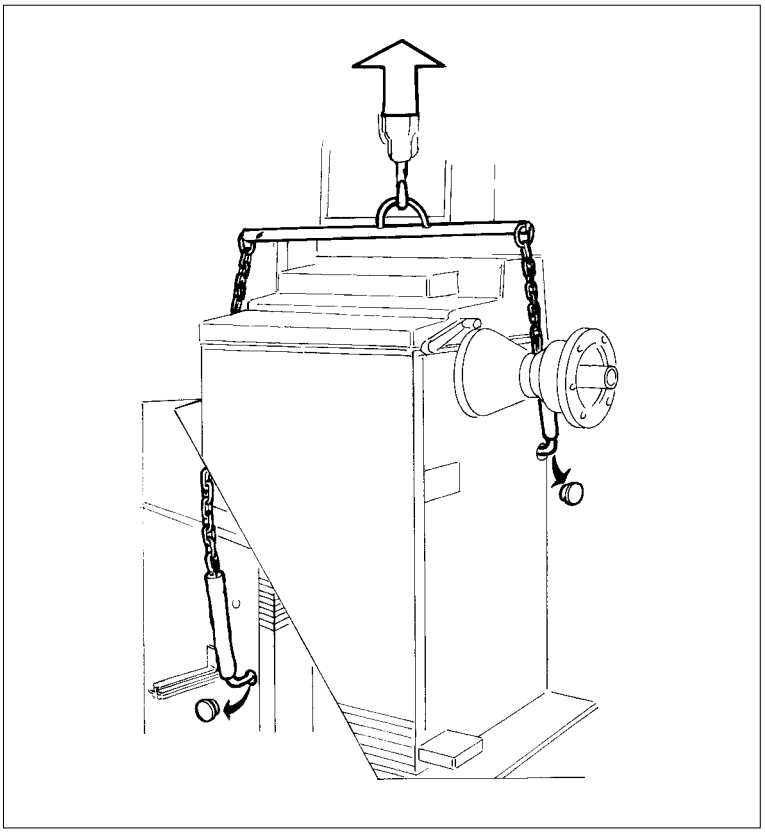

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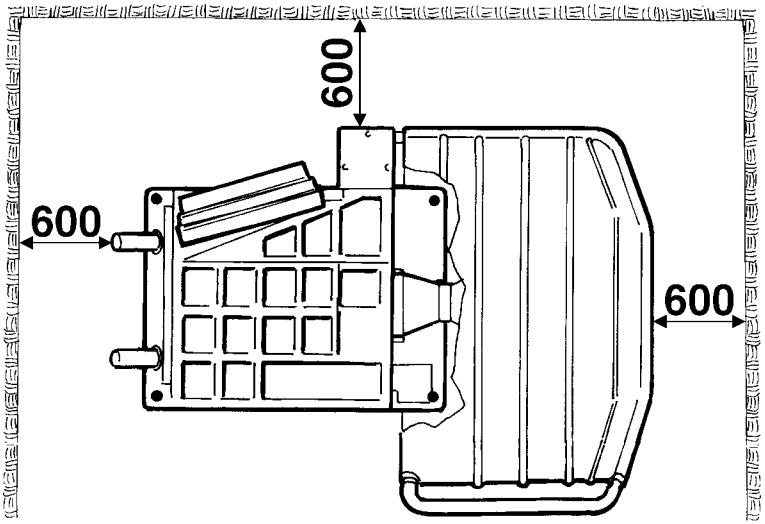

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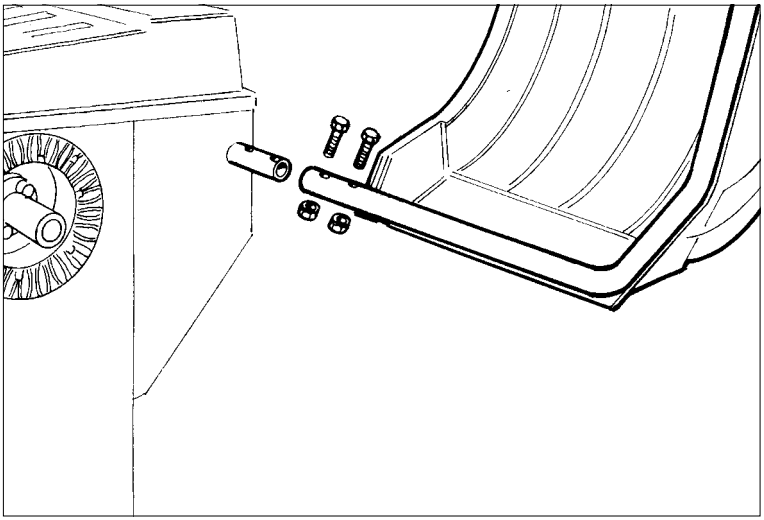

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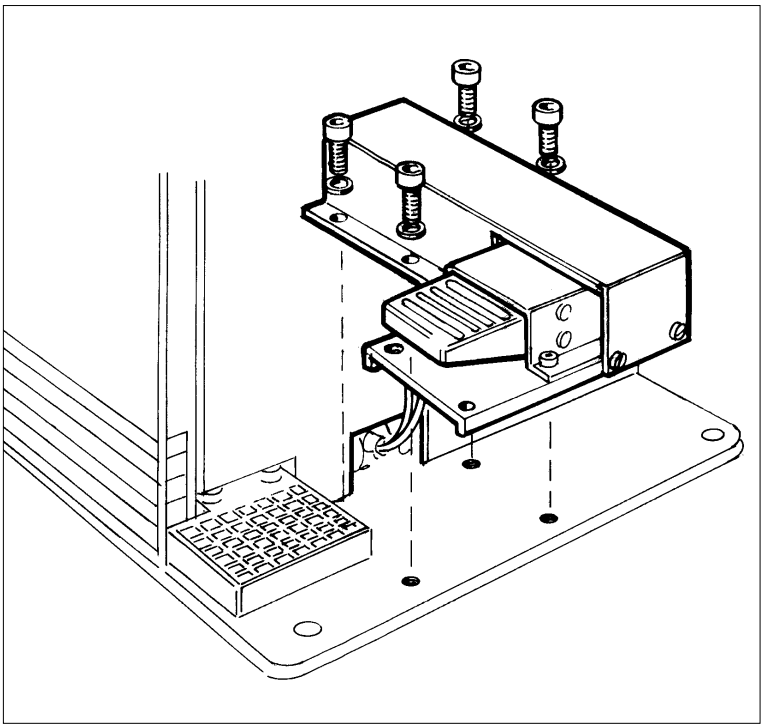

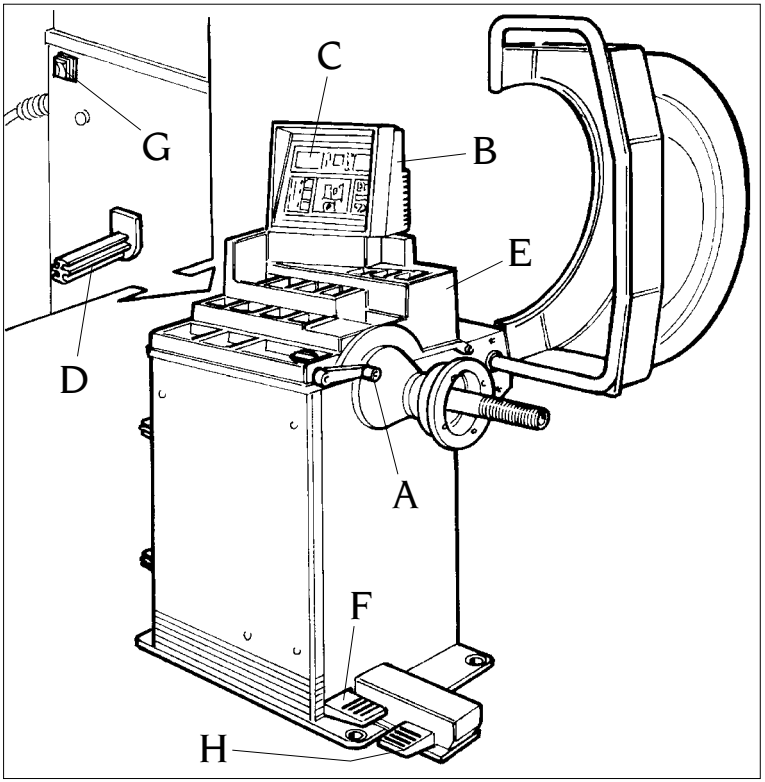
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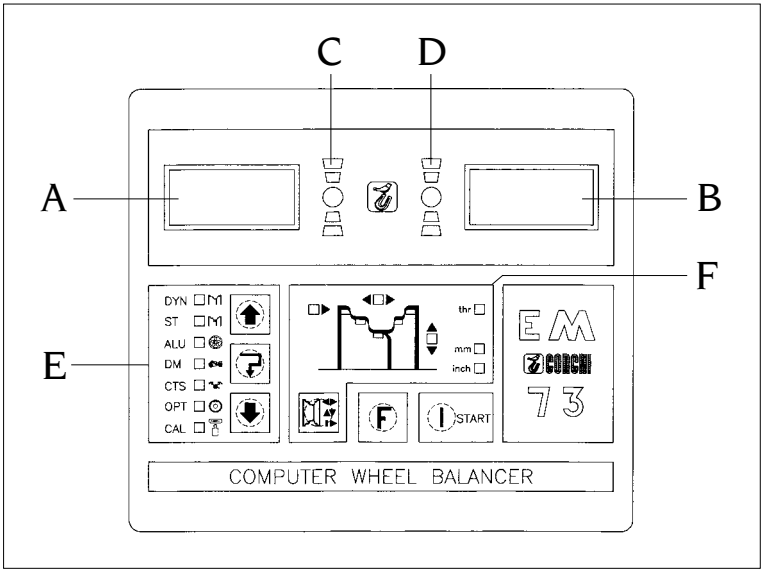
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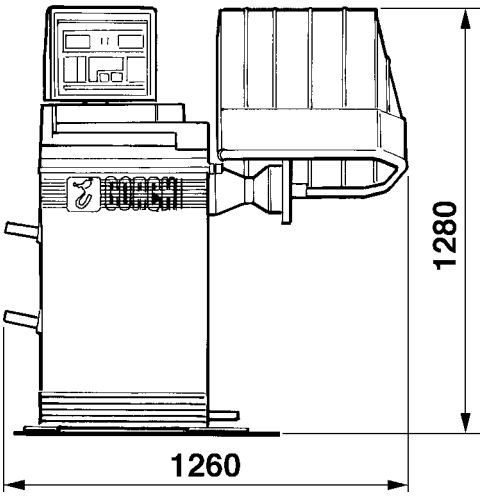

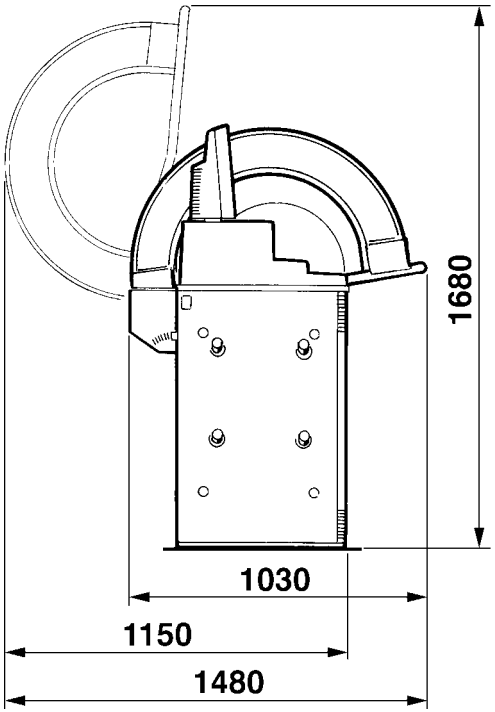

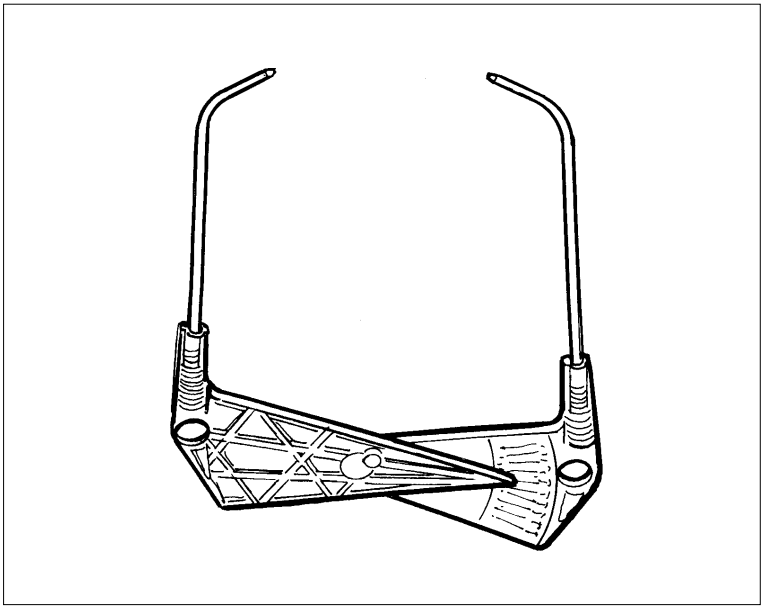

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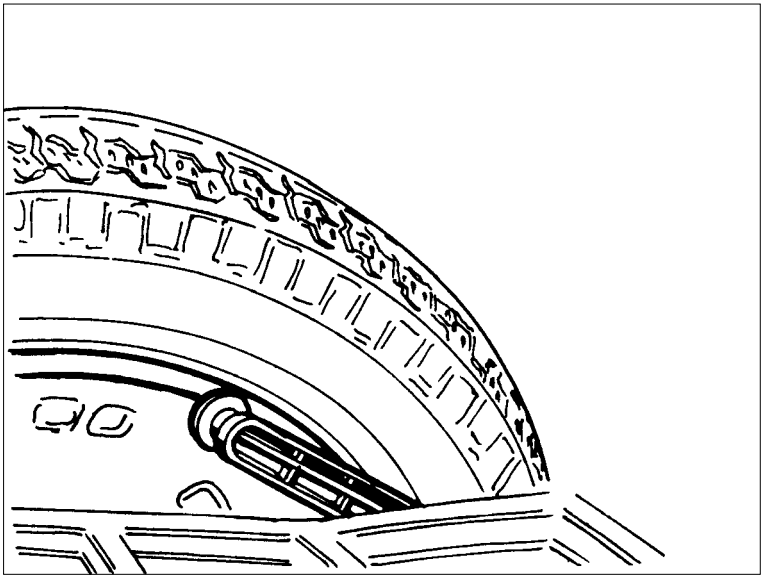

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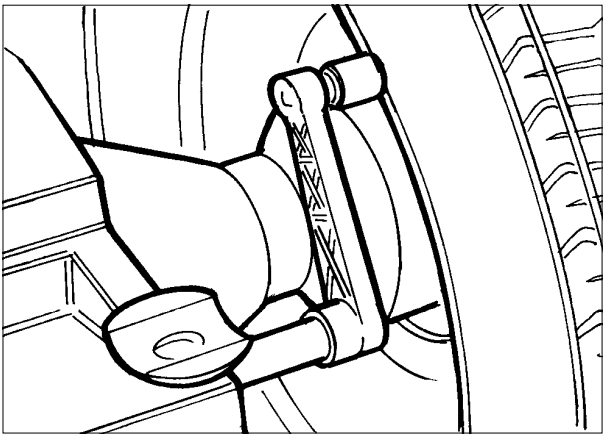

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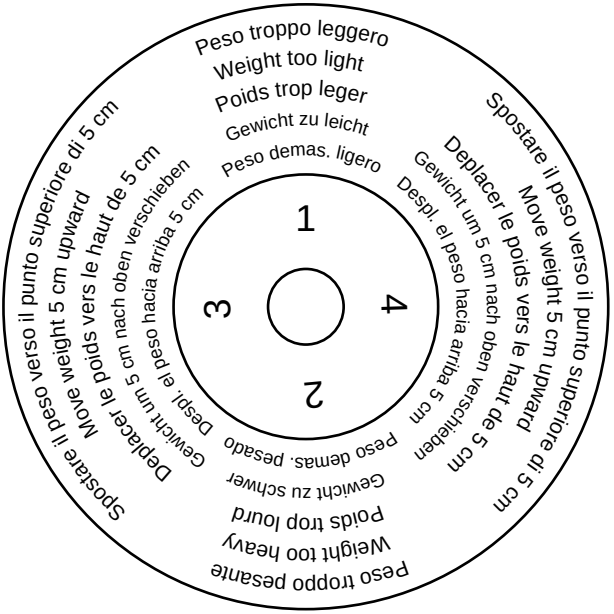

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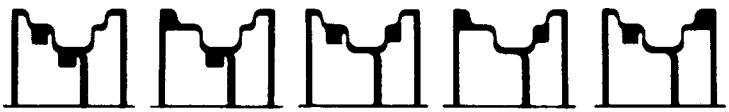

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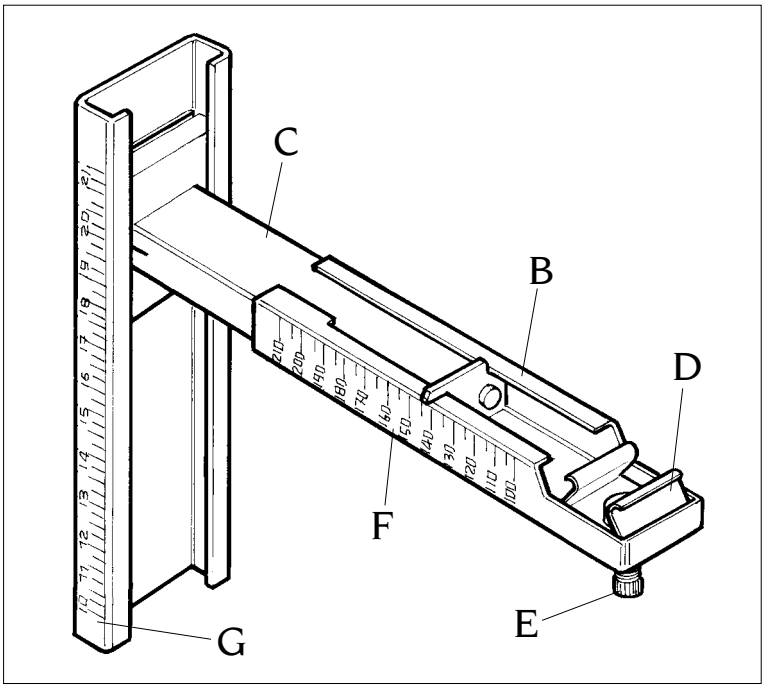
ALU 1P

ALU 2
ALU 2P

ALU 3

ALU 4

ALU 5



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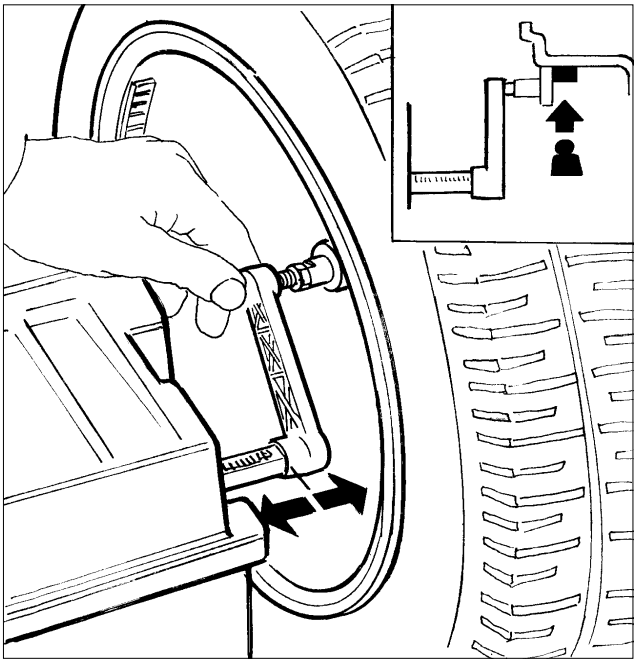

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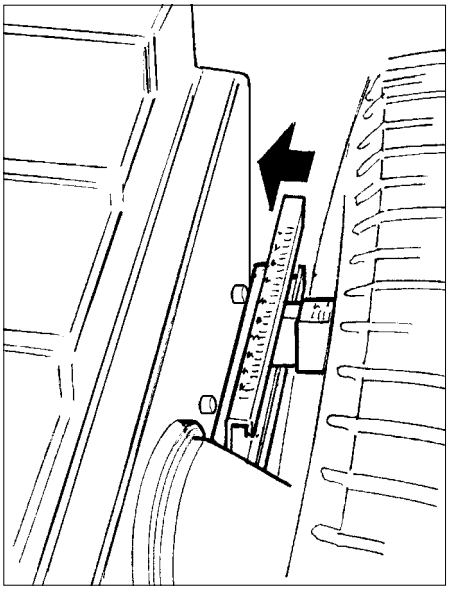

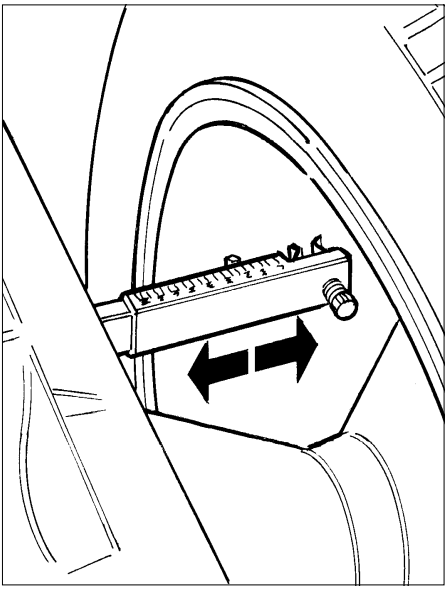

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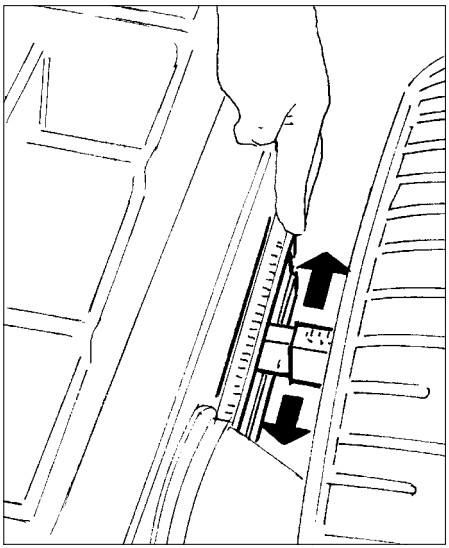

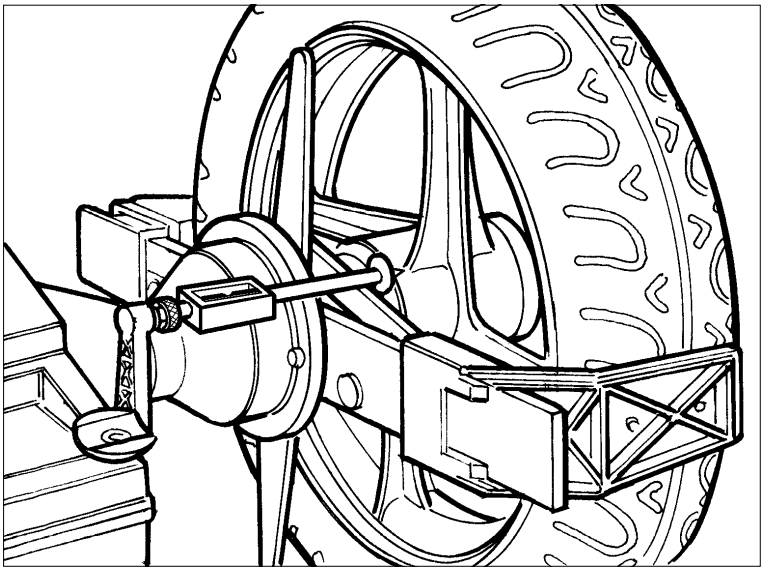

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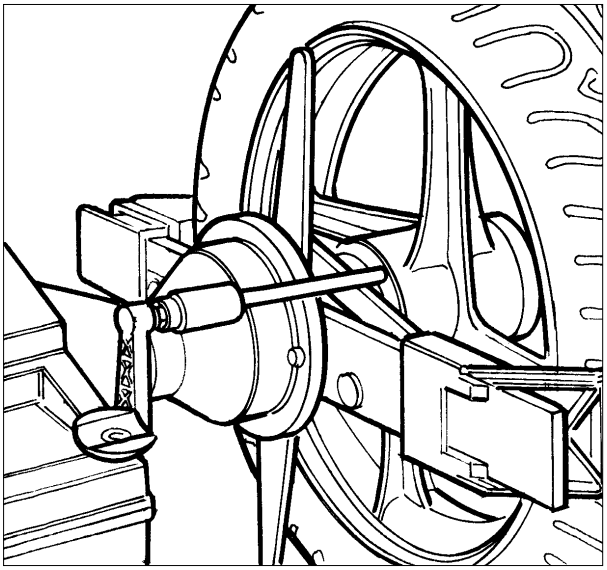

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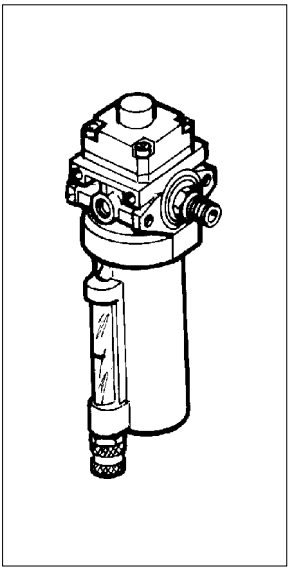
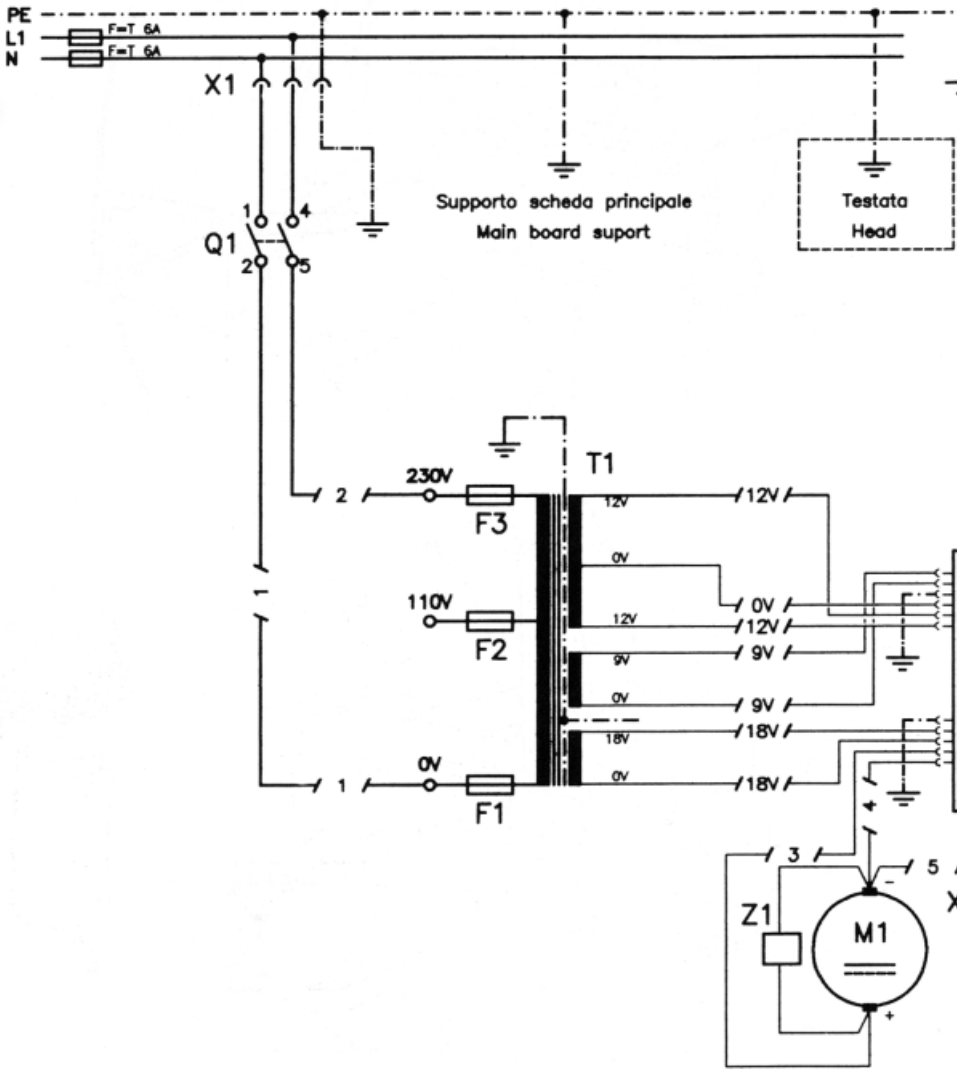
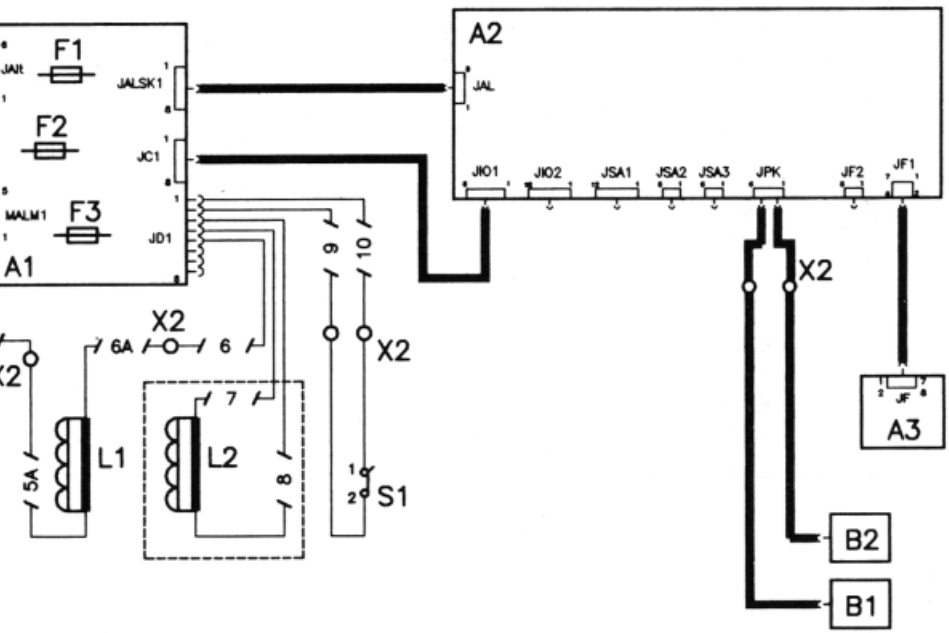
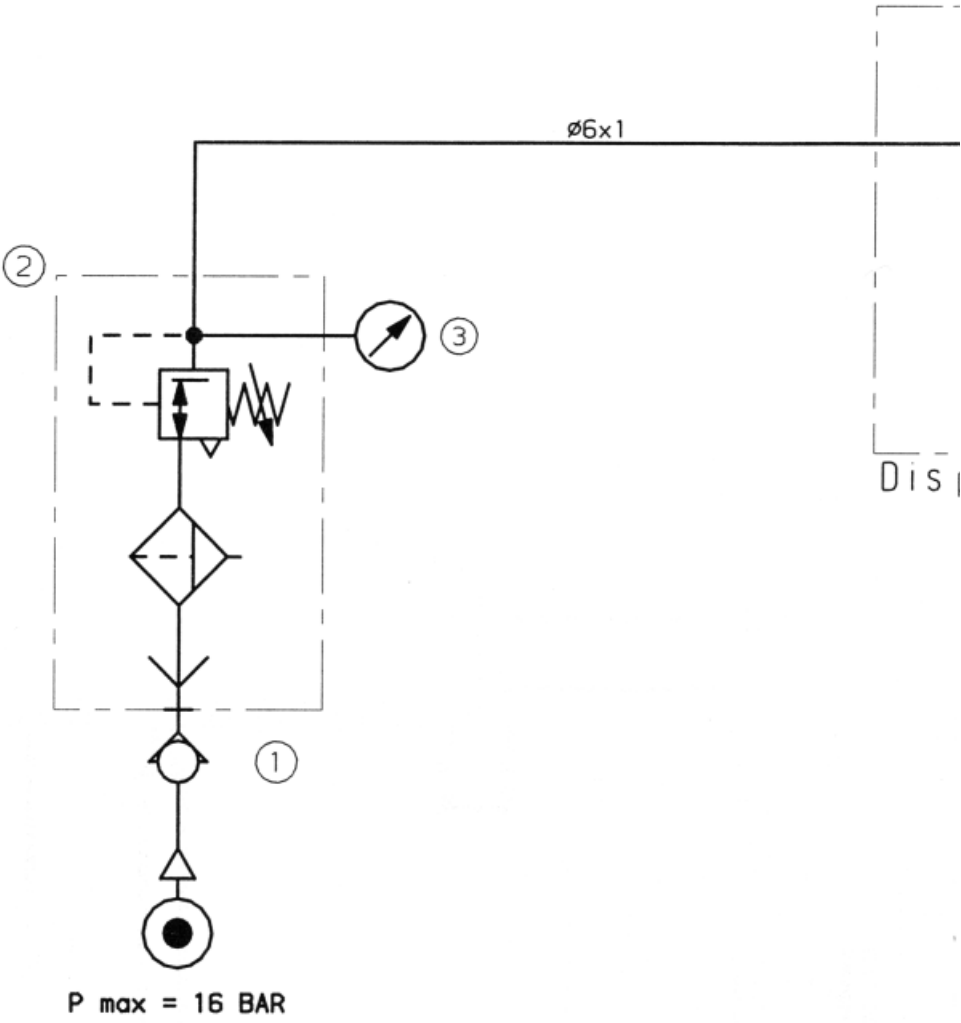


10

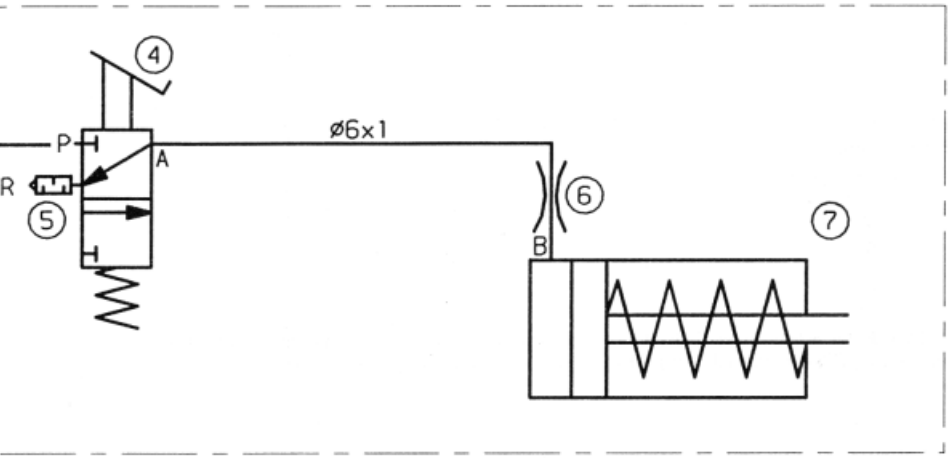

PE
L1
N
F=T 6A
F=T 6A
X1
Q1
1
2
4
5
Supporto scheda principale
Main board suport
Testata
Head
T1
230V
F3
110V
F2
0V
F1
2
1
12V
0V
12V
9V
0V
18V
0V
12V
0V
12V
9V
9V
18V
18V
3
5
Z1
M1
+
-

438776b


A2
JAL
JIO1
JIO2
JSA1
JSA2
JSA3
JPK
JF2
JF1
F1
JALSK1
F2
JC1
MALM1
F3
JD1
A1
X2
6A
6
7
9
10
X2
X2
5A
L1
L2
8
1
2
S1
X2
JF
A3
B2
B1



438637_2



positivo O.L.

Dichiarazione CE di conformità

Noi CORGHI SPA, Strada Statale 468 n°9, Correggio (RE), ITALY, dichiariamo che il prodotto

equilibratrice EM 73

al quale questa dichiarazione si riferisce è conforme alle seguenti norme o ad altri documenti normativi:

EN 292 del 09/91

in base a quanto previsto dalle direttive 89/392/CEE modificata con le direttive 91/368/CEE, 93/44/CEE e 93/68/CEE.

Correggio, 01 / 10 / 94

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CORGHI S.p.A.
E. Santoro

IMPORTANTE: La dichiarazione CE di conformità decade nel caso in cui la macchina non venga utilizzata unicamente con accessori originali CORGHI e/o comunque in osservanza delle indicazioni contenute nel Manuale d'uso.

Il modello della presente dichiarazione è conforme a quanto previsto nella EN 45014.

EC statement of conformity

We, CORGHI SPA, Strada Statale n°9, Correggio (RE), ITALY, do hereby declare, that the product

EM 73 wheel balancer

to which this statement refers, conforms to the following standards or to other regulatory documents:

EN 292, 09/91

with reference to directives 89/392/EEC amended with directives 91/368/EEC, 93/44/EEC and 93/68/EEC.

Correggio, 01 / 10 / 94

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CORGHI S.p.A.
E. Santoro

IMPORTANT: The EC Conformity Declaration is cancelled if the machine is not used exclusively with CORGHI original accessories and/or in observance of the instructions contained in the user's manual.

The form of this statement conforms to EN 45014 specifications.

UPT - Cod.439280 - 01/96 - 1000.