



# **EM 43**

Cod.444501 - 5.1 del 04/03

Italiano

Manuale d'uso

English

Operator's manual

Français

Manuel d'utilisation

Deutsch

Betriebsanleitung

Español

Manual de uso

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Español

Elaborazione grafica e impaginazione

**U**fficio **P**ubblicazioni **T**ecniche

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# INTRODUCTION

The purpose of this manual is to furnish the owner and 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 operating 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.

The technical documentation supplied is considered an integral part of the machine; in the event of sale all relative documentation must remain with the jack.

The manual is only valid for the machine model and serial number indicated on the nameplate applied to the machine itself.



## **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 is shipped in two cardboard boxes: one containing the balancing unit (D, fig 3), the other containing the components of the casing (A, B, C, E, F, G, fig 3) and the equipment kit.
- The balancer must be brought to the installation site in its original packing, in the position indicated on the packing itself. The two boxes should be carried by hand, or wheeled on a trolley.
- Balancer unit packing dimensions:
  - length 770 mm;
  - depth 560 mm;
  - height 430 mm.
- Balancer unit shipping weight:
  - 34 kg version with motor;
  - 30 kg Hand Spin version.
- Packing dimensions of other components:
  - length 770 mm;
  - depth 560 mm;
  - height 310 mm;
- Shipping weight of other components: 29 kg.
- If the machine is to be stored, select a location in which the following conditions can be maintained:
  - relative humidity from 20% to 95%
  - ambient temperature from -10 to +60°C.



## ATTENTION

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

After installation, the machine must be moved manually by two people, gripping with the hands on the lower part of the balancer unit, next to the jutting out part of the support underneath.

An alternative lifting method is to insert the forks of a lifting truck under the machine so that the center of the forks corresponds approximately to the right side of the cabinet (fig.1).



## ATTENTION

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

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

If the machine is moved frequently, you are advised to use an external 12 V battery power supply, requesting the special kit with the leads and terminals for connection to a car battery or the cigar lighter socket.

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# INSTALLATION



## WARNING

Take particular care over the unpacking, assembling and installing operations described in this heading.

**Failure to exercise caution can result in damage to the machine and place the operator at risk.**

Position the boxes as indicated on the markings, then remove. **The packing should not be discarded, but kept in the event that the machine has to be moved at a future time.** Select the site of installation, observing current regulations on safety in the workplace.



## ATTENTION

**If the machine is to be installed outdoors it must be protected by a canopy roof or by suitable means that will prevent water from penetrating inside the head unit.**

Ensure that the following operation conditions can be guaranteed on site:

- relative humidity from 30% to 95% (without condensation);
- ambient temperature range from 0°C to +55°C.



## WARNING

**The machine must not be operated in a potentially explosive atmosphere.**

Position the machine on the selected spot, making certain that the space around the machine is sufficient at least to ensure the clearance as indicated in fig 2.

**IMPORTANT:** for correct, safe use of the equipment, users must ensure a lighting level of at least 300 lux in the place of use.

If the machine is supplied unassembled, proceed with assembly as follows:

- fit the three feet (G, fig 3), one to the casing (B, fig 3) and two to the base (C, fig 3);
- assemble the two casing panels (A, B, fig 3) using eight M8 bolts (heads on the outside, nuts on the inside);
- fit the base to the assembled casing using four M8 bolts with relative nuts and washers;
- position the balancing unit (D, fig 3) on the casing and fix with four M8 bolts;
- fit the two flange-holders (F, fig 3);
- secure the threaded hub to the shaft utilizing a hex wrench of the appropriate size;
- check that the machine is positioned stably on the floor.

If the machine is equipped with a wheel guard, fit the guard as follows:

- fit the two parts B and C to the column A as indicated in fig 4;
- locate the vertical plate of the guard support between the base and the casing and secure using one of the four fixing bolts (1, fig 5). Locate the three spacers between the base and casing, one coinciding with each of the three remaining bolts;
- fix the horizontal plate of the guard support to the casing utilizing the two bolts by which the balancing unit is connected to the casing beneath (2, fig 5).

**N.B.** The horizontal plate must be positioned under the lip of the casing.

- Fit the plastic guard and the relative tube to the support (3, fig 5);

- adjust the foot of the guard support (E, fig 4);
- fit the plastic plug to the hole in the casing (B, fig 4), then pass the guard switch lead through this plug and through the plug in the bottom of the balancing unit;
- locate the lead under the lip of the casing (C, fig 4) and secure by means of two clips utilizing the two holes (D, fig 4);
- ensure that the machine is switched off, then open the weights tray, taking care not to pull on the wires connected to the main circuit board;
- detach the red faston connector from the diode bridge, attach the male faston connector of the wheel guard switch lead, then attach the female faston connector of the switch lead to the free contact of the diode bridge (fig 6);
- shut the tray and check that the wheel spins as it should when the guard is lowered.

If the machine is supplied with the kit for connection to an external 12 V power supply, the special cable must be fitted as follows (see fig 7):

- remove the plastic cover;
- pass the connector through the larger of the holes at the rear of the casing, from the outside to the inside;
- remove the Js6 connector from the circuit board and connect that of the external power socket cable in its place;
- fit the socket and the relative switch to the casing;
- refit the plastic cover;
- set the mains/battery switch for whichever power source is to be used;
- when using an external supply, connect one of the cables supplied (battery or cigar lighter) to the socket.

The final step of the installation procedure is to calibrate the machine (see relative heading).

### **Main parts of the machine** (fig.8)

- A distance and diameter gauge
- B display panel with keypad
- C flange holder
- D weights tray
- E START and brake lever
- F START button (versions with motor without guard)
- G master switch
- H external power socket (12V battery)
- I mains/battery power supply switch.

### **Display panel** (fig.9)

- A inside display (left)
- B outside display (right)
- C inside position indicator
- D outside position indicator
- E keys and Leds for selection and display of programs installed
- F key and Leds for entering 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 electrical hook-up operations must be carried out exclusively by a qualified electrician.**

- The electrical supply must be suitably sized in relation to:
  - absorbed power specifications indicated on the machine dataplate;
  - the distance between the machine and the power supply hook-up point, so that voltage drops under full load do not exceed 4% (10% in the case of start-up) below the rated voltage specified on the dataplate.
- The user must equip the machine with the following:
  - a dedicated power plug in compliance with the relevant electrical safety standards;
  - a suitable circuit-breaker (residual current set to 30 mA) on the mains connection;
  - power line fuses in accordance with specifications in the main wiring diagram of this manual.
  - a suitable earthing system installed on the workshop mains line.
- To prevent unauthorised use of the machine, always disconnect the mains plug when the machine is not used (switched off) for extended periods of time.
- If the machine is connected directly to the power supply by means of the main electrical panel and without the use of a plug, install a key-operated switch or suitable lock-out device to restrict machine use exclusively to qualified personnel.



## 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.**



# 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, authorised operator who is capable of understanding the written instructions given by the manufacturer, suitably trained and conversant with the safety regulations. Operators are expressly forbidden to use the machine under the influence of alcohol or drugs capable of affecting physical and mental capacity.

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.



## WARNING

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

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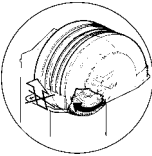
## Key to warning and instructions labels



Never use the shaft as a point from which to lift the machine.



Disconnect the plug from the power socket before carrying out any maintenance or repair work on the machine.



Do not raise the guard while the wheel is spinning.

## GENERAL SPECIFICATIONS

- Single spin fixed flange wheel balancing machine.
- Central processing unit with 16-bit microchip.
- Unbalance values displayed in grams or ounces.
- Resolution: 1 gr (1/10 oz).
- Low balancing speed.
- Variable speed data acquisition.
- STD version with motorized spin, or manual version (Hand Spin).
- External 12 V battery power supply kit (optional, for Hand Spin version).
- Wheel data reading gauge with ALU P adhesive weight positioning function.
- Flange holder.
- Wheel guard (optional).
- LCD digital display and Leds indicating:
  - value and position of unbalance.
  - program selection.
- Types of balancing:
  - Standard: dynamic balancing (both sides of rim).
  - Static: balancing on one side only.
  - Alu: 5 different programs for alloy wheels.
  - Alu P: facility of measuring effective positions for application of weights to alloy wheels.
  - Din Moto: dynamic balancing on both sides of conventional motor cycle wheels.
  - Alu Moto: dynamic balancing on both sides of alloy motor cycle wheels.
- **"Hidden weight"** program (in Alu P) in order to sub-divide the outer plane balancing adhesive weights into two equal weights positioned behind the rim spokes.
- OPT rim/tyre match optimization programs (standard and quick), reducing road noise.
- Calibration and diagnostics programs.

## TECHNICAL DATA

- Supply voltage ..... 110/220 V  $\pm$  10% single-phase  
(option of 12 V from external battery for Hand Spin version)
- Overall rated power: ..... motorized version 200W  
..... Hand Spin version 10W
- Balancing speed ..... 98 -140 rpm
- Average spin time (with 5"x14" wheel) ..... 9 sec
- Shaft diameter ..... 38 mm
- Ambient operating temperature ..... from 0 to 50°C
- Machine dimensions (fig.10):
  - width without guard ..... 870 mm
  - depth without guard ..... 580 mm
  - height without guard ..... 945 mm
  - width with guard ..... 980 mm
  - depth with guard lowered ..... 1030mm
  - depth with guard raised ..... 1310mm
  - height with guard lowered ..... 1230 mm
  - height with guard raised ..... 1650 mm
- Operating parameters:
  - rim width ..... from 1,5" to 20"
  - rim diameter ..... from 1" to 23"
  - maximum distance between wheel and machine ..... 230 mm
  - maximum wheel width (using guard) ..... 400 mm
  - maximum wheel diameter (using guard) ..... 870 mm
  - maximum wheel weight ..... 65 Kg
- Overall weight (without accessories) ..... 52 Kg
- Noise level in operation ..... < 70 dB(A)

## EQUIPMENT KIT

The following parts are supplied together with the machine:

- Weight clip pliers ..... code 900203841
- Threaded hub ..... code 900222099
- Wheel width measurement gauge ..... code 900223420
- 100 gram sample weight ..... code 900430573
- CH 4 hex wrench ..... code 900600714
- CH 6 hex wrench ..... code 900600906
- CH 10 hex wrench ..... code 900600910
- Flange attachment bolt ..... code 900222101

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# OPTIONAL ACCESSORIES

Please refer to Corghi accessories catalogue.

## GENERAL CONDITIONS OF USE

The equipment is intended for professional use only.



### WARNING

**Only one operator may work on the equipment at a time.**

Machines referred to in this manual are designed **exclusively** for balancing automotive road wheels within dimensional and operational limits as specified in the foregoing "Technical Data".



### WARNING

**Any use of the machine other than that described is regarded as unsuitable and rash.**



### ATTENTION

**The machine must not be installed and operated without the wheel clamp assembly.**



### WARNING

**Do not tamper with the safety switch.**



### ATTENTION

**Wheels must never be blasted with compressed air, steam cleaned or hosed with water while on the balancing machine.**



### WARNING

**The use of tools or accessories other than those supplied by Corghi when operating the machine is not recommended.**



### WARNING

**Learn all about your machine: knowing exactly how it works will be the best guarantee of safe operation and optimum performance.**

**Familiarize yourself with the layout of the controls and their respective functions.**


**Check carefully that each of the controls operates as it should.**

**To avoid any risk of accident and injury, the machine must be installed and operated correctly, and serviced regularly.**



# SWITCHING ON


Supply power to the machine by pressing the main switch on the side of the casing (F, fig. 8). Following a beep and a lamp test, the machine is ready to receive wheel data.

## WHEEL DATA INPUT




- Press key .


The machine is ready to receive the WIDTH (the corresponding LED will light).

- Measure rim width with the caliper (fig.11).
- Change the number shown on the right hand display using the   keys until the correct number is set.




WIDTH can be input in millimetres or a previous input can be converted from millimetres to inches. To do this press . To return to input in inches strike 'ENTER' 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 hand display with the   keys until the correct number is shown.


DIAMETER can be input in millimetres or a previous input can be converted into inches. To do this press . To return to input in inches strike again.

A LED on the panel will light to show 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.12.
- Read the machine/rim distance on the ruler.
- Change the number shown on the right hand display by pressing the   keys until the correct setting is shown.

**If you hold down the   keys the numbers will spool up or down quickly and make data input faster.**

Once the wheel data have been input correctly:

- press  to display the unbalance (recalculated for the new wheel data) or
- execute a new spin cycle.

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# 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

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 input in ounces has been selected. In this default setting the first 4 grams are not displayed since they are regarded as below the operational threshold (the “x5” LED on the panel will be lit).

To remove this threshold press **F** (the “x5” 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 mode is active). Each time the F key is pressed, the machine toggles between threshold ON and threshold OFF.

## WHEEL SPIN

Motor-driven version with guard: first close the wheel guard and pull up the lever on the front of the machine (fig.13).

Motor-driven version without guard: pull up the lever on the front of the machine (E, fig. 8) and at the same time press the START button (F, fig. 8).

Hand Spin version: spin the wheel using the knob on the locking ring-nut (fig.14).

To spin wheels secured with the flanges (FRU, U3, U4, U5 ...), in the Hand Spin version, the special handle is first attached to one of the wheel nuts (fig. 15).

The correct direction of rotation is clockwise, viewed from the operator's position. If the wheel is spun anticlockwise, the message “Rot Err” will be displayed.

During acceleration, the position indicators light up progressively to show that the wheel is approaching data acquisition speed; a beep will be heard once the speed is reached.

**Interrupt the spin immediately once the machine is up to speed, and wait for the balancing unit to read the values during the subsequent freewheel.**

If the wheel is spinning too fast, the message “Spd Hi” will be displayed and measurement can take place only when the message disappears.

**To ensure maximum precision, avoid jolting or disturbing the machine while unbalance signals are being processed.**

A beep indicates when the processing operation has been completed.

Brake the wheel by pushing the lever (fig 13) downwards. The method of braking is the same for both motorized and Hand Spin versions.

When the lever is pushed firmly down and to the right the brake is applied permanently. Position the wheel as indicated by the machine to facilitate application of the balancing weight. To release the brake, push the lever down and left.



### WARNING

When using a Hand Spin version of the machine, ensure the spinner arms will not strike any part of the hand or catch on garments by drawing back as soon as the knob is released.



### WARNING

**Always brake the wheel as soon as the machine displays the imbalance values.**

In the event that wrong signals are acquired by the machine during the spin, the message “GO Err” will be displayed once the spin has ended, and the operation must be repeated. If the computed unbalance value is higher than permitted, the message “CCC” will be displayed.

The spin can be interrupted during data acquisition by pressing the **F** key. In this instance the message “ALT” will be displayed temporarily.



### WARNING




**In the event of a malfunction occurring, press the main switch to deactivate the machine, or unplug the connector from the power supply circuit board (emergency stop).**

## BALANCING PROGRAMS

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 (standard) balancing

- Press the   keys until the LED for DYN balancing 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.
- Wait for the beep signalling that data processing has been completed and then brake the wheel.

The unbalance weights will be shown on displays A and B (Fig.9) for the inside and outside planes respectively.

- Choose the first side you intend to balance.
- Bring the wheel into the position marked by the corresponding indicator (when the centred position is reached, the LEDs C or D fig. 9 blink simultaneously).
- Fit the balancing weight indicated at the 12 o'clock position.
- Repeat the above steps for the other side of the wheel.

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- Make a test spin to check balancing accuracy. If it is not completely to your satisfaction, change the amount of the weight and its position following the suggestions given in the 'balancing check diagram' (Fig.16).  
Don't forget that especially when the unbalance is large, a slight error (one or two degrees) in positioning the weight can produce a residual unbalance of up to 5 or 10 grams.






### WARNING

**Check that the weight connection system is in perfect working condition.**  
**A badly or incorrectly connected weight may become detached as the wheel turns, creating a potential danger.**

## Static balancing

A wheel can also be balanced with a single weight placed on one of its sides in the centre of the channel. This 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 the selection.
- Input the diameter of the wheel (**in Static mode you need only input the diameter**).
- Spin the wheel.
- Wait until you hear the beep signalling that the unbalance has been calculated and then brake the wheel.

The static unbalance value appears on display B (fig.9).

- Turn the wheel to the position shown on indicator D (fig.9).
- Fit the weight indicated at the 12 o'clock position on either side or in the centre of the rim channel.

If you decide on the rim channel remember that the diameter is less than the nominal diameter of the wheel so enter a value 2 or 3 inches less than the nominal value when you input the diameter in order to ensue good results.




- Make a test spin following the same procedures as for standard balancing.

## Alloy wheel balancing (ALU)

### ALU 1P, 2P programs

For balancing alloy wheels self-adhesive weights are generally used, applied in positions which differ from those for standard balancing with clip weights (fig. 17).

These programs are for high-precision balancing of light alloy rims which require **both weights to be applied to the same side (internal) of the rim.**








- Press the   keys until the illuminated point corresponding to the program lights up ALU.
- Press  the number of times required for confirming selection of the Alu program desired (the display show the corresponding balancing planes on the wheel).

### Wheel data measurement

Geometrical **data relative to the real balancing planes** must be set instead of the nominal wheel data (as for the standard ALU programs). The balancing planes to which the weights will be applied can be chosen by the user according to the form of wheel in question.



Consider however that in order to reduce the weight to be applied, **it is always best to choose the balancing planes which are furthest away from each other**; if the distance between the two planes is less than 37mm (1.5), the Alu Err message is shown.

- Press the  key to prepare the machine for entering **DISTANCE d1** relative to the internal side (the distance LED lights up on the panel)
- Position the measuring arm according to the plane chosen for placement of the internal weight (fig. 18 for ALU 1P and fig. 12 for ALU 2P). In ALU 1P the centre of the hollow in which the adhesive weight will be applied is taken as a reference. In ALU 2P the edge of the wheel is taken as a reference, since the internal weight is of the conventional clip type.  
**Take great care to position the end of the arm in a smooth zone of the wheel so as to allow application of the weight in that position.**
- Read the **internal distance d1** from the cabinet off the rule. The value of the **internal diameter di1** must be read off the weight tray cover window for ALU 1P, whereas it corresponds to the nominal rim diameter as given on the tyre for ALU 2P.
- Modify the value on the r.h. display by pressing   to get the previously measured **distance d1**.
- Press the  key again to prepare the machine for entry of the **di1 DIAMETER** relating to the inner side (the diameter LED lights up on the panel).
- Modify the value displayed on the r.h. display by pressing   to get the previously measured **diameter di1**.
- Press the  key again to prepare the machine for entry of the **d2 distance** relating to the outer side (the distance LED lights up on the panel).
- Position the end of the automatic measuring arm on the plane chosen for application of the external weight (fig. 19), as described for the inner side.
- Read the value of the **external distance d2** from the cabinet off the rule and the value of the **external diameter di2** of the weight holder lid window.
- Set the two parameters as described for the inner side.

## Carry out a spin




### Balance weight application

- Choose the plane for the first balance weight.
- When the centred position is reached, the LEDs C or D fig. 9 blink simultaneously.  
If the weight is of the **conventional clip type** (inner side in ALU 2P), apply it on the corresponding **12 o'clock** position.  
If the weight is **self-adhesive**:
- Rotate the end of the arm until the adhesive strip is facing the rim's surface.
- Press the button (fig. 19A) to expel the weight so that it adheres to the rim.
- Move the arm back to its rest position.
- Repeat the procedures to apply the second balance weight.
- Carry out a test spin to check the balancing accuracy.



The wheel surface must be perfectly clean to ensure correct adhesion of the wheel. If necessary clean with detergent.


### **“HIDDEN WEIGHT” program (only available with ALU P programs)**


**This program subdivides the outside balancing weight into two equivalent weights placed in positions concealed behind two spokes of the alloy rim.**

- First select either the ALU 1 P or the ALU 2 P program.
- Press the   keys until the dot corresponding to the Fn program illuminates;
- press the  key to confirm the selection.

This accesses the “hidden weight” program and the message “hid” appears on the left-hand display. If the user attempts to select the program without first selecting an ALU P program the message Err 26 is displayed.

- Press the   keys until the number of spokes in the rim appears on the right-hand display.

If OFF is selected instead of a number of spokes, the next time the  key is pressed the program activated previously is disabled, or the system exits without activating it.




- Turn the wheel until the centre of one spoke is at 12 o'clock.
- Press  to save the data set (number of spokes and angle position). Pressing the same key again updates the values saved.
- Press the **F** key to exit from the data setting environment and return to the Alu P program selected previously. The **Fn** marker dot remains on to show that the “hidden weight” program is active.
- Perform a wheel spin.

The two imbalance values calculated will appear on the display relating to the outside of the rim in alternation, as the angle position of the wheel changes.

Each of the two balancing weights is applied to the outside of the wheel as described in the “applying the balancing weights” section of the Alu P programs.

### **Standard ALU programs (ALU 1, 2, 3, 4, 5)**

The standard ALU programs allow for the various modes of application of the weights (Fig. 17) and supply correct unbalance values **maintaining the settings of the nominal geometrical alloy wheel data**.

- Press the   keys until the program illuminated point lights up ALU.
- Press  the number of times required to confirm selection of the Alu program desired (the screen displays the corresponding balancing planes on the wheel).
- Set the nominal geometrical wheel data.

If the values of the diameter and of the distance between the two balance planes recalculated on a statistical basis starting from the wheel's nominal data are outside the normally accepted interval stated in the “technical data” section, the message “alu Err” is displayed.



- Proceed as described for dynamic balancing.

At the end of the spin test some residual unbalance may be present due to the appreciable differences in form between wheels with the same nominal dimensions. Modify the value and position of the weights previously applied following the instructions of the balance check diagram (fig. 16), until accurate balancing is obtained.

## Balancing motorcycle wheels

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 one weight on each side of the wheel.

If the WIDTH of the tyre (over 3 inches) is such as to generate considerable unbalance which cannot be eliminated with static balancing, it may be worthwhile performing 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.20) on the distance gauge.

- 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** balancing lights.


- Press the  key twice to select "**Alu moto**" (the circle on the panel shows the types of weights and planes to be balanced in the various programs).

- Follow the instructions above for **dynamic motorcycle** wheel balancing. The unbalance will be calculated and displayed for the position you will actually use for the adhesive weight.

## OPT OPTIMIZATION PROGRAM (Optional)

This procedure is used to reduce **road** noise (vibrations) to a minimum. Road noise can still be present even after painstaking wheel balancing but it can be reduced by eliminating any mismatch between tyre and rim as far as possible. 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 program.

- Press the   keys until the OPT program LED lights.


- Press  to confirm your selection.

Once you have selected this program the machine will indicate whether it is worthwhile going through the OPT program. 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 detected in 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 program and this will be signalled on the display.

If you do not wish to continue with this program press the  key.


**GB**

### OPT 1

- Mount the rim without the tyre on the balancing machine.
- Turn it until the valve (or hole) is at the 12 o'clock position.
- Press .
- Make a second spin (as instructed on the display).


At the end of the spin the program goes into its second stage.

### OPT 2

- Remove the rim from the balancer.
- Mount the tyre on the rim.
- Put the complete wheel on the balancer.
- Turn it until the valve is at 12 o'clock.
- Press .
- Make the second spin.


At the end of the spin the program goes into the third stage of the OPT program.

### OPT 3

- Turn the wheel until it is in the position shown by the position indicators.
- 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 aligned with the valve (i.e. 180°)
- Remount the wheel on the balancer.
- Turn the wheel until the valve is at the 12 o'clock position.
- Press .
- Make the third spin.

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

### OPT 4

- Turn the wheel until it is in the position shown by the position indicators.
- Make **two chalk marks** on the **outside** wall of the tyre at 12 o'clock. If the screen gave you the message to invert the tyre as it is mounted on the rim, make the two chalk marks on the **inside** wall of the tyre.
- Turn the tyre on the rim (and switch it around if necessary) so that the double chalk mark is aligned with the valve.
- Remount the wheel on the balancer.
- Turn the wheel until the valve is at 12 o'clock,
- Press .
- Make the fourth spin.

When the fourth spin has finished the machine will exit the OPT program and display the weights to be added to balance the wheel.

If you make an error that will negatively affect the end result the machine will inform you by displaying the message: Opt Err. This means that the entire procedure should be repeated from the beginning.

### Notes

- If you do not want to make the first spin with just the tyreless rim you can skip this phase by hitting the **F** key immediately after pressing the key for the OPT program.  
This means that you start by mounting the rim plus tyre on the balancer and carrying out phases 2,3,4 as described above.
- 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 it is opportune to abandon the program by pressing the **⬆** key; the display will then give the weights needed to balance the wheel.  
This allows you to shortcut the program by accepting the current status without going all the way.  
If you want to carry on to the end, press the **F** key and you will continue in the **OPT** program.
- At the end of the 3rd spin the screen may suggest switching the tyre around on the rim.  
If you are unwilling or unable to do this, press key **F**. The screen will display instructions on how to complete the OPT program 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

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 “Err 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.
- 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 and wait for the message “End Sp1” to appear before braking the wheel.  
**Important: spins may take longer in the calibration program than during normal operation.**

The wait can be reduced by starting the spin gently, accelerating gradually and interrupting as soon as the correct data acquisition speed is reached.

- Once the wheel is at standstill, remove the sample weight 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 and wait for the message “End CAL” to appear before braking the wheel.

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 and will remain until cleared by pressing any key. The calibration program must then be repeated, ensuring that the procedure is correct and that the weight utilized is in fact 100 g.

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.**

# DISPLAY MESSAGES

The machine is able to recognize a certain number of error conditions and inform the user of their occurrence by displaying respective messages.

## Error display

<b>Err CAL</b>	Machine out of calibration tolerances. Run the calibration program.
<b>Err 7</b>	The machine cannot currently activate the program requested. Run a spin cycle and repeat the request.
<b>Err 28</b>	Encoder error. If this message appears frequently contact your service centre.
<b>GO Err</b>	Acquisition of discontinuous signals during spin. Make certain the machine is standing firmly on the floor and repeat the spin, ensuring that the structure is not jolted during data acquisition.
<b>ALU Err</b>	Dimensions entered for an ALU program are not correct. Enter the dimensions correctly.
<b>Opt Err</b>	Error detected in execution of the optimization program. Repeat the procedure from the start.
<b>Spd Hi</b>	Spin speed too high. Allow the wheel to slow down until the message disappears.
<b>Rot Err</b>	Apply the brake, and restart the spin correctly in the clockwise direction.

## Other messages

<b>CAL [GO]</b>	Calibrating spin
<b>GO ALU</b>	Spin using ALU program
<b>GO d15</b>	Spin using Motorcycle Dynamic program
<b>GO A15</b>	Spin using Motorcycle Alu program
<b>GO CTS</b>	Spin using CTS program
<b>St</b>	Spin using static balancing program
<b>CCC CCC</b>	Unbalance values too high
<b>End Sp1</b>	End of first calibration spin
<b>End CAL</b>	End of calibration procedure
<b>ALt ALt</b>	Data acquisition aborted by pressing the F key

**GB**

# EFFICIENCY OF BALANCING ACCESSORIES

This check permits you to make sure that wear and tear has not altered the mechanical tolerances of flanges, cones, etc. beyond certain specific limits.

The check is carried out with a perfectly balanced wheel (to zero without the threshold and showing the first gram). When this wheel is mounted on the balancer, removed and remounted in a different position, the unbalance weight shown must not be greater than 10 grams.

If the unbalance is higher, check all the accessories carefully and renew any items that are dented or worn, such as bent flanges and so forth.

Always remember that if you are using cones or bushes are used as centring devices, perfect results can never be obtained if the centre hole in the rim is not perfect, i.e. off-centre or out of round; in such cases better results will be obtained 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 result in a degree of unbalance. This can only be corrected by on-vehicle balancing with a finishing balancer to complement the work of the fixed balancing machine.

## 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.

**GB**

# MAINTENANCE



## WARNING

No liability whatever will be admitted by Corghi in respect of claims for damage attributable to the use of replacement parts or accessories not supplied by the company.



## WARNING

Before performing any adjustment or servicing operation, isolate the machine from the electrical power supply and make certain that all moving parts are immobilized.



## WARNING

Never remove or modify any part of the machine (except to allow access for servicing or repairs).



## ATTENTION

**Keep the work area clean.**

**Never clean the machine by blasting with compressed air and/or spraying with water.**

**Take care as far as possible, when cleaning the workshop, not to create or raise dust.**

- Keep the balancing machine shaft, the spinner, the cones and the centering flanges clean. These components can be cleaned using only environmentally friendly solvents.
- Handle cones and flanges with care to avoid their being dropped, as this could result in damage and consequently a loss of centralizing precision.
- Ensure that cones and flanges are kept in a place affording protection from dust and dirt, and returned there immediately after use.
- Clean the display panel, when necessary, with ethyl alcohol.
- Run the calibration procedure at least once every six months.

# DEMOLITION

If the machine is to be scrapped, first dismantle and separate electrical, electronic, plastic and metallic components.

Thereafter, dispose of different materials in accordance with current regulations.

## RECOMMENDED FIRE-EXTINGUISHERS

Consult the following table to ensure selection of the most suitable extinguisher.

	Dry materials	Inflammable liquids	Electrical fires
Water	YES	NO	NO
Foam	YES	YES	NO
Dry chemical	YES*	YES	YES
CO <sub>2</sub>	YES*	YES	YES

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



**WARNING**

**The information given in this table is of a general nature, and intended as a guideline for the user. Specifications for each individual type of extinguisher must be obtained from the manufacturer.**

## 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.

### BUSH

Cylindrical element with central hole inserted on the shaft of the balancing machine to centre wheels having central hole of the same diameter as the outside diameter of the bush on the shaft itself.

### 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.

**GB**

## **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 the 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.

# GENERAL ELECTRIC LAY-OUT

**Fig. 21**

AP1	Power supply and control board	RP3	External distance potentiometer
AP2	Main board (CPU)	RP4	REB potentiometer
AP3	Keyboard	RP5	ROD potentiometer
AP4	Monitor	RP6	Voice synthesis volume potentiometer
AP5	Retrieval board	SB1	START button
AP6	Printer	SB2	STOP button
AP7	PWM board	SB3	Brake button
AP8	Memory expansion board	SB4	ENTER button
AP9	Voice synthesis board	SQ1	Guard microswitch
AP10	Display board	SQ2	START microswitch
AP11	Alphanumeric display pilot board	SQ3	Brake pedal microswitch
AP12	Optical sensor board	SQ4	Motor microswitch
B1	Speaker	ST1	Motor overload cut-out
BP1	Internal pick-up	TC1	Power supply transformer
BP2	External pick-up	V1	Diode
BR1	Encoder	VC1	Diode rectifier
C1	Capacitor	XB1	Connector
EV1	Fan	XS1	Power supply socket
FU..	Fuse	XT1	Terminal board
KM1	Remote switch	YA1	Motor coil
M1	Motor	YA2	Brake / motor separator coil
QS1	Master switch	YV1	Wheel spin solenoid valve
QS2	Three-pole direction reverser	YV2	Brake solenoid valve
R1	Resistor	Z1	Mains filter
RP1	Internal distance potentiometer	Z2	Filter for remote switch / motor
RP2	Diameter potentiometer		



## **EM 43**

Cod.444501 - 5.1 del 04/03

Italiano

Illustrazioni e schemi

English

Illustrations and diagrams

Français

Illustrations et schémas

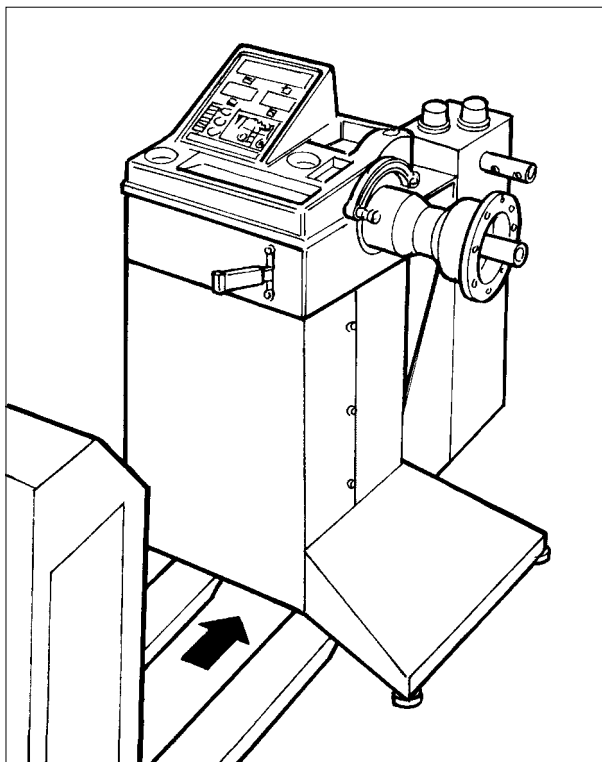
Deutsch

Bilder und Zeichnungen

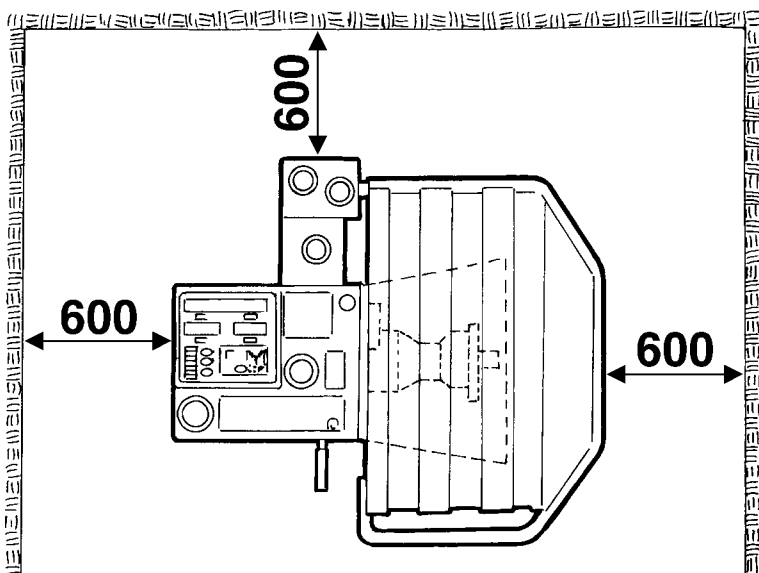
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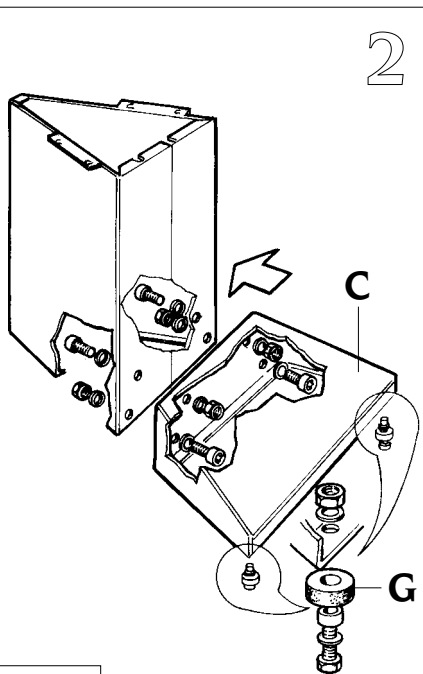
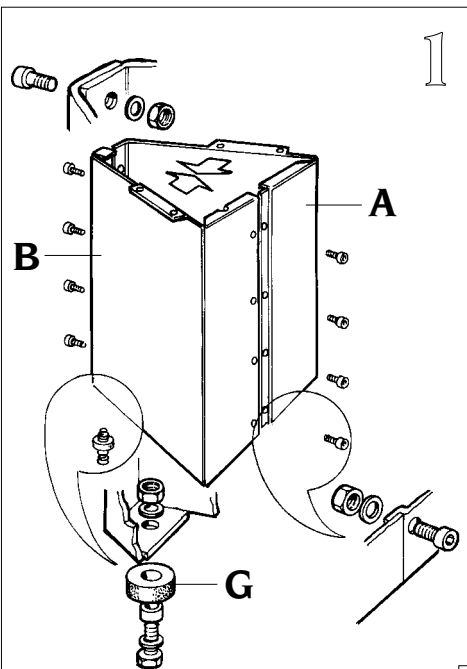
Ilustraciones y esquemas

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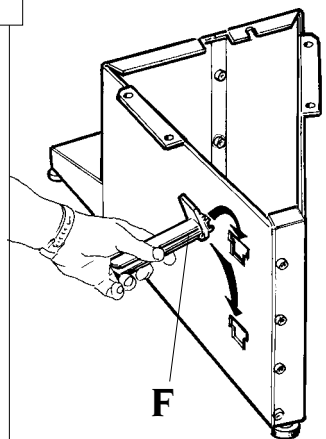
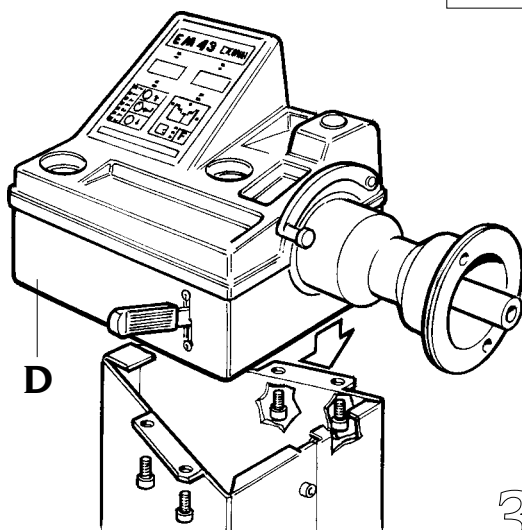


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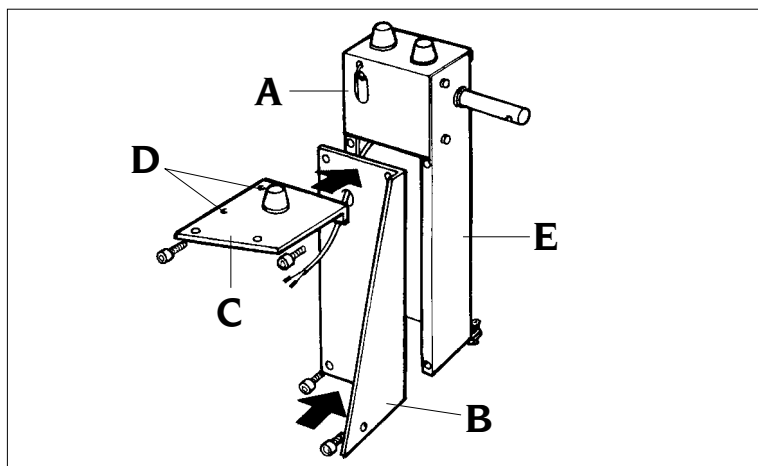


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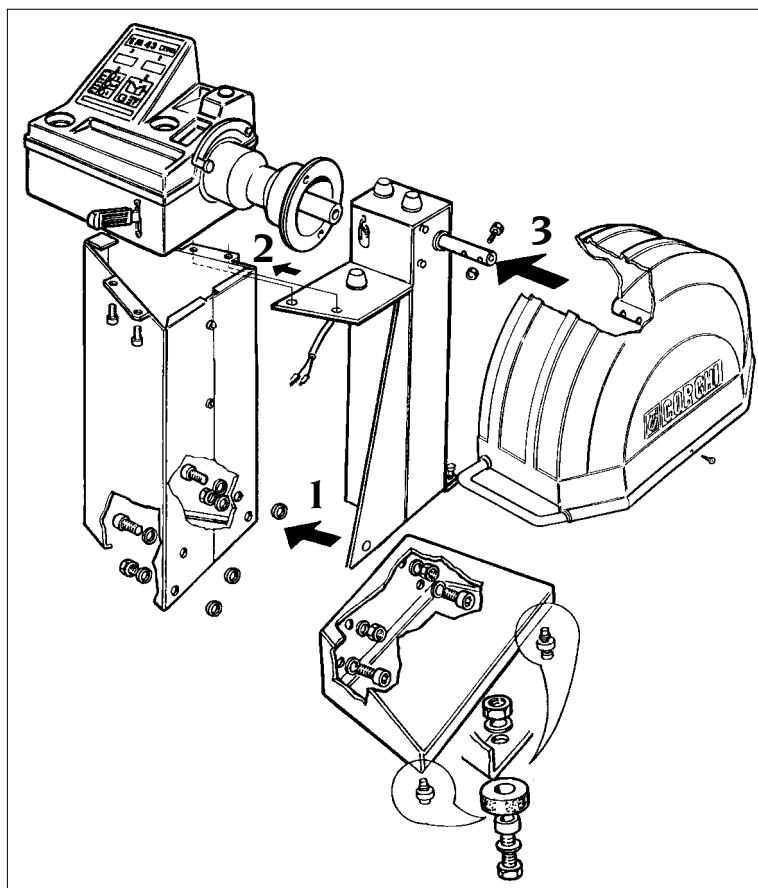
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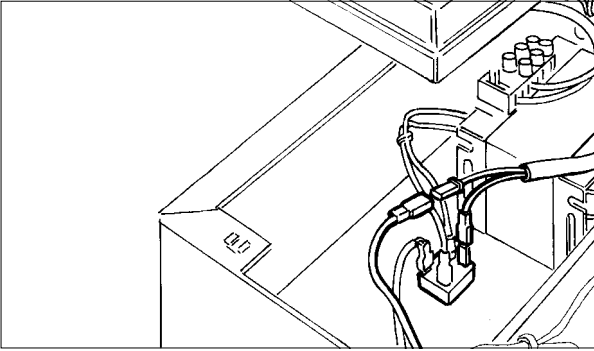


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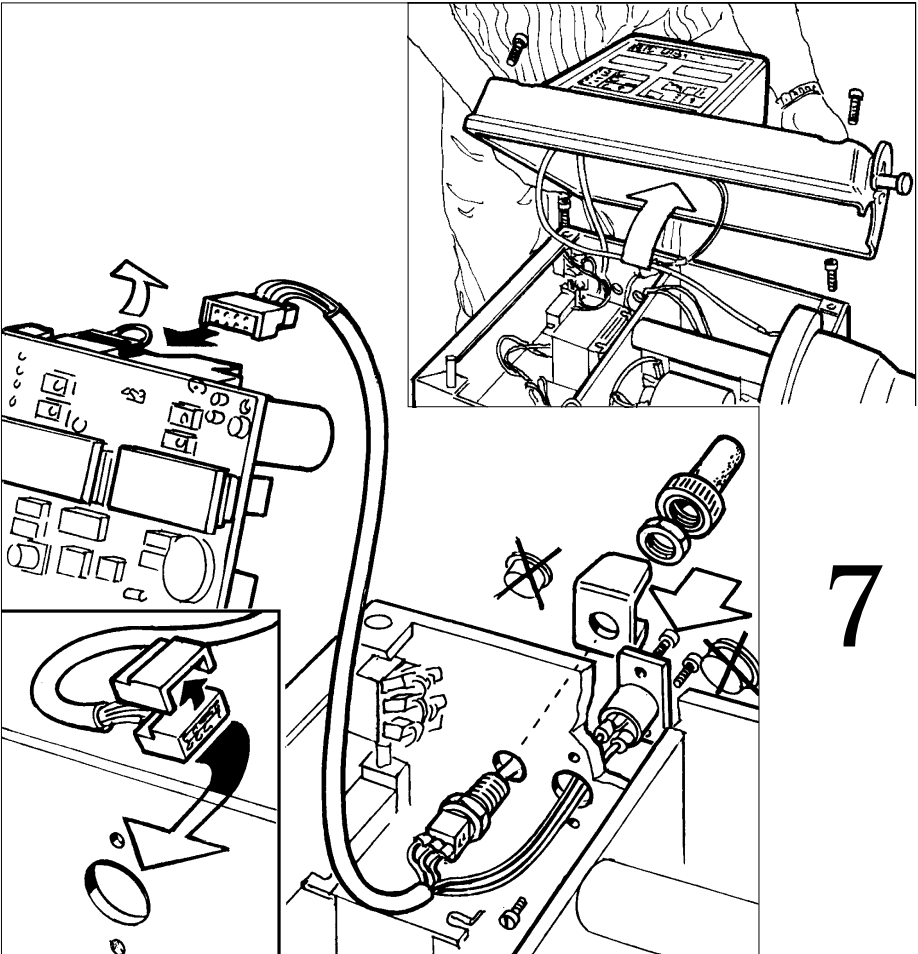


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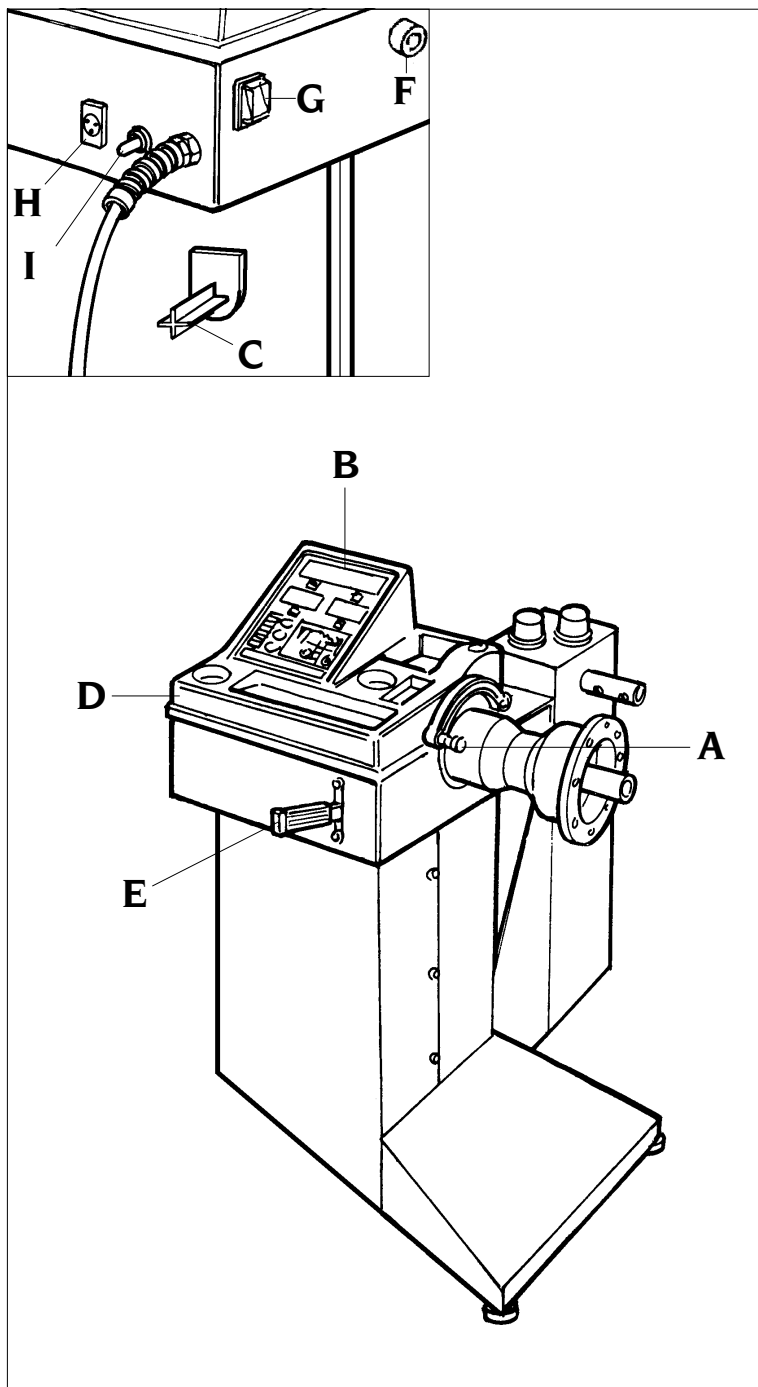


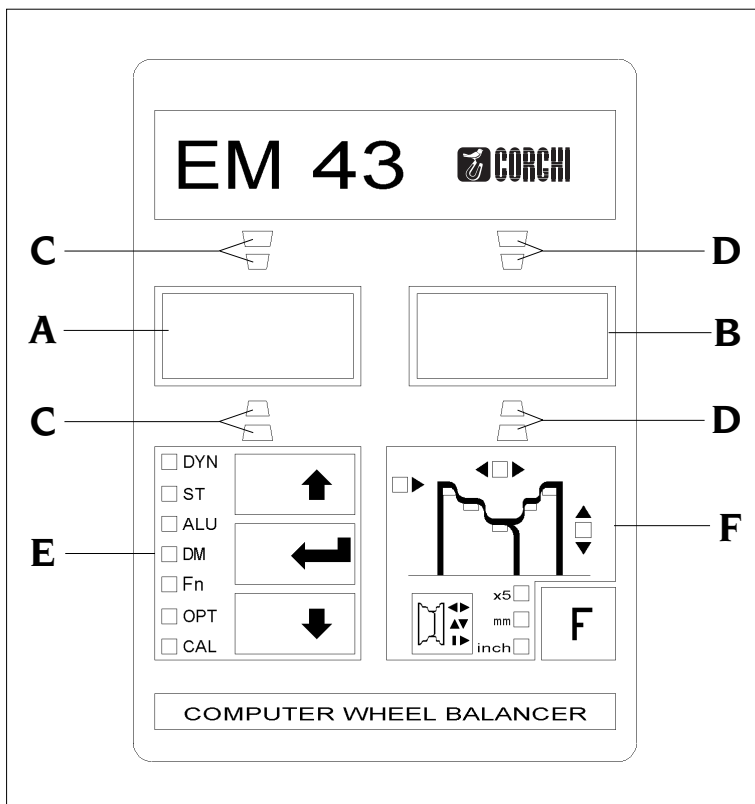
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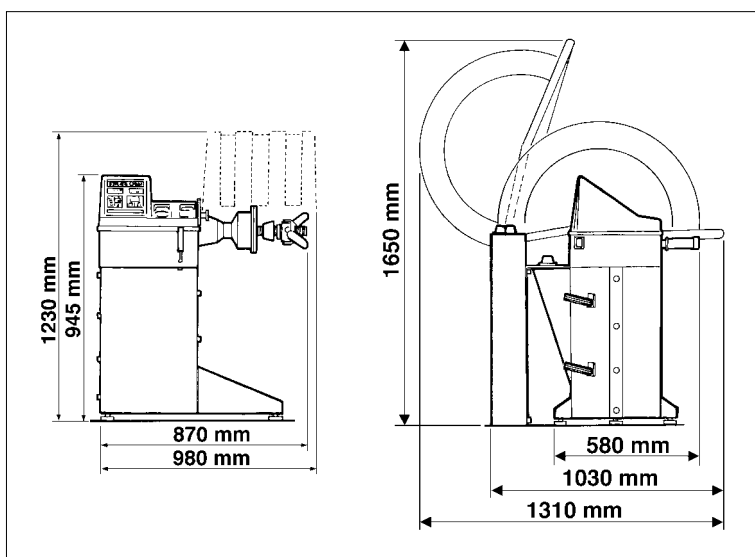
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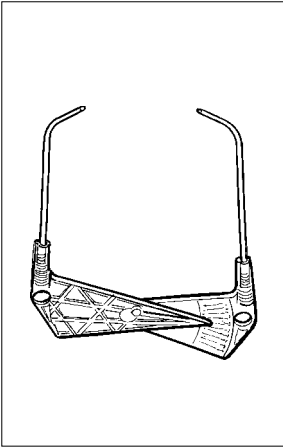


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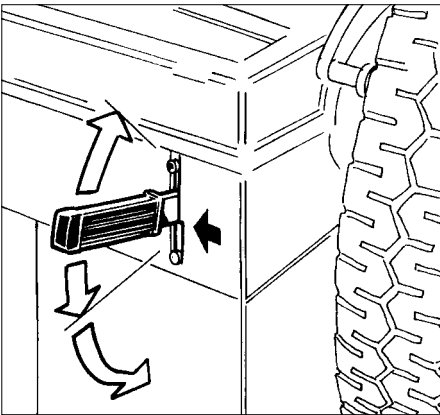
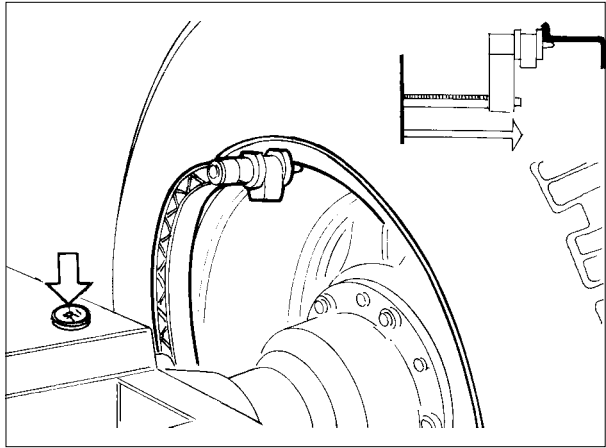


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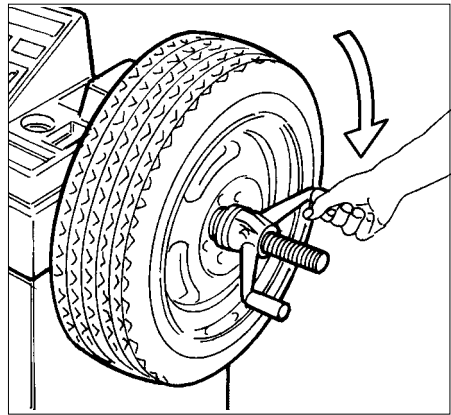
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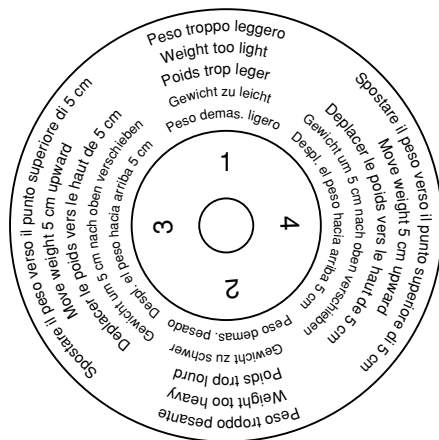
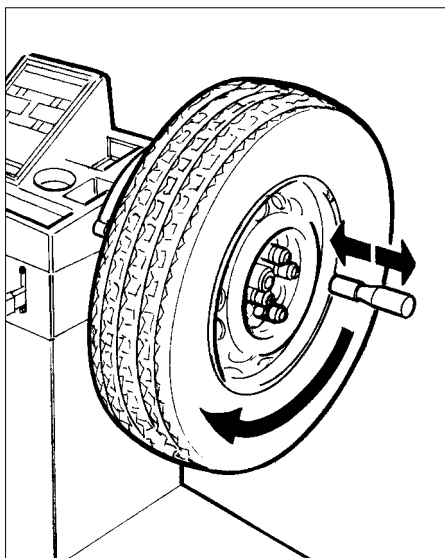


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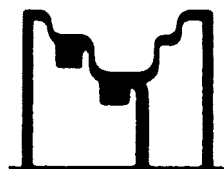
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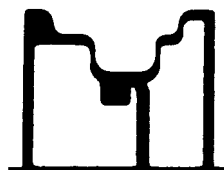
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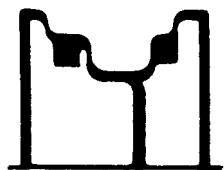
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ALU 1P



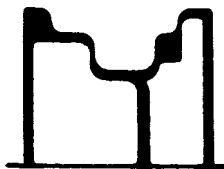
ALU 2  
ALU 2P



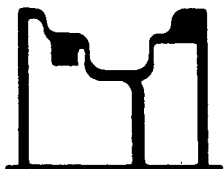
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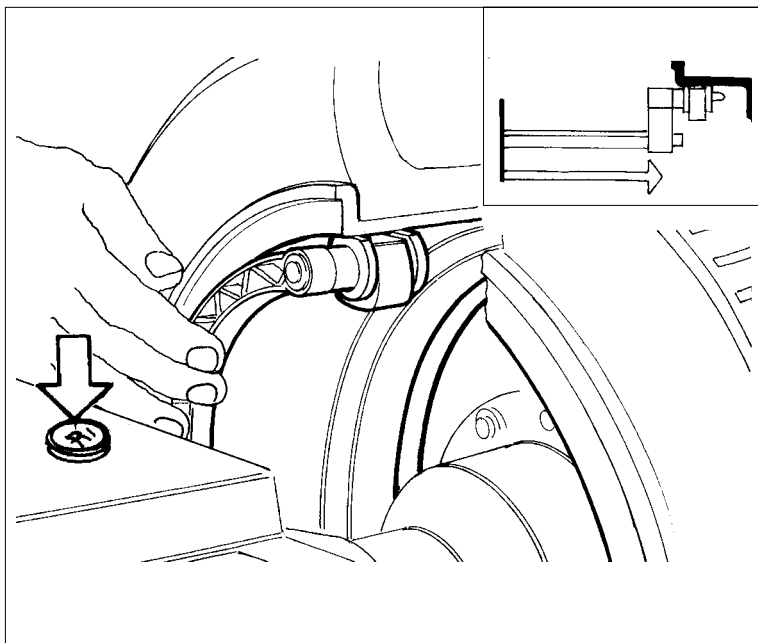
ALU 4



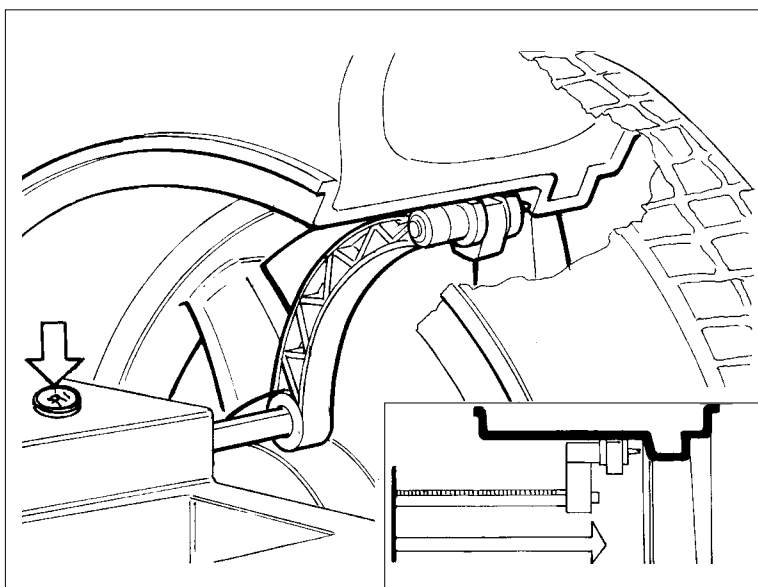
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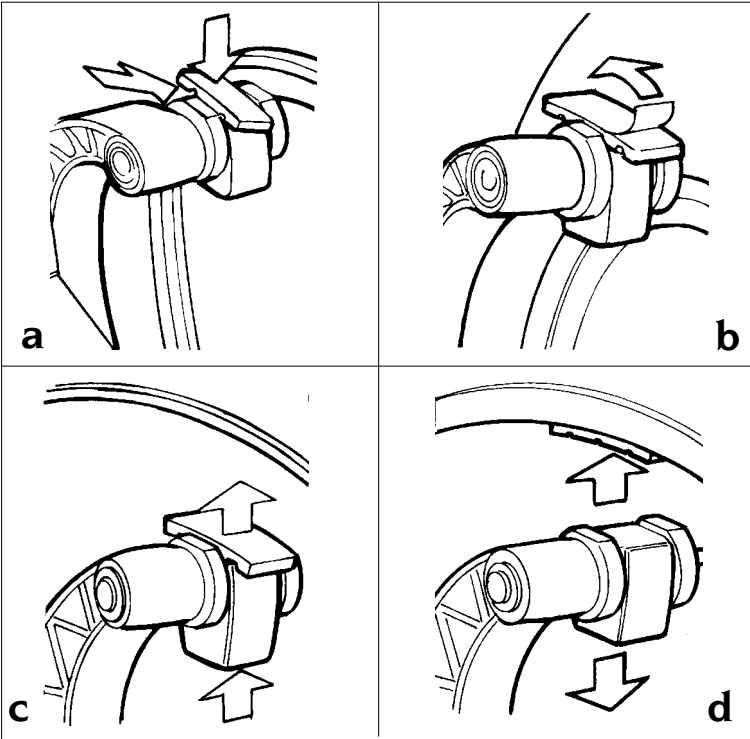


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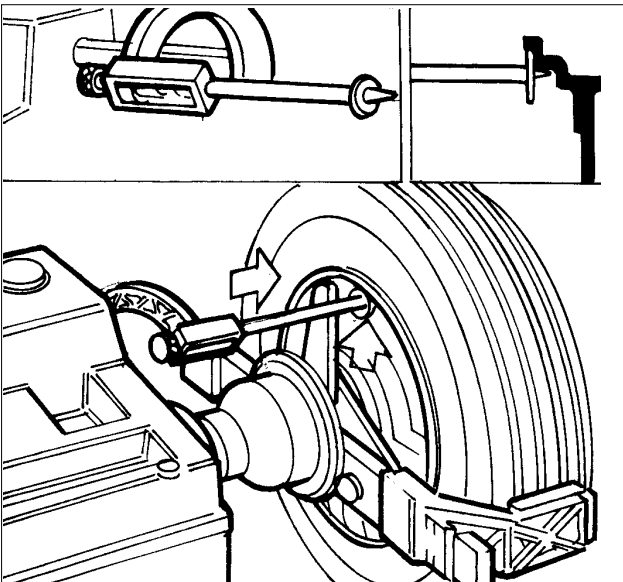


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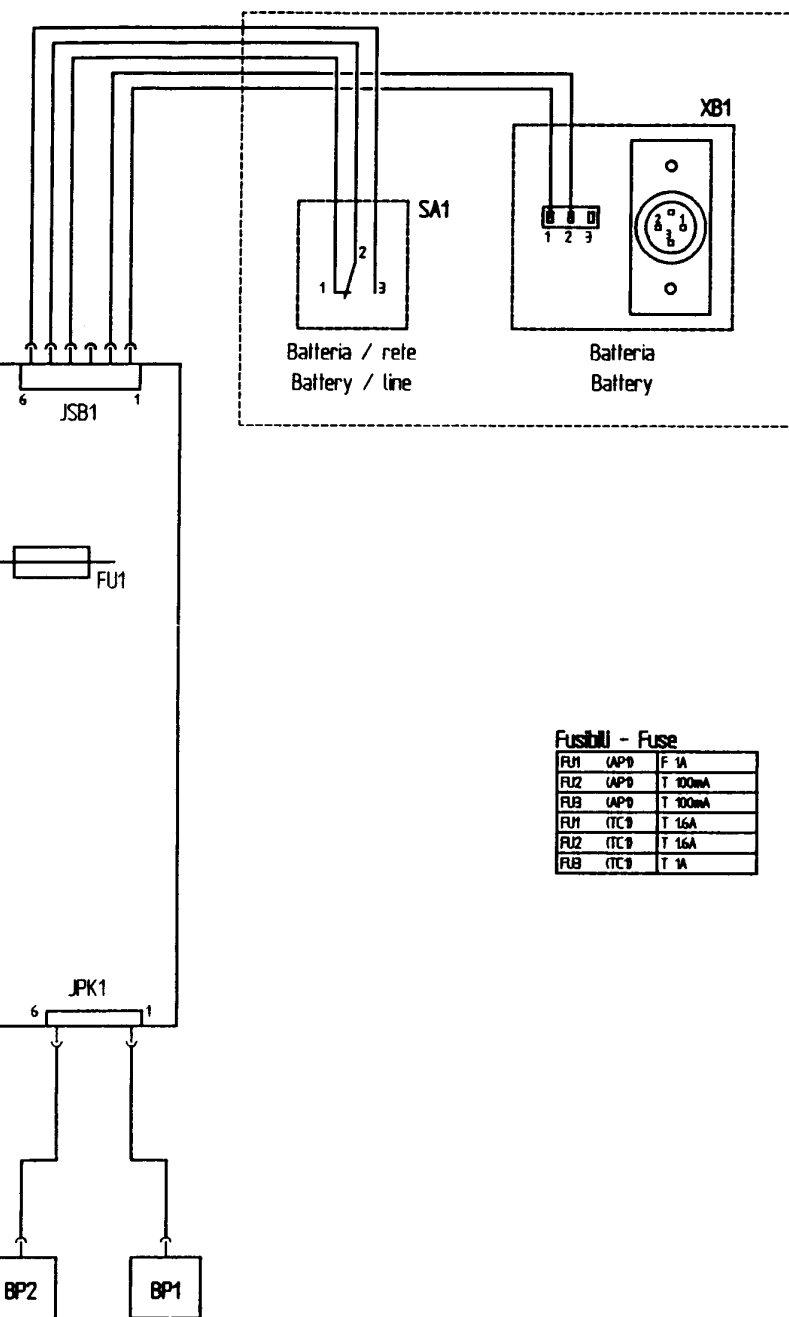
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## Fusibili - Fuse

FU1	(APD)	F 1A
FU2	(APD)	T 100mA
FU3	(APD)	T 100mA
FU1	(TTC)	T 15A
FU2	(TTC)	T 16A
FU3	(TTC)	T 1A

## EC statement of conformity

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

### EM43 wheel balancer

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

EN 292 of 09/91

according to directives:

- 98/37/CE;
- 89/336/EEC amended with directive 92/31/EEC.

Correggio, 01 / 01 / 00



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.

## Déclaration CE de conformité

Nous, CORGHI SPA, Strada Statale 468, n° 9, Correggio (RE) Italy, déclarons que le matériel

### équilibruse EM43

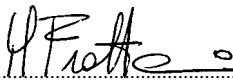
objet de cette déclaration est conforme aux normes et/aux documents légaux suivants:

EN 292 du 09/91

Sur la base de ce qui est prévu par les directives:

- 98/37/CE;
- 89/336/CEE modifiées par la directive 92/31/CEE.

Correggio, 01 / 01 / 00



CORGHI S.p.A.  
E. Santoro

**IMPORTANT : La déclaration CE de conformité est considérée comme nulle et non avenue dans le cas où la machine ne serait pas utilisée exclusivement avec des accessoires originaux CORGHI et/ou, dans tous les cas, conformément aux indications contenues dans le Manuel d'utilisation.**

Le modèle de la présente déclaration est conforme à ce qui est prévu par la EN 45014.

## CE - Konformitätserklärung

CORGHI SPA, Strada Statale 468, Nr. 9, Correggio (RE), ITALY, erklärt hiermit, daß das Produkt

### Auswuchtmaschine EM43

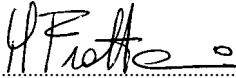
worauf sich die vorliegende Erklärung bezieht, den Anforderungen folgender Normen und/oder normativer Dokumente entspricht:

EN 292 vom 09.91

auf Grundlage der Vorgaben durch die Richtlinien:

- 98/37/CE;
- 89/336/EWG mit Änderung durch die Richtlinien 92/31/EWG.

Correggio, 01 / 01 / 00



CORGHI S.p.A.

E. Santoro

**WICHTIG: Die CE-Konformitätserklärung verliert ihre Gültigkeit, falls die Maschine nicht ausschließlich mit CORGHI-Originalzubehör und/oder unter Mißachtung der in der Betriebsanleitung aufgeführten Gebrauchsanweisungen verwendet wird.**

Das Modell der vorliegenden Erklärung entspricht den Anforderungen der in EN 45014 aufgeführten Vorgaben.

## Declaración CE de conformidad

La mercantil CORGHI SpA abajo firmante, con sede en Strada Statale 468 n°9, Correggio (RE), Italia, declara que el producto:

### equilibradora EM43

al cual se refiere la presente declaración, se conforma a las siguientes normas y/o documentos normativos:

EN 292, de septiembre de 1991

a tenor de lo dispuesto en la Directiva:

- 98/37/CE;
- 89/336/CEE, modificada por la Directiva 92/31/CEE.

Correggio, 01 / 01 / 00



CORGHI S.p.A.

E. Santoro

**IMPORTANTE: La declaración de conformidad CE deja de tener validez en el caso en que la máquina no sea utilizada exclusivamente con accesorios originales CORGHI y/o, en cualquier caso, con arreglo a las indicaciones contenidas en el Manual de Empleo.**

El modelo de la presente declaración se conforma a lo dispuesto en la EN 45014.

## Dichiarazione CE di conformità

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

### **equilibratrice EM43**

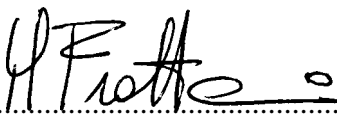
al quale questa dichiarazione si riferisce è conforme alle seguenti norme e/o documenti normativi:

EN 292 del 09/91

in base a quanto previsto dalle direttive:

- 98/37/CE;
- 89/336/CEE modificata con la direttiva 92/31/CEE.

Correggio, 01 / 01 / 00



*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.

**UPT** - Cod.444501 - 04/03 - 300.



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