

Start Line MT 601 D



de Originalbetriebsanleitung
Radauswuchtmaschine

en Original instructions
Wheel Balancing Machine

fr Notice originale
Banc d'équilibrage de roues

es Manual original
Máquina de equilibrado de ruedas

it Istruzioni originali
Equilibratrice per ruote

pt Manual original
Máquina de balanceamento de rodas

de EU-Konformitetserklæring
en EU Declaration of Conformity
if Declaração de conformidade "CE"
es Declaración de conformidad CE

it Dichiarazione di conformità CE
sv E-förklaringsom överensstämmelse
da E-förklaringserklæring
nl EG-conformiteitsverklaring

pt Declaração CE de conformidade
hr EK izjave o skladnosti
hu EZ izjáva o skidatnosti
no EU-samsvarserklæring

Start Line MT 601

Radauswuchsmaschinen
Equilibreuses de roue
Maquinas de equilibrio de ruedas
Equilibratrici per ruote
Hjulbalanseringsutrustning
Hjulbalanceringsmaskine
Wielbalancermachines
Equilibradora de pneus
Centrozvazepke
Strojevi za balansiranje kotača
Hjulballanseringsmaskiner

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Datum/Date - Rechtsverbindliche Unterschrift / Legally binding Sign
ppa. AA-AS/VW Richard Wagner
(Sales)

18.7.2016 rfm. 

Datum/Date - Rechtsverbindliche Unterschrift / Legally binding Sign
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MD 2006/42/EC (OJ L 157, 09.06.2006, p. 24-66): Maschinenrichtlinie / Machine Directive / Directive Machines / Directiz de maquinas / Direktiva mašin / Beskrivning av maskiner / Diretiva relativa alle macchine / Maskindirektiv / Maskindirektiv / Maschinenrichtlinje / Drenz Maquinas / Gépírányelv / Direktiva o strojevima / Benannte Stelle / notified body:
 EMC 2014/30/EU (OJ L 96, 29.03.2014, p. 79-100): EMV-Richtlinie / EMC Directive / Directive CEM / Directiz de CEM / Diretiva relativa alla compatibilità elettromagnetica / EMV-richtlijn / Drenz EMC Compatibilidade eletromagnética / EMV-írányelv / Direktiva EMK o elektromagnetnoj kompatibilnosti / EMC-direktiv

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La conformité est démontrée par le respect des normes harmonisées suivantes:
La conformidad queda demostrada mediante el cumplimiento de las siguientes normas armonizadas:
A conformitate viene demonstrata dal rispetto delle seguenti norme armonizzate:
Overensstemmelsen bevisas gennem att följande harmoniserade standarder tillämpas:
Konformiteten dokumenteres ved overholdelsen af følgende harmoniserede standarder
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Samsvarset påvises gjennom overholdelse av følgende harmoniserte standarder:
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EN 61000-6-2:2005+AC:2005; EN 61000-6-3:2007+A1:2011+AC:2012

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Applied national standards and technical specifications and/or data on the modules as per the pressure equipment directive:
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Tycybárande anordningar:
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Normas e especificações técnicas nacionais aplicadas/eou dados sobre módulos, de acordo com as diretivas relativas aos equipamentos sob pressão:
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Priljubljenene nacionalne norme i tehničke specifikacije i/ili podaci o sklopovima skladno Direktivi o strojevima:
Averndete nasjonalne standarder og tekniske spesifikasjoner og/eller angivelser om komponentgrupper i henhold til direktivet for trykktidstyr:

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1. Symbols used

1.1 In the documentation

1.1.1 Warning notices - Structure and meaning

Warning notices warn of dangers to the user or people in the vicinity. Warning notices also indicate the consequences of the hazard as well as preventive action. Warning notices have the following structure:

Warning symbol **KEY WORD – Nature and source of hazard!**
 Consequences of hazard in the event of failure to observe action and information given.
 ➤ Hazard prevention action and information.

The key word indicates the likelihood of occurrence and the severity of the hazard in the event of non-observance:

Key word	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate impending danger	Death or severe injury
WARNING	Possible impending danger	Death or severe injury
CAUTION	Possible dangerous situation	Minor injury

1.1.2 Symbols in this documentation

Symbol	Designation	Explanation
!	Attention	Warns about possible property damage.
i	Information	Practical hints and other useful information.
1. 2.	Multi-step operation	Instruction consisting of several steps.
➤	One-step operation	Instruction consisting of one step.
↻	Intermediate result	An instruction produces a visible intermediate result.
➔	Final result	There is a visible final result on completion of the instruction.

1.2 On the product

! Observe all warning notices on products and ensure they remain legible.



DANGER – Exposure of live parts on opening the MT 601 D!

Risk of (fatal) injury or heart failure from electric shocks on contact with live components (e.g. master switch, printed circuit boards).

- Work on electrical installations or equipment is only to be performed by qualified electricians or trained personnel under the guidance and supervision of an electrician.
- Disconnect the MT 601 D from the mains before opening.

Information on the rating plate

Product designation, 10-digit material number; voltage (V), setting (Hz), installed load (kW); current (A), maximum supply pressure (kPa), protection class (IP); year of manufacture; CE mark; 13-digit material number and machine model; barcode.



Disposal

Dispose of used electrical and electronic devices, including cables, accessories and batteries, separately from household waste.

Prescribed voltage supply

DIESES GERAET IS AUF EINGESTELLT. THIS INSTRUMENT MUST BE OPERATED WITH CET APPAREIL EST PREVU POUR ESTE APARATO HA DE OPERARSE CON QUESTO APPARECCHIO DEVE OPERARSI CON	FAC SIMILE 230 V ~	VOR OEFFNEN DES GERAETES NETZSTECKER HERAUSZIEHEN! BEFORE OPENING SET UNPLUG FROM MAINS! AVANT D'OUVRIR L'APPAREIL SORTIR LA PRISE ELECTRIQUE! ANTES DE APRIRE EL APARATO SAQUE EL ENCHUFE! PRIMA DI APRIRE LO APPARECCHIO STACCARE LA PRESA DI CORRENTE!
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Information on the voltage set and safety warning.



Direction of wheel rotation

Wheel must turn in direction indicated. (see chapter "Checking the direction of rotation")

1.3 Safety Instructions



Please read the manual before operation.



Please wear eye protection.



Rotating equipment, exercise caution.

2. User information

2.1 Important notes


Important information on copyright, liability and warranty provisions, as well as on equipment users and company obligations, can be found in the separate manual "Important notes on and safety instructions for Beissbarth Tire Equipment". These instructions must be carefully studied prior to start-up, connection and operation of the MT 601 D and must always be heeded.

2.2 Safety instructions

All the pertinent safety instructions can be found in the separate manual "Important notes on and safety instructions for Beissbarth Tire Equipment". These instructions must be carefully studied prior to start-up, connection and operation of the MT 601 D and must always be heeded.

2.3 Electromagnetic compatibility (EMC)

The MT 601 D satisfies the requirements of the EMC directive 2004/108/EG.


 The MT 601 D is a class/category A product as defined by EN 61 326. The MT 601 D may cause high-frequency household interference (radio interference) so that interference suppression may be necessary. In such cases the user may be required to take the appropriate action.


3. Product description

3.1 Intended use

The MT 601 D is a wheel balancing machine featuring mechanical wheel clamping for the balancing of car, light van and motorcycle wheels with a rim diameter of 10" - 27" and a rim width of 1" - 20".

The MT 601 D is to be used exclusively for this purpose and solely for the range of applications specified in these instructions. Any other purpose is not consistent with the intended use and is therefore not permissible.

 The manufacturer cannot accept any liability for possible damage arising from improper use.

 ¹⁾ * These dimensions refer to standard rims (A); for rims with a special shape (B - C), special accessories should be used.

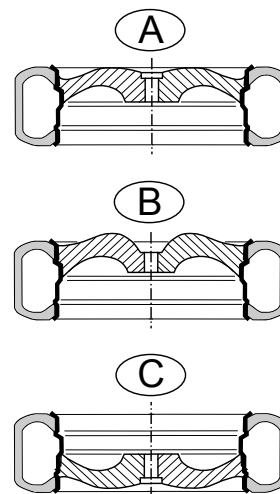




Fig. 1: Rim types

3.2 Prerequisites

The MT 601 D must be installed on a flat surface made of concrete or similar material and anchored in position.

 An uneven or vibrating surface can lead to inaccurate unbalance measurements.

 Any uneven floors or that do not meet the previously expressed safety requisites relieve the manufacturer from any liability for damages to persons and/or property.

3.3 Device description

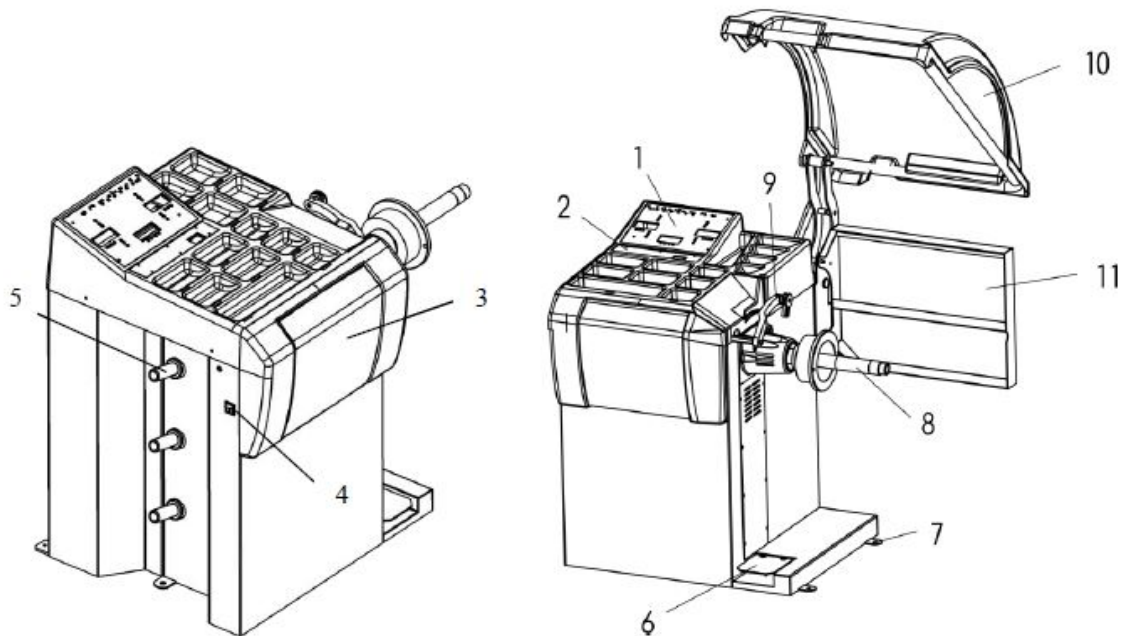


Fig. 2: Product introduction

Item	Designation	Function
1	Display panel	Display of measuring results
2	Control panel	Operation of the MT 601 D
3	Shelf	Shelf for balance weights and accessories.
4	On/Off switch	Switching power On/Off
5	Clamping tool holders	Attaching spare parts and cones
6	Brake pedal	Blocking of wheel while attaching or removing wheel weights
7	Retaining tabs	For fastening to the floor
8	flange	Fasten wheel.
9	Rim-distance gage (electronic)	<ul style="list-style-type: none"> Records rim distance and rim diameter. Determines positions for attachment of adhesive balance weights.
10	Wheel guard	<ul style="list-style-type: none"> Protects operator against flying particles (e. g. dirt, water). Starting and stoppin measurement
11	Cover plate	Storing & reconditioning the weights

3.4 Accessories supplied

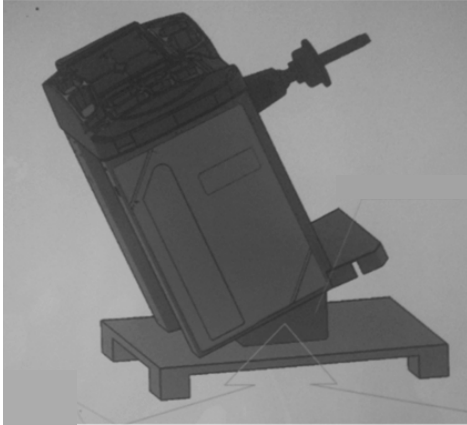
Name	Order number
Large flange	0530201001
Small cone	0530201016
Cone 2	0530201037
Cone 3	0530201038
Cone 4	0530201039
Spacer plate, large	020601001
Quick-action clamping nut	020601003
Wrench, waf 12	022102001
Wrench, waf 6	022102002
Wrench, waf 4	022102003
Wrench, waf 3	022102004

Name	Order number
Balance weight pliers	022102005
Spring	020701012
Weights 100 g	022102006
Weights 50 g	022102010
Weights 35 g	022102011
Weights 10 g	022102013
Weights 5 g	022102027
Measuring compass	020601004
Adhesive weights remover	020601105
Allen key	022102035
hexagon socket head bolt	030201064


4. Initial commissioning


4.1 Unpack the MT 601 D

1. Remove the steel band and fasteners.
2. Carefully lift off the packaging.



3. Remove the accessories and packaging material from the packaging unit.

 Check that the MT 601 D and the accessories are in proper working order and that there are no visible signs of component damage. In case of doubt, do not commission the unit and consult customer service.

 Dispose of the packaging material at an appropriate collection site.

4.2 Setting up the MT 601 D

1. Unfasten locating screw on MT 601 D.
2. Attach hoisting strap as shown in illustration. The hoisting strap must be at least the same length, and must have enough load-bearing capacity (at least 100 kg).

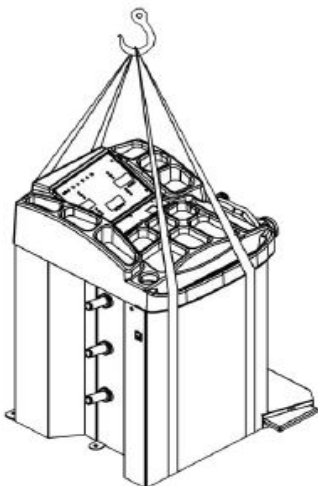


Fig. 3: Lifting the wheel balancer



Warning of damage or wrong lifting gear

Risk of injury if MT 601 D falls.

- Please check hoisting strap before attaching it.
- Secure the hoisting strap.
- Lift the MT 601 D carefully.

3. MT 601 D must never be lifted by the flange shaft. After lifting, set down at prepared installation location and pay attention to the minimum specified distance.

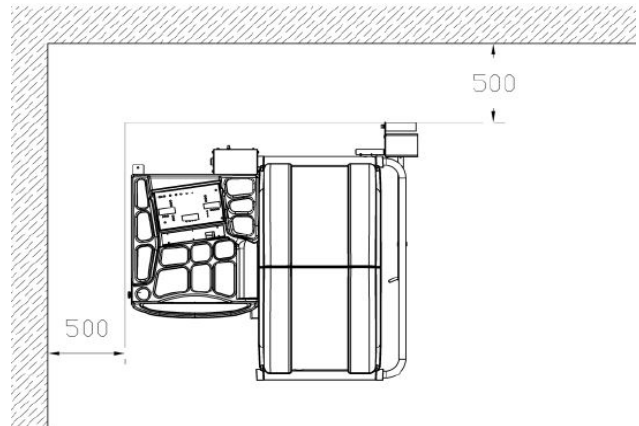



Fig. 4: Wheel balancer installation location

 For safety reasons, the installation location must be 500 mm away from the wall.

4. MT 601 D must be secured to the ground with expansion bolts. Measuring errors will occur if it is not fixed firmly.

4.3 Fitting the wheel-guard hood

1. Remove nut from support bracket on the 2 wheel-guard hoods, then remove the support bracket.

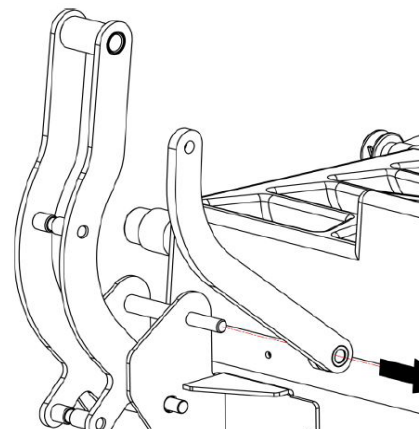


Fig. 5: Unfastening the guard hood

2. Attaching the wheel-guard hood and hood bracket.

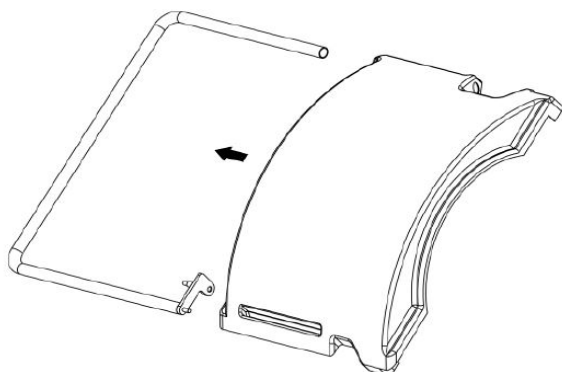
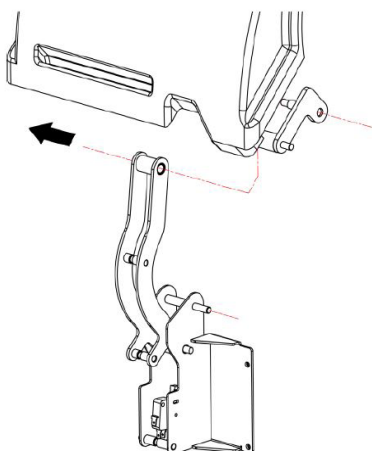


Fig. 6: Fitting the wheel-guard hood

3. Install wheel-guard hood in support and tighten the screw.



4. Install support bracket 2, then install the plate as shown in the following Figure.

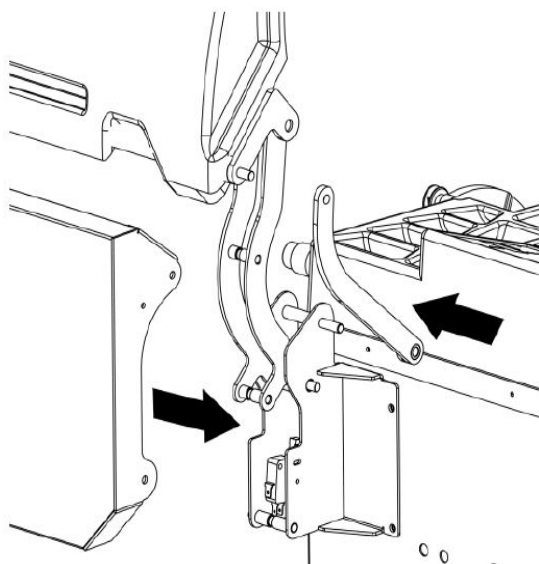


Fig. 7: Installing the support bracket

4.4 Power socket

! MT 601 D must not be connected to the power supply unless its voltage is the same as that specified on the rating plate.

1. Check to ensure that power supply is at the same voltage as specified on the rating plate.
2. Check the usual standard for machines and ensure that the power connector and power port on customer premises both comply with that standard.
3. Connect up to power supply.
4. Connect switch connector of wheel-guard cover.



Fig. 8: Connect switch connector of wheel-guard cover

4.5 Checking direction of rotation

1. Check whether the MT 601 D is properly connected to the mains.
2. Switch on the MT 601 D at the on/off switch.
3. Close the wheel-guard hood.
 - ⇒ Flange shaft rotates.

! If flange shaft does not rotate, press button <???.>.

i If the direction of rotation is incorrect the MT 601 D comes to an immediate halt and the error message **ERR 3** is displayed.

4. Check direction of rotation of flange shaft.

i The correct direction of rotation is indicated by a label on the right side of the MT 601 D.

4.6 MT 601 D calibration

! Calibration must be performed after initial commissioning.

1. Calibrate the flange.
2. Calibrate rim-distance gage.
3. Calibrate MT 601 D.
4. Perform reference measurement.

i The calibration is described in the section "Calibration".

5. Fitting and removing flange

5.1 Fitting flange

1. Actuate pedal.
⇒ Flange shaft blocked.
2. Screw lead screw into flange shaft.
3. Install the M14 screw.

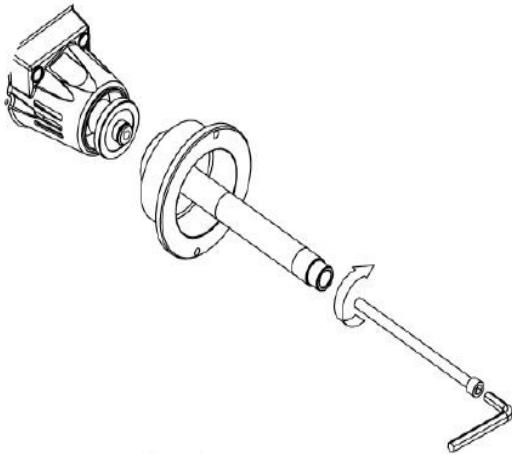


Fig. 9: Installing the lead screw

4. Use Allen key to tighten until there is no clearance between lead screw and flange, i.e. until tight.
→ Screw connection established

 Install until "0" marks on flange shaft and lead screw are aligned.

5.2 Removing flange

1. Actuate pedal.
⇒ Flange shaft blocked.
2. Turn wrench anti-clockwise until lead screw and flange shaft disconnect from one another.

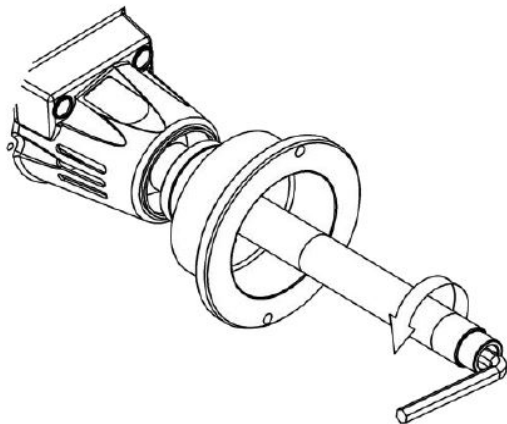


Fig. 10: Removing flange

6. Fitting and removing wheel




WARNING - wheel may slip!

Risk of crushing of fingers and other body parts when attaching and removing wheel.

- Wear protective gloves.
- Wear safety shoes
- Do not place finger(s) between wheel and flange shaft.
- Heavy wheels should always be handled by two people.

6.1 Clamping the wheel

6.1.1 Clamping on correct side

 The usual clamping method is with aligned sides, a quick and easy operation suitable for normal steel rims. This method can only be used on steel rims where distortion is not serious.

1. Push wheel onto flange shaft with internal face onto lead screw.
2. Fit suitable cone (small surface facing inwards).
3. Press quick-locking nut, then rotate quick locking nut on the flange shaft.
4. Release clamping device, then rotate quick locking nut clockwise.

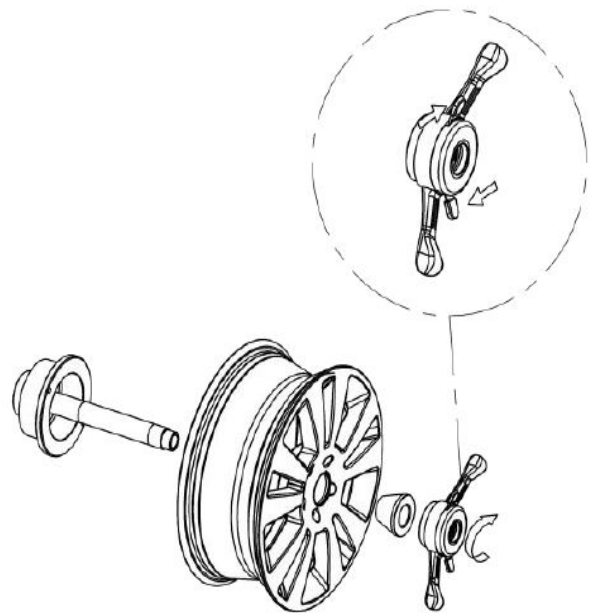



Fig. 11: Install wheel on correct side

6.1.2 Clamping on opposing side

 Choose opposing side for clamping if the wheel is badly distorted outside its central holder because this process assures precise clamping action between the internal face of the steel rim mounting and the flange shaft. It is also suitable for alloy rims, especially for thick rims.

1. Attach spring to flange shaft.
2. Install a suitable cone (small surface facing outwards).
3. Install tire on flange shaft (locating surface of wheel rim facing outwards).
4. Install with quick locking nut and big spacer plate.
5. Press down quick clamping tool, and rotate quick locking nut onto lead screw.
6. Release clamping device, then rotate quick locking nut clockwise.

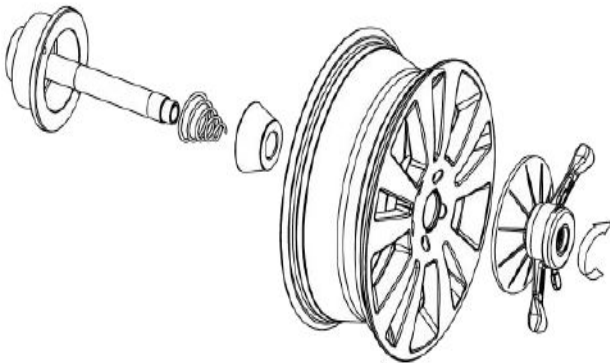



Fig. 12: Clamping with spacer plate (large)

6.1.3 Clamping with special flange

 The clamping method is suitable for wheels on which the centre bore diameter is larger than the diameter of the shaft flange.

1. Secure the flange to the lead screw (in any position).
2. Fit tire to lead screw (locating surface of wheel rim facing inwards).
3. Install a suitable cone (small surface facing outwards).
4. Press down quick clamping tool, and rotate quick locking nut onto lead screw.
5. Release clamping device, then rotate quick locking nut clockwise.

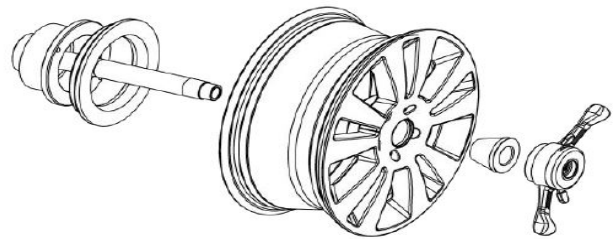


Fig. 13: Locating the wheel with a special flange

6.2 Removing the wheel

1. Turn quick locking nut anti-clockwise.
2. Loosen and remove quick locking nut while holding the tire.
3. Remove wheel.

7. Program layout

7.1 Display

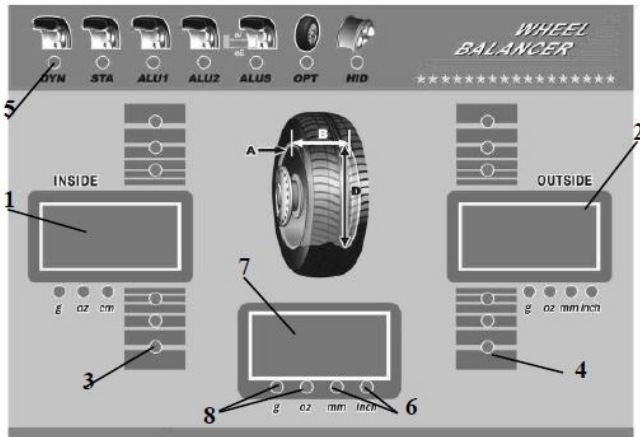


Fig. 14: LED screen

No.	Description
1	Left display panel A: <ul style="list-style-type: none"> Distance of rim to MT 601 D Value of imbalance on 1st balancing plane (inner)
2	Right display panel D: <ul style="list-style-type: none"> Diameter of rim Value of imbalance on 2nd balancing plane (outer)
3	Display of 1st balancing plane (inner)
4	Display of 2nd balancing plane (outer)
5	Display of balancing function and balancing method
6	Display of set unit (millimetre or inch)
7	Average display panel B: <ul style="list-style-type: none"> Width of rim the static value Instructions about the balancing weights
8	Display of set unit (grams or ounces)

I After starting MT 601 D the screen displays the machine code and three display windows show "8.0 5.7 14.0".

7.2 Control buttons

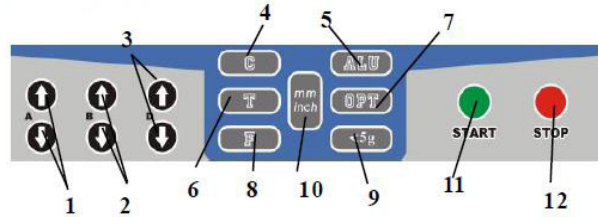













Fig. 15: Control buttons

No.	Name	Description
1	A	Enter distance of wheel from MT 601 D by hand. <ul style="list-style-type: none"> Arrow upwards, increase value, Arrow downwards, reduce value.
2	B	Enter rim width manually: <ul style="list-style-type: none"> Arrow upwards, increase value, Arrow downwards, reduce value.
3	D	Enter rim diameter manually: <ul style="list-style-type: none"> Arrow upwards, increase value, Arrow downwards, reduce value.
4	C	Calibration/reset button
5	ALU	Dynamic imbalance measurement for alloy rims (optional)
6	T	Starting the self test to check the mainboard (PCB)
7	OPT	Starting the optimization process of tires and rims
8	F	Changeover between static / dynamic balancing
9	< 5 g	Precision display of imbalance value below 5 g (0.3 ounces)
10	mm/inch	Changeover between millimetres/inches
11	START	START button, start of measurement
12	STOP	STOP button, stop measurement




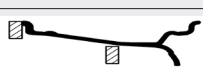

! Only press key by hand. Do not press using sharp objects.


7.3 Keystroke combination for changing between functions


Keystroke combination	Description
 + 	Changing between grams and ounces
 + 	Automatic start of measurement when closing the wheel-guard hood
 + 	Calibration, internal scales, A and D values
 + 	Weight calibration
 + 	Calling up the "Attaching concealed weights" program


 After the selected function has ended, the data are retained.

7.4 Balancing programs

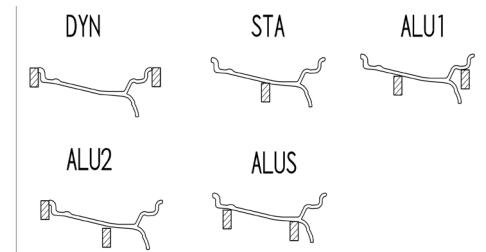
Symbol	Description
	DYN: Dynamic clip weights, on both sides of the rim. For the balancing of steel rims.
	STA: Choose static balancing if no balancing weights are fitted to both sides of a wheel or to the wheel(s) on a motorbike.
	ALU1: Balancing of light alloy rims by attaching adhesive balance weights to the inner and outer side of a rim.
	ALU2: Attach clip-on balance weights and adhesive balance weights to inside of rim.
	ALUS: Adhesive balance weights to any locations on inside of rim


 We recommend using the static balancing program for wheel widths of less than 3.5 inches (8.9 cm). For static balancing, to eliminate static imbalance, adhesive balance weights can be attached to one side of the rim or or adhesive balance weights can be attached to the center of the rim. Only the diameter is relevant to the imbalance result. No other parameters are relevant.

 Press "F" to choose static balancing mode. Press "ALU" to choose a different balancing mode.
 → An LED displays the status of the balancing program.

 In accordance with standard practice, the inside of the tire faces the machine while the outside of the tire faces away from the machine.

7.5 Standard program for input of rim data



 The form of input for rim data depends on the choice of balancing program.

To balance a wheel successfully, please enter the following parameters:

- Rim distance: Distance between wheel and MT 601 D.
- Rim diameter: The nominal diameter of the rim.
- Rim width: In the standard program, to be read from or measured on the rim.

Automatic measurement of distance & diameter

1. Retract the rim-distance gage until the gage head is close to the inner rim, and hold it there.
2. Whenever the warning tone sounds, return the rim-distance gage to its starting position.
3. Read out test result from display window.

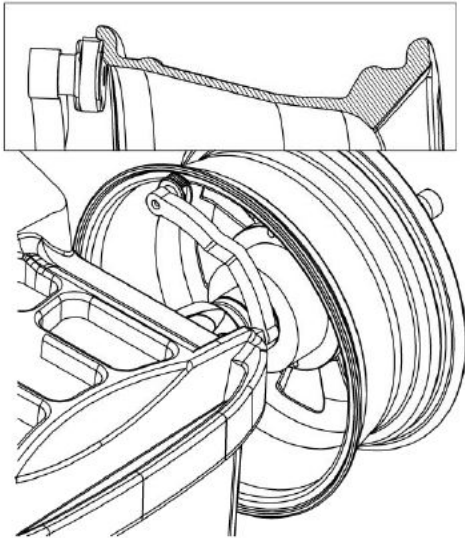


Fig. 16: Setting gage head for automatic measurement

- ⓘ The warning tone confirms the position.
- ➔ Left window shows A value (distance).
- ➔ Right window shows D value (rim diameter).
- ⓘ Enter value for rim width manually.

Manual input of rim data.

1. Pull rim-distance gage onto rim.
2. Read off the scale value.
3. Using the "↑ ↓" keys, enter the relevant rim data for A, B and D.

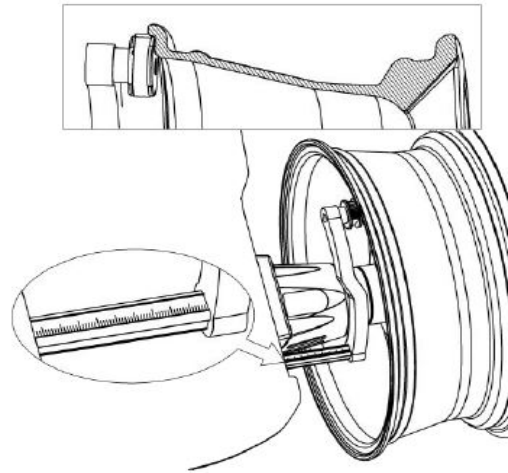


Fig. 17: Reading off scale value A (rim distance)

- ⓘ The rim width and rim diameter can also be read off the rim.

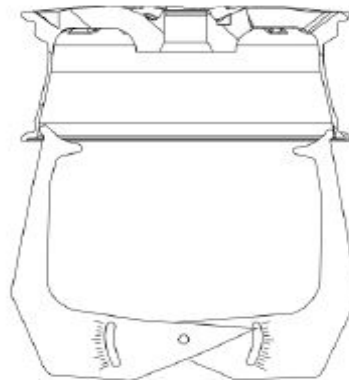


Fig. 18: Measuring the rim diameter

- ⓘ The rim width and rim diameter can also be measured using a measuring compass.

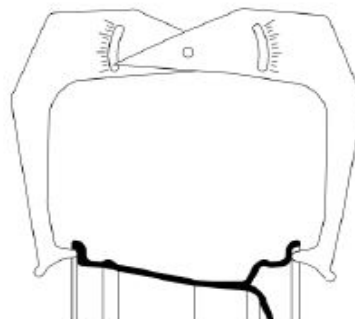




Fig. 19: Measuring the rim width

- ➔ All data required are established and are keyed in.

7.6 Input of rim data for ALUS

 The type of input for tire data depends on the choice of balancing program. To balance a wheel successfully, please key in the following parameters.

- Rim distance: Distance between wheel and machine body.
- Rim diameter: Nominal diameter of rim.
- Rim width: The distance between inner and outer balancing points.

 The balancing point depends on the choice of balancing program.

Automatic entry in ALUS balancing mode

1. Pull the rim-distance gage to inside of first adhesive balance weight position and wait for warning tone to confirm.
2. Pull in rim-distance gage to second inner adhesive balance weight position and hold it there. After the warning tone, return rim-distance gage to its starting position.

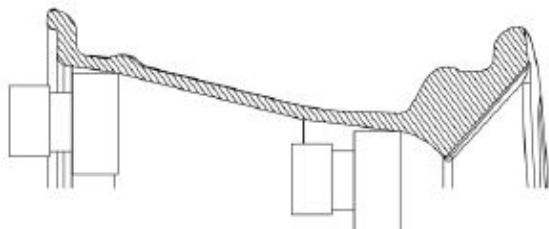




Fig. 20: Automatic input in ALUS balancing mode

 After completing the process described above, the ALUS balancing mode is selected automatically.

 The ALUS balancing mode can also be selected using the ALU key.

8. Balancing the wheel



WARNING – Incorrectly balanced wheels!

Risk of injury due to change in handling characteristics of vehicle.

- MT 601 D must stand on a flat surface and must be secured.
- Specified flange must be mounted on a clean and grease-free flange shaft.
- Use the specified accessories (cone, spacer rings).
- Rim must contact flange accurately, remove any dirt.
- Perform a reference measurement after attaching balance weights.

8.1 Occupied area



CAUTION – Danger of injury if the wheel is turning!

Danger of crushing of limbs when wheel is turning for persons in the restricted area.

- When the wheel is turning the operator must stay in the work area.
- There must be no persons in the restricted area when the wheel is turning.

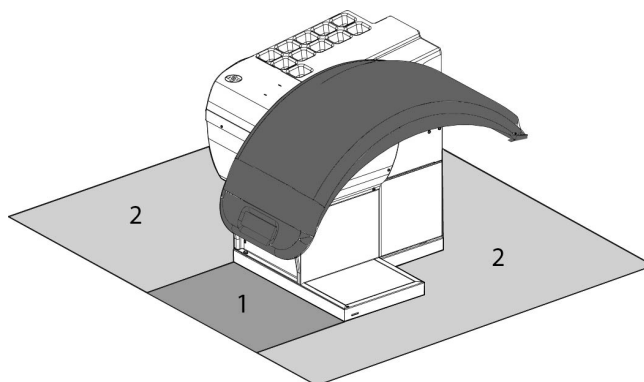





Fig. 21: Definition of working range

- 1 Area which can be occupied during the measurement
- 2 Area which must not be occupied during measurement

8.2 Measuring imbalance

-  This measurement can be stopped at any time.
 - Press the stop button.
 - Raise wheel-guard hood.
 -  Before measuring the imbalance, remove old balance weights, dirt etc. from the tire. Check to ensure that tire is at its specified pressure. Check locating surface of rim and distortion of installation hole. Remove old balance weights.
1. Close the wheel-guard hood.
 - ⇒ The dynamic mode is selected automatically.
 - ⇒ Once the measurement is over, the value for imbalance of the 1st balancing plane is displayed in the left-hand display panel A and the 2nd balancing plane is displayed in the right-hand display panel B.
 2. Raise the wheel-guard hood once the measurement process has ended.

8.3 Attaching balance weights

-  After the balance weights have been attached, the imbalance must be measured again to check the balance.

8.3.1 Standard procedures for clip-on weights and adhesive weights

Attach balance weights to inside of rim, facing the machine.

1. Turn tire by hand.
 - ⇒ The relevant indicator lights up and the warning tone sounds once the balancing position has been reached.
2. If a clip-on balance weight is selected, a balance weight is fitted in the 12 o'clock position (see left-hand display panel A for value). For adhesive balance weights, use the automatic rim-distance gage.

Fit balance weights to outside of rim.

1. Turn tire by hand.
 - ⇒ The relevant indicator lights up and the warning tone sounds once the balancing position has been reached.
2. Attach clip-on weight or adhesive balance weight in the 12 o'clock position (see right-hand display panel D for value).

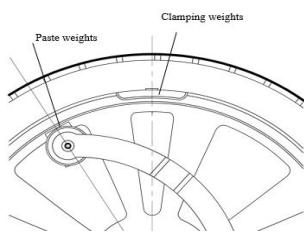







Fig. 22: Attaching balance weights

8.3.2 ALUS balancing mode

-  The position of the adhesive balance weights is determined by the automatic rim distance gage.
 -  The left-hand display panel A shows the 1st balancing plane, while display panel D shows the 2nd balancing plane.
1. Turn tire by hand.
 - ⇒ The relevant indicator lights up and the warning tone sounds once the imbalance point is reached.
 2. Actuate pedal to hold the flange shaft.
 3. Fit the required adhesive balance weights to the head of the rim-distance gage.
 4. Pull out the rim-distance gage.
 5. If the left-hand window displays "—□" and if the warning tone sounds, the point directly on the head of the rim-distance gage is the balancing position.
-  In this way, attach weights to both balancing planes of the wheel. The pedal light lights up while the pedal is being depressed to hold the flange shaft firmly.

8.3.3 Splitting the balance weights (HID program)

-  For ALUS, the balance weights can be split to conceal them behind the spokes.

-  After measurement, to split the balance weights, please press "T+OPT". If Hide lights up, this means that the HID function can be used.

1. Press the "T+OPT" key.
 - ⇒ Indicator panel B displays 12 o'clock.
2. Rotate tire until corresponding position on outer side lights up. Press "ALU" key for confirmation purposes.
3. Indicator panel B displays "-1-". Rotate tire, move left-hand spoke with imbalance point to 12 o'clock position on the flange shaft. To confirm, press "ALU" key.
4. Indicator panel B displays "-2-". Rotate tire, move left-hand spoke with imbalance point to 12 o'clock position on the flange shaft. To confirm, press "ALU" key.
5. Indicator panel B displays "SPD". On the outside of the tire are two split balancing points. Corresponding position on the outer side lights up, actuate pedal to hold flange shaft in place.
6. Fit the required adhesive balance weights to the head of the rim-distance gage.

7. Pull out the rim-distance gage. If window B displays "—□" and if the warning tone sounds, the point directly on the head of the rim-distance gage is the balancing position.
8. Continue rotating tire manually to secure other balance weights behind the spokes.
 - ⇒ Repeat steps 5 and 6.

8.4 Attaching the clip-on weights

I To attach the clip-on weights, you need to use counterweight pliers.

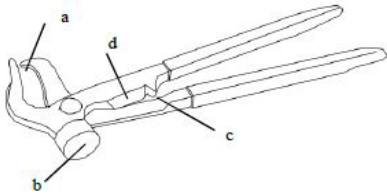


Fig. 23: Balance weight pliers

- a. Balance hammer jaw
- b. Hammerhead
- c. Hook rolling groove
- d. Metal shears for removal of metal

1. Find balancing position, then take off clip-on weights.
2. Fixed the clip-on weights to rim with hammerhead.



I The pliers end of the counterweight pliers is needed to remove balance weights.

I Carefully remove the tire on completion of all balancing work to prevent collision impact with flange shaft.

8.5 Attaching adhesive balance weights

! Remove all weights using adhesive balance weight remover. To prevent damage to the rim, do not use any other sharp objects for this job.

1. Set required number of balance weights on head of rim-distance gage.
2. Extract rim-distance gage once window B displays "—□" and the warning tone sounds.
3. Rotate rim-distance gage, fit it closely to the tires, then attach weights to the rim.
4. Repeat process for the adhesive balance weight and repeat the 2nd balancing plane.

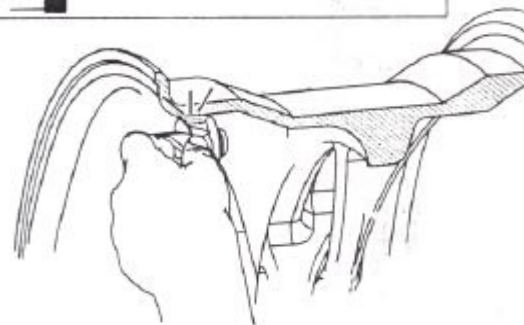
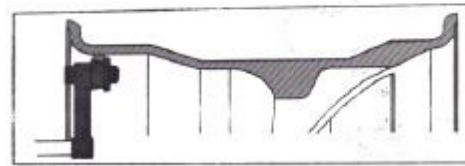


Fig. 24: Balancing plane 1 – Attach the adhesive balance weights

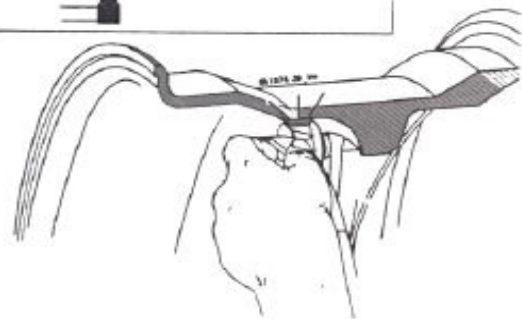
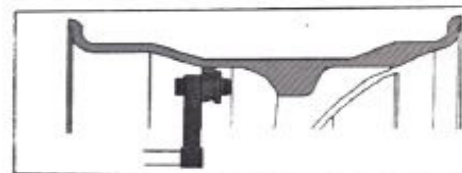


Fig. 25: Balancing plane 2 – Attach the adhesive balance weights

9. Imbalance minimization

If great wheel imbalance is measured (e.g. static imbalance greater than 50 g), it is advisable to perform wheel matching by using the imbalance of the rim to provide compensation for the static imbalance of the tire (imbalance minimization). The first step involves rotating the tire 180 degrees on the rim. Additional minimization can then be achieved by rotating the tire further. The matching program provides assistance with this minimization process.

! Work as accurately as possible throughout the entire procedure.

1. After measurement and running a balance cycle, if the result is over 50 g, press "OPT" button to call up the function.
 2. Rotate wheel to inner imbalance position, press "OPT" button, then monitor displays "180".
 3. Make double mark, on tire and rim (external side 12 o'clock position).
 4. To achieve even greater precision, also make marks on cone and shaft at 12 o'clock position.
 5. Remove wheel.
 6. Pull tire off rim using tire changing machine.
 7. Mount tire again, but this time with mark on tire in position 180 degrees directly opposite to the mark on the rim.
 8. Inflate tires and clamp back onto MT 601 D.
 9. This time, marks on rim, cone and flange shaft should all be at 12 o'clock position while mark on tire should be at 6 o'clock position.
 10. Switch on MT 601 D by pressing START button, or by lowering the wheel-guard hood.
 11. If MT 601 D stops rotating, turn wheel to position of inner imbalance and only apply a mark to the rim. Outer face at 12 o'clock position.
 12. Rotate wheel to outer imbalance position, make another new mark, this time only on the tire, outer side at 12 o'clock position.
 13. Remove wheel.
 14. Pull tire off rim using tire changing machine.
 15. Mount tire again but this time with new mark on tire precisely aligned with new mark on rim.
- Minimization of imbalance is now finalized.

10. Adjustment

Operator error or other reasons may give rise to a fault or malfunction. With the following adjustments, the MT 601 D can be put back into service.

i To set up MT 601 D, the correct parameters must be used to assure the balancing precision of the MT 601 D.

1. Press and hold down the C-key then, half a second later, also press the T-key. The indicator panel displays "CAL CAL CAL", and the LED for the relevant window flashes. If LED stops flashing, release the keys.
 2. Press A key "↑", A key "↓", and ALU key, window now shows "re"05".
- Left and right windows now display symbols and values.

Function	Key
Change of setting/value	B-key "↑""↓"
Perform next setting	A-key "↑"

Adjustment	Left-hand window	Right-hand window	Description
Residual imbalance	re	05	Setting of residual imbalance not displayed
External gage On/Off	aut	On or Off	Adjustment of external gage On/Off
Compensation, internal gage	da-1	000	Adjustment of compensation value on internal gage
Compensation, external gage	db-1	000	Adjustment of compensation value for external gage

i The value displayed in the right-hand window is the normal stored value.

i In the event of data loss or replacement of the computer PCB, the standard memory must always be calibrated in accordance with the details on the label inside the machine.

! If above operation is not successful, please contact Customer Service.

11. Faults

! *If the error message persists, contact customer service.*

i Other possible malfunctions are primarily of a technical nature and are to be checked and if necessary rectified by a qualified engineer. Please always contact the Customer Service of the dealer authorized to trade in Beissbarth-workshop equipment.

i For rapid assistance it is important to quote the details on the rating plate (label on MT 601 D) and the nature of the problem when calling.

Fault	Cause	Remedy
No display when powering up	<ul style="list-style-type: none"> • Fuse defective • Switch defective 	<ul style="list-style-type: none"> • Changing the fuse • Replace switch
"Err1" appears on screen display	Press START key and keep it held down	Contact customer service
"Err2" appears on screen display	<ul style="list-style-type: none"> • No wheel installed in machine • Mount flange and check lead screw for backlash. • Wheel incorrectly installed and not secured. • Motor belt too loose or too tight 	<ul style="list-style-type: none"> • Clamp tire and try once again • Reinstall flange • Reinstall the wheel according to 6.1
"Err3" appears on screen display	Imbalance value of tire is too high	To check, replace wheel and, if necessary, perform a self check.
"Err4" appears on screen display	Position sensor error	Contact customer service
"Err5" appears on screen display	Wheel-guard hood not closed	Close wheel-guard hood
"Err7" appears on screen display	Stored data missing	Enter memory values and repeat self-calibration
Only 00-00 is displayed. No other value.	<ul style="list-style-type: none"> • Sensor head wire is broken or has a loose contact • Stored data missing 	Contact customer service
Every rotational value range has been exceeded	<ul style="list-style-type: none"> • The tire is dirty or the center contact surface on the rim is distorted • The sensor head has become damp • The quick locking nut is not securely mounted • Power supply is too weak • Tire pressure is too low • Machine not fixed 	<ul style="list-style-type: none"> • Replace wheel • Reset sensor head • Use stable power supply • Inflate tire to correct pressure. • Secure machine to a flat concrete floor with an expansion bolt.
Powers down within 10 seconds.	<ul style="list-style-type: none"> • Power supply connection is loose • Fault 	<ul style="list-style-type: none"> • Check power connector • Restart after powering down
The imbalance value is not correct. Faults on left and right and very difficult to achieve imbalance of 00.	<ul style="list-style-type: none"> • Sensor head defective • Program error 	<ul style="list-style-type: none"> • Repeat self-calibration
Does not brake as soon as value is displayed	<ul style="list-style-type: none"> • Brake system defective • External fault 	<ul style="list-style-type: none"> • Restart the machine
Second imbalance value exceeds 10 g.	<ul style="list-style-type: none"> • Inside of rim hole not regular. • Lead screw incorrectly installed. 	<ul style="list-style-type: none"> • To check, replace wheel • Reinstall flange (see Chapter 5.1)
Self-calibration shows "Err8"	<ul style="list-style-type: none"> • No 100 g self-calibration weight • Power wire on pressure sensor is broken • Computer PCB is defective • Power supply PCB is defective 	<ul style="list-style-type: none"> • Add 100 g weights • Check cable and connect it securely
100 g is displayed as an error value	<ul style="list-style-type: none"> • Stored parameter is impaired. • Tire error value is too high 	<ul style="list-style-type: none"> • Key in data again from label inside machine. • To check, replace wheel

12. Service

12.1 Cleaning and Maintenance

! Before cleaning and servicing, switch off the MT 601 D and disconnect mains plug.

! Do not use any solvent-based cleaning agents. Use alcohol or similar cleaning agents to clean plastic parts.

For perfect operation and to guarantee the performance capability of MT 601 D, the following work must be carried out at the intervals indicated:

Scope of service work	Weekly	Semi-annually
	Treat and clean moving mechanical parts with spray oil or kerosene and lubricate with engine oil or a suitable grease.	x
Performing the check measurement		x

Tab. 1: Maintenance and calibration intervals

12.2 Spare and wearing parts

The manufacturer cannot accept any liability for damage arising from the use of non-genuine replacement parts.

Designation	Order number
Centering flange	1 695 602 400
Centering cone 42 - 65 mm	1 695 632 500
Centering cone 54 - 80 mm	1 695 652 862
Centering cone 75 - 110 mm	1 695 605 600
Balance weight pliers	1 695 606 500
Manual vernier caliper	1 695 629 400
Measuring compass	1 695 602 700
Balance weight	1 695 654 377
Balance weights, calibrated	1 695 654 376
Label, electrical power supply 230 V	1 695 101 269
Label, electrical power supply 110 V	1 695 100 854
Direction of wheel rotation label	1 695 653 878

Tab. 2: Spare and wearing parts

12.3 Self-calibration

12.3.1 Self-calibration of system

1. Press and hold down the C-key then, half a second later, also press the T-key. The indicator panel displays "CAL CAL CAL". All LEDs light up and flash. If LED stops flashing, release the keys.
2. Press START key and start the test. When the indicator panel displays "ADD" "12H", then press ALU to confirm.
3. Whenever the indicator panel displays "100" "ADD", then attach 100 g weights to any desired positions on outside face of wheel.
4. Start test run by pressing START key.
5. Whenever the indicator panel displays "ADD" "100", then attach 100 g weights to any desired positions on inside face of wheel.
6. Press START key and start the test. Indicator panel displays "END" "CAL".
7. Press START key and start the test.
8. Check result.

Description	Result
Value is displayed	If "00" "100" is displayed, ± 4 g deviation is allowed.
Phase difference	All outside indicators light up, 100 g weights underneath flange shaft, $\pm 4^\circ$ error is permitted.

➔ System self-calibration is now finalized.

ⓘ After replacement of computer PCB or pressure sensor, the system must be recalibrated.


12.3.2 Automatic self calibration of the rim-distance gage

1. Ensure that rim-distance gage is in starting position. Press STOP and "< 5 g". The indicator panel displays "CAL" "100".
2. Extract rim-distance gage 100 mm. Press ALU key to confirm. Indicator panel displays "CAL" "215".
3. Pull rim-distance gage out to 215 mm, let head of rim-distance gage make contact with top of inside of tire. Press ALU key to confirm.
4. Check the result.

Description	Result
The values "000" "000" "000" are displayed	Calibration successful
"CAL" "100" is displayed	Repeat self-calibration

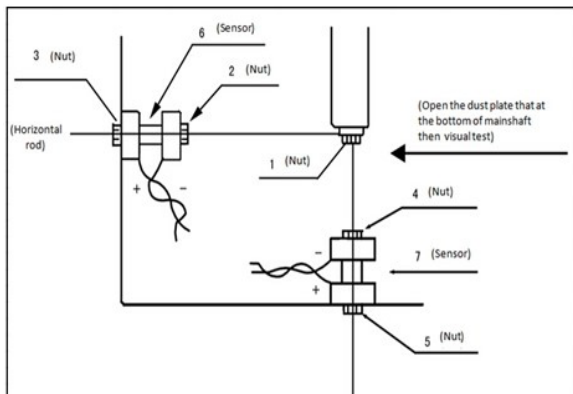
12.4 Self-inspection


1. Press T-key. Displays light up one after the other, from left to right. After the system test of the LEDs, [][POS][] appears on the display screen.
2. Rotate tires until LED starts to flash. If the single tooth on the flange shaft passes the sensor, the display screen shows [][POS][0].
3. With each round, [0] appears once in the right-hand window. When rotated in the opposite direction, the ALUS LED starts to flash.


 The self-test program tests the position sensor and checks that the LED is functioning normally.

12.5 Structure and setting of pressure sensor

1. Unfasten nuts 2, 3, 4 and 5.
2. Unfasten nut 1, unscrew and remove vertical rod.
3. Remove or replace pressure sensor for checking purposes.
4. Place the measuring sensors longitudinally on the vertical rod and transversely on the horizontal rod. The positive terminals on both measuring sensors should point downwards.
5. After connecting horizontal and vertical rods, screw vertical rod into iron beam 1-1.5 cm.
6. Visually check to ensure that flange shaft and machine body are perpendicular. If necessary, use nut 2 or 3 to adjust its position.
7. Tighten nut 4 by hand, then tighten for one half turn. Then tighten nut 5 with a wrench.
8. Tighten nut 2 by hand, then tighten for one half turn. Then tighten nut 3 with a wrench.
9. After installation, use an iron wire to short-circuit connector on pressure sensor to discharge it.




 Before maintenance on the pressure sensor, the machine must be powered down because the computer PCB may otherwise burn out during removal of the sensor head. After maintenance work on the pressure sensor, perform an endurance test.

 If the size of the clamped tire exceeds 15", bridge pins 1 and 4 on the computer PCB. Let the machine run continuously in extended automatic operating mode for about 15 minutes. Then turn off the power for about 30 minutes. Then switch the machine back on again. Perform the endurance test 5 times or more.

12.6 Adjusting the belt tension

1. Remove the cover panel.
2. Unfasten motor screw, turn motor until belt tension is OK, at which point it should be possible to press down belt by up to 4 mm.
3. Retighten motor screw then install cover.

12.7 Changing the fuse

 Install two fuses in the power supply board and always replace them after every malfunction.

13. Decommissioning

13.1 Temporary shutdown

In the event of lengthy periods of non-use:

- Unplug the electrical connection.

13.2 Change of location

- If the MT 601 D is passed on, all the documentation included in the scope of delivery must be handed over together with the unit.
- The MT 601 D is only ever to be transported in the original or equivalent packaging.
- Unplug the electrical connection.
- Heed the notes on initial commissioning.
- Secure MT 601 D back to pallet with 3 screws.

13.3 Disposal and scrapping

13.3.1 Substances hazardous to water

! Oils and greases as well as refuse containing oil and grease (e.g. filters) represent a hazard to water.

1. Substances hazardous to water must not be allowed to enter the sewage system.
2. Substances hazardous to water must be disposed of in accordance with the applicable regulations.

13.3.2 MT 601 D and accessories

1. Disconnect the MT 601 D from the mains and detach the power cord.
2. Dismantle the MT 601 D and sort out and dispose of the different materials in accordance with the applicable regulations.



MT 601 D, accessories and packaging should be sorted for environmental-friendly recycling.

- Do not dispose MT 601 D into household waste.

Only for EC countries:



The MT 601 D is subject to the European directive 2012/19/EC (WEEE).

Dispose of used electrical and electronic devices, including cables, accessories and batteries, separately from household waste.

- Make use of the local return and collection systems for disposal.
- Proper disposal of MT 601 D prevents environmental pollution and possible health hazards.

14. Technical parameters

14.1 MT 601 D

Function	Specification
rotational speed	910 rpm 50 Hz 1100 rpm 60 Hz
Balancing precision	± 1 g
Noise	Under 70 dB
Motor power	0.37 kW
Voltage	230 V/1 P/50-60 Hz
Degree of protection	IP22

14.2 Size and weight

Function	Specification
Size of packaging (length x width x height)	855×705×1085 mm
Net weight	145 kg

14.3 Operating range

Function	Specification
Rim width	1.5 inches - 20 inches
Rim diameter	12 inches - 26 inches
Max. wheel diameter	1050 mm
Max. wheel weight	65 kg

14.4 Temperatures and operating range

Function	Specification
Operating Temperature	+5 ° C \ +40 ° C
Storage Temperature	-20° C \ + 60° C
Temperature gradient	20° C
Relative operating humidity (25 °C, 24 hrs)	<75%\max90%(25°C,24h)
Relative humidity gradient	10 %
Installation height	-200 m. \ 2.200 m.
Transportation height	-200 m. \ 12.000 m.