

Please note:

****This machine is factory calibrated****

******Disregard manual inside of
caliper box******

******DO NOT CALIBRATE AFTER
ASSEMBLY******

BLACK DIAMOND
Auto Equipment

Operation Manual

WB1030L
Wheel Balancer



Read these instructions before placing unit in service.

Keep these and other materials with the unit in a binder near the machine for easy reference by supervisors and operators

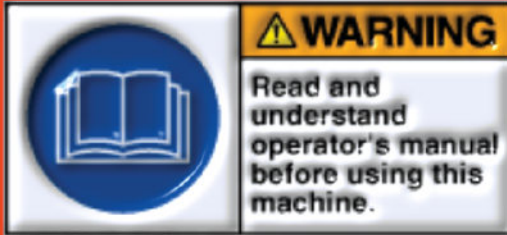
Installation—Operation—Maintenance

<i>Part</i>	<i>Content</i>	<i>Part</i>	<i>Content</i>
1	<i>Accidents and safety management</i>	4.7	<i>Enter wheel data</i>
1.1	<i>Workshop owner's responsibility</i>	4.7.1	<i>Manual data entry</i>
1.2	<i>Safety instructions</i>	4.7.2	<i>Automatic data entry</i>
1.3	<i>The five basic safety rulers</i>	4.7.3	<i>User data presetting</i>
1.4	<i>Work environment and surrounding area</i>	4.8	<i>Balancing programs</i>
1.5	<i>Personally protection and safety</i>	4.8.1	<i>Standard dynamic balancing</i>
1.6	<i>Maintenance and service rules</i>	4.8.2	<i>Standard ALU programs</i>
1.7	<i>Rules for working on rotating machines</i>	4.8.3	<i>ALU-S program</i>
1.8	<i>The safety wheel protection hood</i>	4.8.4	<i>Hide Weight program</i>
1.9	<i>Get prepared—check machine</i>	4.8.5	<i>OPT optimization program</i>
		4.8.6	<i>Static balancing</i>
2	<i>Installation</i>	4.8.7	<i>AS alterative plane static</i>
2.1	<i>Unpacking</i>	4.8.8	<i>Motorcycle wheel balancing</i>
2.2	<i>General guidelines installation position</i>		
2.3	<i>Install the wheel balancer</i>	5	<i>Procedure of system calibration and parameter setting</i>
2.4	<i>Assemble and installation</i>	5.1	<i>Balancing calibration</i>
2.4.1	<i>Display & Control panel</i>	5.2	<i>Distance A calibration</i>
2.4.2	<i>Wheel guard</i>	5.3	<i>Diameter D calibration</i>
2.4.3	<i>Thread shaft</i>	5.4	<i>Width W calibration</i>
2.4.4	<i>Power plug and cord</i>	5.4.1	<i>System parameter setting</i>
		5.5	<i>Replace parts</i>
3	<i>General overview</i>	5.5.1	<i>Replace fuses</i>
3.1	<i>Technical specifications</i>	5.5.2	<i>Cleaning</i>
3.2	<i>Standard accessories</i>	5.5.3	<i>Maintenance interval recommendation</i>
3.3	<i>Technical specifications</i>		
		5.6	<i>Trouble shooting</i>
4	<i>Operating instructions</i>	5.6.1	<i>Error messages</i>
4.1	<i>LED-DIGITAL-DISPLAY-PANEL (display panel)</i>	5.6.2	<i>What if?</i>
4.2	<i>SOFT-TOUCH-CONTROL-KEYPAD (touch pad)</i>		
4.3	<i>LED-DIGITAL-DISPLAY-PANEL-PILOT</i>		
4.4	<i>SOFT-TUCH-CONTROL-KEYPAD-PILOT</i>		
4.5	<i>Key combination overview</i>		
4.6	<i>Wheel balancing</i>		
4.6.1	<i>Mounting a wheel onto the spin shaft</i>		
4.6.2	<i>Wheel centering "back-coned"</i>		
4.6.3	<i>Wheel centering "front-coned"</i>		

1.0 ACCIDENTS AND SAFETY MANAGEMENT

Accidents and Safety Management
Environmental Health and Safety

ENVIRONMENTAL HEALTH AND SAFETY



Read entire manual and safety references before start assembling, installing, operating, or servicing this equipment.

Non-compliance with these recommendations may result in damage to the machine and may jeopardize the operator's safety and warranty.

1.1 WORKSHOP OWNER'S RESPONSIBILITY

Before getting started and using the balancing machine the responsibility of the owner is to carefully read, note and understand this operation manual and to follow all these instructions:

- 1.1.1 Follow all installation instructions
- 1.1.2 Make sure setting up the wheel balancer meets to all applicable Local, State, and Federal Codes, Rules, and Regulations; such as State and Federal Occupational Safety and Health Regulations and Electric Codes.
- 1.1.3 Read and follow the safety instructions. Keep them readily available for future reference for all machine operators.
- 1.1.4 Make certain all operators are properly trained and supervised; know how to safely and correctly operate the machine and accessories.
- 1.1.5 Allow machine operation only with all parts in place and operating safely.
- 1.1.6 Carefully examine the wheel balancing machine on a regular basis and perform all maintenance as required.
- 1.1.7 Only use authorized or approved replacement parts to service and maintains the machine unit.
- 1.1.8 Keep all instructions with the unit and all decals, labels and notices on the unit clean and visible.
- 1.1.9 Do not override safety features.

1.2 SAFETY INSTRUCTIONS

- 1.2.1 Do not use this machine if you have not had a read through this instruction manual or / and have not been taught how to operate it safely by a supervisor / instructor.
- 1.2.2 The warnings, precautions, and instructions mentioned in this manual cannot cover all possible conditions and situations that may occur. The operator must understand that common sense and caution are factors which cannot be built into this product and must be supplied by the operator.



- 1.2.3 People with pacemakers should consult their doctor

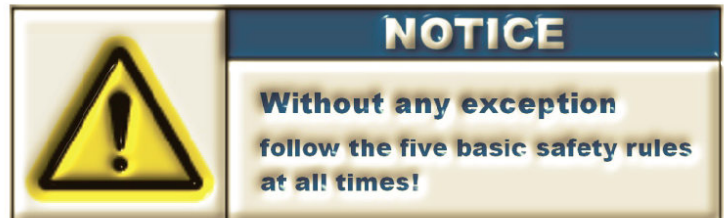
before using this product. Operation of this product in close proximity to a pacemaker may cause interference or failure of the pacemaker.

- 1.2.4 The balancing machine never should be used for purposes other than those described in the instruction manual.



1.3 THE FIVE BASIC SAFETY RULES

All hazards involved in the use of power tools can be prevented by workers following five basic safety rules:



- 1 Keep all tools in good condition with regular maintenance. ✓
- 2 Use the right tool for the job. ✓
- 3 Examine each tool for damage before use. ✓
- 4 Operate tools according to manufacturer's instructions. ✓
- 5 Select and use appropriate protective equipment. ✓

Employees and employers have a responsibility to work together to maintain established safe work practices. If an unsafe tool or hazardous situation is encountered, it should be brought to the attention of the proper individual immediately.

1.4 WORK ENVIRONMENT AND SURROUNDING AREA

- 1.4.1 Keep work area, machines and tools always clean and dry. Cluttered, damp or wet work areas invite accidents.
- 1.4.2 **KEEP CHILDREN AWAY FROM WORK AREA.** Do not allow them or untrained people to handle this machine. Also make sure that unauthorized personnel are unable to approach into the working area of the unit during working cycles.



1.5 PERSONALLY PROTECTION AND SAFETY

- 1.5.1 Do not use this product when under the influence of alcohol or drugs. Read warning labels on prescription medicines to determine if your judgment or reflexes may be impaired. If there is any doubt do not attempt to use this product.
- 1.5.2 Use safety goggles for your eye protection. Permanently wear approved safety impact eyeglasses when operating this product.
- 1.5.3 Dress safely. Avoid wearing gloves while operating the wheel balancer, but tight fitting leather gloves are recommended to protect operator's hands when handling worn wheels and heavy wheels.
- 1.5.4 Avoid wearing loose clothes or jewelry. Always wear proper mechanic's overalls while doing a job in the workshop; and keep your jewelry safe in your locker.
- 1.5.5 Wear protective hair covering to prevent long hair that may get caught in moving parts of the machine. During work and maintenance operations, always tie back long hair.
- 1.5.6 Robust leather work safety shoes with steel toes and oil resistant soles should be worn by wheel service technicians to help prevent injury in typical workshop activities.
- 1.5.7 Consider the use of hearing protection if wheel service activity is performed in an enclosed area and surrounding noise levels are high.
- 1.5.8 Do not over reach. Keep proper footing and balance at all times to prevent tripping, falling back, injury and other types of accidents.
- 1.5.9 Stay alert.
Watch what you are doing at all times. Use common sense.
Do not use this product when you are tired or distracted.
- 1.5.10 Tools and equipment not in use should be stored in a dry location to keep working environment tidy and also to reduce possibility of premature corrosions. Always lock up tools and equipment. Keep out of reach of children.
- 1.5.11 Before each use always examine the product for structural cracks and damage to the wheel guard and electrical wiring. Look for any other condition that may affect the safe operation of the machine. Avoid using the product even if minor damage is discovered. Report immediately. Machine shall be locked out until repairs are completed.



1.6 MAINTENANCE AND SERVICE RULES



*Proper maintenance is essential for safety!
Machine must be inspected before each use!*

- 1.6.1 The wheel balancer is designed for a fixed location and shall be securely anchored to prevent accidental displacement and inaccurate measure results.
- 1.6.2 Make sure this machine is operated on a dry, flat, level, oil and grease free concrete surface designed to support the weight of the product, the wheel being balanced as well as all additional tools and equipment.
- 1.6.3 Maintain a safe working environment. Keep the work area well lit. Make sure there is adequate workspace. Always keep the work area free of obstructions, grease, oil, trash and other debris. Do not use the wheel balancer in damp or wet locations. The machine must not be operated in potentially explosive atmospheres or in areas near flammable chemicals and dust.
- 1.6.4 Always unplug the product from its electrical supply source before performing any inspection, maintenance or cleaning procedure. 
- 1.6.5 This wheel balancer is designed for use with most passenger car and light duty truck wheels. Do not attempt to exceed this machine's maximum wheel diameter and wheel width capacity as indicated in the specification table.
- 1.6.6 The wheel balancer equipped with an electrical power plug. Prior to using, this machine requires the attachment of a grounded. For your safety, only a qualified, certified electrician should attach the power plug onto the power cord. Never remove the grounding prong or modify the plug in any way. Do not use adapter plugs with the power plug.
- 1.6.7 If an extension cords (not provided or available as option) is needed make sure to use only approved cords that have the correct gauge and length. The longer the extension cords the higher the amperage (pulled amperage).
- 1.6.8 Replacement parts and accessories. When servicing, use only identical replacement parts. Only use accessories intended for this product.
- 1.6.9 Maintain this product regularly for details see RECOMMENDED MAINTENANCE.
Keep this product clean and dry for better and safer performance.
- 1.6.10 For maintenance and repairs, a qualified technician best performs all service, repair, and maintenance jobs. Call your local distributor or authorized service center.
- 1.6.11 Always use the right tool for the job. Do not attempt to force a small tool or use an attachment to do the work of a larger industrial tool. Each tool was designed for a specific application. It will do the job better and more safely at the rate for which it was intended. Do not modify a tool and do not use a tool for a purpose other than for which it was destined.

The balancer requires only minor maintenance to keep the unit operating properly

- 1.6.12 Keep the display and keypad clean and clear. Use a damp cloth.
- 1.6.13 Do not use cleaners or solvents which leave oily or filmy residues behind.

1.6.14 Never use any liquids containing solvents to clean plastics.

1.6.15 Use cleaning spirits to clean plastic panels and tool tray.

1.6.16 Weights stored in a dirty tray may pick up grease and dirt which may keep them from securely attaching to the wheel.

1.6.17 Keep the thread shaft, faceplate, adapters, centering-cones, protective ring, hub wing nut and pressure cup (quick nut) clean. A potentially grease and dirt buildup will cause premature wear and inaccurate balancing. The use of a vaporizing solvent to clean these metallic items at least once a day is recommended.

1.6.18 Do not use strong jets of compressed air or power washers for cleaning.

1.6.19 Use a common sense, to handle this electrical device. Exposing the balancer to water, either by hose or bucket, or by exposure to rain or snow, may cause risk of shock or electrocution to operator or bystanders and extensive damage a total failure of the machine. Never hose down with water or bucket wash the balancer. Sensitive electronic components, wiring harnesses, and other devices housed in the balancer are not intended to be exposed to water. Extensive damage to the balancer will result.



1.7.1 GENERAL RULES FOR WORKING ON ROTATING MACHINES

1.7.1 The Basic rule for dealing with all rotating machines is: Keep hands away from moving or rotating machinery!

1.7.2 Always keep hair, loose clothing, ties, necklaces, wristwatches or any other items, hands, all parts of the body, also work tools and other things out of the range of moving or rotating parts of machinery, while the machine is in use.



Don't get caught up!

1.8 THE SAFETY WHEEL PROTECTION HOOD



The guard (safety wheel protection hood) on the wheel balancer, assuming when in good working condition and properly adjusted, protect the operators and other trained employees from hazards and potential serious injuries such as those created by point of operation, rotating parts and flying balancing weights.

- 1.8.1 Check guard and make sure it is constantly in good working condition and fully operational.
- 1.8.2 Do not operate a machine if a guard is missing or damaged.
- 1.8.3 Damaged or missing guard must be replaced and machine shall be locked out until repairs are completed.
- 1.8.4 Adjustable guards must be set properly to prevent access to point of operation and danger zone.
- 1.8.5 Always leave guard in place while the machine is in operation.
- 1.8.6 At all times leave guard in place over idle machines where there is a potential for injury by contact.
- 1.8.7 Put guard back in position after its removal for repairs and before the machine returns to operation.
- 1.8.8 Remain clear of the spinning wheel during balancing procedure.
- 1.8.9 During the spin, the operator is obliged to stay in a lateral position, away from the wheel.
- 1.8.10 Never stand in line of the spinning wheel.

1.9 GET PREPARED - CHECK MACHINE

Machine must be inspected before each use!

- 1.9.1 Check for damaged or broken parts prior to operation that may affect the operation conditions. Before using this product carefully check that it will operate properly and perform its intended function. Replace or repair damaged or outworn parts immediately. Report any damage to machines or equipment as this could cause an accident.
- 1.9.2 Before turning the machine on, make sure tools, tool trays, wheel weights, and other parts and equipment are removed from the direct vicinity of the mounted wheel that has to be balanced.
- 1.9.3 Never stand or allow an observer to stand in line with the spinning wheel.
- 1.9.4 Make sure that the safety guard is in the proper lowered position. Do not raise the safety guard until the spinning wheel comes to a complete stop.
- 1.9.5 Never leave the wheel balancer unattended while it is running. After completing a wheel balancing job turn the power switch to its off position, and wait until the machine comes to a complete stop before leaving.
- 1.9.6 Make sure to read and understand all instructions and safety precautions as outlined in the manufacturer's manual for the wheel you are balancing, and the vehicle the wheel is to be used on.



2.0 INSTALLATION & PREPARATION

Installation Instructions

The machine is supplied partially disassembled and is to be assembled according to the procedures described below.

2.1 UNPACKING



NOTE

Carry out the unpacking, assembly and installation operations indicated below with great care.

Remove the original packing materials; keep and store them intact so that the machine can be safely shipped at a later date if necessary.

When unpacking, first check to make sure all the parts shown on the Packing Lists are included. If any parts are missing or broken, please call the distributor as soon as possible.



NOTE

Upon delivery, parts should exist according to pack-list, see STANDARD ACCESSORIES. For additional references also refer to the exploded view drawings and part lists.

2.1 GENERAL GUIDELINES - INSTALLATION POSITION

Determine the proper location for the wheel balancer. All regulations in force concerning safety at work must be complied with when choosing the installation position.

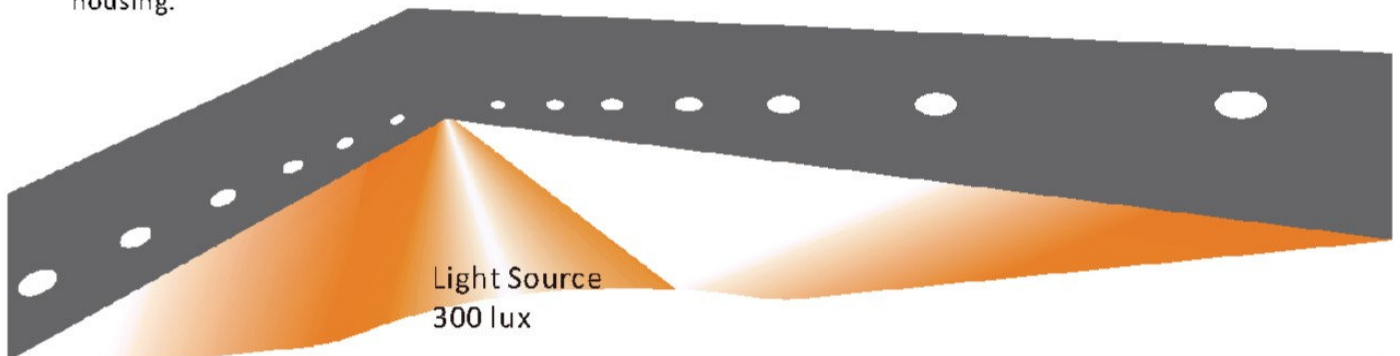
- CAUTION** The main prerequisites is to select a suitable location for the machine that provides dry, oil and grease free, flat, level and solid concrete surface capable of supporting the load of the wheel balancing unit, the wheel being balanced, and any additional tools and equipment required. As well the support base on the sole and the envisaged mounting means must be taken into account.
- Make sure to check the desired location for possible obstructions such as a low ceiling, overhead power lines, adequate working area, access ways and exits.
- Essential necessary conditions for the allocated work space of the wheel balancing machine are sufficient amount of room above and behind the unit so the hood can be raised completely, and abundantly enough surrounding working room for the mounting and removing the wheels.
- The apparatus is designed for indoor operation only. Do not install or use the wheel balancing machine outdoors or in damp or wet locations. In particular, it must only be installed and operated in protected environments where there is no risk of it being exposed to dripping.

For the correct and safe operation of the wheel balancing machine, the artificial lighting level in the place of use should be illuminated with a minimum value of 300 lx (lux).

- Environmental operating conditions must comply with the following requirements: relative humidity ranging from 30% to 80% (without condensate); temperature ranging from 5 °C to +40 °C (41- 104°F).
- The wheel balancing machine should be located in an area free of flammable materials and liquids.

2.3 INSTALL WHEEL BALANCER

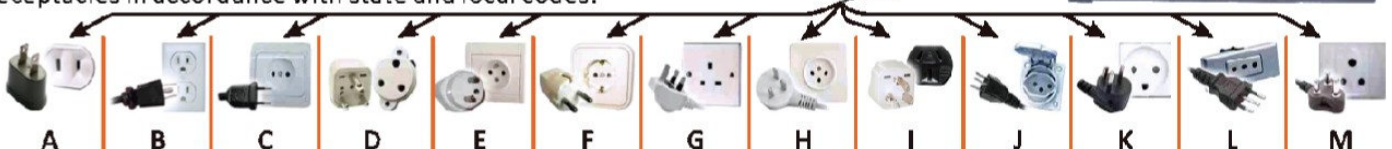
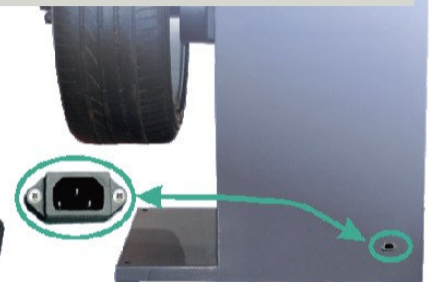
- 1 Using an appropriate lifting device or a second person for assistance. Place the wheel balancing machine on its upright position at the desired location. Use the three 1/2" machine mounting holes located at the base of the machine housing as a template to mark the points where three floor anchor holes will be drilled. Temporarily move the wheel balancing machine aside.
- 2 Move the wheel balancer back to the desired location; align the three machine mounting holes at the base of the machine housing with the three drilled anchor holes in the floor. The balancer must be level to operate correctly. Level the wheel balancing machine by inserting steel shims between the base of the machine and the concrete floor surface. Shims should not be thicker than 1/2" / 12mm.
- 3 Secure the wheel balancer to the concrete floor surface using three concrete anchor bolts with washers and nuts (not provided). Make sure the balancer is leveled using a spirit level for this purpose. It is recommended to use a standard silicon or acrylic body sealant around the bottom line of the machine housing.



NOTE Take into consideration to give more space if you want a wheel lift to use.

Electrical Requirements

See serial tag for the appropriate power requirements of your machine. Always have a qualified electrician install the proper electro plugs or receptacles in accordance with state and local codes.



2.4 ASSEMBLING AND INSTALLATION

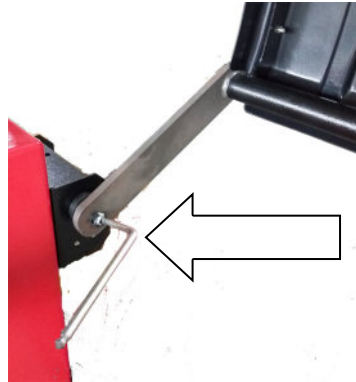
1 MOUNT CONTROL & DISPLAY PANEL



As shown in the pictures above, unfold the control & display panel till it fit your desire position.

2 MOUNT WHEEL GUARD

Please follow pictures to install the wheel guard. Assemble the protection gauge and install on the cabinet with screws. As shown, install the protection hood.



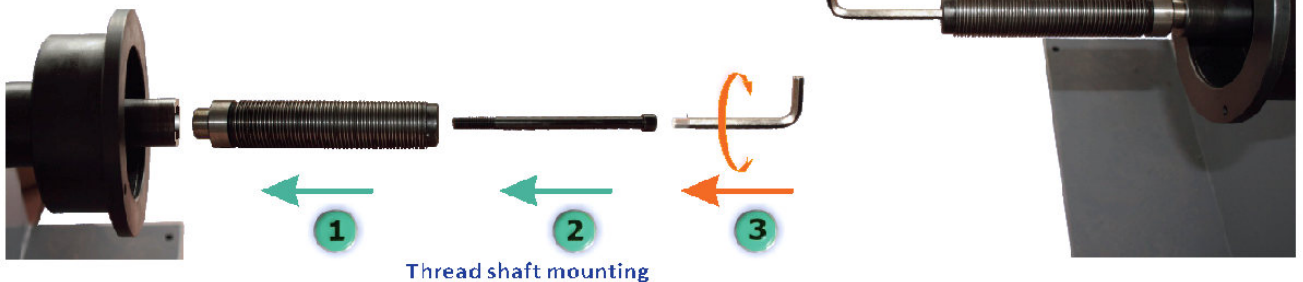
Install the width measurement (if there is), use left hand to hold the rod and right hand install the screw until it is tighten.

* After install / re-install the width measurement, make sure that you do the width calibration



3 MOUNT THREAD SHAFT

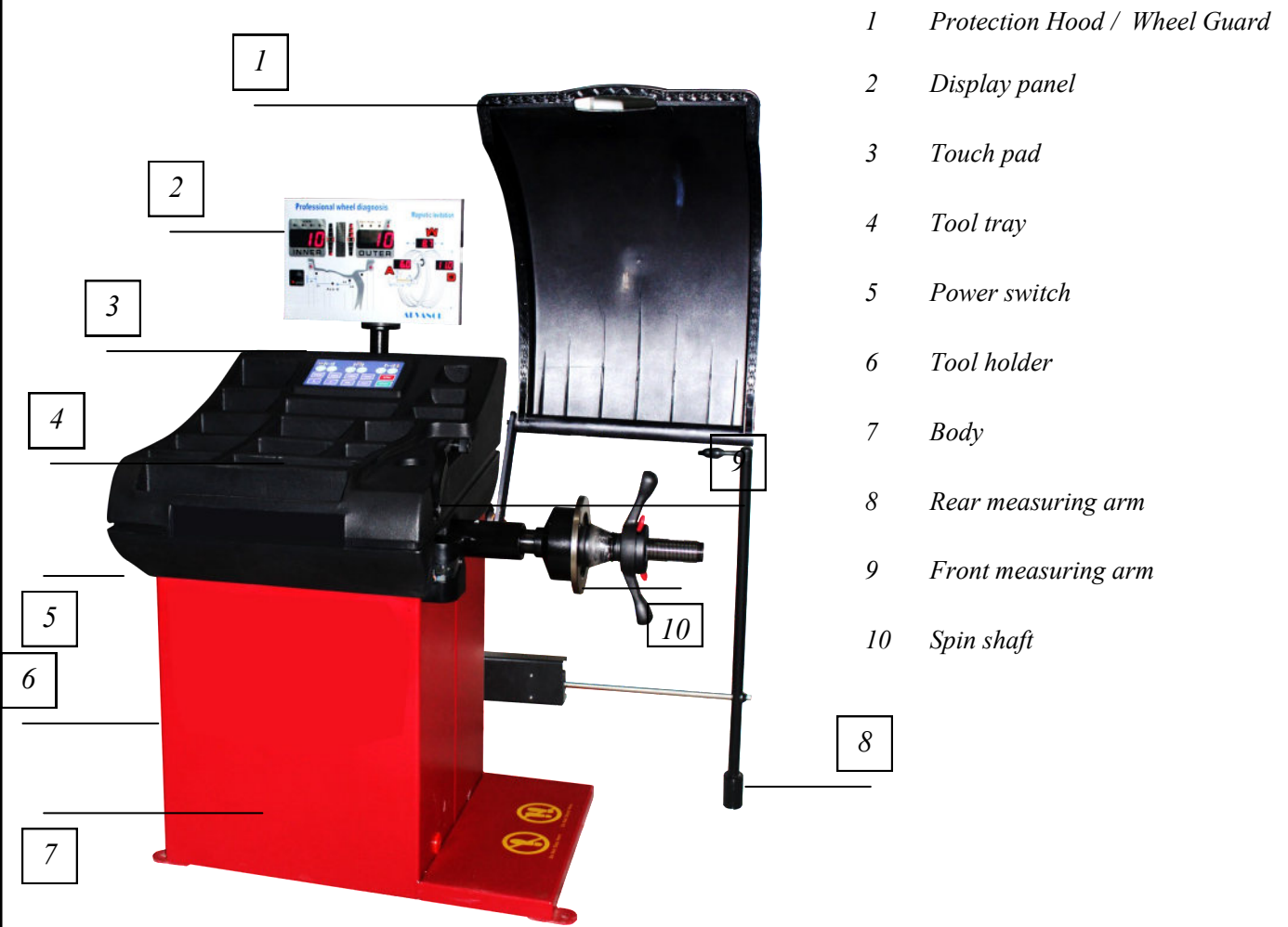
Install the $\varnothing 40\text{mm}$ thread shaft into the flange borehole; lock it with the provided fixing bolt, tighten it by using the supplied hex key.



4 POWER PLUG & CORD

Install a locally approved grounded plug on the power cord. Factory installed plugs are offered as an option only. Then make sure the electrical outlet has a properly ground electrical receptacle. For your safety, only a qualified, certified electrician should do this job!

3.0 General Overview
















- 1 Protection Hood / Wheel Guard
- 2 Display panel
- 3 Touch pad
- 4 Tool tray
- 5 Power switch
- 6 Tool holder
- 7 Body
- 8 Rear measuring arm
- 9 Front measuring arm
- 10 Spin shaft

3.1 Technical specifications

Technical information





Rim with data range	1.5" - 16"
Rim diameter data range	8" - 30"
Rim diameter input range with data arm	8" - 28"
Maximum rim width	16"
Maximum wheel diameter	40"
Distance to spin flange	285 mm (11.2")
Maximum wheel weight	100kg
Spin shaft diameter	40mm
Balancing precision	1 gram (0.05 oz)
Average balancing speed (RPM)	180 rpm
Average balancing cycle time	7-10s
Angular precision	0.35 degrees
Electrical requirements (AC)	1PH / 100-120V or 200-240 /50 /60 Hz
Average consumption	0.5A

3.2 Standard Accessories

						
<i>Pliers</i>	<i>Calibration wheel weight 100g (3.5oz)</i>	<i>Manual</i>	<i>110-133mm</i>	<i>74-111mm</i>	<i>55-80mm</i>	<i>44.1-65mm</i>
						
<i>Quick Nut</i>	<i>M8 Allen Key wrench</i>	<i>M5 Allen Key wrench</i>	<i>Threaded spin shaft 40mm</i>	<i>Spin shaft bolt</i>	<i>HDRWMC</i>	

3.3 Optional Accessories

Please call you local reseller for detail information

	MC-KIT Balancing Shaft Set for Motorcycle
	MC-XLT-KIT Balancing Shaft Set for Motorcycle
	Universal adapter and special wrench
	CSTA Cone kit type A for light trucks

4.0 OPERATION GUIDE

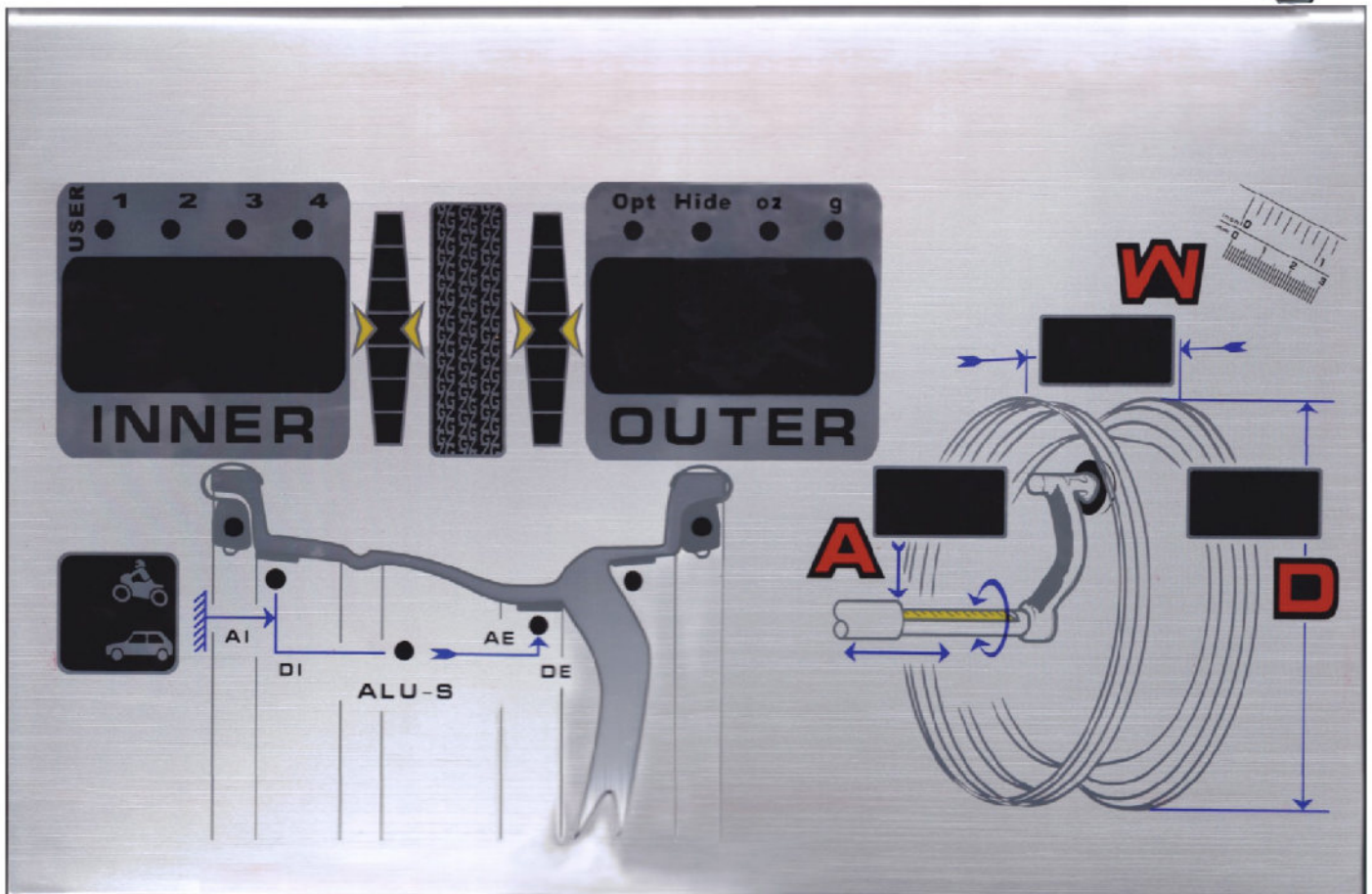
Operation Instructions

FUNCTION DESCRIPTION



4.1 LED-DIGITAL-DISPLAY-PANEL ILLUSTRATION

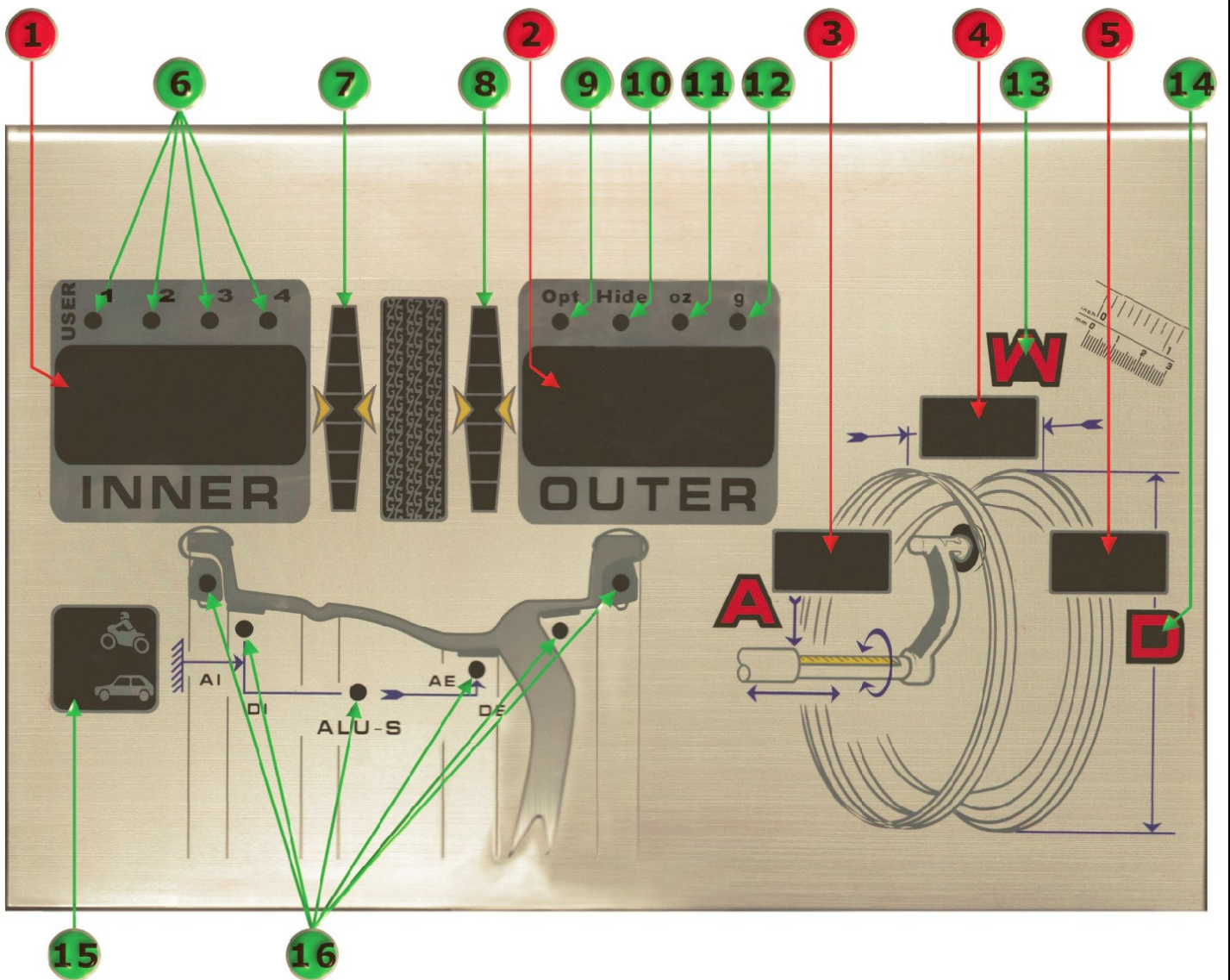
LED-Digital-Display-Panel



4.2 ALUMINIUM FRAME BASED TOUCH-CONTROL-KEYPAD ILLUSTRATION

Touch-Control-Keypad

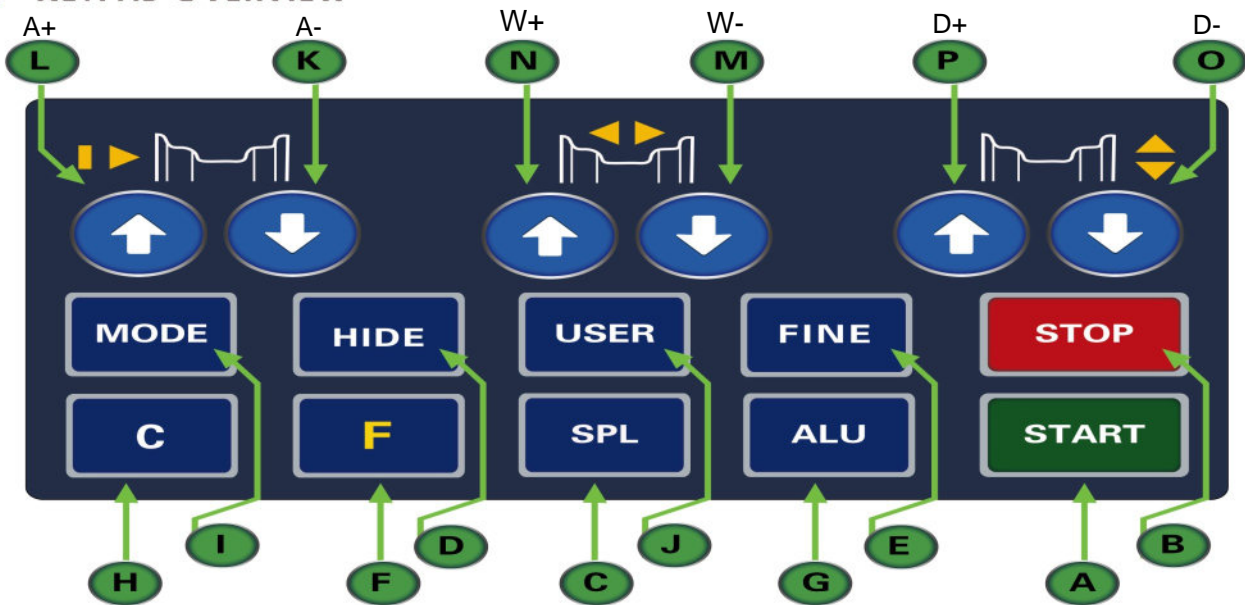
4.3 DISPLAY OVERVIEW



- 1** INNER (left) Weight Display Window.
- 2** OUTER (right) Weight Display Window
- 3** Rim Distance **A** Display Window.
- 4** Rim Width **W** Display Window.
- 5** Rim Diameter **D** Display Window.
- 6** User Number Indicator, light is on beside the selected user number 1 to 4.
- 7** INNER (left) Weight Position Indication Bar.
- 8** OUTER (right) Weight Position Indication Bar.

- 9** Opt Function Indicator, light is on when the Optimization Program is activated.
- 10** Hidden Weight Function Indicator (under ALU-S mode), light is on when the HIDE Program is activated.
- 11** Ounce Indicator, light is on when ounce (oz) is selected.
- 12** Gram Indicator, light is on when gram (g) is selected.
- 13** Width **W** Unit Indicator, light is on when millimeter (mm) is selected, or when ALU-S program is activated. Light is off in inch mode.
- 14** Diameter **D** Unit Indicator, light is on when millimeter (mm). Light is off in inch mode.
- 15** Vehicle Mode Indicator, light is on beside the corresponding vehicle type selected
- 16** Balancing Mode Indicator, illustrates the weight (either click-on or stick-on type) positions corresponding to the rim profile. Refer to the detailed balancing programs followed.

4.4 KEYPAD OVERVIEW



A **START** **START Key:** Press the **START** key to start a spin cycle. Note: Lower the protection hood to activate a spin cycle.

B **STOP** **STOP Key:** Press **STOP** key to perform the following functions in each different status:

- Stop spin cycle in emergency when the wheel is spinning
- Activate the wheel lock (solenoid brake) when the wheel is not spinning, deactivate it by pressing **STOP** key again.

C **SPL** **SPL Key:** Press the Smart Position Locator key to locate the wheel to the balancing weight position.

D **HIDE** **HIDE Key:** Press this key to enter the hidden weight function (behind the spokes) when ALU-S program is activated.

E **FINE** **<T Key:** Press this key to indicate actual imbalance weight amount reading below 5 grams or ¼ ounce.

F **F** **Fn / Static Key:** Press this key to toggle between dynamic and static balancing modes.

G **ALU** **ALU Key:** Press this key to select a balancing program, corresponding modes will be indicated on the balancing mode indicator.

H **C** **C Key:** Press this key to perform the following functions in each different status:

- Recalculate the balancing result after a test spin done, after changing either of A, W and D data, press C key to do recalculation without additional spin;
- Exit program during in process of some programs such as OPT and HIDE, details are described in the specific sections;

CALIBRATION. Press Fn + C key to enter calibration procedure. See details in the calibration chapter.

I **MODE** **Vehicle Selection (MODE) Key:** Press this key to select the vehicle wheel type.

J **USER** **USER Key:** Repeat pressing this key to toggle to choose the desired user working environment.
Press Fn + USER key to save presetting data in each user environment.

K **A-** **"A-" Key:** Press this key to trim down value of rim distance **A**.

L **A+** **"A+" Key:** Press this key to raise up value of rim distance **A**.

M **W-** **"W-" Key:** Press this key to trim down value of rim width **W**.

N **W+** **"W+" Key:** Press this key to raise up value of rim width **W**.

O **D-** **"D-" Key:** Press this key to trim down value of rim diameter **D**.





























P **D+** **"D+" Key:** Press this key to raise up value of rim diameter **D**.

NOTE

The above listed 16 keys are all programmed with extended functions, either mode switching or program activating. Details are shown in the following sections.

Continued

4.5 KEY COMBINATION OVERVIEW

KEY COMBINATION	FUNCTIONS	KEY IN PROCEDURE
 	<p>Spin Mode Setting Auto spin = Wheel spin after protection hood is lowered down. Manual spin = Wheel spin by pressing START key.</p> <p>NOTE In calibration program, wheel spin by press START key. Factory default setting is auto spin.</p>	Press and hold the STOP key and then press the C key, hold for 5 seconds until both weight display windows are turned off. The spin mode changes when keys are released and the display window's lights are on. Lower the protection hood to check spin mode status.
  	Weight unit setting Set the weight units in Gram (g) or Ounce (oz).	Press and hold the STOP key, then press A+ and A- keys, either oz or g indicator is illuminated upon the selection.
  	W and D Unit Setting - mm / inch Set the Width W and Diameter D unit between mm and inch. The default setting is inch .	Press and hold the STOP key, then press W+ and W- keys, LED located on W and D indicators are illuminated when the units are set to mm , or the indicators are off when they are set to inch .
F  	Balancing Calibration To enter the unbalance weight calibration program.	Press both Fn and C keys to enter weight calibration program. See details in section Balancing Calibration
F   	Distance A Calibration To enter the Distance A calibration program.	Press Fn and A+ or A- keys to enter Distance A calibration program. See details in section Distance Calibration .
F   	Width W Calibration To enter the Width W calibration program.	Press Fn and W+ or W- keys to enter Width W calibration program. See details in section Width Calibration .
F   	Diameter D Calibration To enter the Diameter D calibration program.	Press Fn and D+ or D- keys to enter Diameter D calibration program. See details in section Diameter Calibration .
F  	Save User's Presetting Data To preset data in each user's environment.	Press the user key to toggle to the selected user number . Enter A , W and D data, then press Fn and USER keys to save data into the selected user environment.
F  	Optimization (OPT) Program. To enter OPT program.	Press both Fn and Vehicle-MODE keys to enter OPT program. See detail in the section OPT Optimization Program .
	ALU-S Program. To enter ALU-S program.	Press ALU key to enter ALU-S program. See detail in the section ALU-S Program .
F  	System Check Program Enter system check program to scan each Input and Output status.	Press both Fn and SPL keys to enter the system check program. When this program is activated, all indicators and display windows will be illuminated one by one, until the weight display windows prompts the scanning result. NOTE This function is for service personal only.
F  	Alterative Plane Static (APS) Program. To Enter the APS program.	Press both Fn and HIDE keys to enter APS program. See section STATIC Balancing for detail.
KEY COMBINATION	FUNCTIONS	KEY IN PROCEDURE

4.6 WHEEL BALANCING



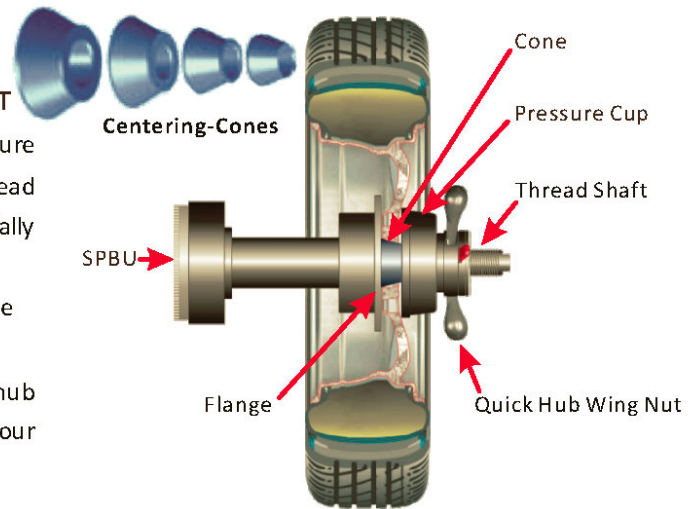
- Calibration is required when the wheel balancer is first put into operation at a fixed location, after it is moved to a new location or when the technician suspects the machine of providing incorrect values or when mechatronical main components have been replaced. It is recommended to perform a calibration every 3 months, but especially while having enormous possible changes of temperature during the seasons. The procedure of calibration is shown in section 5.

4.6.1 MOUNTING A WHEEL ONTO THE SPIN SHAFT

Select the correct size centering-cone diameter that will ensure the wheel rim is tightly secured (no wobble) to the thread shaft. Insert the centering-cone to the spin shaft and partially through the center hole of the rim.

Please pay attention use cones and quick hub wing nut in the different fields of application!

Below are some of the different methods for the quick hub wing nut wheel mounting, choose the proper one in your application.

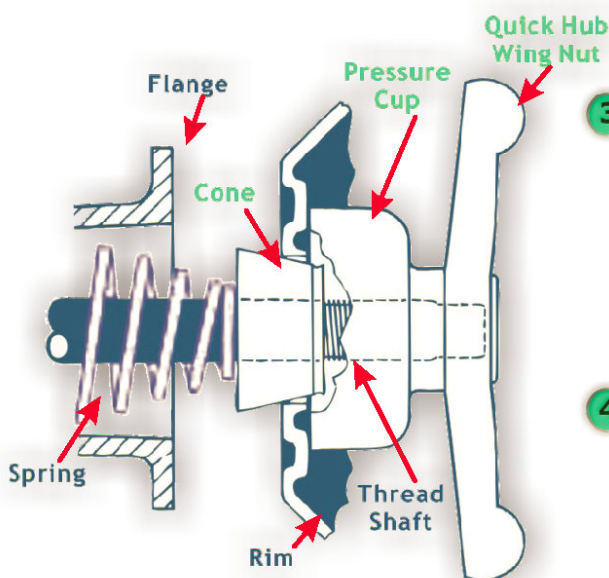


Failure to tighten the Quick Hub Wing Nut properly may result in wheel self-dismounting, causing personal injury and property damage!

4.6.2 BACK CENTERING-CONE MOUNTING

The majority of original equipment rims and steel rims can be handled by using this procedure. The wheel is back-cone-centered, centering-cone from the INNER side of the hub.

- 1 Make sure the pressure cup is attached to the quick hub wing nut.
- 2 Select the centering-cone that best fits the center hole in the rim. Slide the centering-cone over the thread shaft with the larger diameter towards the flange, small diameter joining the center hole of the rim.
- 3 Lift the wheel onto the thread shaft and center it onto the centering-cone. Make sure to position the INNER side of the wheel rim against the flange and cone.



Back Centering-Cone Mounting



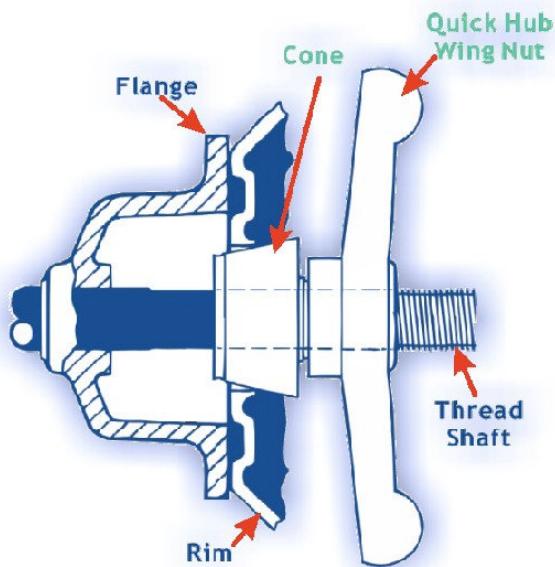
Use the nylon spacer between rim and pressure cup to protect custom wheel finishes.

- 4 Mount the quick hub wing nut with pressure cup onto the thread of the spin shaft and tighten it firmly against the rim. The quick hub wing nut should engage the threads for at least three full turns.



If the quick hub wing nut will not tighten completely, use the front centering-cone mounting method.

4.6.3 FRONT CENTERING-CONE MOUNTING



Front Centering-Cone Mounting

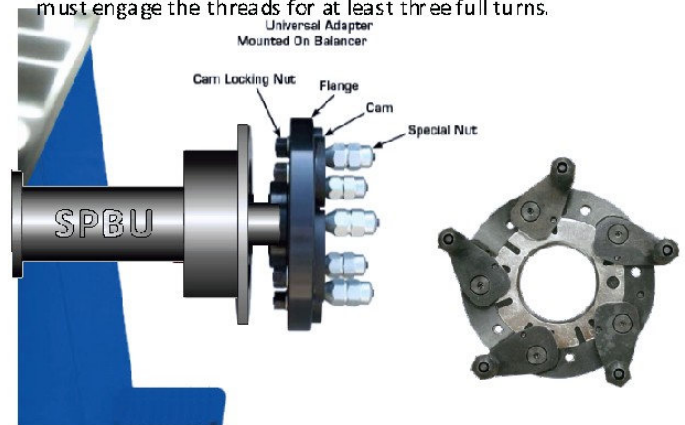
ATTENTION *A wheel should only be centered with this method when the type of the INNER surface of the rim is not convenient to provide an accurate centering seat.*

For wheel without center hole you must use the optional Universal Adaptor.

For Universal Adaptor details see in the Original Equipment Manufacturer's manual.

The wheel is front-cone-centered, centering-cone from the outer side of the hub.

- 1 Make sure the pressure cup is **NOT** attached to the quick hub wing nut.
Select the centering-cone that best fits the center hole in the rim.
- 2 Lift the wheel onto the threaded spin shaft and slide it back against the shaft flange. Make sure to position the **INNER** side of the wheel rim against the flange.
- 3 Slide the centering-cone onto the shaft into the middle of the wheel rim. It is necessary to lift the wheel to get the centering-cone placed in the center hole.
- 4 Fit the quick hub wing nut without pressure cup onto the spin shaft. Tighten it securely against the centering-cone. The hub wing nut must engage the threads for at least three full turns.



Universal Adaptor Mounting (optional)



Quick Hub Wing Nut

ATTENTION

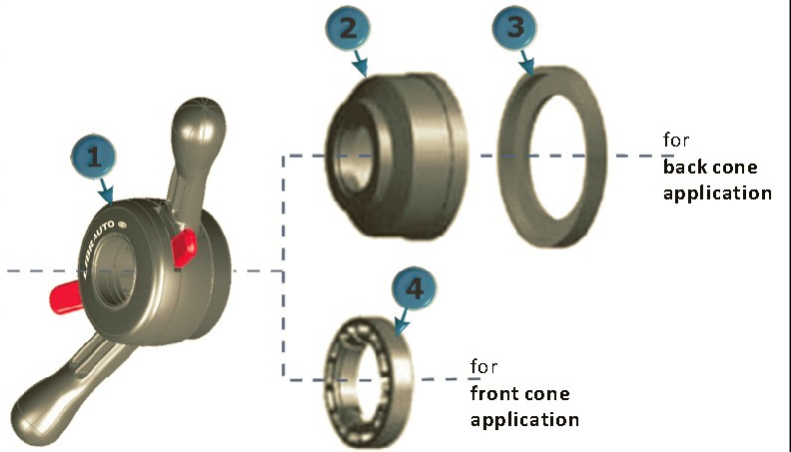
The handles of the Quick Hub Wing Nut must not touch the rim surface as this type of pressure may damage the wing nut which may lead to fractures. And as well it can cause scratches to custom wheel finishes.

QUICK HUB WING NUT

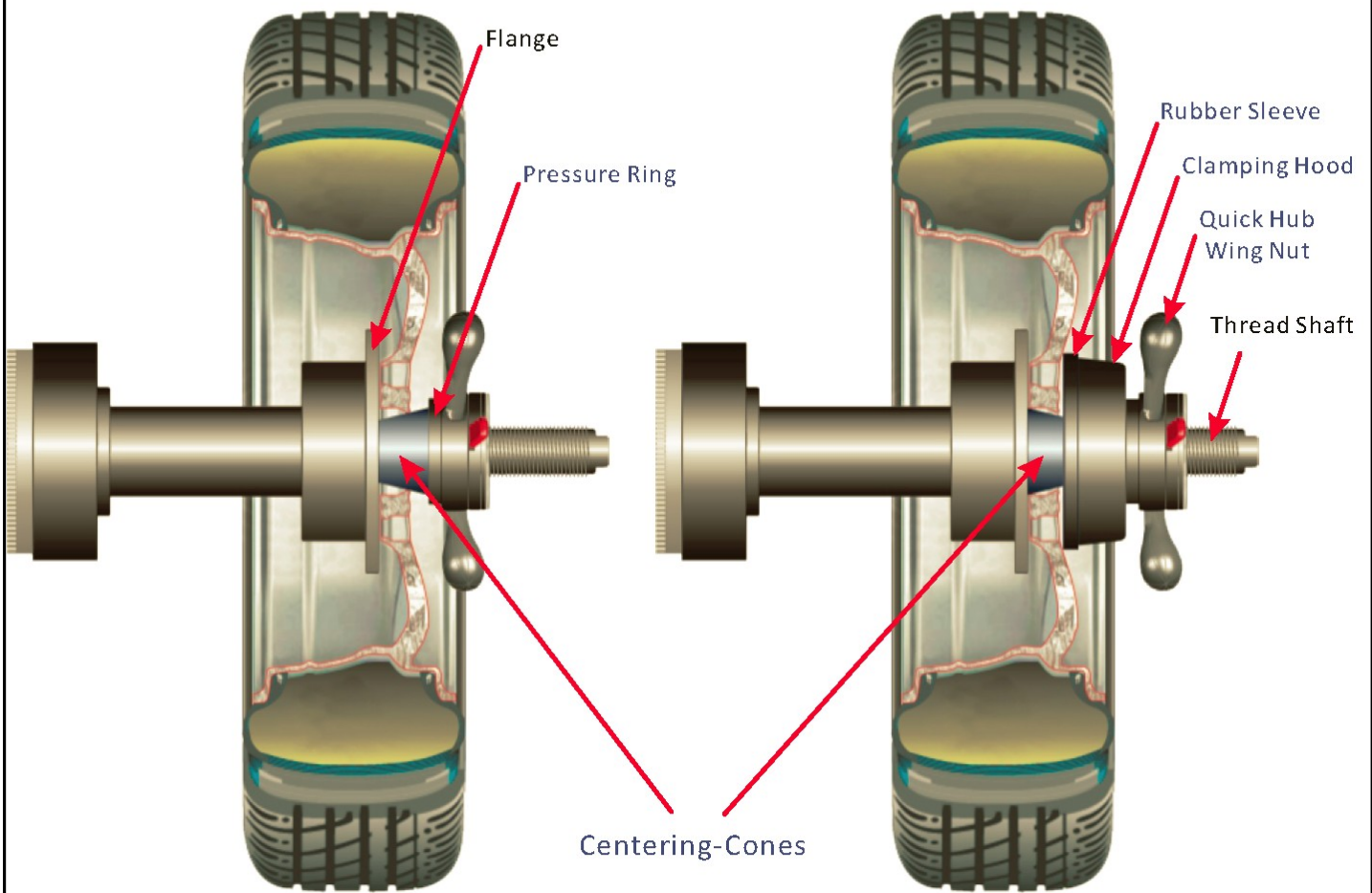
Quick Hub Wing Nut

The Kit Includes:

- 1** Quick Hub Wing Nut
- 2** Clamping hood small with snap-fit (for steel rims)
- 3** Rubber Sleeve (for clamping hood)
- 4** Standard Pressure ring with snap-fit (for Quick Hub Wing Nut)



Cone and Quick Hub Wing Nut Mounting



Front Centering-Cone Mounting

Back Centering-Cone Mounting

4.7 ENTER WHEEL DATA

Wheel dimension data must be entered into the computer before a wheel can be balanced. There are 2 ways to enter wheel data A, D and W, manual entry and automatic entry.

DEFINITIONS OF THE WHEEL DATA

A = Distance	The distance is measured from the wheel balancer to the INNER plane of the rim (INNER weight location).
W = Width	The width of the rim at the rim flange.
D = Diameter	The rated diameter of the rim, it is indicated on the tire.

4.7.1 MANUAL DATA ENTRY

For manual entry models, wheel data can be entered manually through the key pad.

Step 1 : Rim Distance **A**

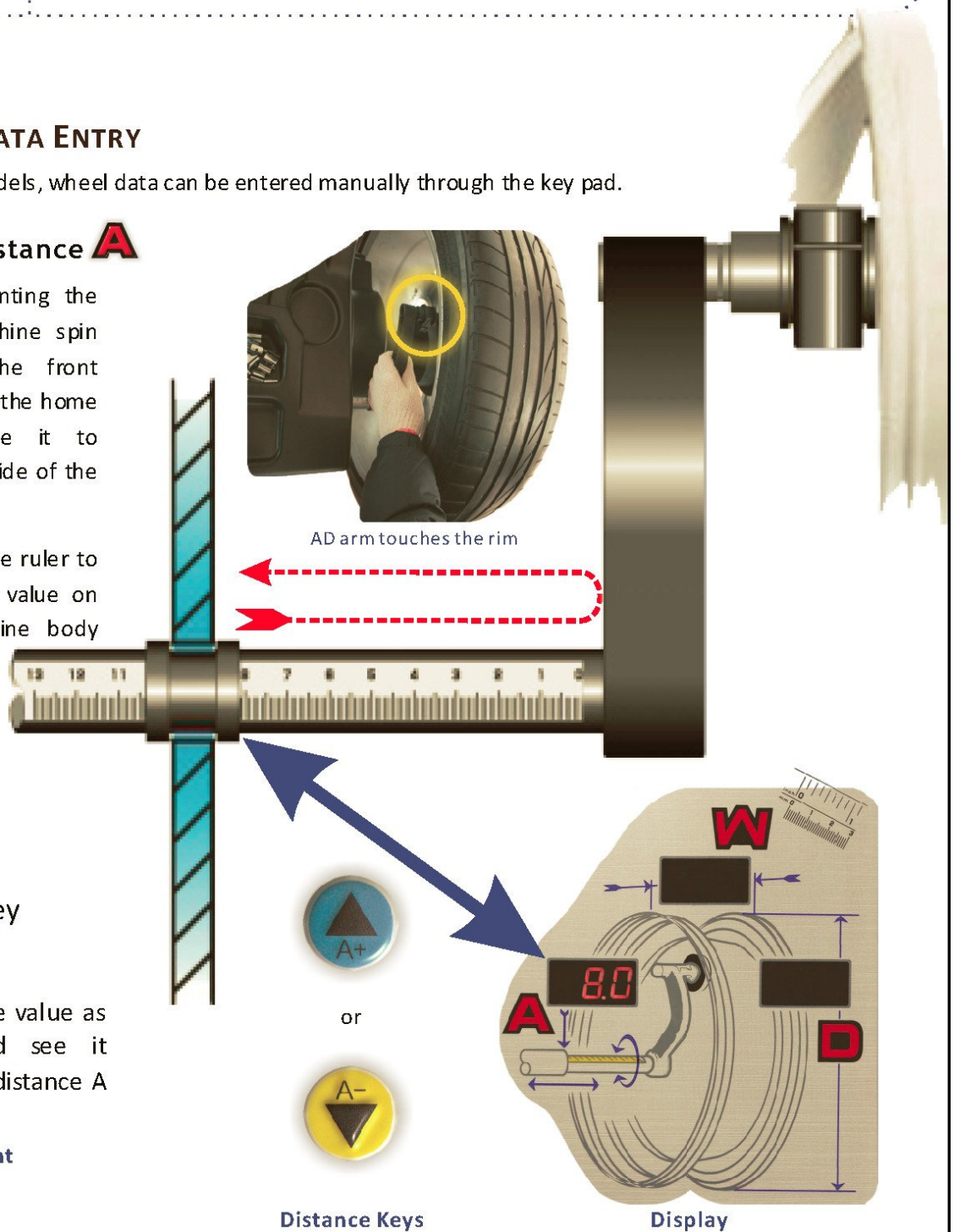
After properly mounting the wheel on the machine spin shaft, pull out the front measuring arm from the home position and move it to contact on the left side of the rim.

Read the scale on the ruler to obtain the distance value on between the machine body and the wheel.

Press A+ or A- key

to set the distance value as per reading, and see it shows on the rim distance A display window.


Accomplishment

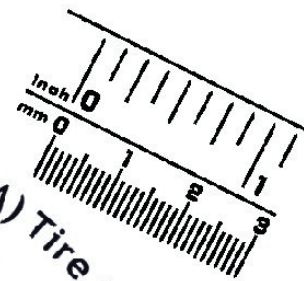


Step 2 :

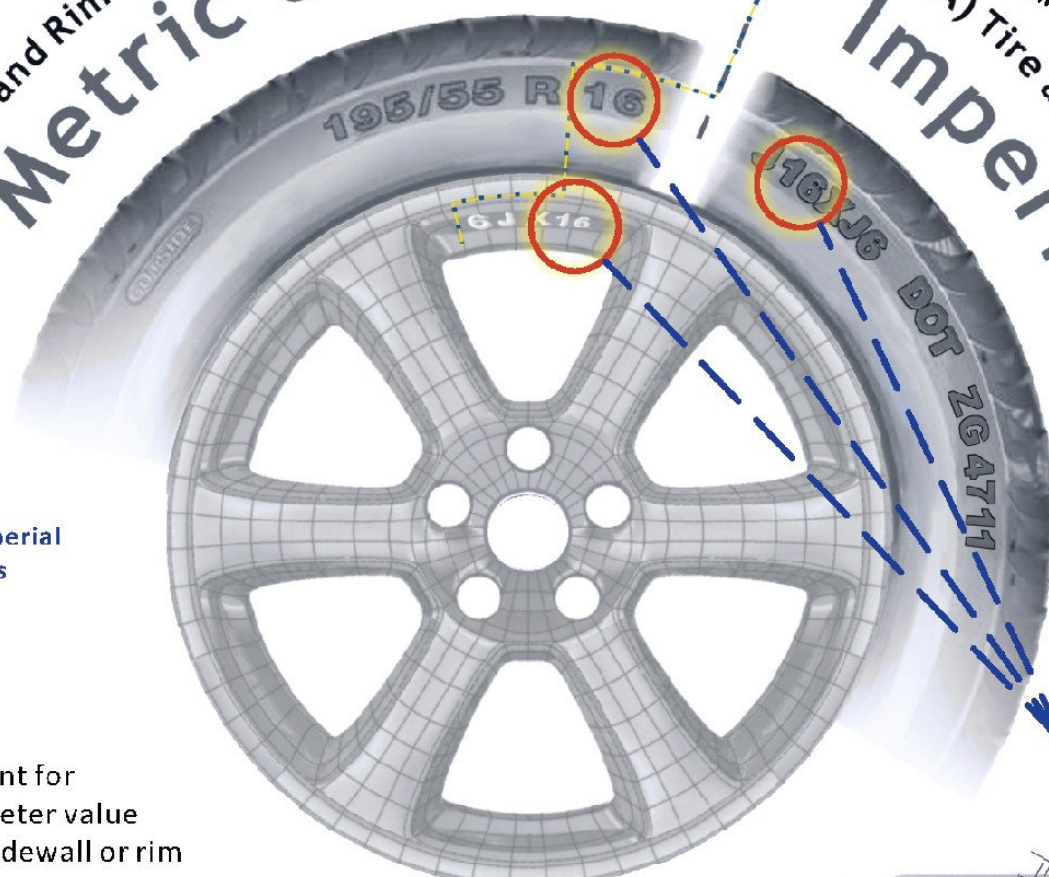
Rim Diameter **D**

European Tyre and Rim Technical Organisation (ETRTO) 
Metric Units

 (TRA) Tire and Rim Association of America
Imperial Units



Metric & Imperial Units on tires



Read imprint for rated diameter value from tire sidewall or rim and manually, put in the data.

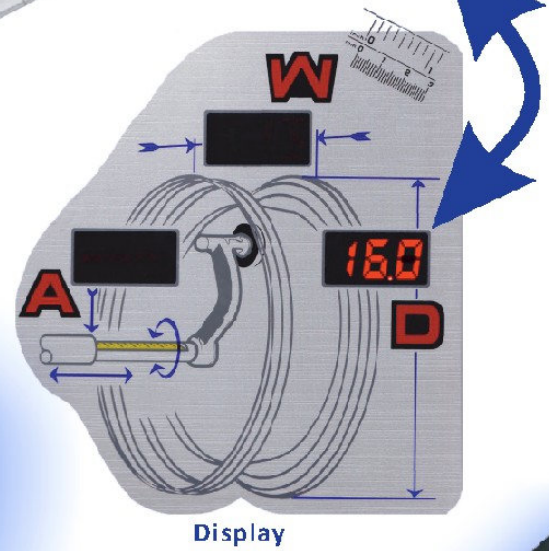
Press D+ or D- key



Distance Keys

to set the rim diameter accordingly.

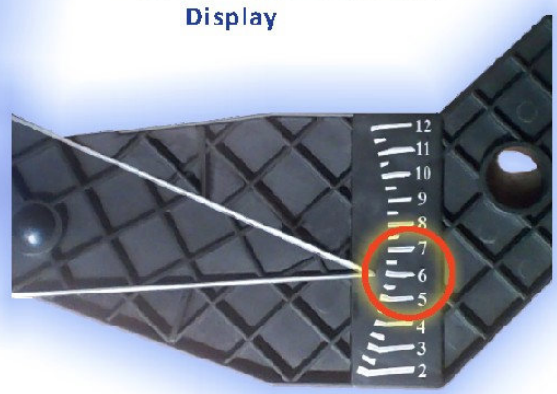
Accomplishment



Step 3 :

Rim Width **W**

Measure width of the rim with caliper provided



Caliper reads: "6 inch width"

Press W+ or W- key

to set the rim width as per value read from the provided caliper.

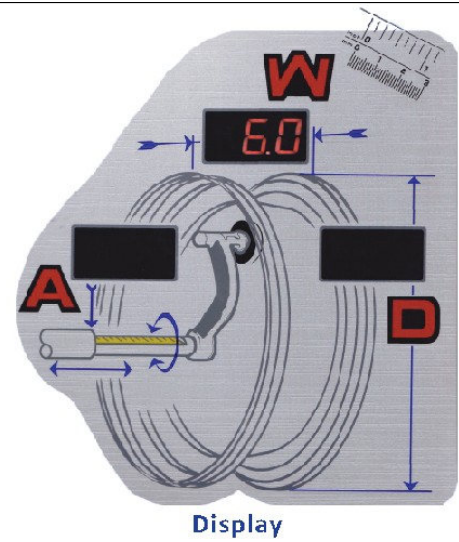
Accomplishment



or



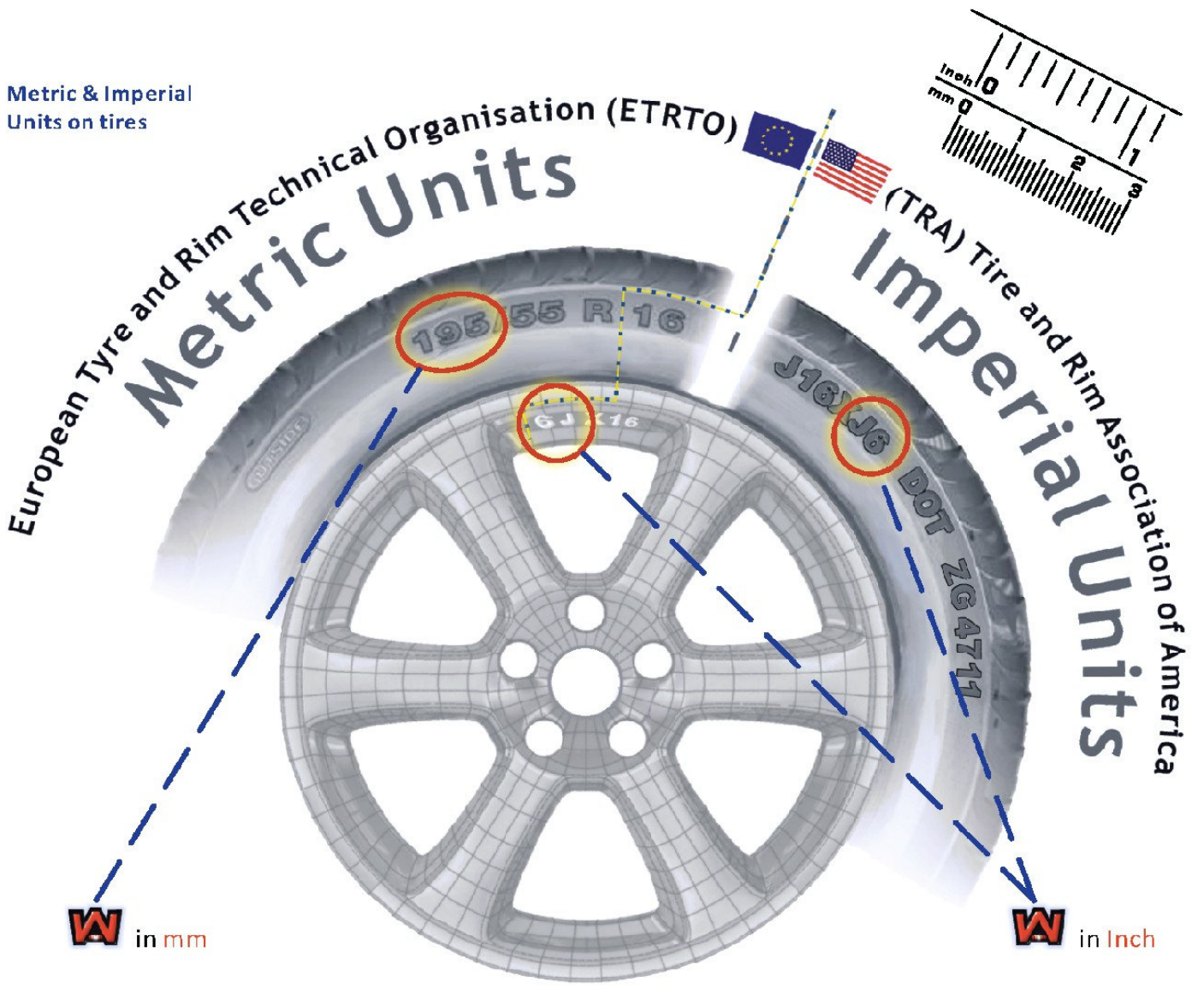
Distance Keys



Display

Alternatively read imprint for Width from wheel sidewall or rim and manually put in the data.

Metric & Imperial Units on tires






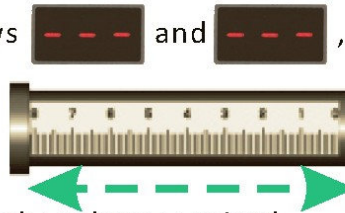
4.7.2 AUTOMATIC DATA ENTRY

For auto entry models, wheel data can be set automatically with the electronic measuring arms built in the machine. The front measuring arm is for taking measurement of wheel distance A and rim diameter D, and the rear measuring arm is for the rim width W.

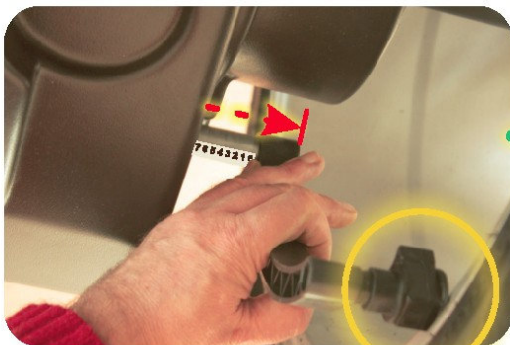
Step 1:

Distance **A** and Rim Diameter **D**

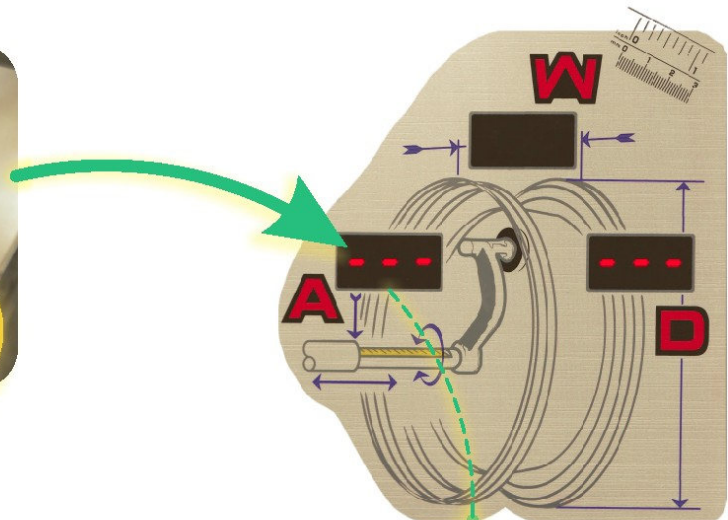
- 1 Bring out the measuring arm and make the tip (stick weight holder clip) contact on the **INNER** side of the rim,
- 2 hold it until the display windows A and D shows ,
- 3 return the arm back to the home position,
- 4 the display windows A and D are now showing the values acquired.
(Example:  and ).



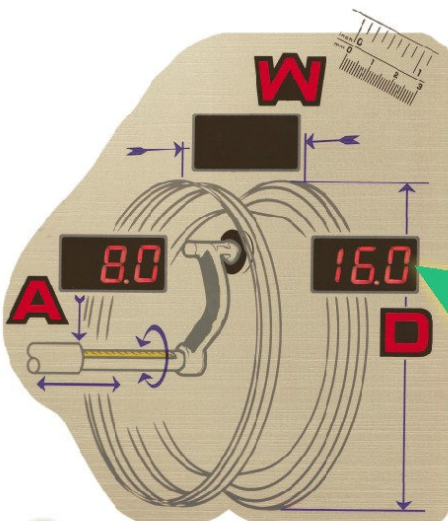
ATTENTION Position of the measuring arm shall be correctly placed to ensure accurate data acquisition. If an incorrect value has been acquired during measurement, move the arm back to home position and repeat the operation.



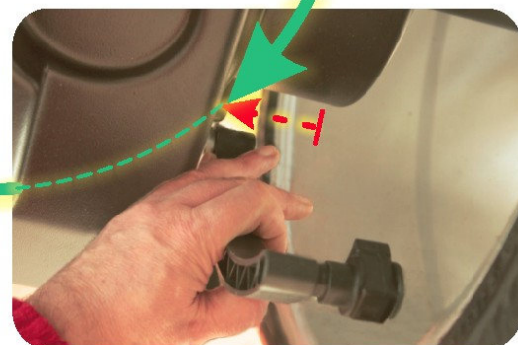
- 1 AD arm touches inboard rim flange
(AD arm in read data position)



- 2 Display A and D shows: 



- 4 Display A (distance) and D (diameter)
with digits acquired

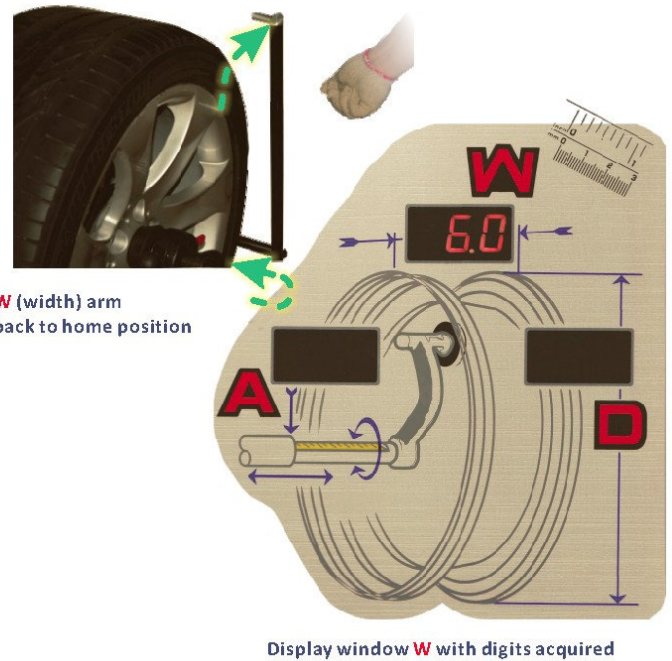
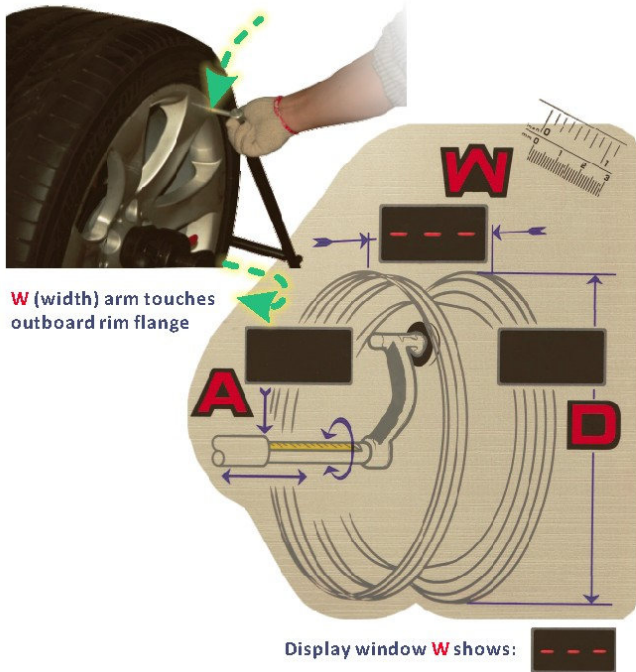


- 3 AD arm pulled back from inboard rim flange
to home position

Continued

Step 2 : Rim Width **W**

Move the pointer of the rear measuring arm to the outboard rim flange, as shown in the pictures followed, hold it until the display window **W** is showing **---**, and rest it back to the home position, the display shows digits as the data acquired. (Example: **6.0**)



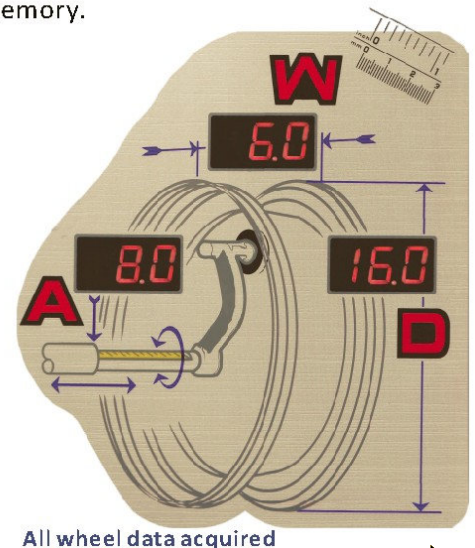
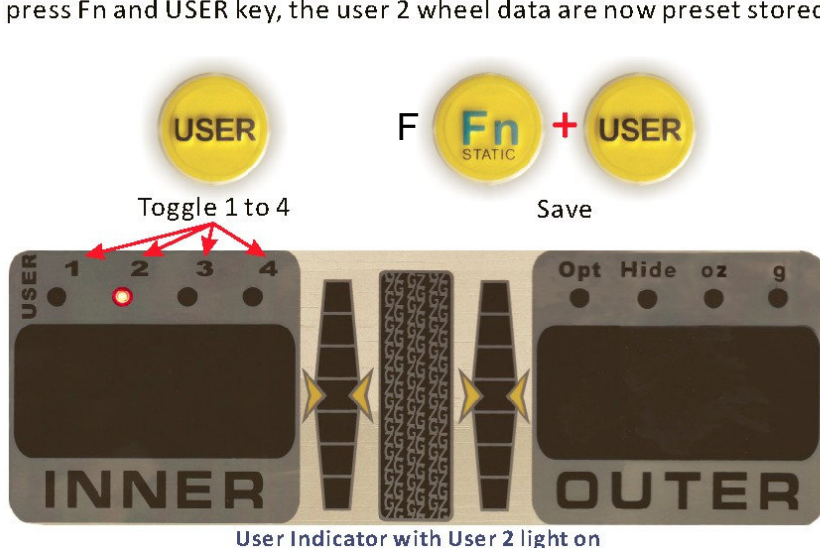
NOTE

If your machine is not built with the rim width measurement arm, enter the width value manually according to the procedure described in [section 4.7.1](#). Data can also be entered by hand for auto entry models.

4.7.3 USER DATA PRESETTING

Four different user data can be preset to the memory to save operation time.

To preset a wheel data into one of the four user environments, repeat pressing the **USER** key to toggle to a desired user working environment (for example user 2), the corresponding user number is illuminated, as illustrated in the picture followed, enter wheel data **A**, **W** and **D** manually or with the automatic measuring arms, simultaneously press **Fn** and **USER** key, the user 2 wheel data are now preset stored to the memory.



Continued

To recall the wheel data preset, for example user 2, repeat pressing the



key to toggle to user 2.

When the wheel balancer is switched on, the wheel data are set to the default values as followed:

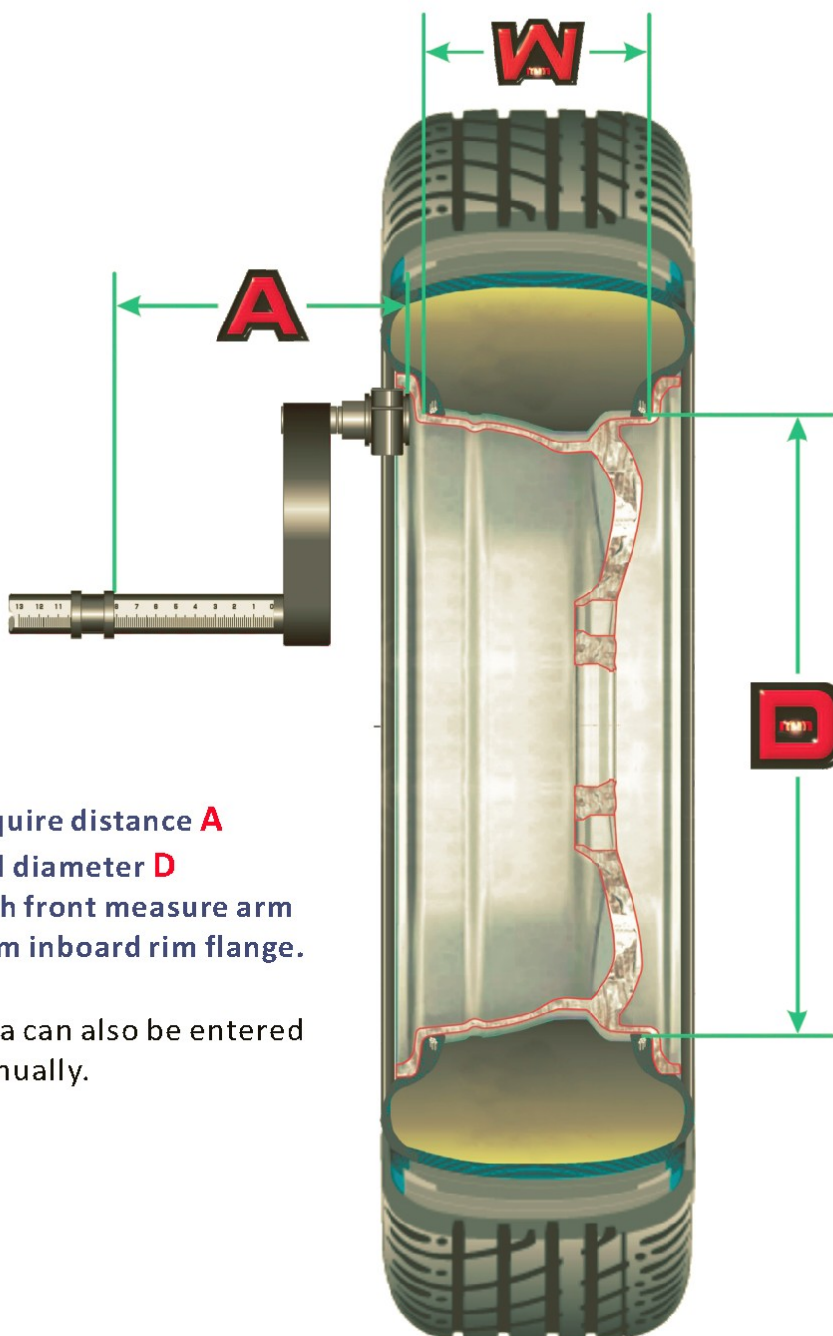


A = 9.0 cm

W = 6.0 "

D = 15.0 "

Operator should change the wheel data as needed.



Acquire width **W** with back measure arm from outboard rim flange.

Alternatively enter the width value manually if your machine is not built with a rim width measure arm.

Data can also be entered by hand for auto entry models.

Acquire distance **A** and diameter **D** with front measure arm from inboard rim flange.

Data can also be entered manually.

Continued

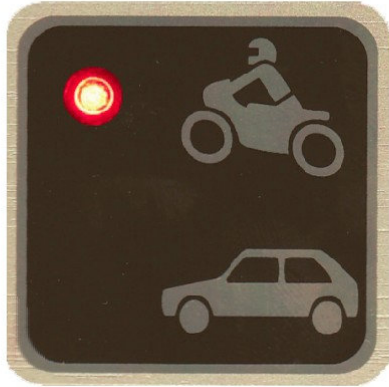


4.8 BALANCING PROGRAMS

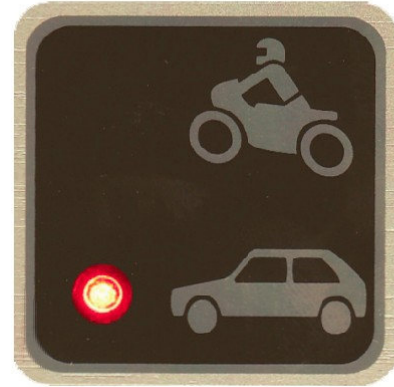
Vehicle Type Selection

There are 2 different vehicle wheel types programmed in the wheel balancing unit:

Motor Cycle Wheel



Car & Light Truck Wheel



To change the type

press Vehicle Selection (MODE) Key



to select the vehicle wheel type. The vehicle type indicator is illuminated upon selection.

The default setting is: Car & Light Truck Vehicle Wheel.



ATTENTION Before balancing operation, the following primary preparation steps must be done:

- 1** Mount the wheel onto the spin shaft; follow-up the procedures described in section MOUNTING A WHEEL ONTO THE SPIN SHAFT.
- 2** Remove any counter weight, pebble, dirt or other foreign materials from the wheel.
- 3** Set the wheel data as per procedure mentioned in section ENTER WHEEL DATA.

G2 PROGRAMS

The following table presents the available programs in the balancing unit. Follow the instruction listed on "key to access" column to enter the program needed.

Continued











BALANCING PROGRAMS

DYNAMIC

MODE	PROGRAM	DISPLAY	KEY TO ACCESS
	Standard		<p>Use the</p> <p>ALU key</p> <p>to toggle between program modes in sequence.</p> 
	ALU-1		
	ALU-2		
	ALU-3		
	ALU-4		
	ALU-5		
	ALU-S		
MODE	PROGRAM	DISPLAY	KEY TO ACCESS

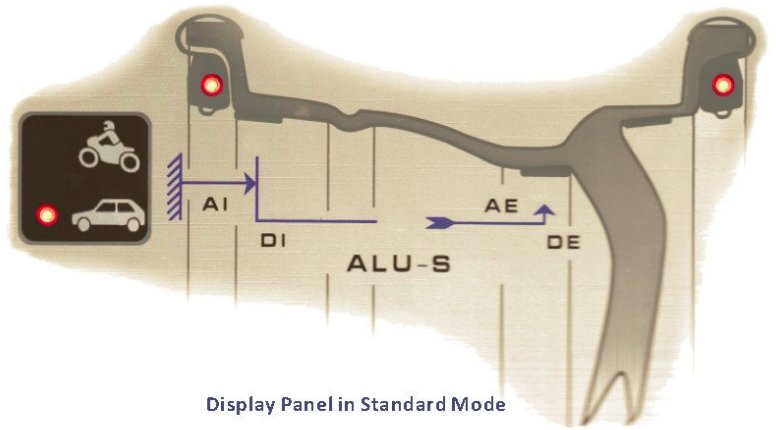
Continued 

BALANCING PROGRAMS

MODE	PROGRAM	DISPLAY	KEY TO ACCESS
DYNAMIC	Hide & Split ALU-S		Press HIDE  when the program entered in ALU-S
	OPT Optimization		Press Fn + Vehicle Mode F  + 
STATIC	Standard STATIC		Press Fn F 
	APS Alternative Plane STATIC		Press Fn + Hide F  + 
	Motorbike STATIC		Press Vehicle Mode 
	Motorbike DYNAMIC		Press Vehicle Mode   then ALU
MODE	PROGRAM	DISPLAY	KEY TO ACCESS

4.8.1 STANDARD DYNAMIC BALANCING

This mode is the most commonly used balancing program, the wheel balancer sets standard dynamic balancing as default mode. As shown in the picture, the balancing mode indicator is in standard dynamic balancing mode, which shows clip on type weights are to be fitted on both sides of the rim flange.



Display Panel in Standard Mode

Procedures:

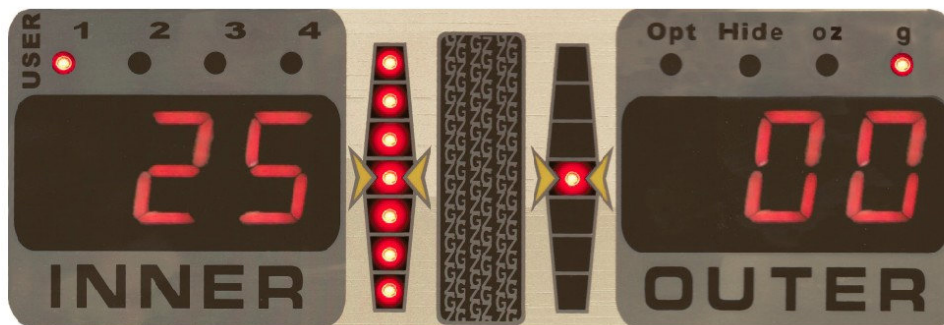
1

Set the wheel data.

2

Spin the wheel.

Lower the protection hood, the wheel spins automatically, as the wheel spins, all indicators and display windows on the display panel are turned off until the wheel stops, the balancing results are indicated on both weight display windows as illustrated in the picture followed.



Left and right weight display windows



ATTENTION Do not apply any undue stress to the machine during wheel spin to obtain most accurate result.



WARNING Do not operate the machine without protection hood. Never raise the protection hood before the wheel stopped. Keep hair, loose clothing, fingers and all parts of body away from moving parts.



NOTE To terminate a spin process, press STOP



key.

3

Raise the protection hood.

4

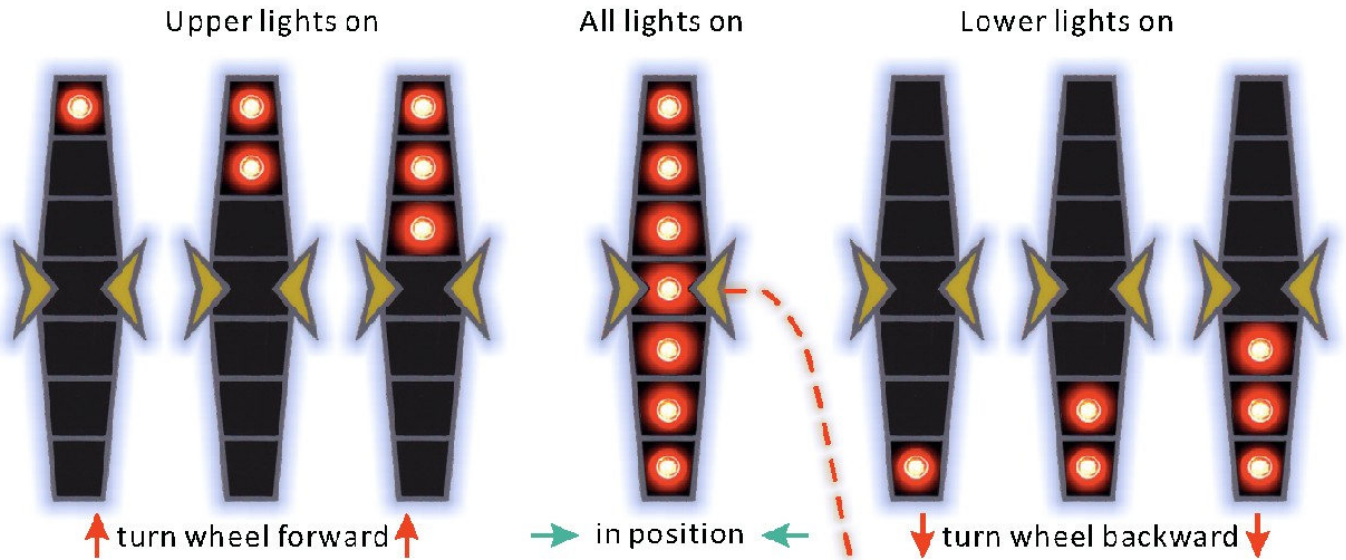
Weight position search. Two methods are available in this machine: Manual search and Automatic search (SPL), the user can choose one of them during operation.

Continued

MANUAL POSITION SEARCH

STEP 1 To search first weight position (i.e. **INNER** (left) side), rotate the wheel with hand, as indicates on the weight position indication bar, turn the wheel backward (reverse spin direction) or forward (spin direction) until all lights of the indication bar are illuminated, hold the wheel for about 1 second, the locking device activated to restrain the wheel in the position


Indication Bar Display



STEP 2 Apply a balancing weight with displayed amount to the **INNER** plane in "TDC" (Top Dead Center) position of the rim.


At 12 o'clock, the highest point of the rim = 0°.

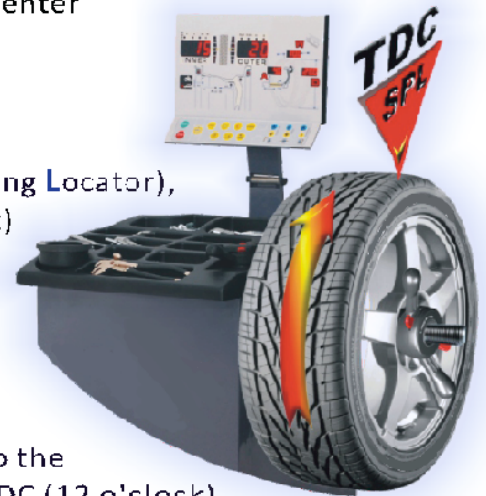


Step 3 :  Press **STOP** key to unlock the wheel (user can also turn the wheel backward to unlock the wheel), search 2nd weight position (i.e. **OUTER** (right) side) with the same way described on step ①.


Step 4 : Apply a balancing weight with displayed amount to the **OUTER** (right) plane in the position on the rim at top dead center 12 o'clock.

Automatic Position Search (SPL)

Step 1 :  Press the **SPL** key (**SPL = Smart Positioning Locator**), the wheel rotates slowly, the **INNER** (left) weight positioning bars are fully illuminated as the wheel stops at the **INNER** (left) correction weight position (Top Dead Center of the rim).



Step 2 : Apply a balancing weight with displayed amount to the **INNER** (left) plane in the position onto the rim at TDC (12 o'clock).

Step 3 :  Press the **SPL** key (**SPL = Smart Positioning Locator**), the wheel rotates slowly, the **OUTER** (right) weight positioning bars are fully illuminated as the wheel stop at the **OUTER** (right) correction weight position (TDC of the rim).

Step 4 : Apply a balancing weight with displayed amount to the **OUTER** (right) plane in the position onto the rim at TDC (12 o'clock).

NOTE

SPL might locate at a position very close to TDC due to wheel weight deviation. Slightly rotate the wheel forwards or rearwards until you get the buzzer sound.

C

Press key **C** to exit the SPL program.

5

After balance weights applied on the wheel, lower the protection hood, and proceed a test wheel spin to check the balancing result. The result shall be zero on both weight display windows if correct weights are applied to the correct positions.

NOTE

During applying weights to verify the wheel balance, positioning error might happen, and a few degrees error might cause a residual unbalance as large as 5-10 grams, especially in case of large unbalance.

In practical wheel balancing operations, available counter weights are 5 grams increments, i.e. 5, 10, 15...60 grams etc. However, an actual unbalance results might be any grams in between, for example, when there is a 23 grams unbalance in actual, and the program will suggest 25 grams to balance it.

The facts described above might cause an unsatisfied balancing result, if such cases happen, it is recommended to remove the applied weights from the rim and redo the balancing.

Continued 



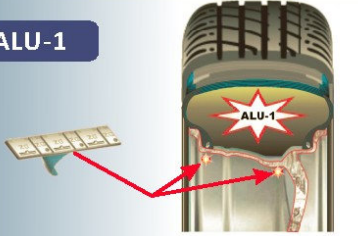
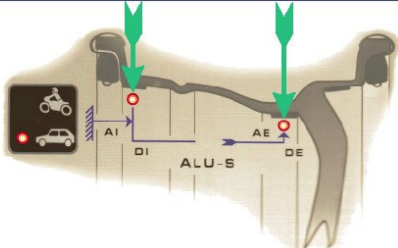
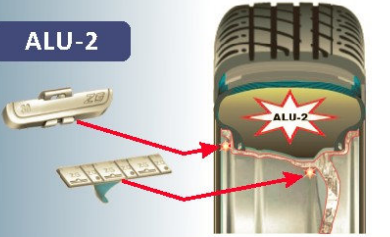
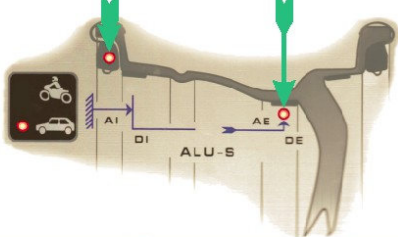
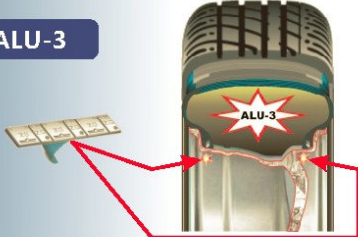
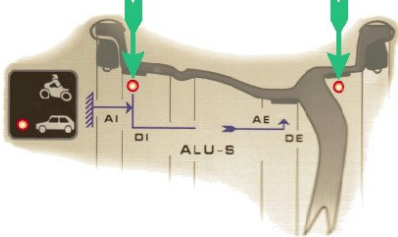

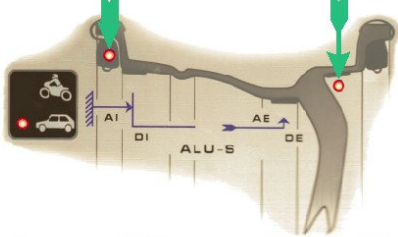
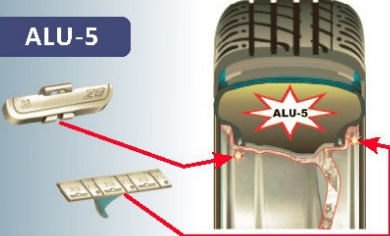
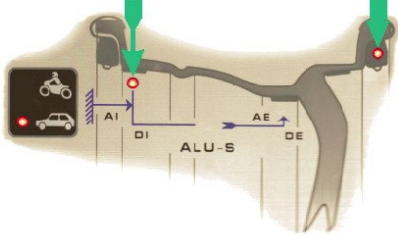
Press "<T" Key to read the actual unbalance value.



WARNING Always check if the balancing weights (either clip-on or stick-on weights) are securely applied onto the rim. A weight not fitted securely might come off as the wheel rotates and causes a potential danger.


4.8.2 STANDARD ALU PROGRAMS

With the rated wheel data A, W and D entered, there are 5 standard ALU modes rated available, the different possibilities of weight application have been taken into account. All standard ALU programs provide correct unbalance values while maintaining the rated geometric data A, W and D setting of the alloy wheel.

STANDARD ALU PROGRAMS	ILLUSTRATION	DESCRIPTION
<p>ALU-1</p> 		<p>For both INNER and OUTER planes, adhesive weights to be applied inside the rim as illustrated.</p>
<p>ALU-2</p> 		<p>Clip type weight to be applied for INNER plane, and adhesive weight to be applied inside the rim for OUTER plane as illustrated.</p>
<p>ALU-3</p> 		<p>As illustrated, only adhesive weights have to be applied for INNER and OUTER plane</p>
<p>ALU-4</p> 		<p>Clip type weight to be applied for INNER plane, and adhesive weight to be applied for OUTER plane as illustrated.</p>
<p>ALU-5</p> 		<p>Adhesive weight to be applied inside the rim for INNER plane, and clip type weight to be applied for OUTER plane, as illustrated.</p>
<p>STANDARD ALU PROGRAMS</p>	<p>ILLUSTRATION</p>	<p>DESCRIPTION</p>



Procedures:

- Step 1** :  Press ALU key to toggle the suitable program for your application.
- Step 2** : Enter Wheel data A, W and D as per the procedures described in section [Enter Wheel Data](#).
- Step 3** : Perform a wheel spin as per indication described in the section of Standard Dynamic Balancing
- Step 4** : Search the weight position according to the procedure described in the section of Standard Dynamic Balancing.
- Step 5** : Apply balancing weights as per the selected ALU program illustrated.
- Step 6** : Proceed a test spin to check the balancing correction result.

NOTE

Some slight residual unbalances may remain at the end of the test spin due to the considerable difference in shape that maybe found on rims with same rated dimensions. Therefore, if the standard ALU programs are not giving a satisfy balancing result, choose the variable plane program ALU-S to have correct balancing.

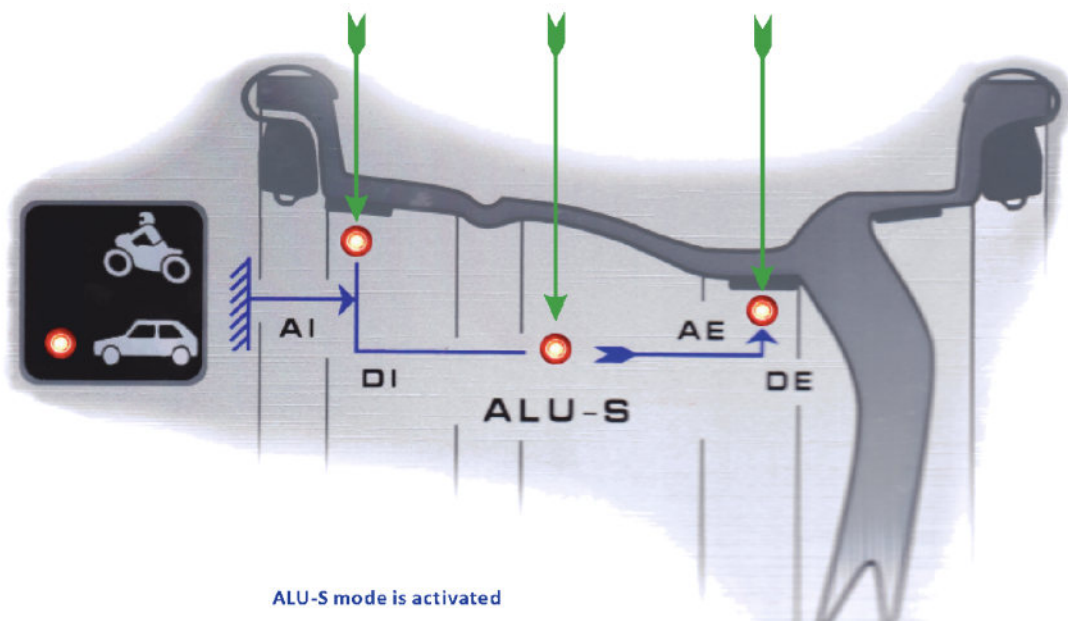
4.8.3 ALU-S PROGRAM (VARIABLE PLANE PROGRAM)

This program makes it possible to apply adhesive weights in user selected positions. It is used for maximum precision balancing of light alloy rims that require both weight to be apply on the same side (**INNER** (left) side).



Press ALU keys enter the programs until the light over the mark "**ALU-S**" illuminates, as illustrated, 3 lights on the balancing mode indicator are illuminated.

Or pull out the front measuring gauge into rim two position where apply weight on AI position and AE position. the system will automatic into ALU-S program



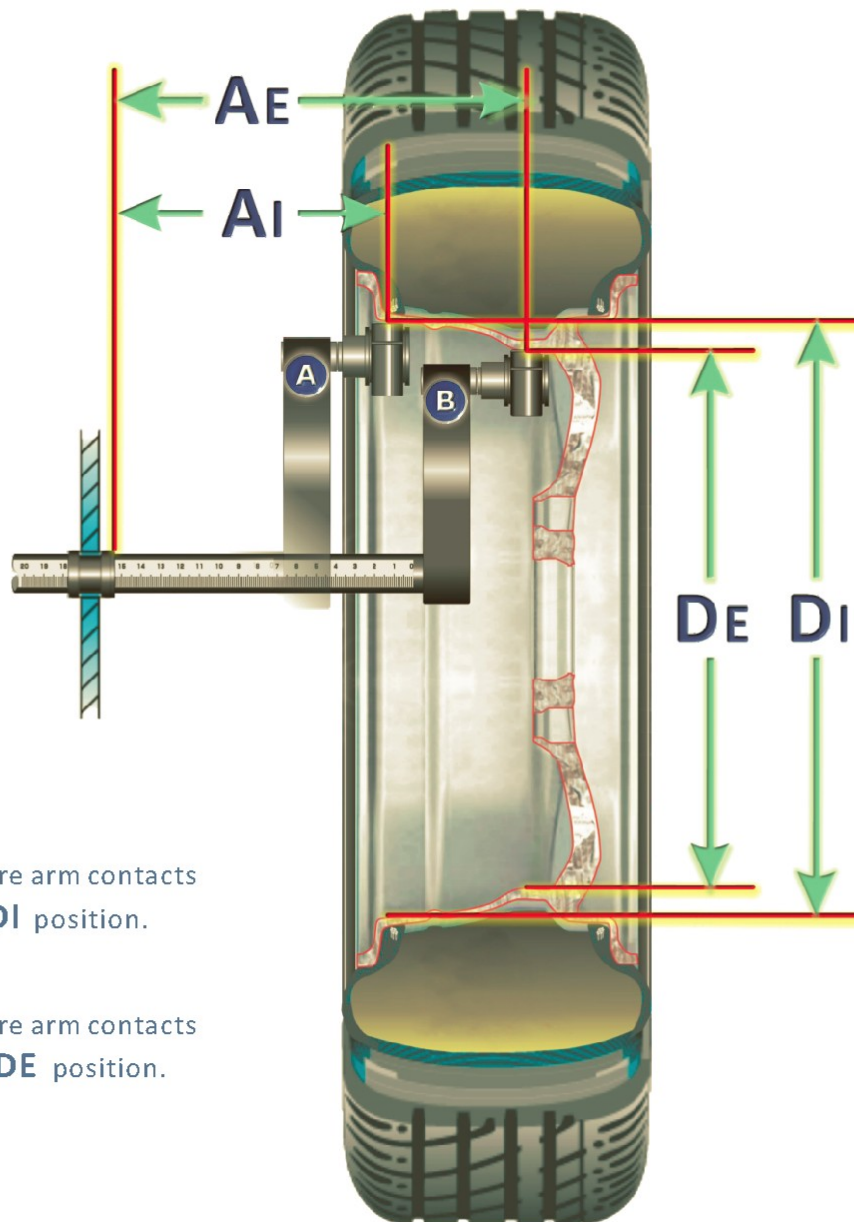
Continued 

WHEEL GEOMETRIC DATA ACQUISITION

Geometric data relating to the actual balancing planes rather than the rated wheel data (A, W and D as in standard dynamic and standard ALU programs) have to be entered. The balancing planes where the adhesive weights are to be applied may be selected by user according to the specific shape of the rim.

However, it is preferable to select balancing planes as far apart as possible in order to reduce the quantity of weights to be applied, normally, the distance between **INNER** (left) and **OUTER** (right) planes shall be more than 38 mm (1.5 inches).

- Definitions:**
- AI** = Distance of **INNER** (left) plane.
 - DI** = **INNER** (left) plane diameter.
 - AE** = Distance of **OUTER** (right) plane.
 - DE** = **OUTER** (right) plane diameter.



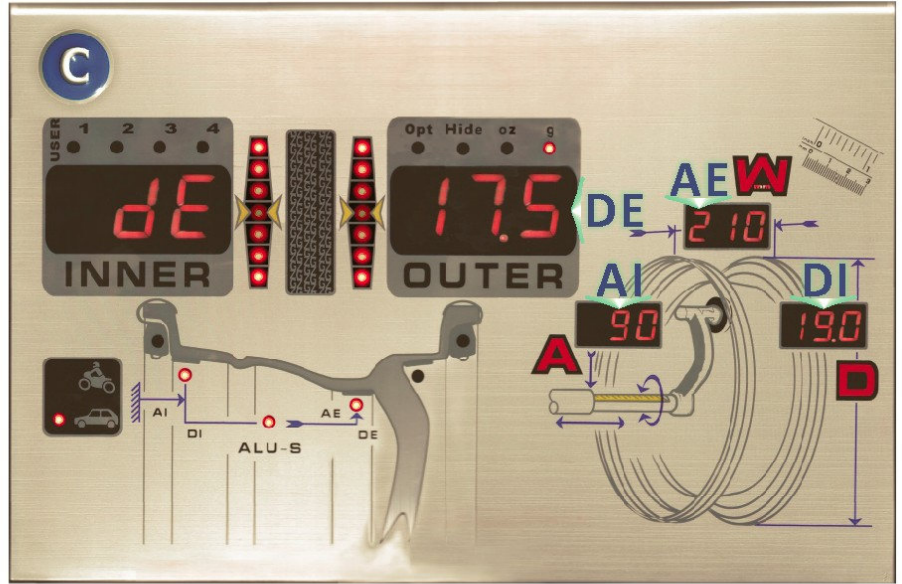
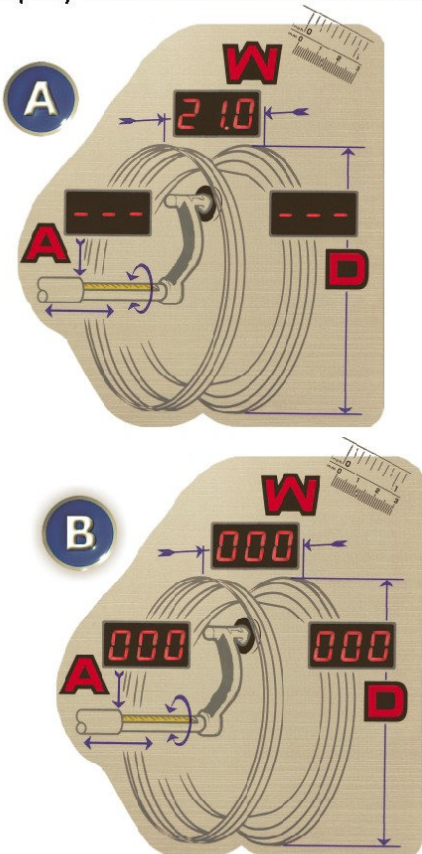
A Front measure arm contacts rim on **AI/DI** position.

B Front measure arm contacts rim on **AE/DE** position.

Continued

For Automatic data entry models, acquired wheel geometric data as per following procedures.

As shown in the illustrations on page "39", move the front measuring arm in line with the selected **INNER** plane for weight application, hold it in the position for about 2 seconds until the wheel data display windows show as illustrated in the figure **A**, then, Do **NOT** return the measuring arm back to rest position. Keep moving the measuring arm to line up with the selected **OUTER** plane, hold it in the position for two seconds until **INNER** and **OUTER** display windows read "**ALU -S-**", refer to **B**. Return the measuring arm back to rest position, the display windows are showing wheel geometric data acquired **C**.



AWD and INNER & OUTER windows, show: AI, DI, AE, DE in each destination window

For Manual Entry Model

Select positions of the rim to apply weights, take measurement of AI/DI and AE/DE.

AI	AE	DI	DE
Press	Press	Press	Press
A+ and/or A- to enter the relevant AI.	W+ and/or W- to enter the relevant AE.	D+ and/or D- to enter DI.	"<T" and use D+/D- to enter DE.

ATTENTION Select an area of rim free of discontinuity, so that the weight can be applied in that position.

Continued

This unit equip Visual laser technology (VLT) . The laser will project as a cross line on imbalance location of rim in ALU –S mode.

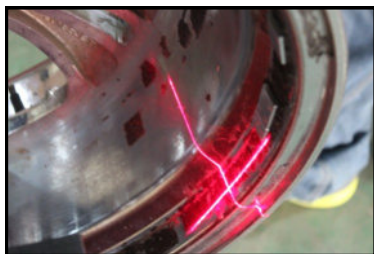
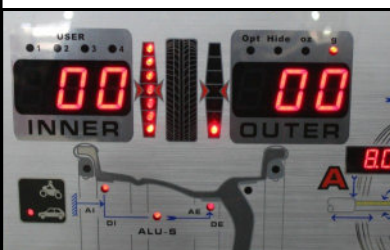


Rotating: procedure as usual ALU-S mode. Spin stop, rotate the rim slowly until the light is fully on. The laser will automatically indicate imbalance location and display shows corresponding weight.

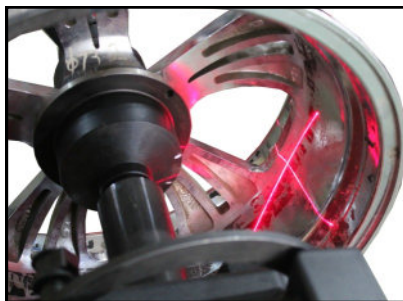


Or pass SPL automatically to find imbalance location: procedure as usual in ALU-s mode. Spin stop, then press SPL key automatically to fine the imbalance location. Once arrive, the laser will automatically indicate imbalance location and display shows corresponding weight.

To procedure one of above way. The rim spins until the light fully on. Then spin stops, the laser will automatically indicate imbalance location. Apply corresponding weight. Before stock on the rim, clean up the imbalance surface.



Do the same procedure on outer side.



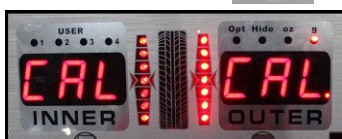
Laser malfunction

If the laser got problem, it is recommend to switch off VLT, then use distance gauge to do ALU-S mode.(See next page for instruction). Following these step how to switch VLT off.

1. on home page, press Fn+C together and hold



2. wait until shows [CAL][CAL]



3 press A- , A+, Fn key in sequence enter data setting



4. press A+ few times to shows



Then switch it off. Press A+ to return homepage.

Spin the Wheel

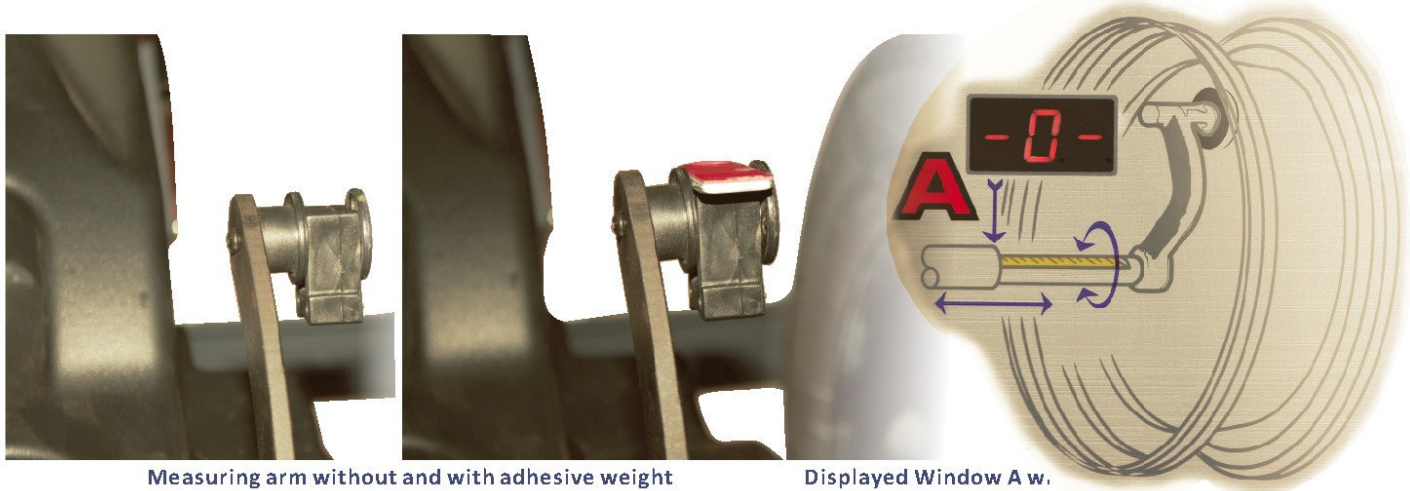
Perform a wheel spin as per indication described in the chapter of Standard dynamic balancing.

Position Search and Weight Application

As the wheel stops, follow the method described in the section of STANDARD DYNAMIC BALANCING, rotate the wheel to the position of **INNER** (left) plane for weight application, the **INNER** (left) position indication bar are fully illuminated, the wheel is locked with the activated.

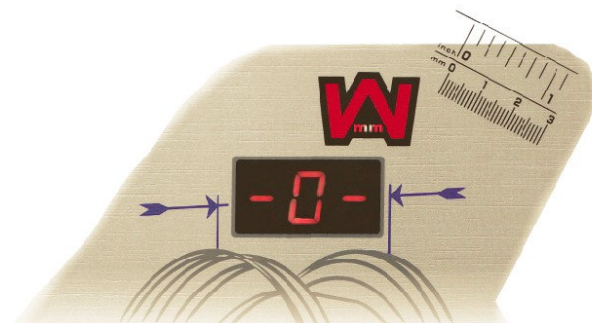
Prepare an adhesive weight as per **INNER** (left) weight window indicated, center it to the cavity of weight holder terminal of the measuring arm, as shown in the figure, keep the adhesive strip facing the internal surface of the rim, move the measuring arm until the window A reads: **-0-**

Rotate the arm to line the adhesive weight to the rim surface, press the button of the weight holder eject the weight and make it stick firmly to the rim. Return the measuring arm to the rest position.



Rotate the wheel to the **OUTER** (right) weight position and repeat the same operation mentioned above to apply the weight for **OUTER** (right) plane. (For **OUTER** (right) weight, move the arm until the window W displays **-0-**).

Perform a test spin to check balancing result.



NOTE


The rim surface must be clean to endure the adhesive weight stick efficiently.

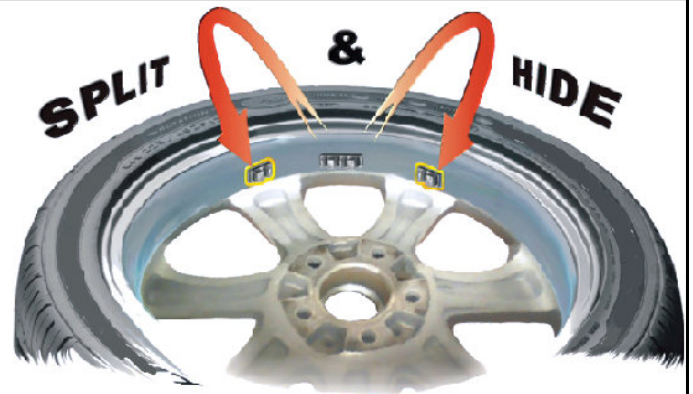
Continued 

4.8.4 HIDE - WEIGHT PROGRAM

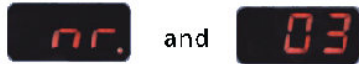
(available with ALU-S only)

STEP 1

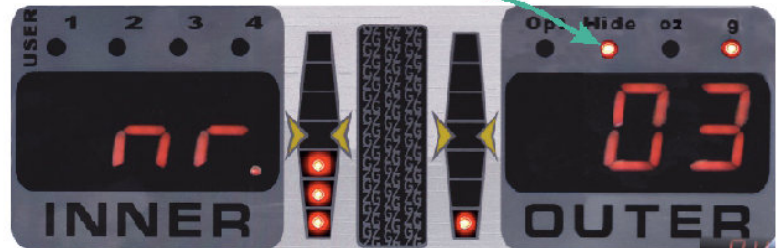
The HIDE weight program is to split 1 weight in the **OUTER** (right) plane into 2 weights placed in hidden positions behind 2 spokes of the alloy rim. Follow the ALU-S procedure, after the spin test done, press HIDE  key to enter the HIDE Weight Program, as shown in the display panel, the HIDE weight function indicator is light up,



and the weight display windows shows



this indicates user to enter the number of rim spokes in the range from 3 to 12.





STEP2

Select number of spokes



Press the A+ or A- key to modify the number of spokes. Press HIDE key to confirm.

STEP3

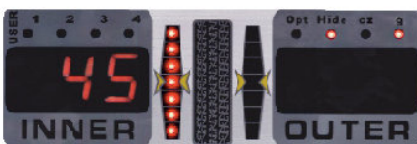
Display shows  and . Rotate the wheel and point one of the spokes at TDC top dead center 12 o'clock position, Press HIDE key to confirm.

STEP4

Press HIDE key to find the inner weight location. place the need weight on inner side. then Press HIDE key again to find outer weight location. place the need weight on the outer side.

In this stage, the **INNER** (left) weight window shows the reading of balancing weight that needs to be added onto user defined **INNER** (left) plane. The **OUTER** (right) weight window does not display any reading until one of the 2 target spokes points at TDC top center 12 o'clock position, corresponding weight will be prompted.

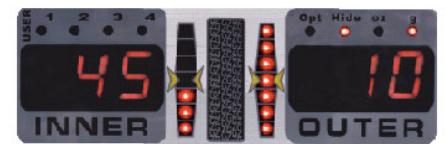
Example




Step 1



Step 2




Step 3

Apply the **INNER** (left) weight with the same procedure described in section **ALU-S PROGRAM**. Press STOP  key to unlock the wheel for next step.

Rotate the wheel to line the first target spoke at the point that the position indication bar fully illuminated with beep sound, at this moment, the wheel is restrained automatically. The **OUTER** (right) weight display window shows the weight need to be added in first position behind the spoke.

Select the relevant weight and apply it as per the same procedure of weight application for **OUTER** (right) plane described in section **ALU-S PROGRAM**.

Press STOP  key to unlock the wheel and rotate the wheel to position of the 2nd spoke, repeat the above described procedure to apply the relevant weight behind the 2nd spoke.

Perform a test spin to check the accuracy.

4.8.5 OPT - OPTIMIZATION PROGRAM

The OPT Program serves to reduce the amount of weight to be added for balancing a wheel, it is suitable for static unbalance exceeding >30 grams (1.5 oz).

Step 1 : Enter OPT Program before an unbalance measurement is done; use Fn and Vehicle-MODE keys,

the display windows show:



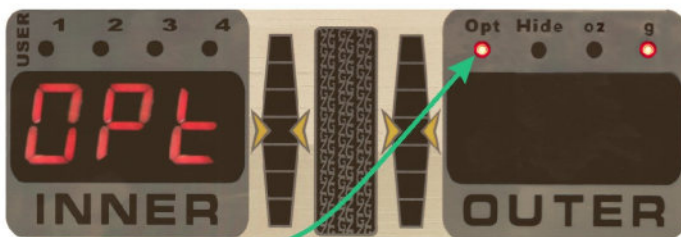
+



OPT

and

The OPT function indicator is on.



Step 2 : Perform a wheel spin,

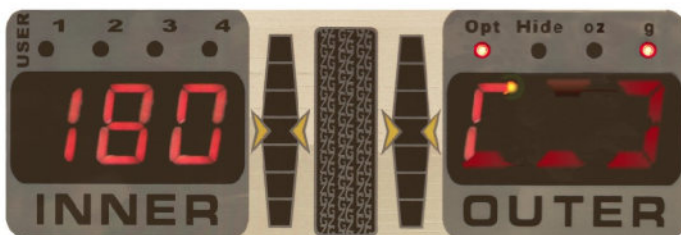
the left display window shows

180

and in the right a run light is circulating around,



this is to indicate user to remount tire and rim assembly by turning 180 degrees.



Step 3 : To do this, mark a reference line with chalk on the adaptor, tire wall and the rim, take the wheel off the machine, use tire changer to turn the tire on the rim by 180 degrees.

Step 4 : Refit the wheel with the reference marks coinciding between rim and adaptor, perform a wheel spin, e.g.:

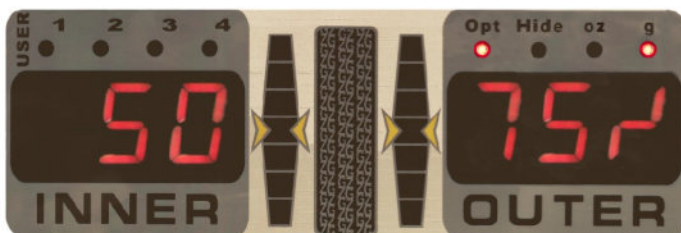
the display windows show

50

and

75%

the left display shows the actual weight static which can be reduced by matching, the right display shows the reduction in percentage (%).

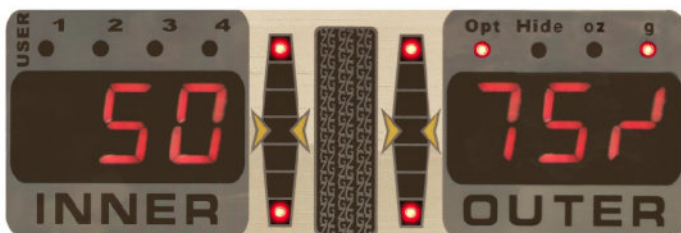


Step 5 : Rotate the wheel until the position

indication bars are showing:



Mark a line on the tire at top center 12 o'clock position.

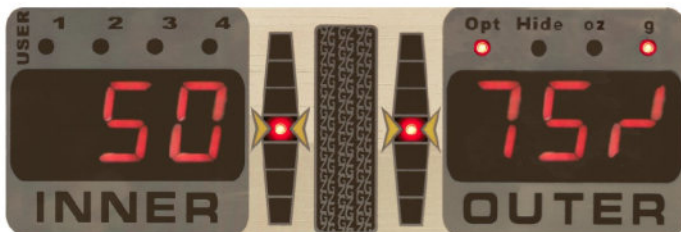


Step 6 : Rotate the wheel until the position

indication bars are showing:



Mark a line on the rim wall at top center 12 o'clock position.



Step 7 : Use tire changer to match tire wall and rim markings.

In case that the first spin is done, press Fn and MODE key + and the display shows

180



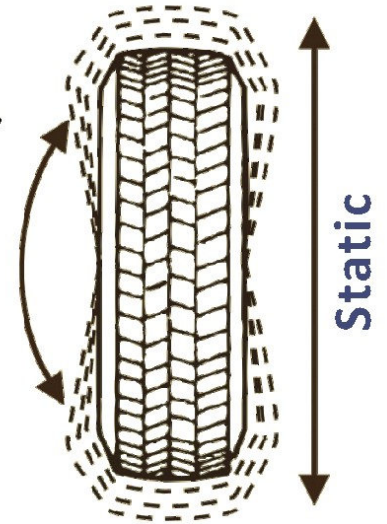
Follow step 3 to 7 to complete the operation.

4.8.6 STATIC BALANCING

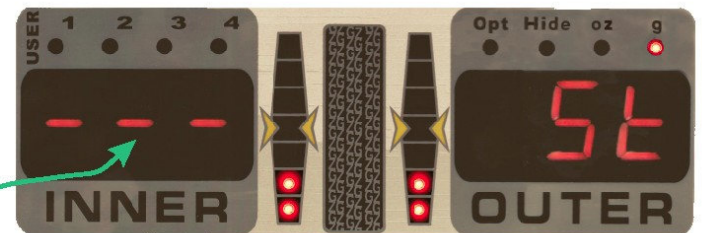
Instead of applying weights on both **INNER** (left) and **OUTER** (right) side, to balance a wheel by using a single counter weight on a single position is called **Static Balancing**. A wheel can be balanced statically, however, ignoring dynamic unbalance will become more risky with an increasing of wheel width size.

Therefore static balancing is suitable for wheels with small width.

Perform a Standard Dynamic Balancing spin first to acquire readouts.



Press Fn **F** Key, the digits are:

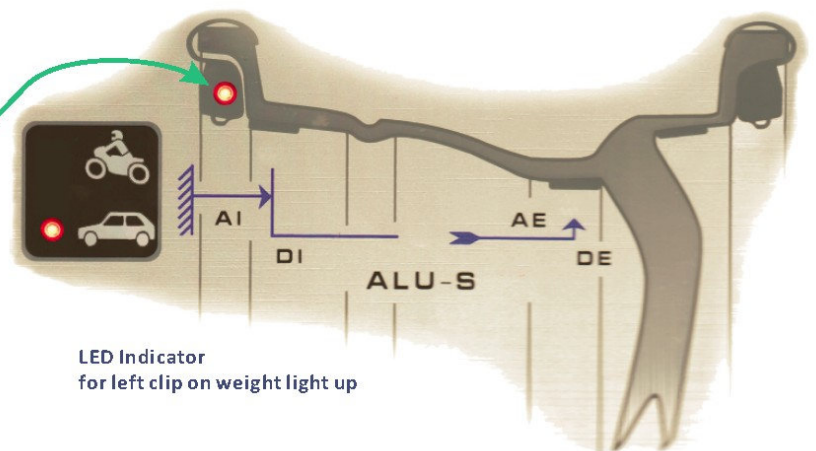


Display Panel in Standard Mode

With some (X) readings

That means STATIC Program is active.

The balancing weight location indicator shows:



LED Indicator for left clip on weight light up

Press Fn **F** key again to re-enter to dynamic balancing mode.





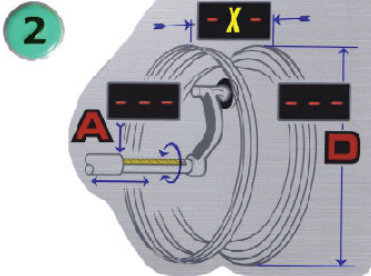
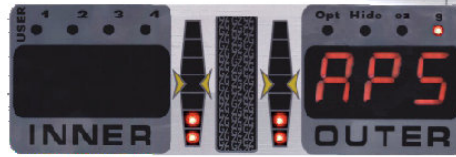
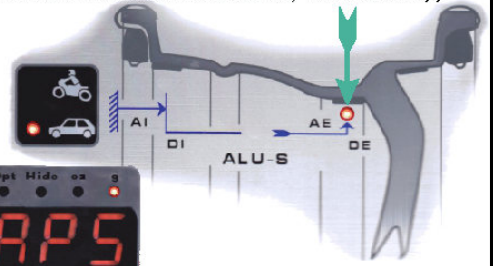
The left weight display window shows the reading of measured static balancing result. Rotate the wheel, when both position indication bars are fully illuminated, apply the balancing weight in the 12 o'clock position on either left or right side, or at the center of the rim, indifferently.

However, when a balancing apply in the rim well, the diameter is smaller than the rated diameter, and it might change in different position selected. As a matter of fact, static balancing depends on diameter, to obtain correct result, diameter must re-entered with the aid of **APS (Alternative Plane Static)** program.

Continued

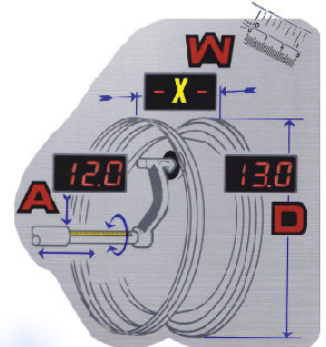
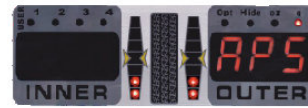
4.8.7 APS (ALTERNATIVE PLANE STATIC) PROGRAM (available with automatic data entry models only)

- 1** Press Fn and HIDE  +  Keys, the display shows:



Pull out the front measuring arm, point the tip at the selected position (same method as used in ALU-S program), hold until the wheel data display windows are showing data (see example).


- 3** Return arm back to home (rest or "0") position)



- 4** Perform a wheel spin to get test result.



- 5** Rotate the wheel to TDC

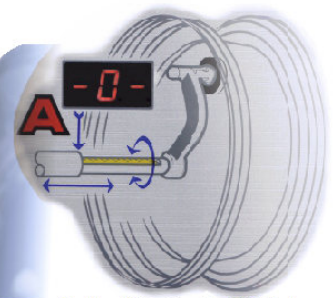
- 6** Prepare an adhesive weight as per **INNER** (left) weight window indicated, center it to the cavity of weight holder terminal of the measuring arm, keep the adhesive strip facing the internal surface of the rim, move the measuring arm until the window A reads: 

- 7** Apply weight

Rotate the arm to line the adhesive weight to the rim surface, press the button of the weight holder eject the weight and make it stick firmly to the rim. Return the measuring arm to the rest position.



Measuring arm without and with adhesive weight



Displayed Window A with '-0-'

Press C



Key to exit the program.

4.8.8 MOTORCYCLE WHEEL BALANCING



Press



Vehicle MODE Key to enter the motorcycle wheel balancing mode.

Motor Cycle Wheel



Vehicle Type Indicator
Motorcycle is on



Mount the wheel with motorcycle adaptor (optional kit).

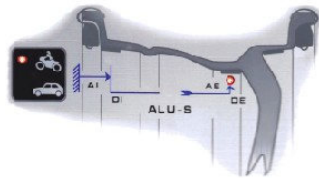


MC kits



MC-XLT Kits

1 Motorbike
STATIC



Motor Bike Static Balancing:

Follow the procedure described in the section for STATIC BALANCING.

2 Motorbike
DYNAMIC

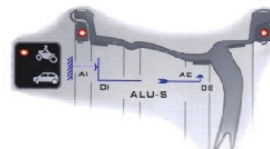
Press



Keys to enter dynamic program.

Motor Bike Dynamic Balancing:

Follow the procedure described in the section for DYNAMIC BALANCING.



5. Procedure of system calibration and parameter setting

5.1 Balancing calibration

Important: Calibration is needed when: a) First time operation; b) Incorrect test result suspected. The procedure of calibration:

5.1.1 Put a medium size wheel, mount on the shaft and lock it well. Input the data of the rim.

5.1.2 Press and hold the key [F] and key [C]. The display reads: [CAL][CAL], hold the keys until the unbalancing position LEDs light on and blinking. Put down the protective cover and press [start] key.

5.1.3 After first spin, rotate the wheel until outer LED light fully flash. The display reads:[ADD] [100], which tells to add 100g(3.5oz) weight to the outer circumference edge of the rim. the 100g must attach on 12 o'clock position of rim. Put down the protective cover, press [start] to proceed second spin.

5.1.4 after second spin, rotate the wheel until inner LED light fully flash. The display reads:[ADD] [100], which tells to add 100g(3.5oz) weight to the inner circumference edge of the rim. the 100g must attach on 12 o'clock position of rim. Put down the protective cover, press [start] to proceed third spin.

5.1.5 (only for machine equipped visual laser technology) When third spin stop, the display show [Lar][100]. The laser will turn on and project on the inner side of rim. Slowly rotate the rim until the master weight is center of the laser's project center. Press [ALU] to confirm.



5.1.6 The calibration ended with the data memorized in the machine and the display will read:[End] [Cal].

Error shows during balancing calibration.

[Err][-8-] forget to attach 100g or power board is out function.

[Err][-9-] forget to attach 100g

[Err][-6-] sequence of outer and inner attach 100g incorrect.

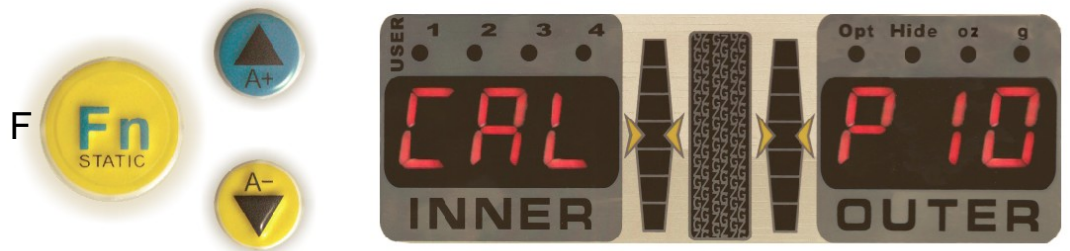
[Err][-r-] hardware installation was not correct. calibration cannot completed.

5.2 DISTANCE **A** CALIBRATION (Available with Auto data entry models only)

Step 1 :

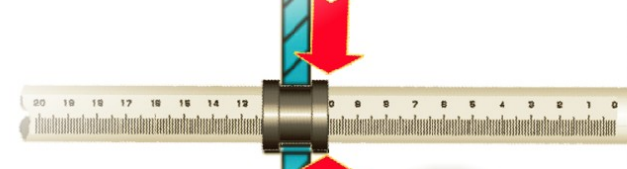
Press Fn (and hold) use A+ or A- key, until the display shows:

CAL **P 10**



Step 2 :

Pull out the front measuring arm to the ruler scale 100 mm position,



press the ALU key,

to see the display shows:

CAL **-0-**

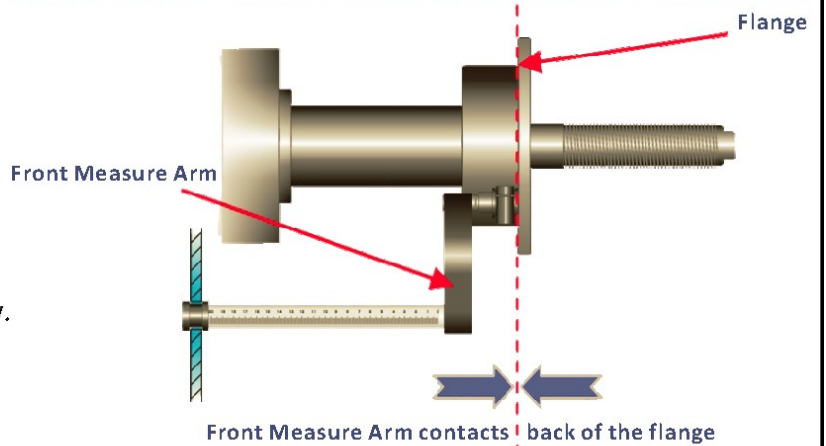


Step 3 :

Move the arm to point at the spin unit flange as shown in the figure, hold it and press the ALU



key.

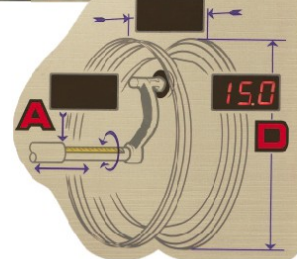


5.3 DIAMETER **D** CALIBRATION

Step 1 :

Press Fn (and hold) use D+ or D- key, until the display shows

CAL **-d-**



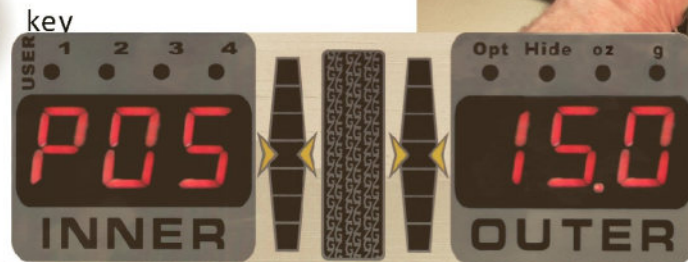
Continued

Step 2 :

Mount a wheel on the spin shaft, use D+ /D- key to enter the rim diameter (for example 15 inches), pull out the front measure arm and make the tip contact the rim, as shown in the picture, then press ALU



to see the display shows:



Diameter calibration is done.

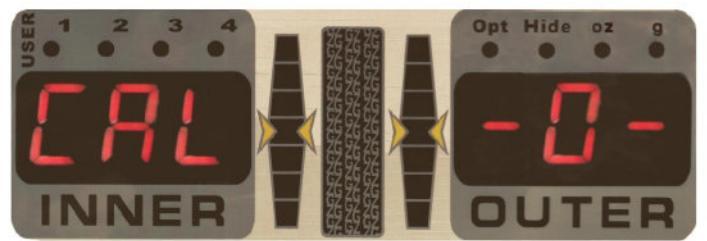
5.4 WIDTH **W** CALIBRATION

Step 1 :

Press Fn (and hold) use W+ or W- key,



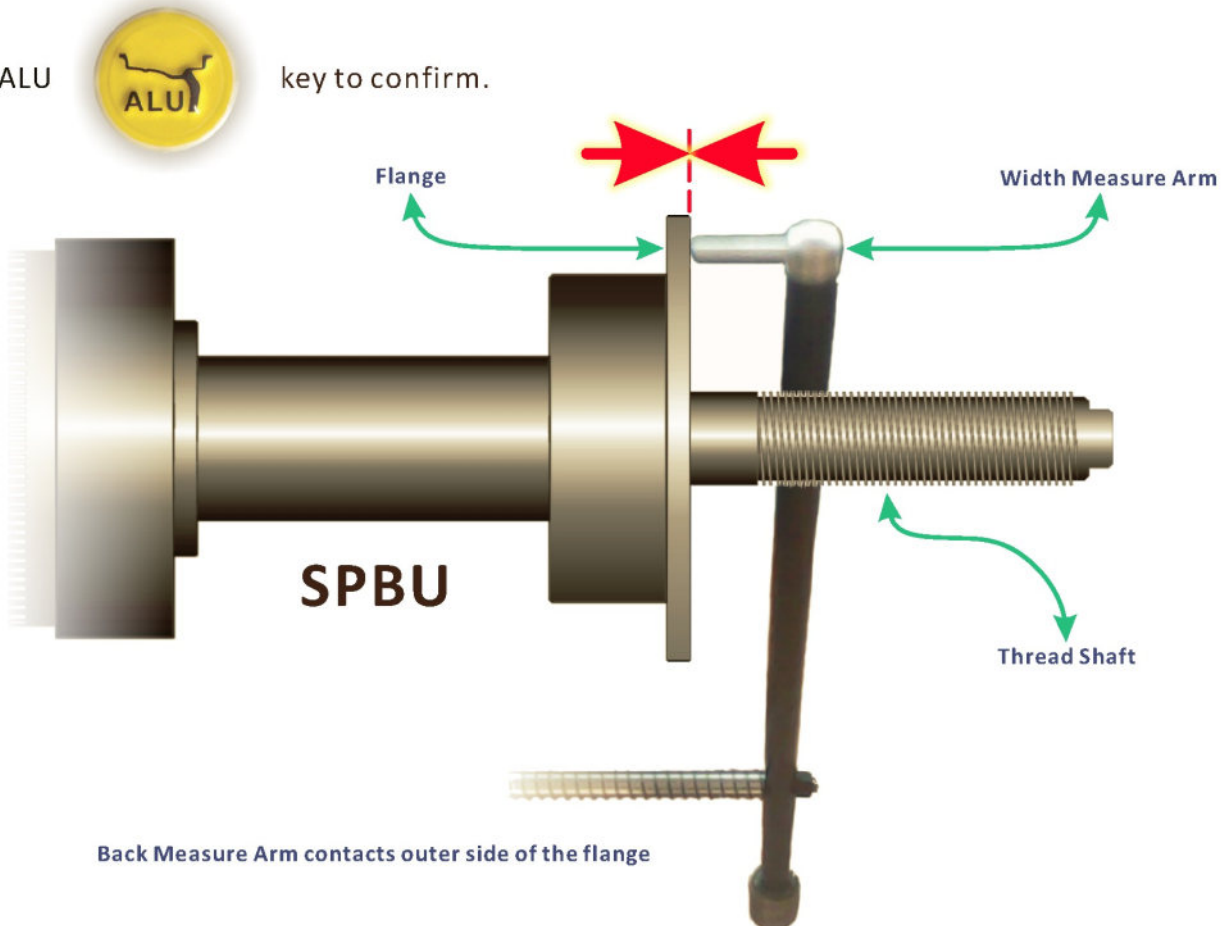
hold until the display shows:



Step 2 :

Pull out the width measuring arm and make the tip contact on the spin unit flange, hold it and

press the ALU key to confirm.



Back Measure Arm contacts outer side of the flange

5.4.1 SYSTEM PARAMETER SETTING

If machine had replace a new computer board, it needs input machine parameter value into new computer board. Then do the self calculation to save the setting.

5.4.1 turn on the machine and wait this homepage.

5.4.2 press Fn +C together



Wait this page shows.



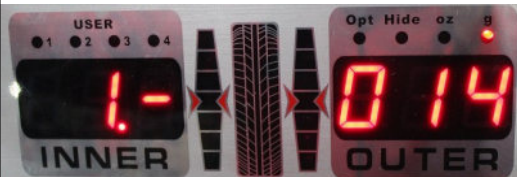
5.4.3 press A-, A+, Fn key in sequence to enter system parameter setting



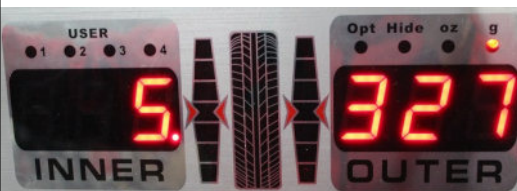
Display will shows below picture



Press B+ or B- to adjust the DF value of offset error.
Press A+ to enter next parameter setting.



Press B+ or B- to adjust the I value of axial error.
Press A+ to enter next parameter setting.



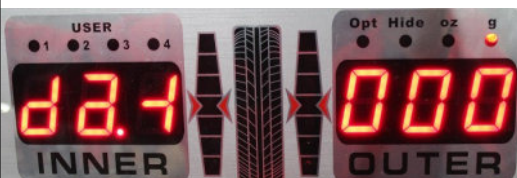
Press B+ or B- to adjust the S value of angle error.
Press A+ to enter next parameter setting.



Press B+ or B- to adjust the RES value of Residual value of showing
Press A+ to enter next parameter setting.



Press B+ or B- to adjust equip the width measuring arm.
Press A+ to enter next parameter setting.



Press B+ or B- to adjust diameter measurement. (1 unit = 0.1 inch).
Press A+ to enter next parameter setting.



Press B+ or B- to adjust laser pointer on or off.
Press A+ to return homepage.

Do not change the parameter value, unless the result of balancing is off. Please contact your reseller or manufacturing for after service before make any change.

5.5 MAINTENANCE



Our Company is not to be held responsible for any claims deriving from the use of non-original spare parts or accessories.

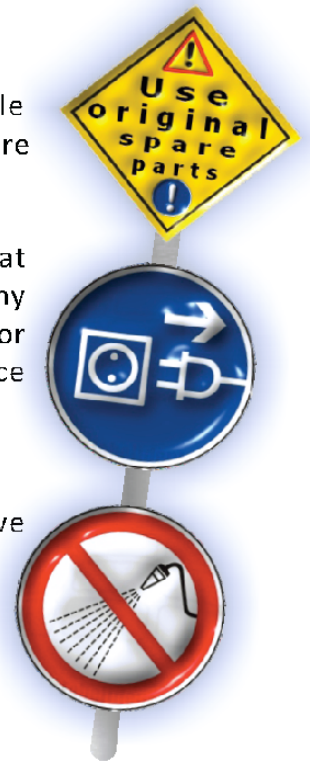


Unplug the machine from the socket and make sure that all moving parts have been locked before performing any adjustment or maintenance operation. Do not remove or modify any part of the machine except for service interventions.



Keep the work area clean. Never use compressed air and/or jets of water to remove dirt or residues from the machine.

Take all possible measures to prevent dust from building up or raising.

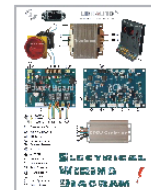


REPLACE PARTS AND ROUTINE MAINTENANCE

(Non specialized personnel) also refer to [EXPLODED DRAWINGS](#). Before performing any Maintenance operation, disconnect the machine from the mains.

5.5.1 REPLACE FUSES

Remove the tray shelf in order to gain access to the power supply board on which two fuses are installed. If the fuses need replacement, use ones of the same current ratings. If the fault persists, contact the Technical Service Department. Also refer to the wiring diagram attached inside of the machine.



5.5.2 CLEANING

Keep the wheel balancer shaft, the securing ring nut, the centering-cones and flanges clean, using a brush previously dipped in an environmentally friendly solvent. Handle centering-cones and flanges carefully so as to avoid accidental dropping and subsequent damage that would affect centering accuracy. After use, store centering-cones and flanges in a place where they are suitably protected from dust and dirt. If necessary, use a suitable plastic cleaner to clean the display panel. Also refer to [SAFETY - MAINTENANCE AND SERVICE RULES](#)

5.5.3 RECOMMENDED MAINTENANCE INTERVALS

When?	What?	Use...
Once a day	clean thread shaft, faceplate, adapters, centering-cones, protective ring, quick hub wing nut and pressure cup	brush and vaporizing solvent
At least once every 3 months	perform the calibration procedure	manual for references
As needed	clean the display panel	cloth, suitable plastic cleaner



None solvents are allowed on plastic parts, avoid ammonia and alcohol, as they can soften the plastic and cause discoloration or fogging.

Continued



5.6 TROUBLE SHOOTING

The wheel balancer is designed for rugged wheel shop or garage environments and will provide trouble free operation for many years into the future. Even so, do take into consideration that it is also an electronic computer with software programs and mechanical systems that require care and maintenance on a regular basis. Electrical connections should be stable and properly grounded to a panel and circuit breaker. In locations or regions with unstable electricity it is recommended that a UPS (uninterruptible power supply) with a minimum 500 watts capacity be used.

The wheel balancer is designed to notify the operator of possible hardware failures identified by built-in ERR (error) codes. ERR are managed by the balancing program they cannot be overridden. These ERR codes are a guide only and should not be considered as firm evidence of what may not be functioning correctly with your balancer.

The wheel balancer software program is able to identify the ERR by evaluating the value of the data obtained on any given spin and makes a programmed decision to notify the operator. The following table provides the ERR numbers, their definition and a possible cause and solution.

IMPORTANT



All wheel balancers, even those commanding higher prices have their primary failures in the electrical wire harness or electrical supply systems. For this reason, it is recommended that cables, connectors and continuity of electrical systems be checked before changing, removing or altering a component to correct an ERR.

5.6.1 ERROR MESSAGES

System failures or malfunctions can be identify and figured out through display messages or phenomenae.



The following items contain indications that are suitable for services technician only. If you are not the service technician and never received any training on servicing the machine, it is not recommended to do further checking and testing on the machine by opening any part of it.


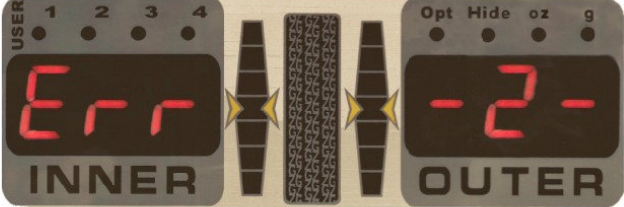
The system will give error messages when the operation is in abnormal conditions or malfunction happened.


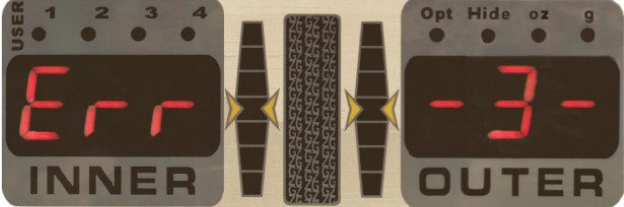
<p>Error Message</p>	
<p>Definitions</p>	<p>No shaft rotation detected</p>
<p>Possible Causes</p>	<p>Case A: Balancing shaft is not rotating during spinning cycle. Case B: Angular position sensor (optical encoder) signal failure.</p>
<p>Solutions</p>	<p>1) In case A, check if the connection of SPBU controller is connected properly. 2) In case B, proceed self diagnose program to proceed sensor check.</p>


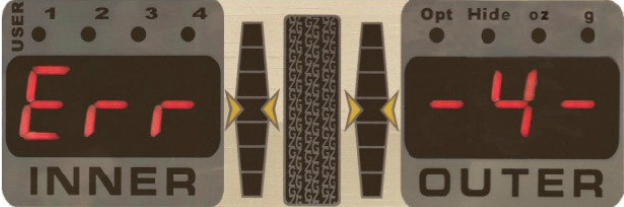




This is for service technicians only.


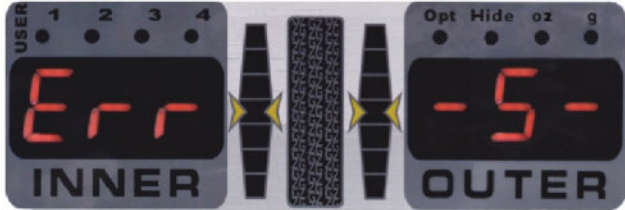
Continued


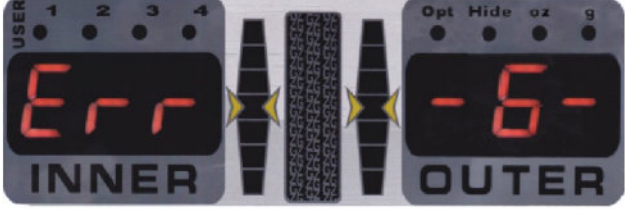
<p>Error Message</p> 	
<p>Definitions</p>	<p>Rotation speed abnormal.</p>
<p>Possible Causes</p>	<ol style="list-style-type: none"> 1.) No wheel mounted 2.) Shaft adaptor not installed properly 3.) Wheel is not mounted properly
<p>Solutions</p>	<p>Mount the wheel and adaptor firmly and proceed further test.</p>


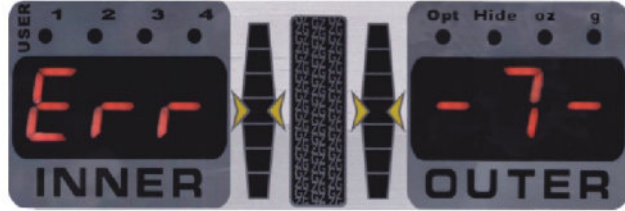
<p>Error Message</p> 	
<p>Definitions</p>	<p>Imbalance is out of range</p>
<p>Possible Causes</p>	<p>Case A: Wheel imbalance is higher than >999 gram; in this case, the machine is normal. Case B: Imbalance detection and calibration failure.</p>
<p>Solutions</p>	<p>Do balancing calibration if case B happened.</p>


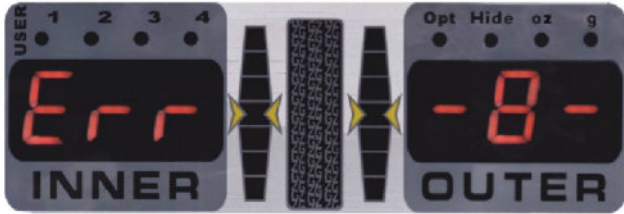
<p>Error Message</p> 	
<p>Definitions</p>	<p>System detects a reverse rotation signal during balancing spin.</p>
<p>Possible Causes</p>	<p>Case A: Rotation direction is reversed. Case B: If rotation direction is not the case, then there might be a failure with the angular detection sensor (optical encoder).</p>
<p>Solutions</p>	<p>In case A, check if the SPBU cable connection is correct. In case B, proceed self diagnose program to check if the angular detection sensor (optical encoder) is working.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;">  NOTE </div> <p style="margin-left: 20px;">This is for service technicians only.</p>


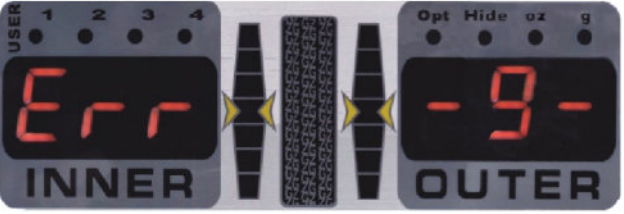
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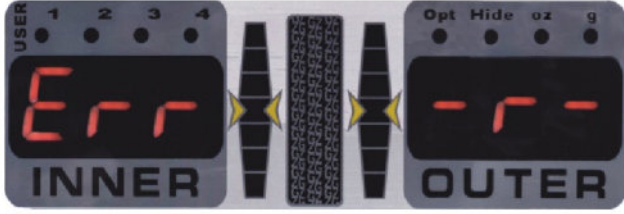
<p>Error Message</p> 	
<p>Definitions</p>	<p>Protection hood is not closed in position when START key is pressed to proceed a balancing spin.</p>
<p>Possible Causes</p>	<p>Case A: Protection hood is not closed in position. Otherwise: Case B: Micro switch is not giving correct on-off signal to the computer.</p>
<p>Solutions</p>	<p>In case B, check the micro switch and the wire connection.</p>

<p>Error Message</p> 	
<p>Definitions</p>	<p>Wrong Sequence of 100g attachment.</p>
<p>Possible Causes</p>	<p>Did not attach 100g on outer first and inner second in sequence.</p>
<p>Solutions</p>	<p>Redo the balancing calibration.</p>

<p>Error Message</p> 	
<p>Definitions</p>	<p>Calibration data lost</p>
<p>Possible Causes</p>	<p>Calibration procedure not completed.</p>
<p>Solutions</p>	<p>Redo the balancing calibration.</p>

<p>Error Message</p> 	
<p>Definitions</p>	<p>Signal from piezoelectric sensor abnormal during balancing calibration.</p>
<p>Possible Causes</p>	<p>CASE A: The calibration weight (provided) is not added as per indication in calibration procedure. Otherwise: CASE B: Piezoelectric sensor connection failure.</p>
<p>Solutions</p>	<p>In case A, redo the balancing calibration as per the calibration procedure. In case B, proceed self diagnose program to check the piezoelectric sensor, check wiring connection.</p>

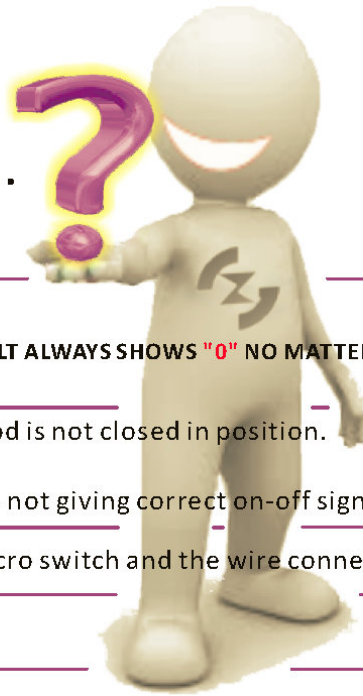
<p>Error Message</p> 	
<p>Definitions</p>	<p>Calibration Error</p>
<p>Possible Causes</p>	<p>Forget adding 100g on inner rim during calibration.</p>
<p>Solutions</p>	<p>Adding 100g on inner rim or redo the calibration.</p>

<p>Error Message</p> 	
<p>Definitions</p>	<p>Calibration didn't completed or Calibration didn't successful</p>
<p>Possible Causes</p>	<p>Hardware installation was not correct.</p>
<p>Solutions</p>	<p>Recheck cable, plug, and hardware installed correctly.</p>

Continued 

TROUBLE SHOOTING

5.6.2 PHENOMENAE - WHAT IF...



5.6.2.1	... THE BALANCING RESULT ALWAYS SHOWS "0" NO MATTER HOW MUCH THE IMBALANCE IS
Possible Causes	Case A: Protection hood is not closed in position. Otherwise: Case B: Micro switch is not giving correct on-off signal to the computer.
Solutions	In case B, check the micro switch and the wire connection.

5.6.2.2	... THERE IS NO RESPONSE BY PRESSING THE KEYPAD
Possible Causes	Case A: Measuring arm has not returned back to home position. Case B: The SPL process is interrupted by physical force. Case C: In ALU-S and APS program, weight application is in process.
Solutions	In case A, return the measuring arm to home position. In case B, move the wheel to one of the TDC point to resume the SPL process. In case C, press Key C to exit the running program.

	... BALANCING RESULT IS FLUCTUATING, AND REPEATABILITY IS FROM TIME TO TIME HIGHER THAN THE ACCEPTABLE LEVEL (>5 GRAMS)
5.6.2.3 Possible Causes	Case A: Wheel is not firmly mounted on the shaft. Case B: Debris on the wheel. Case C: Piezoelectric sensors are wet due to moisture condensates. Case D: Piezoelectric sensors are loose.
Solutions	In case A, mount the wheel properly and do the test again. In case B, remove debris on the wheel and test again. In case C, use hot air to dry up the sensor area, wait for it to cool down and do the calibration test again. In case D, tight up the piezoelectric sensor, re-do the calibration and rest again.

5.6.2.4	... THE BALANCING RESULT IS FAR DIFFERENT (< 10 GRAMS) AFTER THE WHEEL REMOUNTED ON THE SHAFT
Possible Causes	The wheel is not properly centered.
Solutions	Remount the wheel with proper cone and do the test again.



TROUBLE SHOOTING


5.6.2 PHENOMENAE - WHAT IF...



5.6.2.5	... THE WHEEL DOES NOT STOP AFTER SPINNING
Possible Causes	Case A: Power supply was interrupted. Case B: The relays on the power supply board failed.
Solutions	In case A, check the power supply and make sure the machine is properly earthed. In case B, replace the relays on the power supply board.

5.6.2.6	... THERE ARE NO READINGS / NO LEDS ON SHOWN ON DISPLAY AFTER THE POWER IS SWITCHED ON
Possible Causes	Case A: Power socket and plug is not connected. Case B: Display board connection failed. Case C: Power supply board failed. Case D: Main computer board failed.
Solutions	In case A, make sure the power is well connected and test again. In case B, make sure the connection is ok and test again. In case C, check the power board and do the test again. In case D, check the main computer board and do the test again.



5.6.2.7	... THE DISPLAY SHOWS: 
Possible Causes	Some one tried to read software codes from the computer board, the board is self locked.
Solutions	Replace the computer board.

