

# **BASELINE™**

**BY GOATS®**

## **Model 225 Wheel Balancer**



See  
★ **Balancing Your  
First Tire**  
on page 5.

### **Safety Instructions Setup Instructions Operation Instructions Maintenance Instructions**

READ these instructions before placing unit in service. KEEP these and other materials delivered with the unit in a binder near the machine for ease of reference by supervisors and operators.

# IMPORTANT SAFETY INSTRUCTIONS

## READ ALL INSTRUCTIONS

1. Eye and face protection recommendations:  
“Protective eye and face equipment is required to be used where there is a reasonable probability of injury that can be prevented by the use of such equipment.” O.S.H.A. 1910.133(a) Protective goggles, safety glasses, or a face shield must be provided by the owner and worn by the operator of the equipment. Care should be taken to see that all eye and face safety precautions are followed by the operator. **ALWAYS WEAR SAFETY GLASSES.** Everyday glasses only have impact resistant lenses, they are not safety glasses.
2. Do not disable hood safety interlock system, or in any way shortcut safety controls and operations.
3. Be sure that wheels are mounted properly, the hub nut engages the arbor for not less than four (4) turns, and the hub nut is firmly tightened before spinning the wheel.
4. Read and understand this manual before operating. Abuse and misuse will shorten the functional life.
5. Be sure the balancer is properly connected to the power supply and electrically grounded.
6. Do not operate equipment with a damaged cord or if the equipment has been dropped or damaged – until it has been examined and repaired by a qualified serviceman.
7. Do not let cord hang over edge of table, bench, or counter or come in contact with hot manifolds or moving fan blades.
8. If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
9. Keep guards and safety features in place and in working order.
10. Wear proper clothing. Safety toe, non-slip footwear and protective hair covering to contain hair is recommended. Do not wear jewelry, loose clothing, neckties, or gloves when operating the balancer.
11. Keep work area clean and well lighted. Cluttered and/or dark areas invite accidents.
12. Avoid dangerous environments. Do not use power tools or electrical equipment in damp or wet locations, or expose them to rain.
13. Avoid unintentional starting. Be sure the balancer is turned off and power disconnected before servicing.
14. Disconnect the balancer before servicing.
15. Use only manufacturer’s recommended accessories. Improper accessories may result in personal injury or property damage.
16. Repair or replace any part that is damaged or worn and that may cause unsafe balancer operation. Do not operate damaged equipment until it has been examined by a qualified service technician.
17. Never overload or stand on the weight tray or any part of the balancer.
18. Do not allow untrained persons to operate machinery.
19. To reduce the risk of fire, do not operate equipment in the vicinity of open containers or flammable liquids (gasoline).
20. Adequate ventilation should be provided when working on or operating internal combustion engines.
21. Keep hair, loose clothing, fingers, and all parts of body away from moving parts.
22. Use equipment only as described in this manual.
23. Use only manufacturer’s recommended attachments and accessories.

## SAVE THESE INSTRUCTIONS

## Owner's Responsibility

To maintain machine and user safety, the responsibility of the owner is to read and follow these instructions:

- Follow all installation instructions.
- Make sure installation conforms to all applicable Local, State, and Federal Codes, Rules, and Regulations; such as State and Federal OSHA Regulations and Electrical Codes.
- Carefully check the unit for correct initial function.
- Read and follow the safety instructions. Keep them readily available for machine operators.
- Make certain all operators are properly trained, know how to safely and correctly operate the unit, and are properly supervised.
- Allow unit operation only with all parts in place and operating safely.
- Carefully inspect the unit on a regular basis and perform all maintenance as required.
- Service and maintain the unit only with authorized or approved replacement parts.
- Keep all instructions permanently with the unit and all decals/labels/notices on the unit clean and visible.
- Do not override safety features.

## Operator Protective Equipment

Personal protective equipment helps make tire servicing safer. However, equipment does not take the place of safe operating practices. Always wear durable work clothing during tire service activity. Loose fitting clothing should be avoided. Tight fitting leather gloves are recommended to protect operator's hands when handling worn tires and wheels. Sturdy leather work shoes with steel toes and oil resistant soles should be used by tire service personnel to help prevent injury in typical shop activities. Eye protection is essential during tire service activity. Safety glasses with side shields, goggles, or face shields are acceptable. Back belts provide support during lifting activities and are also helpful in providing operator protection. Consideration should also be given to the use of hearing protection if tire service activity is performed in an enclosed area, or if noise levels are high.

## Definitions of Hazard Levels

Identify the hazard levels used in this manual with the following definitions and signal words:

### DANGER

Watch for this symbol:



It Means: Immediate hazards, which will result in severe personal injury or death.

### WARNING

Watch for this symbol:



It Means: Hazards or unsafe practices, which could result in severe personal injury or death.

### CAUTION

Watch for this symbol:



It Means: Hazards or unsafe practices, which may result in minor personal injury or product or property damage.



Watch for this symbol! It means BE ALERT! Your safety, or the safety of others, is involved!

## Safety Notices and Decals



Failure to follow danger, warning, and caution instructions may lead to serious personal injury or death to operator or bystander or damage to property. Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual. For additional copies of either, or further information, contact:

### **Hennessy Industries, Inc.**

1601 JP Hennessy Drive  
LaVergne, TN 37086-3565  
(615) 641-7533 or (800) 688-6359  
www.ammcoats.com

## Standard Safety Devices

- A hood guard of high impact plastic that is designed to prevent the counterweights from flying out in any direction except towards the floor.
- A hood switch interlock system that prevents the machine from starting if the guard is not lowered and stops the wheel whenever the guard is raised.

**WARNING**

**RISK OF EXPLOSION**  
This equipment has internal arcing or sparking parts which should not be exposed to flammable vapors. Do not locate in a recessed area or below floor level.

**THIS EQUIPMENT MUST BE EARTH-GROUNDED**  
The earth-ground connector built into the power cord provides protection to reduce the risk of electrical shock.

**CAUTION**

Do not use below garage floor or grade level.  
Disconnect power before servicing this equipment.  
To prevent electrical shock, do not remove cover. No user servicable parts inside. Refer servicing to qualified service personnel.

May Be Protected by one or more of the following patents:  
USA - 4,423,632 - 4,499,768 - 4,939,941 - 5,311,777 - 5,337,256  
- 6,952,964 - 7,320,248 AUSTRALIA - 564038

8113927 02

**WARNING**

**Maximum Size of Wheel Rating**

Weight	Diameter	Width
<b>100 lbs.</b>	<b>35 in.</b>	<b>20 in.</b>

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	 <span style="font-size: 24pt; font-weight: bold; margin-left: 10px;">NOTICE</span>
	<p style="text-align: center; margin: 0;"><b>Read entire manual before assembling, installing, operating, or servicing this equipment.</b></p>

## Setup Instructions

### Receiving

The shipment should be thoroughly inspected as soon as it is received. The signed bill of lading is acknowledgement, for the carrier, of receipt in good condition of the shipment covered by our invoice.

If any of the goods called for on this bill of lading are shorted or damaged, do not accept them until the carrier makes a notation of the shorted or damaged goods on the freight bill. Do this for your own protection.

NOTIFY THE CARRIER AT ONCE if any hidden loss or damage is discovered after receipt and request him to make an inspection. If the carrier will not do so, prepare an affidavit to the effect that you have so notified the carrier (on a certain date) and that he has failed to comply with your request.

IT IS DIFFICULT TO COLLECT FOR LOSS OR DAMAGE AFTER YOU HAVE GIVEN THE CARRIER A CLEAR RECEIPT.

File your claim with the carrier promptly. Support your claim with copies of the bill of lading, freight bill, invoice, and photographs, if possible.

### Unpacking the Unit

- Remove the shipping carton from the pallet.
- Remove all loose parts and accessories packed around the unit.

### Remove Balancer from Pallet

**1.** Remove the shipping bolts that hold the balancer to the pallet.



**Do not use the control panel, control panel base, accessory storage, faceplate, hood or shaft to lift the balancer.**



**Use help to remove the balancer from the pallet. The unit is heavy and the weight is not evenly distributed. Dropping the unit may cause personal injury or equipment damage.**

**2.** Lift the balancer off the pallet and place it in its operating location.

### Floor and Space Requirements

The balancer must be located on a flat floor of solid construction, preferably concrete. The balancer must sit solidly on its three feet. If the balancer is not level, does not sit solidly on its three feet, or is placed on an unstable floor, the balancer will not function properly and may produce inaccurate balance readings.

Do not operate the balancer while it is on the pallet.

Select a location for the balancer that provides a level, solid floor, and adequate clearance around and above the balancer. Make sure the location selected has enough room above and behind the unit so the hood can be raised completely. The location must also provide working room for mounting and removing wheels. Make sure the area has adequate lighting.

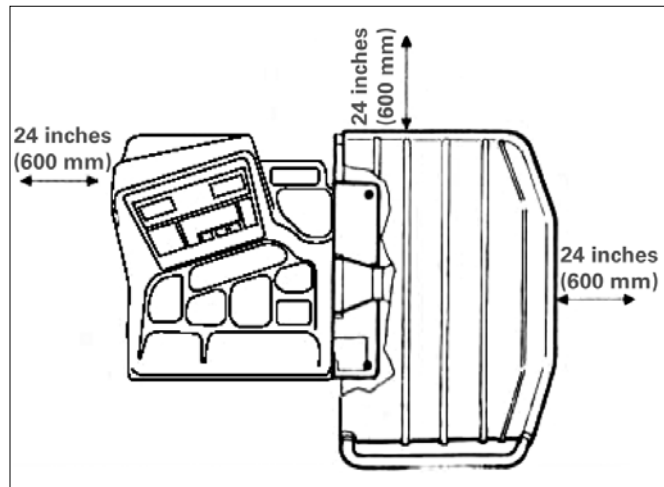


Figure 1 - Space Requirements

### Electrical Requirements

See serial tag for the appropriate power requirements of your machine.

Always have a qualified electrician install the proper receptacles in accordance with state and local codes.

## Wheel Guard Installation

- 1.** Unscrew the nuts that lock the two bolts on the wheel guard support pin holes and take out the bolts.
- 2.** Fit the wheel guard tube into the support pin, lining up the two sets of holes.
- 3.** Fit the two bolts into the holes and attach the wheel guard on to the support by tightening up the nuts.

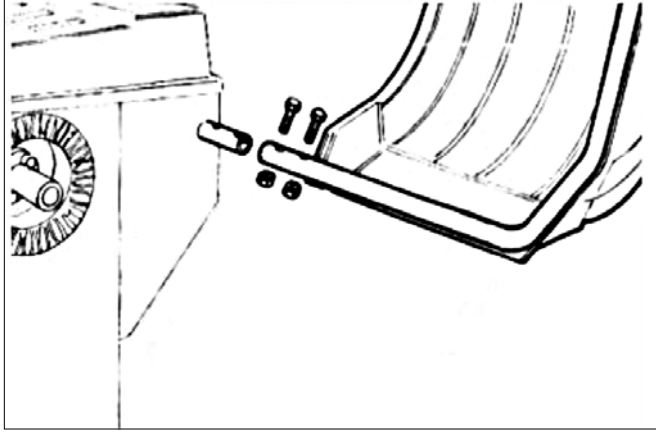


Figure 2 - Install Wheel Guard Onto Balancer

## Connect to Power

Your factory trained COATS® Service Technician should do the final check to verify the power installation before connecting the balancer to a power supply. Failure due to improper power connection may void the warranty.

## Initial Testing

- 1.** Plug the unit into an appropriate power outlet. If the circuit breaker for the outlet is off, turn it on.
- 2.** Turn the balancer on. The power switch is on the back of the unit.

## Specifications

### Wheel Diameter Range

8 - 23 inches (203 - 584 mm)

### Wheel Width Range

1.5 - 20 inches (40 - 510 mm)

### Maximum Outside Tire Diameter

Up to 35 inches (900 mm)

### Maximum Tire/Wheel Weight

100 pounds (45.4 Kg)

### Mounting Shaft Diameter

40 mm

### Resolution (Round Off Mode)

0.25 ounce, position 1.40 degrees

### Resolution (Non-Round Off Mode)

0.10 ounce, position 1.40 degrees

### Balancing Display Increments

0.25 or 0.10 ounces

### Electrical Requirements

115 V, 1 Ph, 5 amp

230V, 1Ph, 2.5 amp

(use grounding type plug)

### Footprint

43 x 39 inches (1090 x 980 mm)

### Shipping Weight

251 pounds (114 Kg)

(without accessories)

## Standard Accessories

- 8112107 Cone Spring
- 8112098 Small Cone
- 8112099 Medium Cone
- 8112100 Large Cone
- 8112106 Small Pressure Drum with Ring
- 8113175 Wheel Weight Hammer
- 8112103 Hub Nut
- 8309011 Caliper

## Features

- Integrated LED touch panel display
- 8 balancing modes, including dynamic clip, static, match, and 5 tape-a-weight™ options
- Positioning foot pedal system to hold assembly in place while placing weights
- Space-saving design
- Access to COATS® extensive Factory Authorized service network
- 6 months Parts Warranty



## ★Balancing Your First Tire

- 1. Turn the machine OFF then ON (resets machine).**

**Note:** The machine wakes up using standard clip-on wheel weight locations (C1 & C2) and wheel dimensions.

- 2. Mount a tire/wheel on the balancer that will use standard clip-on wheel weights.**

Use the most appropriate mounting method.

- 3. Always remove any weights already attached to the wheel.**
- 4. Enter A & D wheel dimensions using offset arm.**



Figure 3 - Offset Arm At Clip-On Weight Location

- 5. Enter Width wheel dimension.**

Use plastic calipers to measure wheel width from wheel flange to wheel flange. Use keypad to enter Width value.

- 6. Lower the hood, press Start; wheel spins and unbalances are measured and displayed.**

After the beep signal, the corrective weight amount appears in the digital readout windows.

- 7. Raise hood after tire stops rotating.**

**Note:** Wait for wheel to stop before raising the hood.

- 8. Rotate wheel to inboard (left plane) position of unbalance.**

- 9. Attach inboard (left plane) corrective weight.**

Attach specified weight amount at top-dead-center on inside flange of wheel.

- 10. Rotate wheel to outboard (right plane) position of unbalance.**

- 11. Attach outboard (right plane) corrective weight.**

Attach specified weight amount at top-dead-center on outside flange of wheel.

- 12. Lower the hood to respin the tire/wheel and check balance.**

Your weight readings should now be 0.00.

**Note:** Throughout this manual tire dimensions are referred to as A, W, and D, see figure 4.

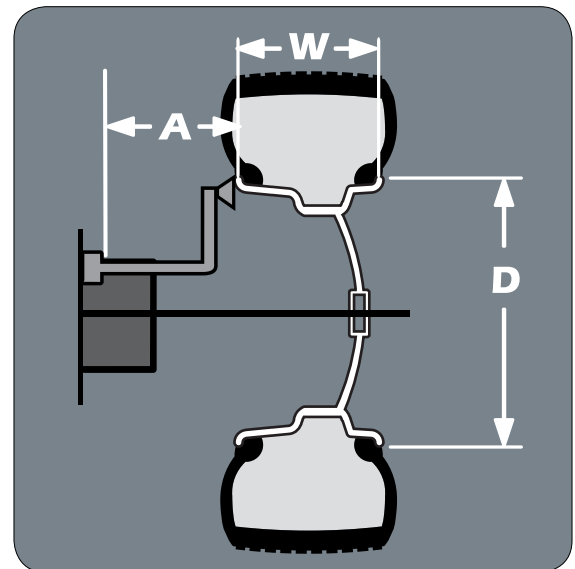


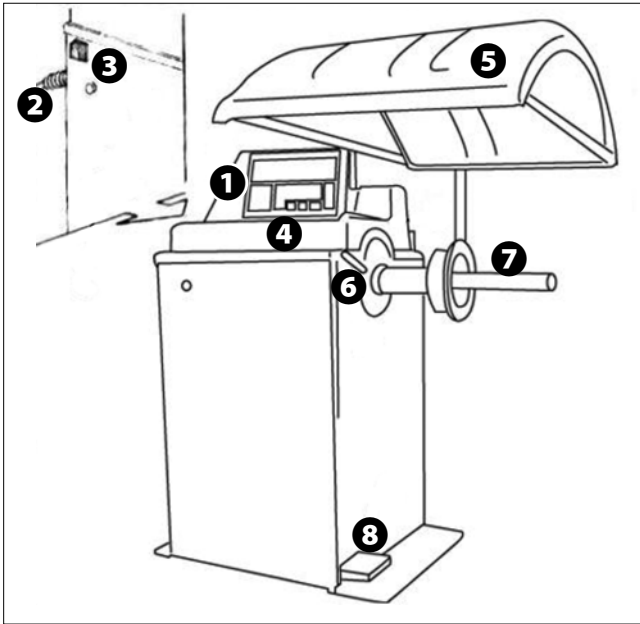
Figure 4 - A, W, and D Tire Dimensions

## Principle Operating Parts

### Know Your Unit

Compare this illustration with the unit before placing it into service. Maximum performance and safety will be obtained only when all persons using the unit are fully trained in its parts and operation. Each user should learn the function and location, of all controls.

Prevent accidents and injuries by ensuring the unit is properly installed, operated and maintained.



- 1 Control Panel
- 2 Plug (back of machine)
- 3 ON/OFF Switch
- 4 Weight Tray with Pockets for Tape-A-Weight Boxes; Individual Weights
- 5 Wheel Guard
- 6 Offset Arm, Measures A & D of Tire/Wheel (shown in home position)
- 7 40 mm Shaft
- 8 Positioning Pedal

**Note:** Throughout this manual wheel weights are referred to as Clip-on or Tape-A-Weight®. Figure 5 shows an example of each weight.



**Clip-on Weight**

**Tape-A-Weight®**

Figure 5 - Corrective Weight Examples. For Best Results, use BADA® Brand Wheel Weights.

### Power Switch

The ON/OFF switch location is on the side of the balancer; below the weight tray. After the beep and the lamp test, the machine is ready to receive the wheel data.

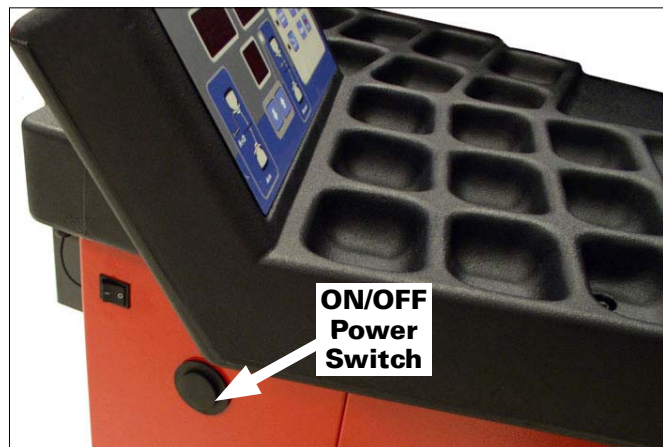


Figure 6 - On/Off Switch

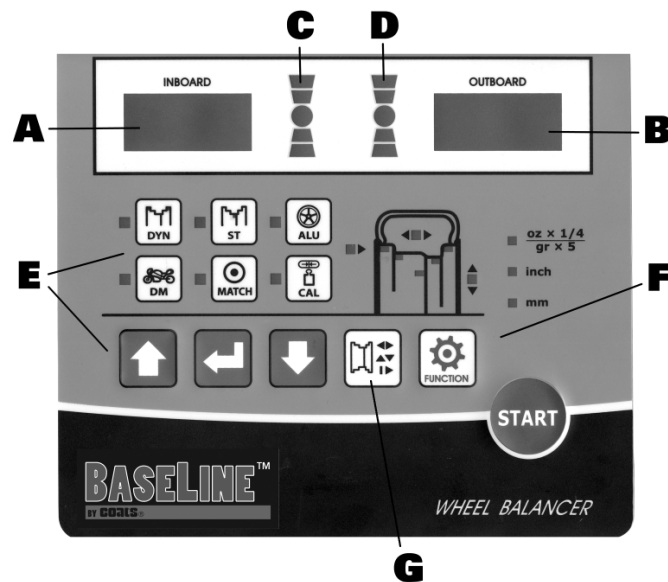
## Using The Offset Arm

When not in use store the offset arm in the home position as shown in figure 7.



Figure 7 - Offset Arm Stored In Home Position

## Control Panel




- A** Inboard Plane Display (left)
- B** Outboard Plane Display (right)
- C** Inboard Plane Position Indicator
- D** Outboard Plane Position Indicator
- E** Keys and LEDs for Selecting and Displaying Available Programs
- F** Key and LED for Selecting Round Off Mode and Units
- G** Key for Input of Wheel Data

## Rounding

When the machine is switched on, its default setting is to show the unbalance to the nearest five grams (rounding up or down as necessary) or to the nearest 1/4 ounce if data output in ounces has been set. In this default setting, the first 4 grams are not displayed since they are regarded as below the operational threshold (the "Thr" LED will turn off) and the unbalance will be shown to the last gram (or to the last 1/10 of an ounce if this display mode is active).



Each time the  is pressed, the machine toggles between threshold ON and threshold OFF.

## Ounce/Gram



**Note:** By pressing the  and holding it down for about five seconds, you can set up the machine to display out of balance values in grams or ounces.

## Wheel Guard



**Never raise up the wheel guard before the wheel has come to a stop. Keep hair, loose clothing, fingers and all parts of body away from moving parts.**

If, due to a fault in the machine, the wheel keeps spinning permanently, switch off the machine at the master switch or by unplugging the plug from the power supply.

Wait until the wheel stops, or actuate the positioning pedal before opening the wheel guard.

## Positioning Pedal



**Do not actuate the positioning pedal during the measurement cycle. Do not use the positioning pedal as a brake.**

After the machine has completed its spin cycle, use the positioning pedal to hold the wheel position during weight application. When you press the pedal with your foot, the spindle shaft is locked.

If you have to brake the wheel in an emergency situation, while it is being spun by the motor, first disconnect the power to disengage the motor and then use the positioning pedal.

## Auto Stop Feature

When the wheel is spun and out of balance measurements are displayed, the balancer's auto stop feature stops the wheel automatically at the corrective weight location (12 o'clock).

## Mounting Wheel On Spindle Shaft

Select the most appropriate mounting method for the wheel you are balancing. Using the proper method ensures secure mounting and safe balancer operation, and prevents damage to the wheel.

On most wheels, the inner side of the wheel hub usually has the most uniform surface for wheel balancing. Always center the wheel by the most uniform shaped side of the hub to achieve the most accurate balance.

Regardless of mounting type, always make sure that the wheel is forced firmly against the shaft faceplate and that the hub nut engages the threaded shaft for at least four complete turns. To assist in centering the wheel properly, rotate the wheel and the shaft while tightening the hub nut.



**Failure to tighten the hub nut properly may result in the wheel dismounting, causing personal injury and property damage.**

## Standard Back Cone Mounting

Most original equipment and steel wheels can be mounted properly using this method. The wheel is centered on a cone from the inner side of the hub.

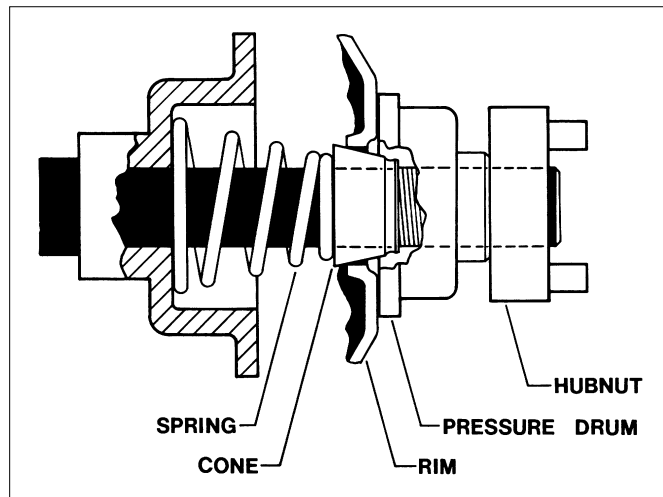


Figure 8 - Back Cone Mounting

**1.** Select the cone that best fits the center hole in the wheel. Slide the cone onto the shaft with the large end towards the faceplate.

**2.** Lift wheel onto the shaft and center it on the cone.

**3.** Attach the pressure cup to the hub nut and install the assembly onto the shaft. Tighten securely.

**Note:** Use a nylon spacer (no mar ring) to protect custom wheel finishes.

**4.** Thread the hub nut onto the shaft, and tighten it against the wheel. The wheel must be forced firmly against the faceplate. The hub nut must engage the threads for at least three full turns.

**Note:** If the hub nut will not tighten completely, use the front cone mounting method.

## Standard Front Cone Mounting

A wheel should be centered by the outer side of the hub only when the inner surface will not provide an accurate surface to center on.

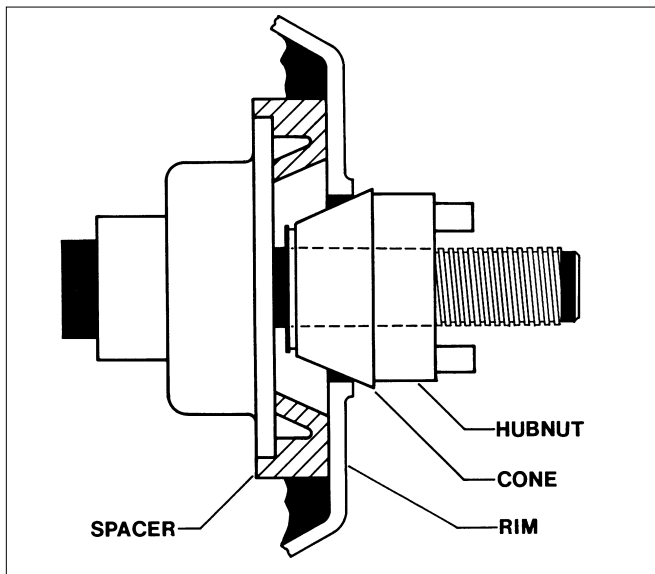


Figure 9 - Front Cone Mounting

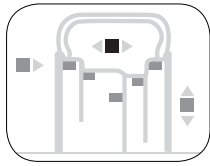
- 1.** Select the cone that best fits the center hole in the wheel.
- 2.** Lift the wheel onto the shaft and slide it back against the shaft faceplate.
- 3.** Slide the cone onto the shaft and into the center of the wheel. You will need to lift the tire to seat the cone in the center hole.
- 4.** Install the hub nut (without pressure cup) onto the shaft. Tighten it securely against the cone. The hub nut must engage the threads for at least three full turns.

**Note:** If the hub nut will not tighten completely because of a lack of threads, use an additional cone as a spacer between the mounting cone and the hub nut. The wheel must be forced firmly against the faceplate.

## Setting Wheel Dimensions (DIM)

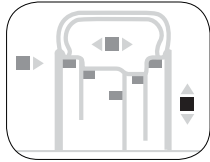
Before a wheel can be balanced, wheel dimensions must be entered into the computer.

### Definition of DIM



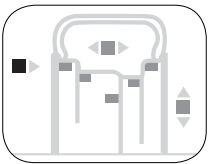
#### W = Width

The width of the wheel at the rim flanges, measured with the calipers as shown in figure 12.



#### D = Diameter

The diameter of the wheel as indicated on the tire.



#### A = Offset

The distance measured from the balancer ("0" on offset arm) to inner plane of the rim (inner weight location).

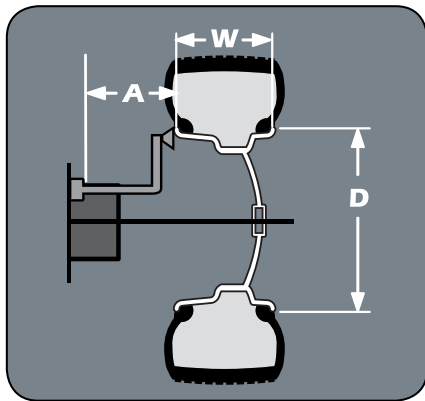


Figure 10 - W, D, and A Tire Dimensions

**Note:** Only use calipers provided by the wheel balancer manufacturer because others may not be the same.

**Note:** A thick flange, on some aluminum wheels, can effect the measured diameter. For example, a 16-inch rim can have a measured diameter of 15.5-inches.

#### A2 = Offset

The distance measured from the balancer ("0" on offset arm) to outer plane of the rim (outer weight location). Typically used in ALU programs.

#### D2 = Diameter

The diameter as measured at the A2 weight location. Typically used in ALU programs.

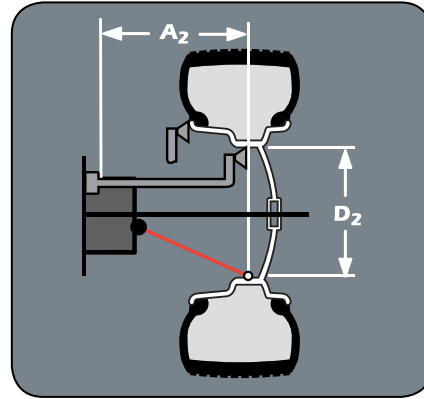



Figure 11 - A2 and D2 Tire Dimensions

## Wheel Data Entry (W, D, A)


**1.** Press . The machine is ready to receive the WIDTH (W) measurement (the corresponding LED will light).

**2.** Measure rim width using the caliper provided with the balancer (figure 12).




Figure 12 - Caliper Placement On Wheel

**3.** Press  or  until the correct WIDTH number is set in the right display window.

**4.** Press  to confirm the W input and set up the machine to receive the DIAMETER (D) measurement (the corresponding LED will light).

**5.** Read the diameter that is printed on the tire.

**6.** Press  or  until the correct DIAMETER number is set in the right display window.

**7.** Press  to confirm the D input and set up the machine to receive the OFFSET (A) measurement (the corresponding LED will light).

**8.** Move the offset arm until it touches the edge of the inside rim flange as shown figure 13 according to the different terminal available on the gauge.





Figure 13 - Offset Arm at Clip-on Weight Location


**9.** Read the machine/rim distance on the gauge.

**10.** Press  or  until the correct OFFSET number is set in the right display window.

**11.** Lower hood and press  to spin wheel.

**Note:** If you hold down  or  the numbers will spool up or down quickly making data input all the more rapid.

**Note:** DIM inputs can be converted between inches and millimeters.

To do this press  to toggle between an inch or millimeter measurement display. A LED on the panel will light to identify the current unit of measurement (mm or inch).

**Note:** When in static mode, you only need to input the DIAMETER wheel measurement.


## Balancing Programs

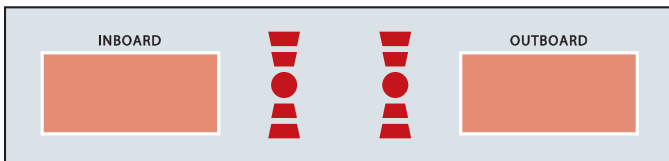
A variety of wheel configurations can be balanced using this wheel balancer. Read through this section, it will help you determine which program and options are best suited for certain wheel assemblies.

To perform a balancing cycle:

- Mount the wheel on the shaft using the most appropriate method. Refer to Mounting Wheel on Shaft, pages 8 & 9.
- Remove any balancing weights, stones, dirt or other foreign bodies from the wheel.
- If necessary, select a balancing program.
- Input wheel data correctly. Refer to Setting Wheel Dimensions (DIM), pages 10 & 11.




- Lower hood and press  to spin wheel.
- Wait for the beep that signals the wheel measurement cycle is complete.
- Use the positioning pedal to stop the wheel spinning; then raise the wheel guard.



- Observe the corrective weight amount requirements displayed for the inside and outside planes respectively.
- Choose the first side you intend to balance and rotate the wheel until the center indicator light flashes and you hear a confirming beep.
- Attach the corrective weight at top-dead-center (12 o'clock) on the tire/wheel assembly. Refer to Attaching Corrective Weights, page 14.
- If necessary, repeat the process for the other side of the wheel.






- Lower hood and press  to spin wheel and check balance. Your weight readings should now be 0.00.


**Important:** Be aware that a slight error (a degree or two) in positioning the corrective weight on the tire/wheel assembly can produce a residual out of balance.

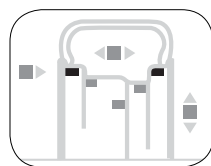
## Dynamic Balancing

Choose a dynamic balance to balance a wheel using two planes for correction. Select the weight option that best fits the available weight locations.

**Clip-on Weights** - The standard default; used for most passenger tire/wheel assemblies using the most common location for corrective weights. Clip-on weights are placed on the inner and outer rim flanges.

- Press  or  until the  DYN balancing program LED lights up. The two clip-on weight LED locations light up on the rim diagram.

- Press  to confirm your choice.







**C1 & C2**

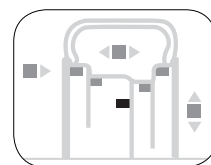
**Note:** The standard dynamic balancing program using clip-on weight locations is the default setting, when the machine is switched on.

## Static Balancing

Choose a static balance to balance a wheel using one plane for correction. Place the single corrective weight at top-dead-center (12 o'clock) on either flange, at the center of the rim channel or place half of the displayed weight on both planes.

- Press  or  until the  STATIC balancing program LED lights up.

- Press  to confirm your choice.



**STATIC**

**Note:** When in static mode, you only need to input the DIAMETER wheel measurement.




**Important:** If you decide to use the rim channel for corrective weight placement, remember you may need to adjust the DIAMETER measurement input. Typically you would make it 2 or 3 inches less than the actual tire/wheel diameter.




## Aluminium Wheel

Choose from 5 ALU programs that represent typical corrective weight positions for aluminum wheels using a dynamic balance. The balancer's ALU programs calculate out of balance values based on the wheel dimension measurements (DIM) entered for the tire/wheel assembly.

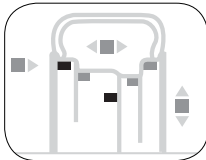
**ALU (Aluminum Wheels)** - To balance aluminium wheels you usually use a self-adhesive weight location that is positioned differently from the clip-on weight position(s) used in standard balancing.

- Press  or  until the  ALU balancing program lights up.

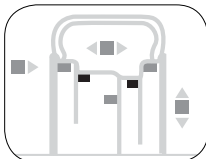
- Press  the number of times needed to select your ALU program choice (the rim diagram on the panel illustrates the type of weights and balancing planes for each ALU program).



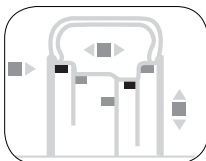
**ALU 1**  
**ALU 1P**



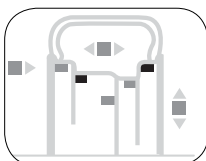
**ALU 2**  
**ALU 2P**



**ALU 3**



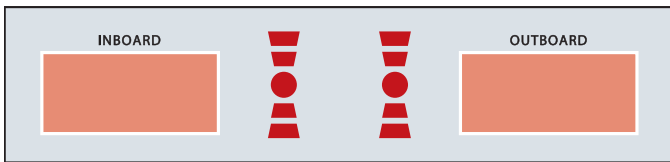
**ALU 4**



**ALU 5**


**Note:** If the WIDTH you input is less than 4-inches or the DIAMETER is less than 11-inches, an Alu Err message may appear. This means that the width and diameter input cannot be used for the ALU program selected.

## Attaching Corrective Weights



- Rotate the wheel until the center indicator light flashes and you hear a confirming beep.
- Attach the corrective clip-on weight amount at top-dead-center (12 o'clock) on the tire/wheel assembly. If the program ALU 1P is running, place the corrective Tape-A-Weight™ amount at the exact position and plane chosen when entering the wheel measurement data.



- Lower hood and press  to spin wheel and check balance. Your weight readings should now be 0.00.

## Match Balance (Optimization)



**The Match Balance involves the loosening of tire beads and the inflation of a tire. Training is necessary in tire changer operation and understanding the dangers involved during bead seating and tire inflation before attempting this stage of the Match Balance procedure. Read the operators manual supplied with the tire changer and consult a supervisor.**

Use the Match Balance (Tire/Rim Weight Optimization) program to determine the best mating of tire and rim that will result in the least amount of total out of balance of the assembly. It requires two spins and two rotations of the tire on the rim. Match Balance may be needed when:


- The customer complains of ride problems.
- The balancer calculates a high out of balance.

**Important:** A high out of balance may indicate the improper mounting of the assembly on the balancer, or a rim that is out of round or misformed, or a tire with a bubble or other problem. If the out of balance is excessive, it may be prudent to replace the rim, the tire, or both. If either is replaced, do not continue with Match Balance. Balance the new tire and rim and evaluate the readings.

### Match Balance Program

Choose the match balance program only after the wheel has spun and the corrective weight amount is displayed.

- Press  or  until the  MATCH balancing program LED lights up.


- Press  to confirm your choice.

When you select this program, the balancer calculates whether it is worthwhile. The balancer will flash the message:

- Yes OPT if it is worth the effort.
- No OPT if it is not.

This calculation is made based on the out of balance found with the last spin made (therefore, the last spin must refer to the wheel on the machine).


You are now ready to move into the first stage of the program as signaled on the display. If you do not want

to continue with this program, press .

### OPT 1

- Mount the rim without the tire on the balancer.
- Turn it until the valve (or hole) is at 12 o'clock.




- Press .
- Make the first spin (as instructed by the display). At the end of the spin, the program goes into its second stage.

### OPT 2

- Remove the rim from the balancer.
- Put the tire on the rim. Put the tire on the balancer.
- Turn it until the valve is at 12 o'clock.




- Press .
- Make the second spin. At the end of the spin, the program goes into the third stage of the OPT program.

### OPT 3

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



- Press .
- Make the third spin. At the end of the spin, the program goes into its fourth and last stage.

### OPT 4

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



- Press .

- Make the forth spin. At the end of the spin, the OPT program is complete, and the machine displays the corrective weight amounts to balance the wheel.

If you make an error, which will negatively affect the end result, the machine will tell you this by, displaying a message: OPT Err. This means you need to repeat the entire procedure from the beginning.


**Note:** If you do not want to make the first spin with just the empty rim, you can skip the first phase by




pressing  immediately after pressing the  for the OPT program. This will mean that you start by mounting the rim plus tire on the balancer and carrying out phases 2, 3, 4 as previously described.

**Note:** At the end of the second and third spin you may get the message OUT 1 or OUT 2 on the screen. This means that you are better off abandoning the program




by pressing the . The display will then give the weights needed to balance the wheel. This allows you to short cut (exit) the program by accepting the current status. If you want to carry on to the end, press the



 and you will continue in the OPT program.

**Note:** At the end of the third spin the screen may suggest that you switch the tire around on the rim. If you do



not want to or cannot do this, press . The screen will display instructions on how to complete the OPT program without making this switch.

### Quick OPT Program

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

Proceed as outlined above in the previous heading with the difference that the first stage of the quick optimization program corresponds to the second stage of the standard program.

You therefore start work with the tire already on the rim and then proceed with the successive stages.


# Calibration Program

## First Sensitivity Calibration

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

- Select a wheel of average size and weight, preferably with a limited unbalance, and mount it on the shaft.
- Enter the correct wheel dimensions for the wheel.

• Press  or  until the  CAL program LED lights up.

• Press  to confirm your choice.

• The machine is now ready to carry out first sensitivity calibration and displays the message "CA.1"

• Rotate the wheel until the center indicator light flashes and when the value "100" (or 3.5 if ounce mode is selected) is on the display.

• Attach a 100 g (or 3.5 oz) sample weight to the OUTSIDE of the wheel rim. Position it at top-dead-center (12 o'clock) exactly.



• Lower hood and press  to spin wheel.

• With the wheel stopped, remove the sample weight from the outside plane and rotate the wheel until the center indicator light flashes and when the value "100" (or 3.5) is on the display.

• Attach the 100 g (or 3.5 oz) sample weight once again to the OUTSIDE of the wheel rim. Position it at top-dead-center at 12 o'clock exactly.




• Lower hood and press  to spin wheel.

When the calibration program is completed successfully, it is confirmed by a beep following the spin. If not, the message "Er3 CAL" is displayed.

The self-calibration program ends with the display showing out of balance values for the wheel (ignoring the sample weight).

**Remember:** Remove the 100 g (3.5 oz) sample weight at the end of the procedure.



**Note:** The  can be pressed at any given moment to abort the calibration procedure and return to the program selected previously.

**Note:** The calibration described above is valid for any type of wheel.


## Second Sensitivity Calibration

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

• Select a wheel of average size and weight, preferably with a limited unbalance, and mount it on the shaft.

• Enter the correct wheel dimensions for the wheel.

• Press  or  until the  CAL program LED lights up.

• Press  twice to confirm your choice. The machine is now ready to carry out second sensitivity calibration and will signal this with the message "CA.2".

• Follow all the steps outlined above for first sensitivity calibration.

## Diagnostic Procedures

### After Balance Vibration Problems

If vibration is still present after balancing the wheels and driving the vehicle on smooth pavement, remove the wheels and recheck the balance. If a wheel is out of balance the cause may be:

- Wheel was not mounted/centered correctly on the balancer.
- A weight has come off the wheel (possibly the wrong clip style). Remove the other weights from the wheel and rebalance.
- Foreign material inside the tire. Remove the tire from the wheel, remove the foreign material, and remount. Remove wheel weights and rebalance the wheel.
- Stones or other foreign objects caught in the tire tread or rim. Remove the objects. Check and rebalance if needed.

If the balancer still indicates the wheels are balanced to within 0.10 ounces on both inner and outer displays, the problem is not in the balance of the wheels. Check the following possible sources of vibration:

- Tire pressure. Bring all tires up to the recommended PSI.
- Radial or lateral runout in the tire or wheel. Replace the damaged part.
- Unbalance in wheel covers or trim rings. Remove the wheel covers or trim rings and test drive. If the vibration is gone, remove the shaft and use an appropriate adapter to mount the wheel to the balancer. Balance the wheel with the wheel cover or trim ring attached to the wheel.
- Incorrectly mounted tire and wheel. Remount correctly.
- Damaged wheel bolt holes. Replace wheel.
- Worn universal joints. Replace as required.
- Drive shaft unbalance or damaged. Balance, repair, or replace.
- Unbalance in brake rotor(s) or drum(s).
- Suspension out of alignment. Align the vehicle and replace any damaged or worn parts.

### Balancing Accessory Availability Status

This check permits you to make sure that wear has not altered the mechanical specifications of flanges, cones and so on beyond the specified limits.

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

If the unbalance is higher, check all the accessories with care and replace any that show dents, abnormal wear, bent flanges and so on.

Always remember that if you are using a cone to center the wheel on the shaft, you will never get good results if the centre hole in the rim is not perfect, i.e. off center or out-of-round. Results are always better when the wheel is centered with the rim holes.

A last important point: any difference between the way the wheel is mounted on the car and on the balancing machine will generate some unbalance.

## Troubleshooting

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

ERROR	CAUSE	REMEDY
<b>Machine fails to switch on, with no light showing at the main switch.</b>	No power at the socket.	<ul style="list-style-type: none"> <li>▶ Test the main voltage.</li> <li>▶ Check the electrical power circuit installed in the workshop.</li> </ul>
	Defective main plug.	<ul style="list-style-type: none"> <li>▶ Check the integrity and efficiency of the plug, and replace if necessary.</li> </ul>
<b>Machine fails to switch on, even with the light showing at the main switch.</b>	One of the fuses F1, F2, F3 at the circuit board has blown.	<ul style="list-style-type: none"> <li>▶ Replace the blown fuse.</li> </ul>
<b>Wheel fails to spin when START button is pressed.</b>	The wheel guard is raised.	<ul style="list-style-type: none"> <li>▶ Lower the guard.</li> </ul>
<b>Machine gives discontinuous unbalance values.</b>	The machine has been jolted or destabilized during the spin.	<ul style="list-style-type: none"> <li>▶ Repeat the spin, taking care not to disturb the machine while data acquisition is in progress.</li> </ul>
	The machine is not sitting level on the floor or is on an unstable floor.	<ul style="list-style-type: none"> <li>▶ Verify the stands and adjust the feet, utilizing shims if necessary.</li> </ul>
<b>Several spins are needed to balance a wheel.</b>	The wheel is not properly clamped.	<ul style="list-style-type: none"> <li>▶ Tighten the hubnut so that the wheel is firmly restrained.</li> </ul>
	The machine has been jolted or destabilized during the spin.	<ul style="list-style-type: none"> <li>▶ Repeat the spin, taking care not to disturb the machine while data acquisition is in progress.</li> </ul>
	The machine is not sitting level on the floor or is on an unstable floor.	<ul style="list-style-type: none"> <li>▶ Verify the stance and adjust the feet, utilizing shims if necessary.</li> </ul>
	The wheel is not properly clamped.	<ul style="list-style-type: none"> <li>▶ Tighten the hubnut so that the wheel is firmly restrained.</li> </ul>
	The wheel dimensions entered are incorrect.	<ul style="list-style-type: none"> <li>▶ Verify the dimensions and program correctly.</li> </ul>
	The machine is not properly calibrated.	<ul style="list-style-type: none"> <li>▶ Run the calibration procedure.</li> </ul>

## Error Display

The machine recognizes a number of incorrect operations and displays this as an error message.

ERROR CODE		DESCRIPTION
Er1 CAL		Error in first sensitivity calibration. Do the first sensitivity calibration procedure.
Er2 CAL		Error in first sensitivity calibration. Do the first sensitivity calibration procedure.
Er3 CAL		Calibration was done without using the 100 g standard weight. Repeat calibration with the correct calibration weight.
Er4 CAL		First sensitivity calibration was done with a tire with a too high out of balance. Balance the wheel (or at least reduce its out of balance) and repeat calibration.
Er5 CAL		Gauge calibration error. Carry out gauge calibration.
Err 7		The machine cannot give the data asked for. Do a spin and repeat the request.
Err 10		Internal distance gauge not in rest position (completely in) when the machine is turned on. Turn off the machine, return the gauge to its correct position and turn on again. Potentiometer malfunction. Press the key to disable the gauges and enter the data from the keyboard.
Err 11		Diameter potentiometer malfunction. Press the key to disable the gauges and enter the data from the keyboard. Contact technical assistance for help.
Err 20		Gauges not in correct position during calibration. Move them to the correct position and repeat calibration.
Alu Err		Incorrect wheel data input for an aluminium wheel balancing program (ALU). Correct the data.
OPT Err		Error made during the OPT procedure (optimization). Repeat from the beginning.
Cr Err		Spin made with wheel guard up.
<b>Other Messages</b>		
CA.1 (GO)		First sensitivity calibrating spin.
CA.2 (GO)		Second sensitivity calibrating spin.
GO	Alu	Spin with Alu program.
GO	d15	Spin with motorcycle dynamic program.
GO	A15	Spin with motorcycle Alu program.
GO	CTS	Spin with CTS program.
St		Spin with static balancing program.
CCC	CCC	Out of balance higher than 9 oz. / 255 grams.

## Maintenance Instructions

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

- 1.** Keep the display clean and clear. Use a damp cloth. Do not use cleaners or solvents which leave oily or filmy residues behind.
- 2.** Keep the adapters, cones, faceplate, threaded shaft, pressure cup, and hub nut clean. Grease and dirt buildup will cause inaccurate balancing and premature wear. Clean these items at least once a day with a vaporizing solvent.
- 3.** Clean weight tray and any accessory posts, pegs, or storage shelves with a vaporizing solvent. Weights stored in a dirty tray may pick up grease and dirt which may keep them from securely attaching to the wheel.



**Use common sense, this is an 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. Place, store, and operate the balancer only in a dry, sheltered location.**



**Do not hose down with water or bucket wash the balancer. Extensive damage to the balancer will result. Sensitive electronic components, wiring harnesses, and other devices housed in the balancer are not intended to be exposed to water.**

- 4.** Keep the area around and under the balancer clear. Remove any tools or other items that are leaning against the balancer. Remove any items that may cause the balancer to not sit level. Be particularly cautious of new or used wheel weights on the floor, as they may cause personal injury due to falls.
- 5.** Use only BaseLine™ accessories. Accessories from other manufacturers may not fit or function properly, and may damage the balancer.



## Glossary Of Terms

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

**Balancing Cycle** – Sequence of operations performed by the user and the machine, beginning from the start of the wheel spin to the time that the wheel is stopped; at a standstill, after the out of balance signals are acquired and the relative values calculated.

**Centering** – Procedure for positioning the wheel on the spindle shaft with the aim of ensuring that the rotational axis of the wheel is aligned with the center of the shaft.

**Centering Flange (accessory)** – Device serving to support and center the wheel. Also keeps the wheel perfectly perpendicular to its axis of rotation. The centering flange is mounted to the balancer shaft by means of its center hole.

**Cone** – Conical components with center hole. When inserted on the spin shaft, serves to center wheels with centre holes whose diameter is between maximum and minimum values.

**Dynamic Balancing** – Operation in which out of balance is corrected by the application of two weights, one on each side of the wheel.

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

**Spin** – Procedure starting from the action that causes the wheel to rotate and the successive free rotation of the wheel.

**Hubnut** – Device for clamping the wheel to the balancer. The hubnut features elements for engaging to the threaded hub and lateral pins that are used to tighten it.

**Static Balancing** – In static balancing only the static component of unbalance is corrected. This is achieved by fitting a single weight, usually at the center of the rim channel. The accuracy of this system increases as the width of the wheel decreases.

**Threaded Hub** – Threaded part of the shaft that is engaged with the hubnut to clamp the wheel. This component is supplied disassembled from the machine.

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

## Notes

## **Notes**

