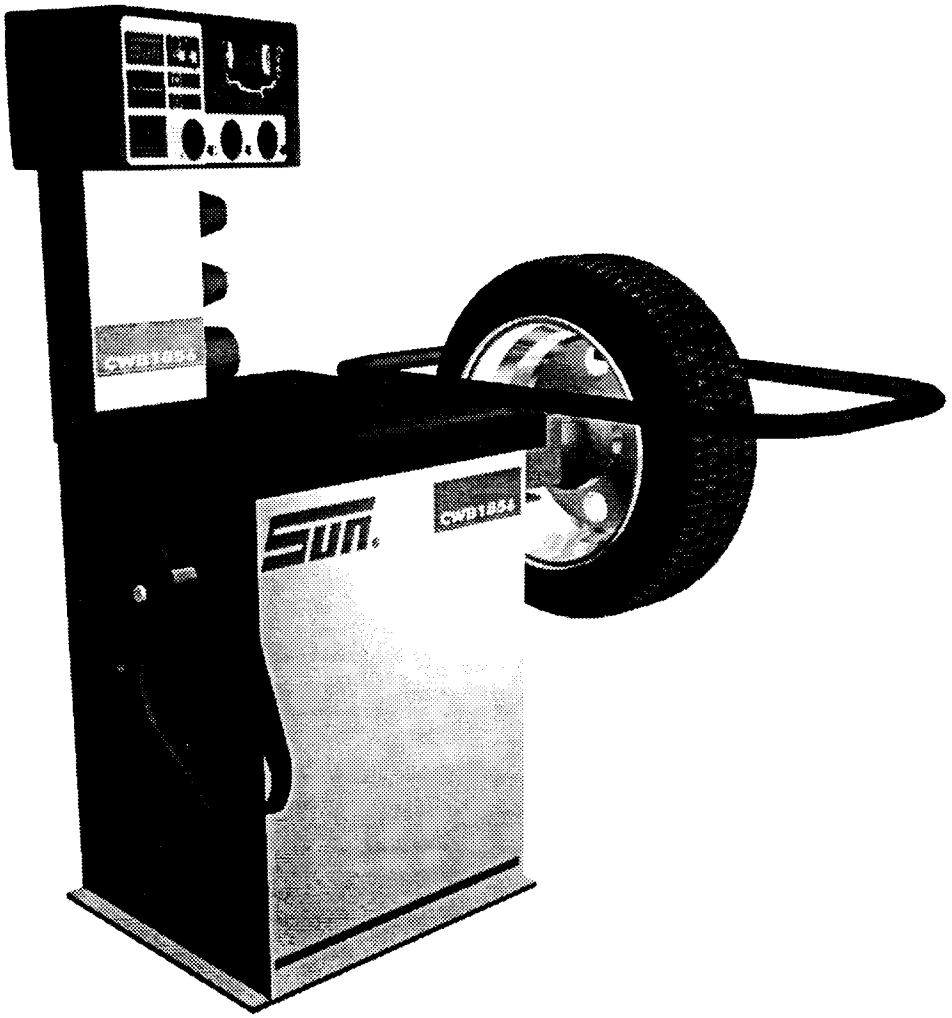
CWB 1856

Wheel balancer

Operation Manual



"FOR REFERENCE ONLY"

CONTENTS

SAFETY CAUTIONS AND WARNINGS

1. Read the Operators Manual before operating the balancer for the first time. Follow all instructions and warnings marked on the product.
2. The balancer operates from a 110 Vac, 60 Hz power source. Do NOT use any other voltage/ frequency electrical outlets. Use only an EARTHED electrical power source. Use only a correctly rated replacement fuse.
3. Arrange the power cord so that it will not be tripped over or pulled, and keep it clear of moving parts. If an extension cord is used, ensure its current rating equals that of the power cord supplied. Immediately replace a damaged power cord.
4. Ensure the balancer rests on all three feet on a clean, level floor with no debris under the base.
5. Do not operate the balancer: a) near fumes or exposed flammable liquids; b) on wet surfaces. Do not expose the balancer to rain.
6. Adopt the correct lifting procedures when lifting any object. Weights in excess of 100lb (45kg) should not be lifted unaided.
7. NEVER remove a cover or access panel on the balancer without first disconnecting the balancer from the electrical power source.
8. Only authorised and trained operators should use the machine.
9. Wear approved eye protection when removing or attaching weights. Keep hair, clothing and all parts of the body clear of balancer moving parts.
10. Remove all stones, old weights, and other debris from the wheel before balancing.
11. Center and tighten the wheel on the shaft before spinning the wheel.
12. Check that all wheel weights are properly applied and secured.
13. The balancer will return to the normal power-up state if the power is interrupted.
14. When the balancer is not in use, disconnect the power cord and use the available pegs and trays for storage of accessories.

CWB 1856 INSTALLATION & ASSEMBLY

Your CWB1856 Wheel Balancer and accessories will be delivered in a single carton mounted on a pallet.

Installation

A. Unpack the balancer and all accessories.
B. Check the contents list below and confirm that all parts are present. Check also for the standard wheel mounting accessories and any optional accessories you may have ordered.

Qty	Item
1	Base unit.
1	Display unit.
1	Display support & backpanel.
1	Frame (tilting).
1	Power cord.
1	Set of wheel mounting accessories.
1	Rim width callipers.
2	Set of weight tray labels.
1	Operators manual.

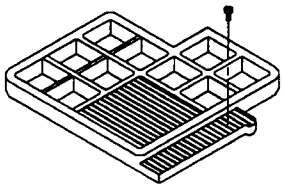
C. Place the base unit on a firm solid floor.
D. Read the *Assembly Instructions* section.

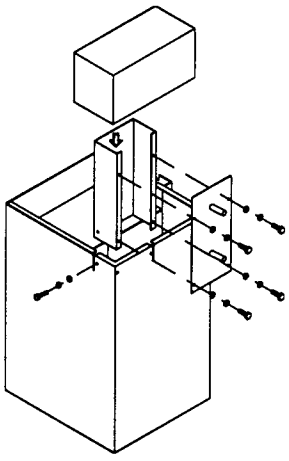
Assembly Instructions

Tools required : 10mm and ½" open end wrench
Philips screwdriver.

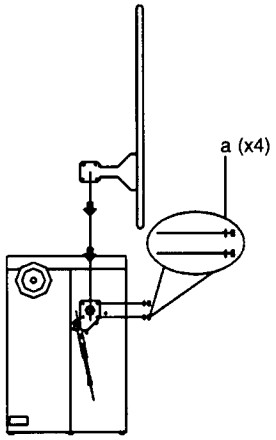
Remove the weight tray by unscrewing the two Philips screws, and then lifting up the tray from the base, separating it from the velcro fasteners.

1. Slide the *display support* into the slots in the machine base, and attach the *M6 bolt and washer* at the side of the *base*. Locate the *display unit* on the *support*, making sure that the cable is on the inside of the *display support*. Slide in the *support backpanel* and attach the four *M6 bolts and washers* into the *backpanel*.

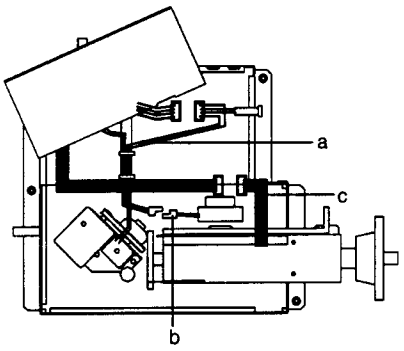




2. Attach the *frame* using the four *nuts and washers* on the *pivot bar.*



3. Attach the three pairs of electrical connectors:
   a.*Motor Relay Cable (4-way).*
   b.*Display Power Cable (2-way).*
   c.Head Signal Cable (20-way ribbon).



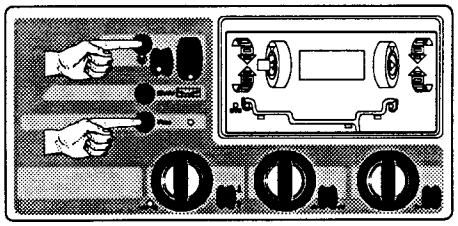
4. Re-assemble the *weight tray* by attaching it using the *velcro fasteners* and *screws.*

5. Verify the correct voltage is shown on the product serial label. Connect balancer to the mains outlet using the power cord provided. Switch on the wheel balancer.

   Your balancer is now ready for use!

Selection of Ounce/Gram Units

The balancer is programmed before leaving the factory to display weight imbalance in grams. To change this setting to ounce units, press and hold the Fine button. While holding the Fine button, press and hold the Matching button for 3 to 4 seconds, until a decimal point appears in the Display Window (0.00). Repeating these steps will change the units back to grams (000).



INTRODUCTION

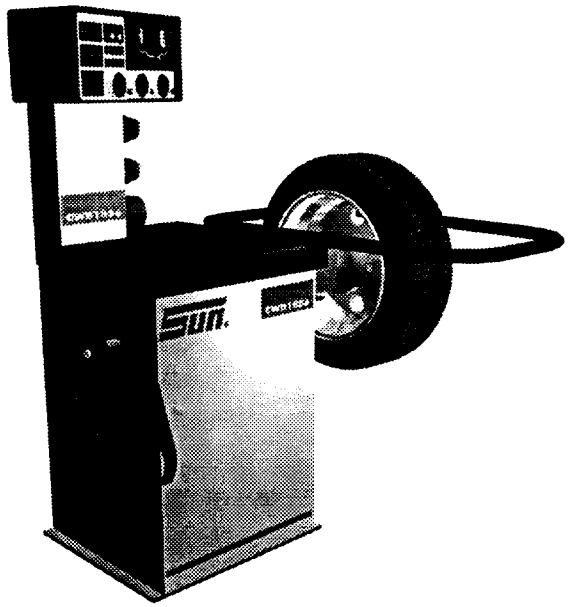
The SUN CWB 1856 Motorised Wheel Balancer combines advanced, high-performance technology, robustness, reliability and simplicity of operation.

The features of the CWB 1856 cater for all wheel service facilities. It is designed for use under a wide range of conditions, and will maintain perfect operation under the most demanding usage.

Low-speed rotation of the wheel by either hand spinning or lowering the tilting frame (which starts the motor), ensure that the CWB 1856 is one of the safest machines available.

The CWB 1856 features an easy-to-use Display and Input Panel, ensuring quick and intuitive operation. Operator time and effort are reduced to a minimum, while main-taining wheel balancing accuracy and repeatability.

Take a few minutes to study this manual and become acquainted with the features and capabilities of your new CWB 1856 Wheel Balancer before operating the balancer for the first time.



FEATURES

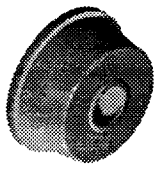
The SUN CWB 1856 Motorised Wheel Balancer applies the latest technology in wheel balancing for automobile and light truck wheels in an economical and powerful package which includes these features:

- Dynamic (twin-plane) and Static (single- plane) balancing.
- Single-spin cycle (7 seconds).
- Choice of 7 weight location modes : Normal, Alu 1, Alu 2, Alu 3, Alu 4, CTS, Static.
- Quick and easy entry of wheel dimensions (rim diameter, rim width and offset).
- Weight position indicators show exact positions of weights for all balance modes.
- Automatic recalculation of results for changes in wheel dimensions or modes without respinning the wheel.
- Fine mode increases accuracy to within 0.10 ounces (2 grams).
- Ounces or Grams weight units.
- Inches or Millimetres wheel diameter units.
- Optimatch - Tire and Rim Matching programme.
- Low-speed balancing and automatic brake for maximum operator safety and equipment protection.
- Automatic self-calibration.
- Low-power motor for minimum power consumption and increased reliability.
- Weight trays and pegs located for convenient storage of weights, cones, springs and other accessories.
- Range of wheel mounting accessories.
- Low service and maintenance costs.
- Bolt-to-floor option.

WHEEL MOUNTING ACCESSORIES

Standard Accessories

Quick-Release Hub Nut	(P/N 4801-1003)
Cone Spring	(P/N WB1131)
Spacer Ring	(P/N 8040)
Large Cone	(P/N WB1090-01)
Medium Cone	(P/N WB1090-02)
Small Cone	(P/N WB1090-03)
Extra Small Cone	(P/N WB1090-04)
Large Drum	(P/N WB1140-01)
Small Drum	(P/N WB1140-02)



Standard Accessories (cont)

Large Gasket	(P/N WB2533-01)
Small Gasket	(P/N WB2533-02)
Stub Shaft	(P/N 8322)
Light Truck Cone	(P/N WB1133-01)
Extension Adaptor (1")	(P/N WB1207-01)

Optional Accessories

Universal Wheel Adaptor : (P/N WB1230)

Fits 3,4,5,6,8 and 10-hole patterns. Used on wheels with untrue center holes, and wheels with closed center.

Metric Bolt Plate Adaptor : (P/N WB1499)

Used instead of Universal Wheel Adaptor for wheels with untrue centers or closed centers.

Extra Wide Extension Adaptor : (P/N WB1207-02)

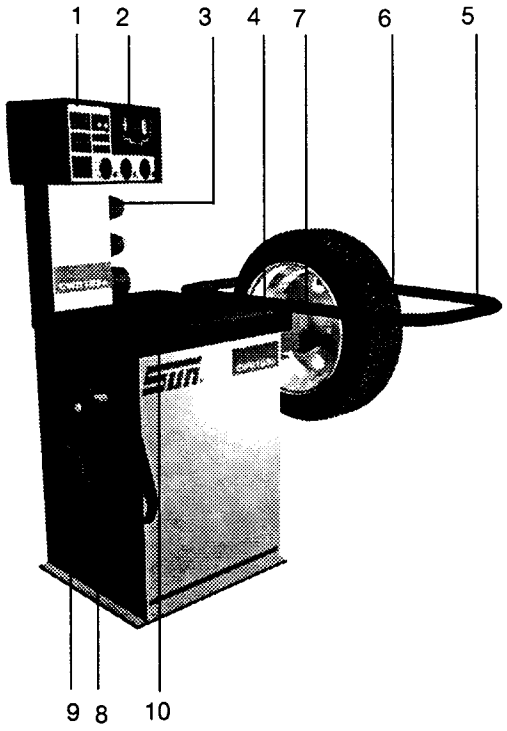
Used for some light truck wheels, reverse offset wheels and any application where wheel must be moved away from machine.

Additional adaptors and accessories for a variety of wheel mounting applications are available (for example, a motorcycle wheel adaptor kit).

FUNCTIONAL DESCRIPTION

The following diagram shows a view from the front of the complete assembled CWB 1856 Wheel Balancer.

1. Input Panel
2. Display Panel
3. Storage Pegs
4. Offset Scale
5. Tilting Frame
6. Stub Shaft
7. Flange
8. Caliper Peg
9. Calipers
10. Weight Tray



Balancer Display

The display combines solid-state electronics and graphical design to provide powerful visual presentation and durability.

The display indicates the amount and position of weights, wheel dimensions, operating modes and error conditions.

1. Numeric Display

Displays weights in ounces or grams after a spin cycle, when the wheel is rotated to the inner or outer Top-Dead-Center position.
Displays wheel dimensions (diameter, width, offset) in inches or millimetres during wheel data entry.
Displays 'EEE' to report an error.

2. Decimal Point

Illuminated constantly when ounces are selected as weight units.

3. Weight Position Indicators

Illuminated sequentially as the wheel is rotated and the correct position for weight placement is approached. This applies to both inner (3a) and outer (3b) weight positions.

4. Top-Dead-Center Indicators

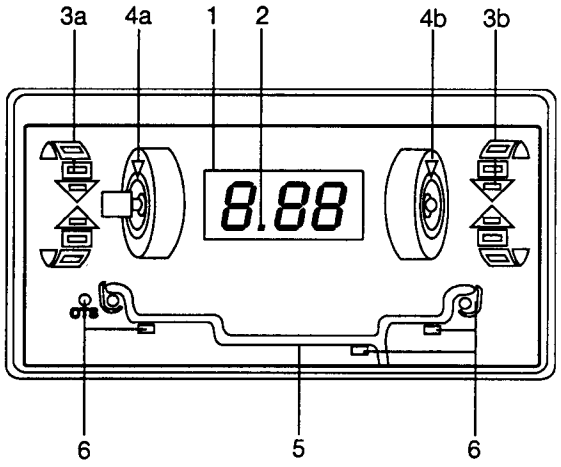
Illuminated when the correct position for attaching the weight at Top-Dead-Center (TDC) is reached. There are separate indicators for the inner (4a) and outer (4b) TDC positions.

5. Rim Profile

Graphical rim profile to illustrate the Weight Mode in operation.

6. Weight Mode Indicators

Illuminated Clip-On Weight (green, circular) and Stick-On Weight (yellow, rectangular) indicators to correspond to the Weight Mode selected.



Input Panel

The input panel combines controls and indicators, positioned for convenience, with graphical symbols clearly defining each function.

The input panel is used to select and indicate specific operating states and to enter data for the wheel to be balanced and the weights to be used.

1. Fine

Used in any mode to balance a wheel to within 0.10 ounces/2 grams (rather than the normal 0.25 ounces/ 5 grams).

2. Mode

Selects the Weight Mode. The mode selected is indicated by the weight mode indicators on the rim profile in the display panel. The balancer automatically recalculates the weights and positions for balancing the wheel when a new weight mode is selected without the need to re-spin the wheel.

3. Match

Used to start the Optimatch (Tire and Rim Matching) programme. Press Fine to exit Optimatch.

4. Rim Diameter

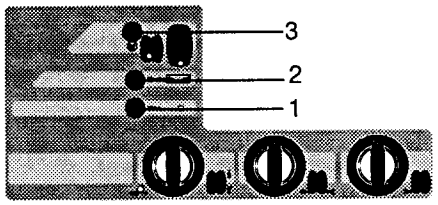
When the dial is moved, the diameter value appears on the numeric display. Rotating this dial sets the diameter of the wheel to be balanced. When rotated fully counter-clockwise, diameter units change from inches to millimetres (or vice versa).

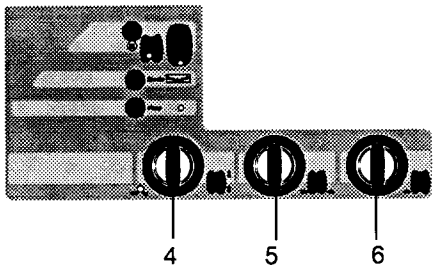
5. Rim Width

When the dial is moved, the width value appears on the numeric display. Rotating this dial sets the width of the wheel to be balanced.

6. Rim Offset

When the dial is moved, the offset value appears on the numeric display. Rotating this dial sets the offset of the wheel to be balanced.





7. Fine Indicator

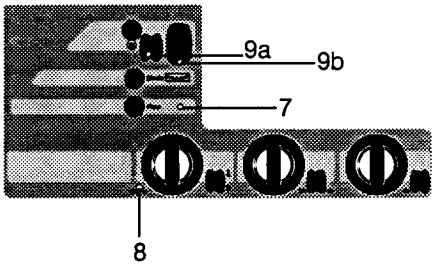
Illuminated when Fine mode is selected.

8. MM Indicator

Illuminated when wheel diameter units are set to millimetres.

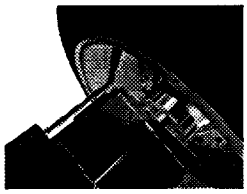
9a. Rim-Only Indicator
9b. Rim+Tire Indicator

Used in the Optimatch programme (see Optimatch: Tire and Rim Matching).



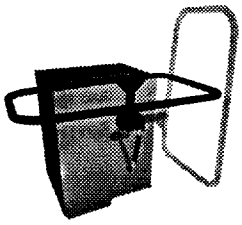
Offset Scale

Offset, or rim distance, is a measurement of where the wheel is mounted relative to the body of the balancer. The offset scale measures this distance. The offset scale is located at the top rear of the head. The offset value is read at the point where the scale arm enters into the housing. This value is input with the Rim Offset dial on the input panel. The scale is spring-loaded and will return to its resting position when released.



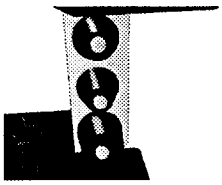
Tilting Frame

The tilting frame is lowered to activate the motor and spin the wheel up to measuring speed. When the wheel reaches measuring speed, the motor disengages. The frame is raised after the measuring cycle is completed, when the brake has been automatically applied. If the frame is raised before the measuring cycle is completed, the brake engages and the display shows 'EEE'.



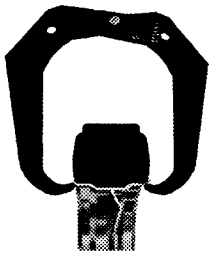
Storage Pegs

These are situated on the side and rear of the display support and provide locations for storing wheel mounting cones and other accessories.



Calipers

The calipers are used to measure the width of the rim of the wheel being balanced. The width is then programmed with the Rim Width dial on the input panel. The calipers are stored on a peg at the side of the machine.



Weight Tray

This moulded tray contains compartments for weights and storage areas for weight pliers and accessories.

BALANCING OPERATION

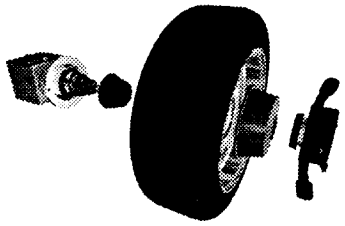
CWB 1856 operation to balance a wheel is based upon a short sequence of actions which are intuitive, efficient and simple.

Operating Procedure

The following summary covers main steps for fast, accurate wheel balancing with the CWB 1856. Later sections of this manual contain detailed information on weight location modes and wheel mounting methods for your balancer.

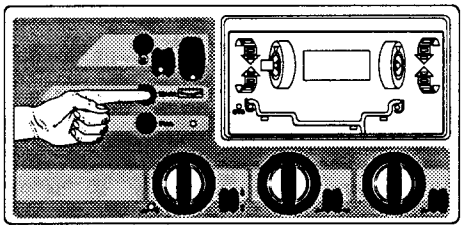
1. Mount the wheel.

Select the accessories appropriate to the method of wheel mounting to be used (refer to the *Wheel Mounting Methods* section). Careful wheel mounting is essential, as the wheel is balanced relative to how well it is mounted on the balancer. If the wheel is not well centered and sitting squarely against the balancer flange plate, accurate balance results will not be achieved.
Most stud-centered wheels have concentric center holes, which allow fast and easy cone mounting. Adaptors should be used only in problem situations and on some aftermarket specialty wheels.



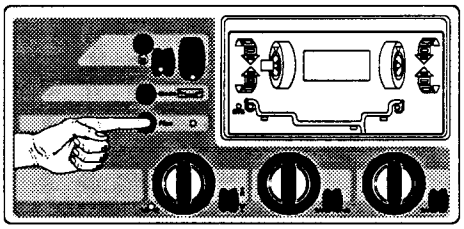
2. Select Weight Mode (if necessary).

Press Mode on the input panel to set Weight Mode Indicators on the rim profile for the types and locations of weights to be used to balance the wheel.



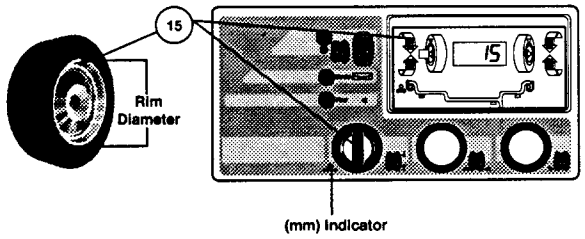
3. Select Fine Mode (if necessary).

Press Fine if the wheel is to be balanced to within 0.10 ounces/2 grams. The Fine indicator will be lit. Press Fine again to reset the standard 0.25 ounces/5 grams. Fine Mode may also be set or cleared after the measuring cycle is over and the results displayed; new results will be automatically recalculated.



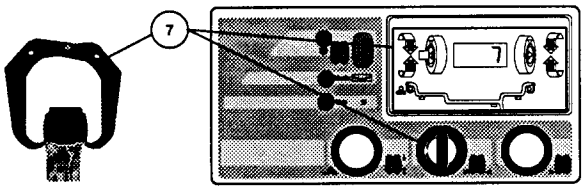
4. Program the Rim Diameter.

Read the wheel diameter, in inches or millimetres, from the tire sidewall. Rotate the Rim Diameter dial on the input panel to program this value - as the dial is moved, the value will be shown on the numeric display.
Turn the Rim Diameter dial fully counter-clockwise to change the units from inches to millimetres (or vice versa). The MM indicator will be lit when the diameter units are set to millimetres.



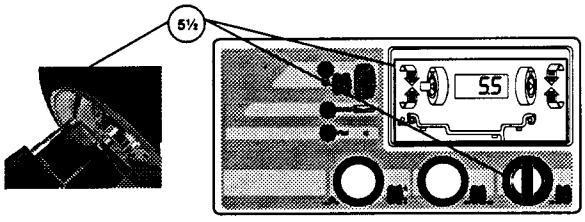
5. Program the Rim Width.

Measure the width of the rim using the calipers - read the width, in inches, from the scale on the calipers.
Rotate the Rim Width dial on the input panel to program this value - as the dial is moved, the value will be shown on the numeric display.



6. Program the Rim Offset.

Pull the offset scale out and position the tip against the rim flange surface of the wheel. (regardless of where the inner weight will be placed). Read the offset value off the scale at the point where it enters into the housing.
Rotate the Rim Offset dial on the input panel to program this value - as the dial is moved, the value will be shown on the numeric display.

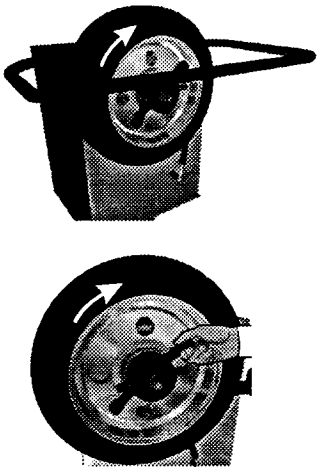


7. Spin the wheel.

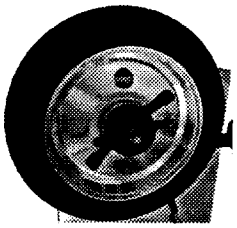
MOTOR-SPIN: Lower the frame to start the motor which will automatically spin the wheel up to measuring speed.

OR

HAND-SPIN: Using the hub nut handle, turn the wheel clockwise until the balancer beeps, then release the handle. The wheel will continue to rotate for the duration of the measuring cycle. If the wheel is spun too fast, the beeps will sound continuously until the wheel slows to the proper measuring speed and the balancer can perform its measuring cycle as normal.



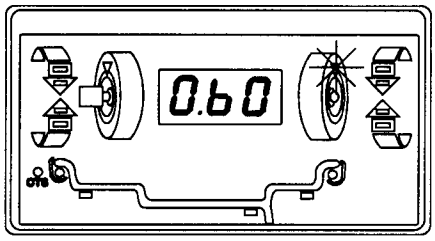
When the measuring cycle is complete, the brake is automatically applied to slow the wheel. Raise the frame if the wheel was not hand-spun.



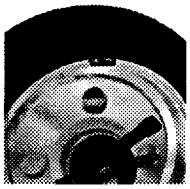
Do not interfere with the balancer or with the wheel during the measuring cycle as wrong results may occur.

8. Attach the weights.

Starting with either side of the wheel, rotate the wheel until all 6 weight position indicators and the TDC indicator for that side of the wheel are lit. The correct balance weight will now be displayed.

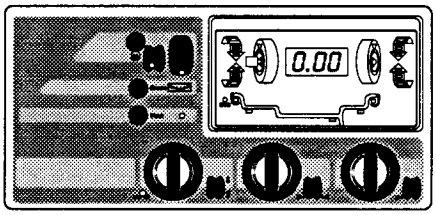


Apply the displayed weight securely at the Top-Dead-Center (12 o'clock) position on the wheel. Repeat these steps for the other side of the wheel.

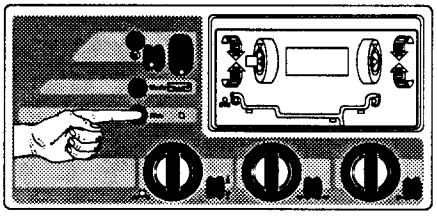


9. Do a check spin.

Spin the wheel again (Step 7). The display should indicate a balanced wheel by showing '0.00' constantly (i.e. regardless of wheel position).



At this point, Fine Mode may be set or cleared, the Weight Mode may be changed, or the wheel dimensions (diameter, width, offset) may be altered. The balancer will automatically recalculate the correct results for the new settings without the need to re-spin the wheel.

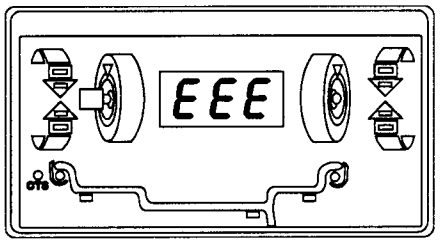


Balancing Errors

If the wheel is intentionally or accidentally slowed or stopped during the measuring cycle, the display will report 'EEE'. Spinning the wheel up to balancing speed again will remove this error and allow the balancer to function normally.

If repeatable results cannot be achieved, there is a possibility of foreign material moving around inside the tire and causing a different imbalance every time. This material must first be removed before the wheel can be balanced.

If readings appear to be inconsistent or additional weights are continually called for, verify that wheel is not slipping on the flange when brake is applied.



WEIGHT MODES

The CWB 1856 features one Normal weight mode for clip-on weights only, four Alu weight modes for combinations of clip-on and stick-on weights and a CTS weight mode for the Continental Tire System wheels. In addition, static weight mode is for static balancing where a single weight is calculated.

Pressing Mode on the input panel sequences through the weight modes. The Weight Mode indicators on the rim profile indicate the selected weight types and placements.

When attaching the weights, observe the placement dimensions shown in the diagrams for each mode. The balancer is programmed for these dimensions; other placement locations will require different weights.

For simple and accurate balancing, the Normal weight mode may be used for all balancing measurements. After the balancing cycle, use Mode on the input panel to set the required weight mode. The balancer will automatically recalculate the weights required for the new weight mode.

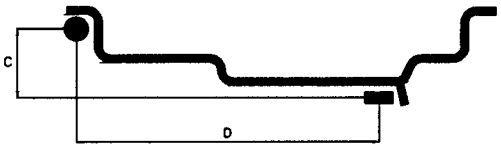
On the rim profile, clip-on weights are indicated by green, circular lights; stick-on weights are indicated by yellow, rectangular lights.

Normal: Standard clip-on weights are applied, one to each of the inner and outer rim flanges.

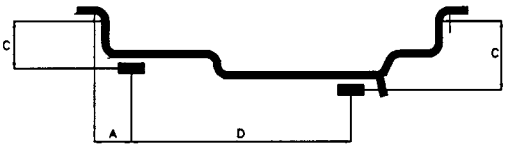
Alu 1: A standard clip-on weight is applied on the inner rim flange. A stick-on weight is used on the outer bead seat of the rim.

Alu 2: Stick-on weights are applied, one on the inner and the second on the outer bead seat areas of the rim.

Alu 3 : A standard clip-on weight is used on the inner rim flange and a stick-on weight is applied towards the center area of the rim. This is a 'hidden-weight' technique - the weights should not be visible when the wheel is replaced on a car.



Alu 4 : This is another 'hidden-weight' method. One stick-on weight is applied on the inner bead seat area and a second stick-on weight is applied towards the center area of the rim.



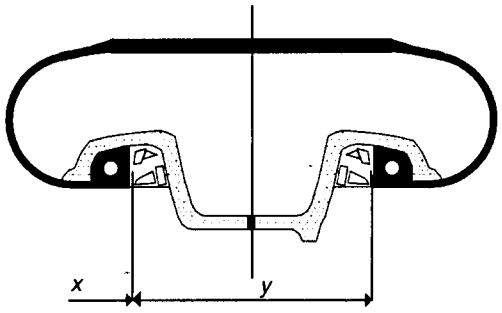
When using the Alu 3 or Alu 4 Modes, the inner and outer weights MUST be placed the correct distance apart longitudinally (dimension "D"). The balancer is programmed for this distance when using these weight modes. If it is neccessary to use weight placements not catered for in the section, refer to the *Special Applications* section.

A = 0.5"/1.25cm
B = 0.75"/2cm
C = 1.5"/4cm
D = 4.0"/10cm

CTS : In this weight mode, the same stick-on weight indicators as set in Alu 2 are lit, as well as the CTS indicator. The weights should be placed in the grooves on the inner and outer wheel-well areas as shown opposite. Use the rim diameter as shown on the tire sidewall (millimetric) to program the balancer.

Static Balancing : Only one stick-on weight indicator is lit; however, either a single clip-on or stick-on weight may be used. The weight can be positioned on the inner or outer rim flange, or towards the center of the rim. If the imbalance is large, the amount of weight required can be divided equally between the inner and outer rim flanges.

For static balancing, the rim width(y) and offset(x) dimensions do not need to be entered into the balancer. Only the wheel diameter must be programmed. After the measuring cycle, the inner (left) weight position indicators will be used to indicate the TDC position for the static balancing weight (the outer indicators will not display).



Special Applications

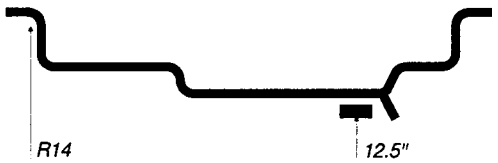
Occasionally it may be necessary to use weight locations which are different from those used in the standard Alu programmes. This will usually only occur for hidden weight methods, where the distance between the weights of 10 cm (4") is not suitable. If situations are encountered where special weight locations are required proceed as follows:-

1. Select Normal weight mode.

Press Mode on the input panel repeatedly until the two clip-on Weight Mode indicators are lit.

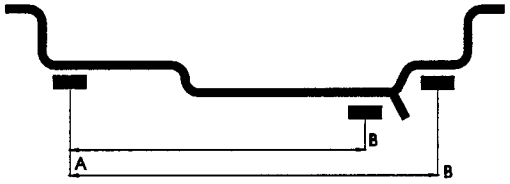
2. Program the diameter.

Rotate the Rim Diameter dial on the input panel to set the diameter at which the weights will be applied. When using stick-on weights set the diameter to less than that indicated on the tire sidewall. Typically, on a 14" wheel the diameter would be set to 12.5". For thicker rims the diameter may need to be reduced further.



3. Program the width.

Measure the distance between the two locations A and B where the weights will be applied. If weight B is a hidden weight use a tape measure or rule. If weight B is on the outer rim, the calipers can be used. Rotate the Rim Width dial on the input panel to set the width.

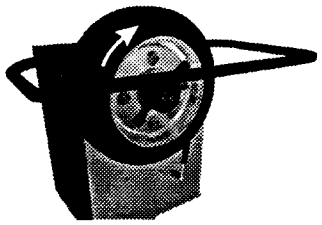


4. Program the offset.

Pull the offset scale out and position the tip at the point where the inner weight is to be located. Read the offset value from the scale, then rotate the Rim Offset dial on the input panel to set the offset.

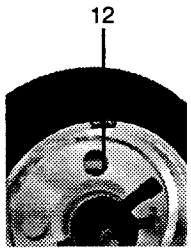
5. Spin the wheel.

Complete normal balance routine.



6. Attach the weights.

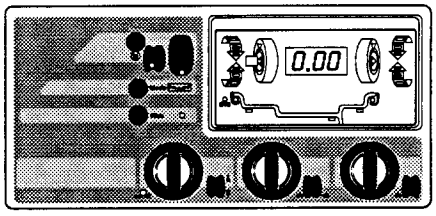
Rotate the wheel until the TDC position on either side of the wheel is reached. Attach the displayed weight amount at the TDC (12 o'clock) position.
Repeat this procedure for the other side of the wheel.



If the weights are not attached at the correct locations (as measured), accurate balance results will not be achieved.

7. Do a check spin.

Repeat the normal balancing routine. The display should indicate a balanced wheel by showing '000' constantly (i.e. regardless of wheel position).

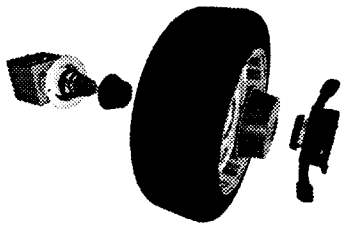


WHEEL MOUNTING METHODS

Back Cone Mounting

Back cone mounting is the most common way to mount automobile wheels. Choose the cone that fits best when placed through the wheel center hole from the rear. Slide the cone spring and cone on the shaft. Place the wheel on the cone and be sure that the cone centers the wheel when you tighten the handle.

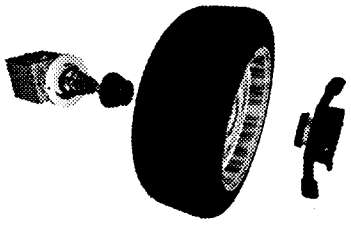
The pressure drum should contact the wheel on a flat surface. Do not center the wheel with the pressure drum. Tighten the wheel firmly against the mounting flange. Hold the handle in place and rotate the wheel when tightening. Be sure that the wheel is firmly against the mounting flange and the handle threads engage at least three turns on the shaft.



Front Cone Mounting

Front cone mounting is required when using light truck wheels and is also an acceptable alternative for many automobile wheels. The wheel center hole must be true on the outside of the wheel to use the front cone mounting method.

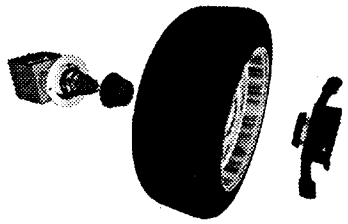
Choose the cone that fits best when placed through the wheel center hole from the front. Slide the wheel on the balancer shaft without a back cone or spring on the shaft. Place a cone on the shaft, through the front of the wheel. Be sure the cone centers the wheel and that the wheel is squarely against the mounting flange when you tighten the handle.



Back Cone Mounting without Pressure Drum

Ensure the handle does not contact the cone, or the wheel will not be centerd and mounted securely. Attach the spacer ring to the hub nut if this situation occurs.

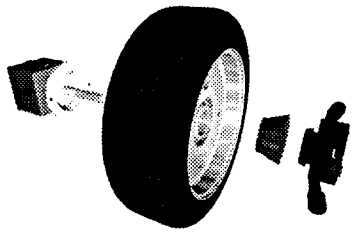
On some extended-center wheels with small hub diameters, the pressure drum cannot contact the front face of the wheel properly. Such wheels can be mounted using the standard back cone method without a pressure drum. Check that the handle contacts the wheel center evenly and that the wheel is centerd on the cone.



Double Cone Mounting

The cones must not touch each other. If the cones touch, the wheel will not be centerd and mounted securely.

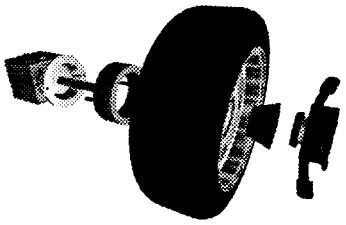
Double cone mounting can be used for some specialty wheels, such as those on a Porsche 928. The back cone centers on the formed part of the wheel, and the front cone centers on the hole.



Front Cone Mounting with an Extension Adaptor

The extension adaptor may be required for some light truck wheels and reverse-offset wheels that must be moved away from the balancer mounting flange. The extension adaptor is often used with the 5-$^1/_2$-inch diameter light truck cone.

Install the extension adaptor on the mounting flange with the knurled thumbnuts provided. Then mount the wheel, using the normal front cone method.



Universal Wheel Adaptor

This adaptor is used on wheels with untrue center holes and wheels with closed centers or for any application where automotive mounting cones can not be used. Instructions for use are supplied with the adaptor.

Metric Bolt Plate Adaptor

The metric bolt plate adaptor is an alternative to the universal wheel adaptor. The adaptor is used on wheels with untrue center holes, wheels with closed center holes as found on many French vehicles, or where the wheel is centerd on the wheel mounting studs rather than by conical wheel mounting nuts. Instructions for use are supplied with the adaptor.

Wheel Mounting Errors

Regardless of the mounting method used, the wheel must be centerd before balancing. A wheel should be mounted on the appropriate cone or adaptor and tightened carefully to ensure proper centering and mating against the balancer flange.

The wheel must be clean and free of large burrs or nicks, especially where it mates with the cone or adaptor and the balancer flange. Any dirt between the flange and the mating surface of the wheel will cause misalignment on the shaft. A misalignment of the thickness of a matchbook cover will cause an unbalance of 0.50 ounce (15 grams) or more on automobile wheels and 1 ounce (30 grams) on light truck wheels.

The wheel must also be tightened securely to prevent it from slipping in relation to the flange. If the wheel slips on the balancer, accurate weight measurement and location are impossible.

Wheel Rotational Errors

When a wheel is mounted on the balancer, whether using a cone or an adaptor, it is fixed in a particular position in relation to the balancer shaft. If the wheel is rotated 180 degrees from the initial position and re-tightened, a different balance reading may result. Such differences are called rotational errors.

When checking balance with the wheel in one position and then rotating it 180 degrees and re-spinning it, the difference between the two readings could be as much as 0.50 ounce (15 grams) for cone-mounted automobile wheels, and 2 ounces (60 grams) for light truck wheels.

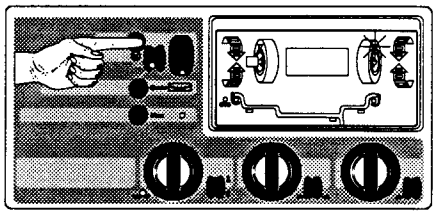
The actual balance error is one-half of the displayed amount because the reading is the sum of the error and the weight required to counterbalance the error. To do a rotational test, first fine-balance the wheel. Then loosen the wheel on the shaft, rotate it 180 degrees, and re-tighten the handle. Spin the wheel in the normal mode to check for rotational errors.

OPTIMATCH TIRE AND RIM MATCHING

Wheel balancing may sometimes be improved by matching the tire to the rim of the wheel. The Optimatch programme matches the rim imbalance (heavy spot) and rim runout against the tire imbalance and runout. Wheel vibrations due to out-of-round conditions and hard or soft spots in the rim or tire, can be reduced by matching.

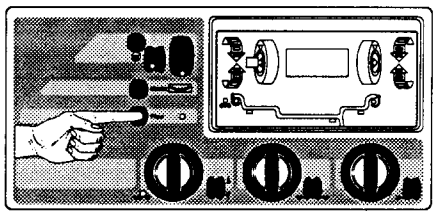
Starting the Matching Procedure

To start the Optimatch programme, press Match on the input panel.

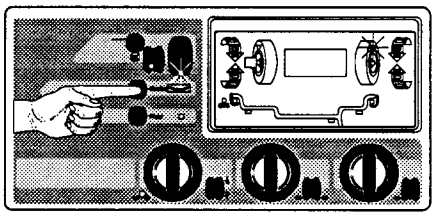


The Rim-Only indicator will light. The numeric display will be blanked. If the wheel has already been spun when Optimatch was started, the TDC indicator will also light.

To exit the Optimatch programme at any time, press Fine on the input panel.

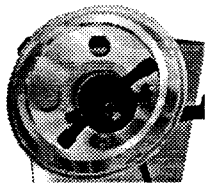


If you are starting with the rim only mounted on the balancer, proceed to the Starting with Rim Only section. If you want to start with the tire on the rim, press Mode on the input panel. The Rim+Tire indicator will light instead of the Rim-Only indicator. Proceed to the Starting with Rim+Tire section.

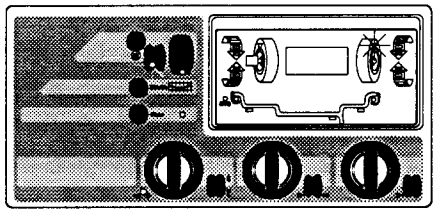


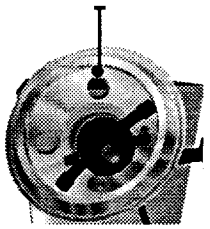
Starting with Rim Only

Ensure that the Rim-Only indicator is lit. Mount the rim on the balancer and spin.

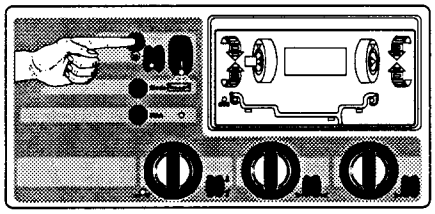


1. After the rim is spun, the outer TDC indicator is lit. When the rim stops move the valve to the TDC (12 o'clock) position.

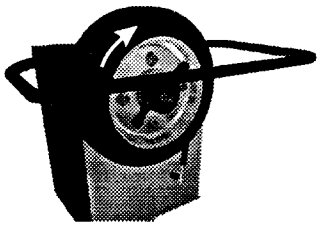




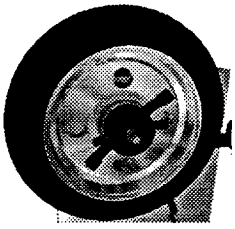
2. With the valve at TDC, press Match on the input panel. The Rim+Tire indicator is lit instead of the Rim-Only indicator. The outer TDC indicator turns off.



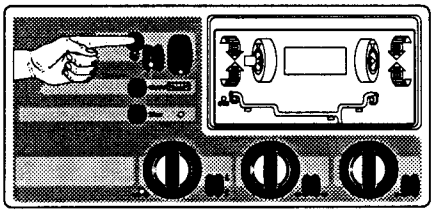
3 Dismount the rim and fit the tire to the rim. Mount the rim with tire on the balancer and spin.



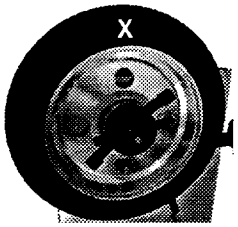
4. When the wheel stops, move the valve to the TDC (12 o'clock) position.

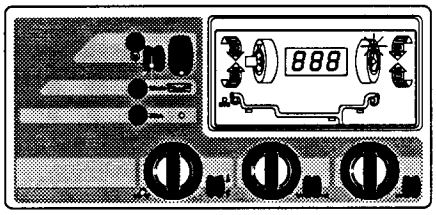


5. Press Match on the input panel. The Rim+Tire indicator is turned off and the Rim-Only indicator lights.

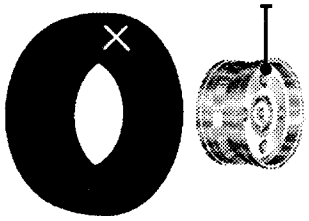


6. Rotate the rim with tire until the numeric display reads "888". Mark an 'X' on the tire at the TDC (12 o'clock) position.

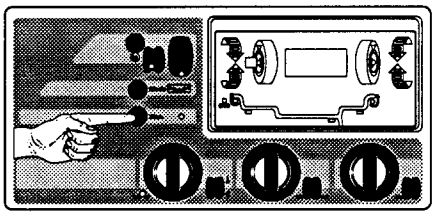




7. Rotate the tire on the rim until the 'X' on the tire is aligned with the valve on the rim.

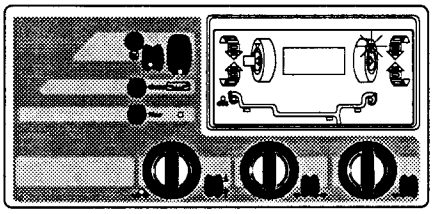


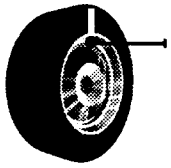
8. Exit the Optimatch programme by pressing Fine on the input panel.



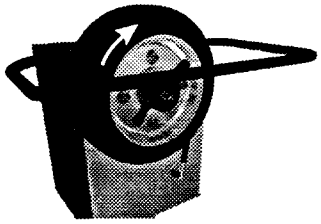
Starting with Rim plus Tire

1. Ensure the Rim+Tire indicator is lit. The TDC indicator lights. Mark a line on the tire at the valve.

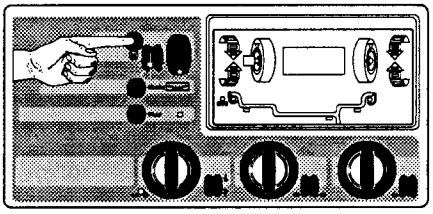




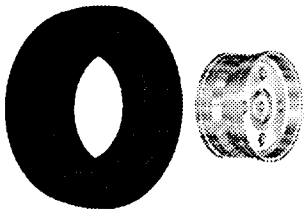
2. Mount the rim with tire on the balancer and spin. When the wheel stops move the valve to the TDC (12 o'clock) position.



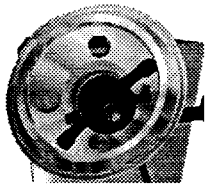
3. Press Match on the input panel. The Rim+Tire indicator is turned off and the Rim-Only indicator lights.



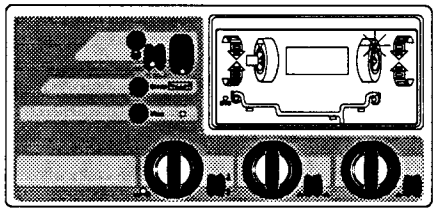
4. Dismount the rim with tire and remove the tire from the rim.

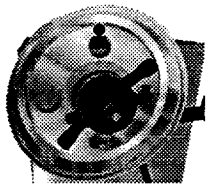


5. Mount the rim only on the balancer and spin.

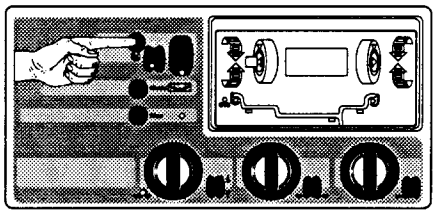


6. The TDC indicator lights. When the rim stops, move the valve to the TDC (12 o'clock) position.

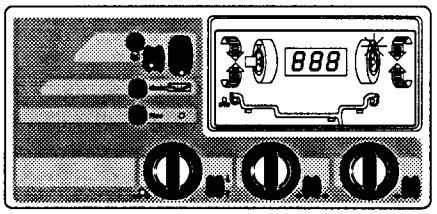


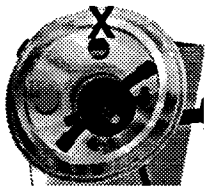


7. Press Match on the input panel. The Rim-Only indicator is turned off and the Rim+Tire indicator lights.



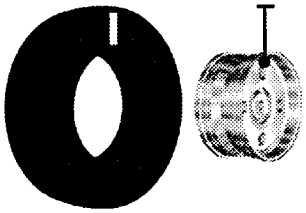
8. Rotate the rim until the numeric display reads "888". Mark an 'X' on the rim at the TDC (12 o'clock) position.



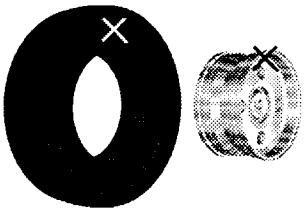


9. To match the rim to the tire:

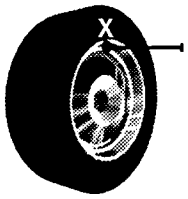
   a: Superimpose the rim to the tire, ensuring that the line marked on the tire is aligned with valve on the rim.



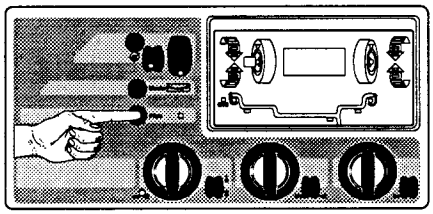
   b: Mark an 'X' on the tire adjacent to the 'X' on the rim.



   c: Fit the tire to the rim with the 'X' on the tire aligned with the valve on the rim.



10. Exit the Optimatch programme by pressing Fine on the input panel.



CALIBRATION

Each balancer is calibrated by computer before shipment from the factory to ensure accuracy of measurements. There should be no requirement to recalibrate in normal service. However, the balancer may need to be calibrated again if:

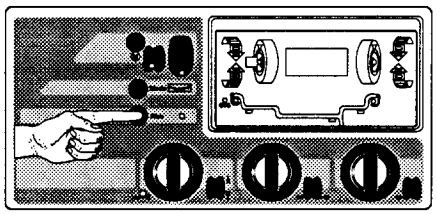
- The electronics assembly or the sensors have to be replaced.
- Balancing results appear to be irregular or inconsistent.

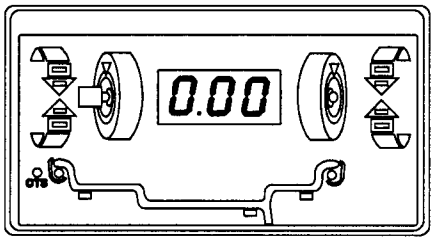
The balancer has a built-in Calibration programme which requires only a few simple steps and can be performed in about the same time as it takes to balance a single wheel. Only a wheel-weight of a certain weight and a standard wheel are needed for the Calibration procedure.

Calibration Procedure

1. Fine-balance the wheel.

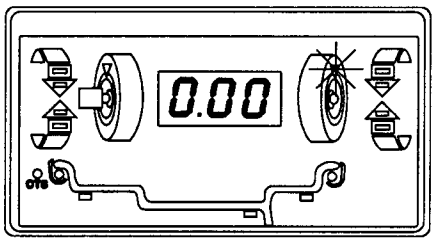
It is advisable to use a wheel of a size similar to those most commonly balanced (for example, a 14" wheel). Mount the wheel carefully. Program the wheel dimensions. Set Normal weight mode. Balance the wheel to '000' in Fine Mode.

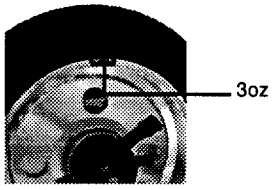




2. Attach the Calibration weight.

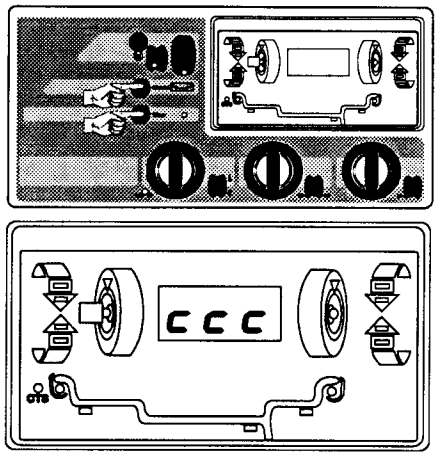
If weights are displayed in ounces, a 3-ounce weight must be used for calibration. If weights are displayed in grams, then a 100-gram weight must be used. With the balancer displaying '000' constantly for a balanced wheel, rotate the wheel until the outer TDC indicator lights. Attach the weight to the outer wheel rim at the TDC (12 o'clock) position.





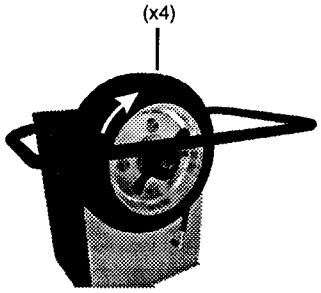
3. Start the Calibration programme.

First press Fine and then press Mode on the input panel. Hold both pressed for 3 seconds. The balancer will beep and a flashing 'ccc' will appear on the numeric display.



4. Spin the wheel.

Lower the frame to motor-spin the wheel, or hand-spin the wheel. The balancer will beep and perform a measuring cycle. The brake will be automatically applied at the end of the cycle.

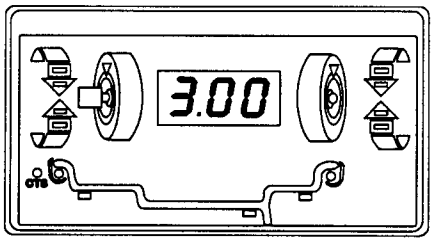


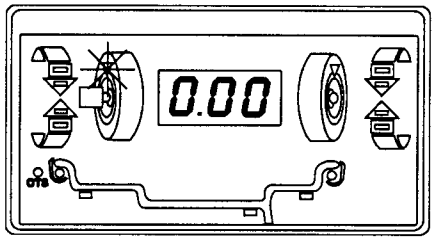
5. Repeat wheel spins.

A minimum of 4 spins are needed for a successful calibration. Another spin is required when the balancer displays a flashing 'ccc' after a measuring cycle.

6. End of Calibration.

When calibration is completed successfully (no more spins required), the display will show the calibration weight value - '3.00' or '100' . This value will be displayed for all wheel positions except when the wheel is rotated to the inner light spot, when '0.00' will be displayed.





After successful calibration, the balancer stores the new calibration values in memory. These new calibration values will be retained even when the power is switched off.

Remove the calibration weight from the wheel and proceed with normal operation of the balancer.

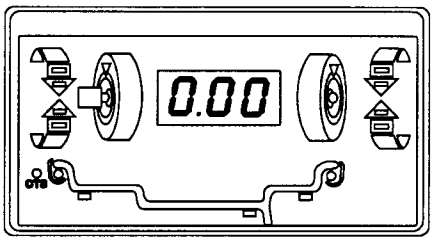
Calibration Errors

The Calibration programme may only be started when a wheel has been balanced to '0.00' in Normal weight mode. If the display is not showing '0.00' constantly, or if the Normal weight mode indicators are not lit, the display will show 'EEE' if an attempt is made to start the Calibration programme.

When the display shows a flashing 'ccc', the balancer expects a balanced wheel, with a specific weight attached to the outer rim, to be spun. The balancer will exit the Calibration programme and the display will show 'EEE' if:

- No weight is attached.
- The wrong weight is attached.
- The weight is attached to the inner rim rather than to the outer rim.
- Wheel dimensions are not programmed correctly.

If the calibration procedure is abandoned, or if a calibration error occurs, the balancer will operate with the original (previous) calibration values.



SERVICE AND MAINTENANCE

The CWB 1856 Wheel Balancer can be maintained with a few simple actions performed at regular intervals.

Wheel mounting accessories and the mounting surfaces of the flange and shaft of the balancer need to be cleaned regularly. Grease and oil will accumulate dirt which can cause incorrect balancing readings, and can also act as a grinding compound resulting in premature wear.

Old wheel weights and other material must be removed from under the balancer. The balancer must rest only on the three machine feet.

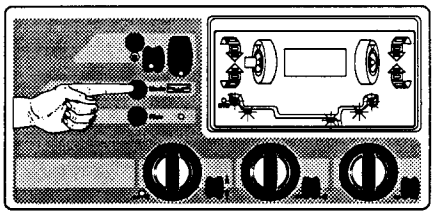
Ensure that tires, rims, tools or other parts are not left leaning against the balancer body.

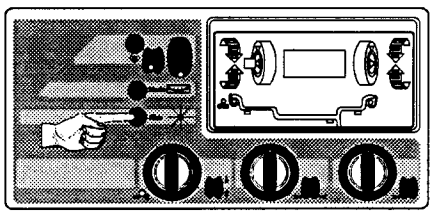
Clean the display and input panels with a dry cloth.

If the balancer gets physically damaged or broken, use the Spare Parts List provided with the balancer to identify the parts to be replaced. Always comply with the safety precautions and instructions described at the beginning of this manual.

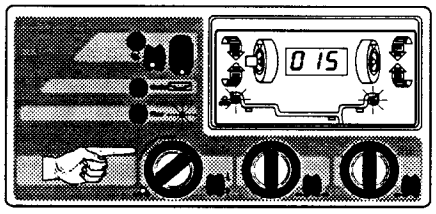
Operational Check

1. Attach the power cord. Switch on the balancer. Press Mode several times. The Weight Mode indicators should light corresponding to each weight mode selected. Return to the Normal weight mode. Press Fine to set Fine Mode. The Fine indicator should light.

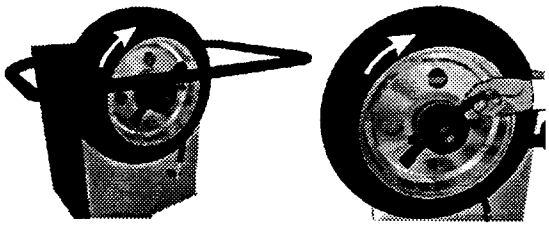




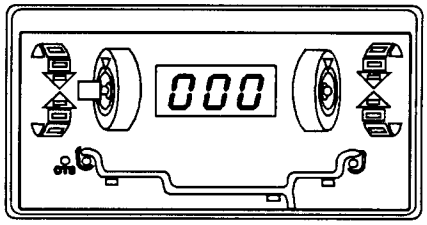
2. Mount a wheel on the balancer and program the wheel dimensions (diameter, width, offset), ensuring that the numeric display shows the values when the dials are moved.



3. Spin the wheel up to speed by lowering the frame to start the motor. If the motor does not operate, raise the frame and hand-spin the wheel.

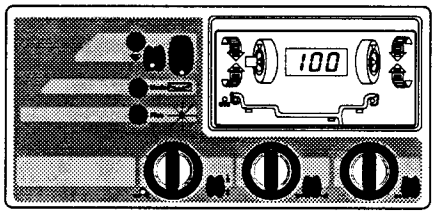


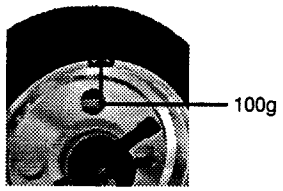
4. Wait for the measuring cycle to complete (7 seconds) and the brake engages. The brake should stop the wheel smoothly (in ½ to 2 revolutions for a standard 14" wheel). The inner and outer weights should be displayed when the wheel is rotated to the respective TDC positions.



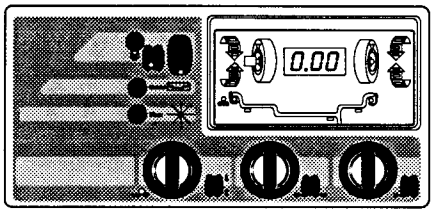
5. Fine-balance the wheel to zero.

   Attach a 3-ounce (100-gram) weight to the outer rim at the 12 o'clock position when the outer TDC indicator is lit. Spin the wheel and note the readings. Repeat with the weight moved to the light spot on the inner rim. The balancer is within calibration limits if the display shows 2.75-3.25 ounces (90-110 grams) for the side with the weight attached and shows 0-0.25 ounces (0-10 grams) for the side without the weight. If the readings are not within these limits, verify that the wheel dimensions are set correctly and perform the CALIBRATION procedure, before proceeding to the next step.

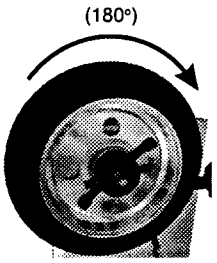




6. Remove the 3-ounce (100-gram) weight and verify that the wheel is balanced in Fine Mode.



7. Rotate the wheel 180° in relation to the mounting flange and re-spin. The sum of the inner and outer readings should be a maximum of 0.50 ounces (15 grams) for a 14" or smaller wheel. If the sum is higher, make sure the wheel is properly centerd when tightening the hub nut. Clean the mounting surface, spindle, cones and wheel, and then repeat the check. If the new sum is also too high, repeat the check with a new wheel.



If the balancer fails any of the above steps,contact your service representative for assistance in correcting the problem.

Troubleshooting Guide

The following tips will help to identify and correct problems which may be encountered when using the wheel balancer.

A. No indicators on the display panel are lit.

There may be no power supplied to the balancer. A fuse may be blown or a cable may be loose.

- Ensure the power cord is inserted properly in the mains inlet at the rear of the balancer unit.
- Remove the power cord. Check the fuse in the plug or in the wall outlet. Replace if necessary.
- Replace the 10A fuse contained in the small tray of the mains inlet. The inner fuse is in-line; the outer fuse is a spare.
- Unplug the power cord. Remove the weight tray and check all cable connections.

B. Display appears to freeze or lock up.

The power to the balancer may have been interrupted, or the balancer may have been left with the Optimatch programme active.

- Turn off the power, wait a few seconds, and turn on the power again.
- If the Optimatch programme is active, pressing Fine on the input panel will exit to normal operation.

C. Balancing results are inconsistent.

The balancer may not be resting on a solid and level surface, the mounting accessories or stub shaft may be worn or damaged, or the electronics assembly or sensors may have been replaced.

- Ensure that the balancer is fixed in position.
- Inspect the mounting accessories and stub shaft; replace if necessary.
- Perform the Calibration procedure.
- Move the balancer to a new location and try again (note that the balancer is heavy - do not move the balancer without assistance).

D. Spinning wheel with the motor - 'EEE' reported.

The most probable cause is the frame being raised before the balancing cycle has been completed.

Alternatively, the wheel may be slowing or stopping during the cycle. This may be due to a) no wheel or a light wheel rim being mounted; b) the wheel slipping on the shaft when the motor accelerates the shaft.

The shaft may not move at all when the motor is started. This might be caused by grease gathering on the drive wheel, the brake sticking in the engaged position, or the shaft being impeded.

Finally, the motor may be unable to spin the wheel up to measuring speed within a preset time, because the wheel is too heavy or because the mains supply is being interrupted.

- The frame is lowered to start the motor. The balancer will beep once when the wheel reaches measuring speed. Always wait until the end of the balancing cycle (the balancer beeps for the second time and the brake is engaged automatically) before raising the frame again.

- Ensure that the wheel is mounted properly and that the Hub Nut is securely tightening the wheel against the flange; the wheel must not slip on the shaft.
- Check that wheel movement is not being impeded.
- When only a wheel rim is mounted, the rim may be too light to maintain speed; try spinning the rim a little faster, using a hand-spin.
- If the wheel is very heavy and the motor cannot accelerate it to measuring speed, leave the frame raised and try spinning the wheel by hand.
- Switch off the balancer and unplug the power cord from the wall outlet. Remove the weight tray. Check for grease on the surface of the drive wheel. If necessary clean surfaces with solvent.
- With the power off and the weight tray removed, check that the brake mechanism is not sticking.

E. Spinning wheel by hand - 'EEE' Is reported.

The wheel may have been spun in the wrong direction (anti-clockwise when facing the outer rim), or the wheel has been spun up to measuring speed (the balancer beeps once) and then slowed, or stopped, before the balancing cycle is completed.

- Respin the wheel, spinning it in the correct direction (clockwise when facing the outer rim).
- Ensure that the wheel is mounted properly and that the Hub Nut is securely tightening the wheel against the flange; the wheel must not slip on the shaft.
- Check that wheel movement is not being impeded.
- When only a wheel rim is mounted, the rim may be too light to maintain speed; try spinning the rim a little faster.

F. Balancer beeps continuously.

The wheel has been spun too fast by hand and is spinning above the measurement speed range, or there may be a fault in the electronics assembly.

- Wait until the wheel slows to a speed within the required range or carefully slow the wheel. The balancer will no longer beep when the wheel spins at the correct measuring speed, and will continue with the balancing cycle.
- If the balancer continues to beep even when the wheel is slowed or stopped, then the balancer should be switched off. Wait a few seconds and then turn on the power again.

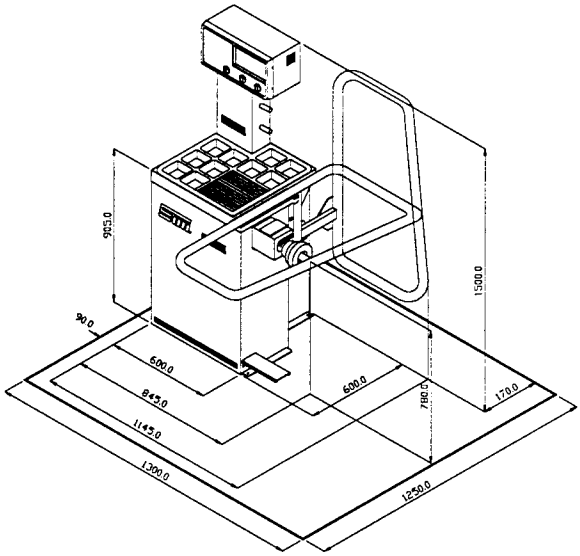
G. The decimal point is constantly displayed.

The balancer is set to display weight units in ounces, or the display electronics are faulty.

- To change weight units, press Fine and then press Match on the input panel. Hold both pressed for 3 seconds. The balancer will beep and the decimal point will be turned off.
- If this does not work, the electronics assembly should be replaced.

TECHNICAL SPECIFICATIONS

Maximum tire diameter	44"	(1117mm)
Maximum tire width	19"	(483mm)
Maximum rim diameter		
• Automobile wheels	17"	(432mm)
• Special applications	24"	(610mm)
Maximum rim width	14"	(355mm)
Maximum wheel weight	154lbs	(70kg)
Power supply	110Vac/60Hz	
Balancer weight	230lbs	(104kg)
Shipping weight	284lbs	(129kg)
Balancer dimensions		
• Height (H)	59"	(1500mm)
• Floor area (L x W)	24"x24" (600x600mm)	
Shipping dimensions		
• (L x W x H)	47"x30"x39" (1180x750x970mm)	



The information and specifications in this manual are based on the latest information available at the time of publication. The product manufacturer reserves the right to change the specifications at any time without notice.

This product is protected under the following Patents,and Patent Applications Pending:

U.S.A.	4,435,982 4,489,608 4,507,964 4,741,211 4,859,111 5,024,001
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France	2 536 857 2 558 591
Australia	574053 575371 622734
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