



OPERATOR'S MANUAL

CWB 1855

COMPUTER
WHEEL
BALANCE

**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
U.K.	GB 2 131 561 B
	GB 2 153 095 B
France	2 536 857
	2 558 591
Australia	574053
	575371
	622734
Italy	1,169,097
	1,182,123
Canada	1,217,661
	1,230,758
Japan	733740
Germany	DE 35 01 577 C2

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 specification at any time without notice.

Safety Cautions and Warnings

Before operating the balancer for the first time, review the following safety precautions.

1. Wear approved eye protection when removing or attaching weights.
 2. Check that the voltage/frequency rating shown on the balancer serial label is compatible with the mains supply.
 3. **NEVER** remove a cover or access panel on the balancer without first ensuring that the balancer is disconnected from the electrical power source.
 4. The balancer will automatically return to the Normal balancing mode if the power is interrupted.
 5. Make sure that the Balancer is sitting on all three feet on a clean, level floor with no debris under the base.
 6. Do not attempt to balance a cracked, badly bent, or otherwise severely damaged wheel.
 7. The wheel must be centred and tightened down on the balancer shaft before spinning the wheel.
 8. Remove all stones, old weights, and other debris from the wheel before balancing.
 9. Check that all wheel weights are properly applied and secured.
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CWB 1855 OPERATORS MANUAL

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Installation and Set Up

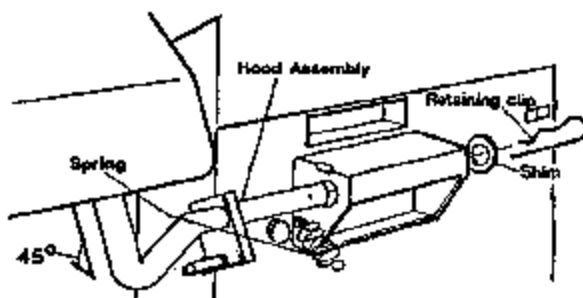
Your balancer and accessories will normally be delivered on a single pallet.

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	Balancer assembly.
1	Hood assembly.
1	Rim width Callipers.
1	Operators manual.
2	Weight label set.
1	Mains cable.

- C. Place the balancer on a firm solid floor.
- D. Assemble the hood into the rear bracket as shown below. Install the hood at an angle of 45 degrees to enable the spring to be attached to the stud.



- E. Install the threaded shaft and bolt onto the spindle. Torque bolt to 30-40 Nm (250-300 in lbs)
- F. Verify the correct voltage is shown on the product serial label. Connect balancer to the mains outlet using the cable provided.

Your balancer is now ready for use!

Gram/Ounce Switch

The balancer is programmed before leaving the Plant to display the 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. Repeating this step will change back to grams.

Maintenance

- 1. Clean mounting accessories, mounting surface, and spindle of balancer regularly. Grease and oil accumulate dirt which can cause incorrect balance results, and also act as a grinding compound resulting in premature wear.
- 2. Remove wheel weights and rubbish from under the balancer. Make sure the balancer rests only on the three machine feet.
- 3. Do not lean any tyres, rims, tools or other parts against the balancer.
- 4. Clean the Control Panel and Display Window with window cleaner.

Balancing Operation

Operation of your Sun balancer is based on LED indicators on the control panel, three soft-touch buttons and three control knobs that allow you to enter all information needed for precision balancing. The display indicates dimensions as they are entered.

Operating Summary

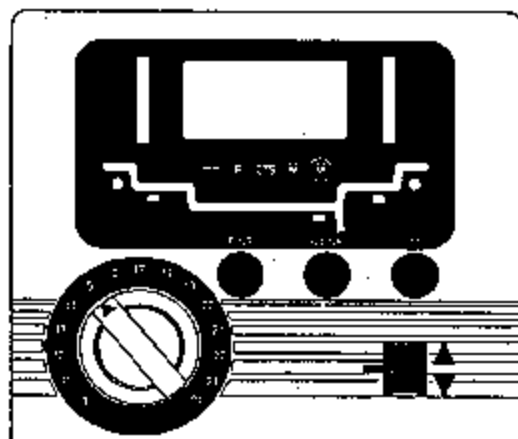
The following summary covers main steps for fast, accurate wheel balancing with your Sun balancer. Later sections of this manual contain detailed information on weight location modes and wheel mounting methods for your balancer.

1. Mount the Wheel.

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 centred and sitting squarely against the balancer flange plate, accurate balance results will not be achieved.

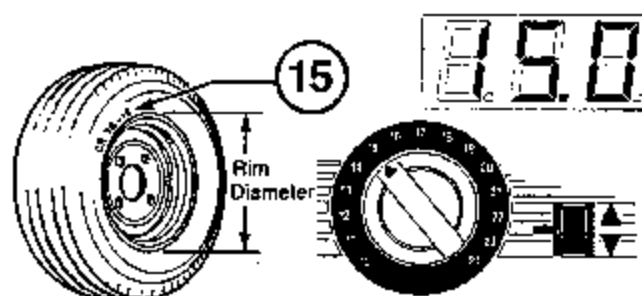
Most stud-centred wheels have concentric centre holes, which allow fast and easy cone mounting. Adapters should be used only in problem situations and on some aftermarket specialty wheels. Refer to the *Wheel Mounting Methods* section of this manual for more detailed instructions.

2. Select the required Weight Locations.



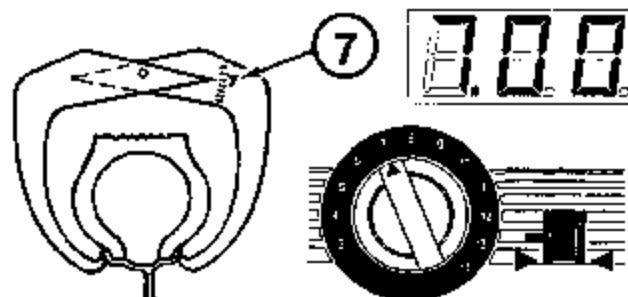
Depress the Mode Select Button repeatedly until the Weight Location Indicators display the chosen locations.

3. Set the Rim Diameter Knob to the Diameter shown on the tyre sidewall.

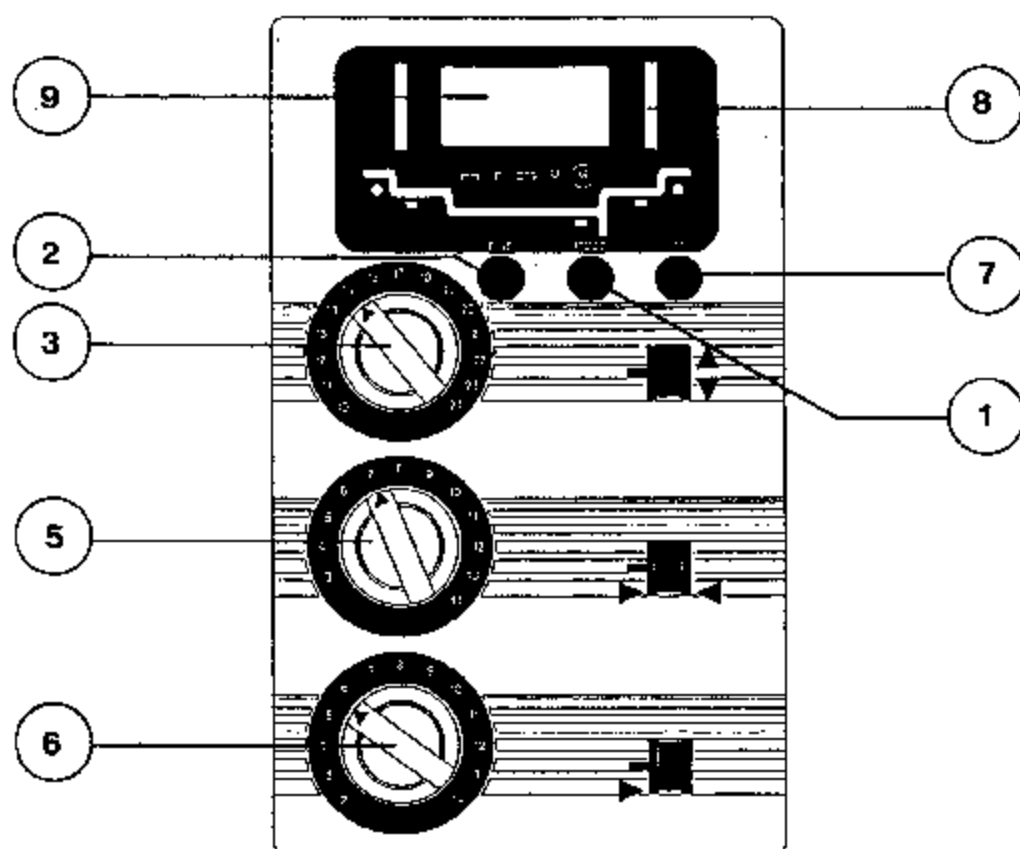


Note: To display the diameter in millimetres, turn the Diameter Knob fully counter clockwise. The MM Indicator will light and the diameter will be shown in millimetres in the Display Window.

4. Set the Rim Width Knob as measured with the Calliper.



Balancer Controls and Indicators



1. Mode Select Button, Weight Location and CTS LED Indicators

The Mode Select Button works in conjunction with the Weight Location and CTS LED Indicators on the Display window, to select the correct balance weight location. Weight requirements are automatically recalculated when the Mode is changed.

For easy and accurate custom mode operation, do the balancing operation in the NORMAL (clip-on) Mode. Then press the Mode Select Button for the desired custom weight location. The balancer will automatically recalculate the amount of weight required for the selected weight location.

2. Fine Button and LED Indicator

The Fine Button switches the balancer between Standard and Fine resolution. The 'F' LED Indicator lights when the balancer is in Fine resolution.

3. Rim Diameter Knob

Turn the Rim Diameter Knob to set rim diameter as shown on the tyre sidewall. Read the selection in the Display Window.

4. mm Indicator

Turning the Rim Diameter Knob fully counter clockwise allows the rim diameter to be set in millimetres. When the mm LED is lit the Display Window will show the diameter in millimetres

5. Rim Width Knob

Turn the Rim Width Knob to set rim width as measured with the callipers. Read the selection in the Display Window.

6. Offset Knob

Turn the Offset Knob to set rim offset, or distance as measured with the offset scale. Read the selection in the Display Window.

7. Matching Button and Match LED Indicators

Press the Matching Button to enter the Tyre Matching Programme. The LED Indicators define whether Rim only or Rim + Tyre operations are current.

8. Proximity Indicators

The LED's light sequentially as the correct position for weight placement is approached. The Top-dead-centre position is indicated when all six LED's are lit for the inner or outer side of the wheel.

9. Display Window

The LED's in the Display Window indicate the diameter, width, and offset selections as each is entered into the balancer. After the balance spin, the Display Window indicates the weight to be placed at top dead centre position when the appropriate six proximity Indicators are lit.

Balancing Operation

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Operating Summary

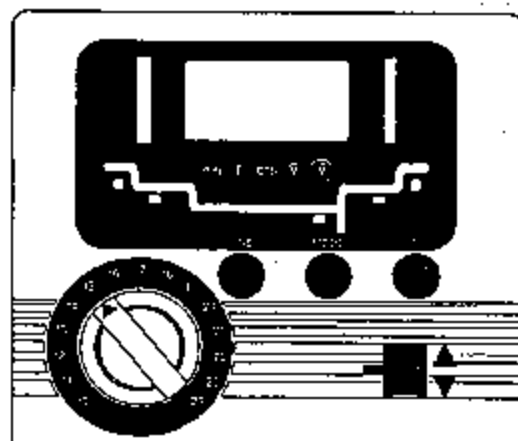
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1. Mount the Wheel.

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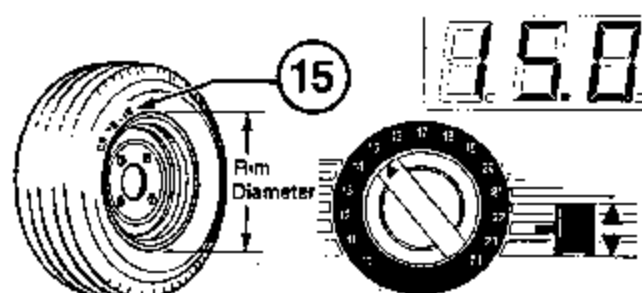
Most stud-centred wheels have concentric centre holes, which allow fast and easy cone mounting. Adapters should be used only in problem situations and on some aftermarket specialty wheels. Refer to the *Wheel Mounting Methods* section of this manual for more detailed instructions.

2. Select the required Weight Locations.



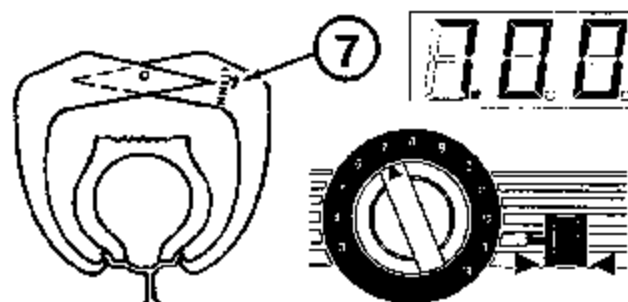
Depress the Mode Select Button repeatedly until the Weight Location Indicators display the chosen locations.

3. Set the Rim Diameter Knob to the Diameter shown on the tyre sidewall.

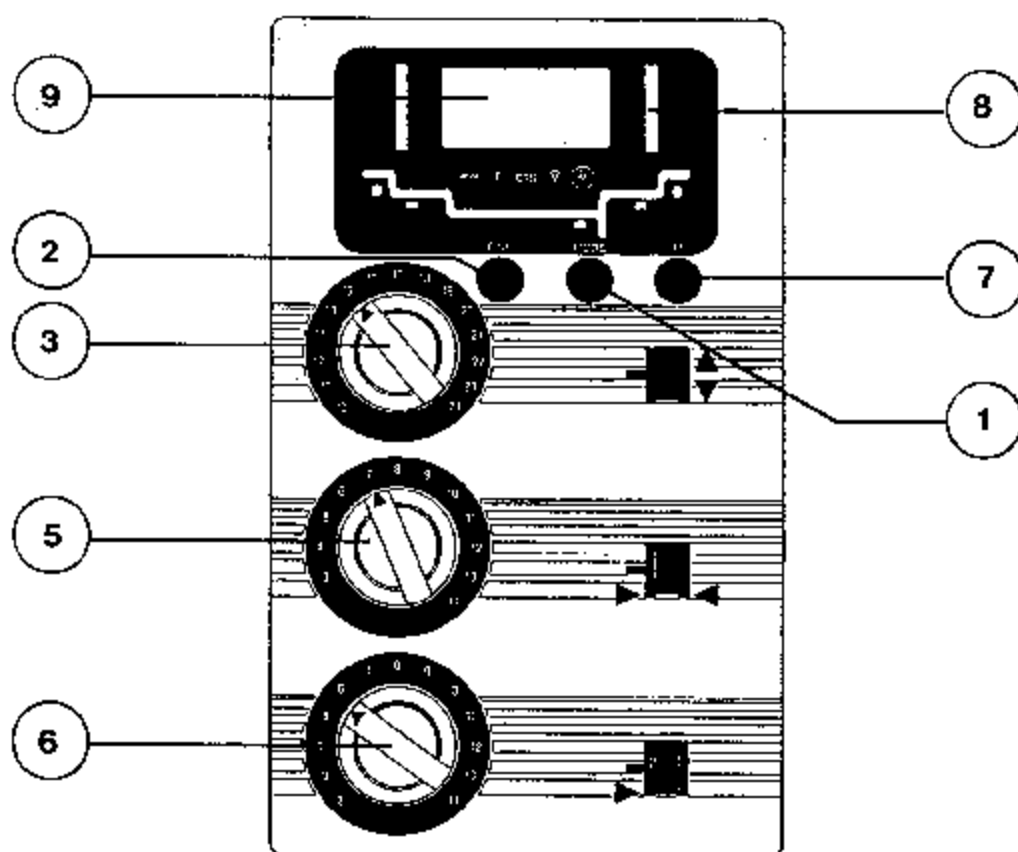


Note: To display the diameter in millimetres, turn the Diameter Knob fully counter clockwise. The MM Indicator will light and the diameter will be shown in millimetres in the Display Window.

4. Set the Rim Width Knob as measured with the Calliper.



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For easy and accurate custom mode operation, do the balancing operation in the NORMAL (clip-on) Mode. Then press the Mode Select Button for the desired custom weight location. The balancer will automatically recalculate the amount of weight required for the selected weight location.

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5. Rim Width Knob

Turn the Rim Width Knob to set rim width as measured with the callipers. Read the selection in the Display Window.

6. Offset Knob

Turn the Offset Knob to set rim offset, or distance as measured with the offset scale. Read the selection in the Display Window.

7. Matching Button and Match LED Indicators

Press the Matching Button to enter the Tyre Matching Programme. The LED indicators define whether Rim only or Rim + Tyre operations are current.

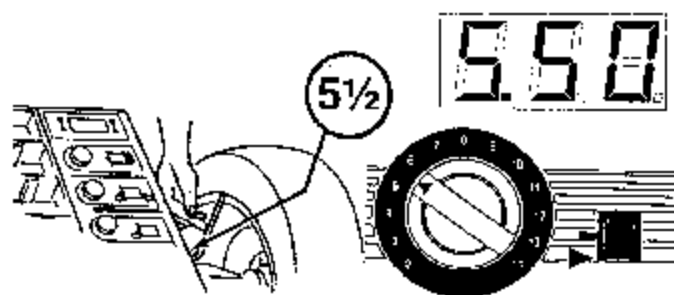
8. Proximity Indicators

The LED's light sequentially as the correct position for weight placement is approached. The Top-dead-centre position is indicated when all six LED's are lit for the inner or outer side of the wheel.

9. Display Window

The LED's in the Display Window indicate the diameter, width, and offset selections as each is entered into the balancer. After the balance spin, the Display Window indicates the weight to be placed at top dead centre position when the appropriate six proximity Indicators are lit.

5. Set the Rim Offset Knob as follows.



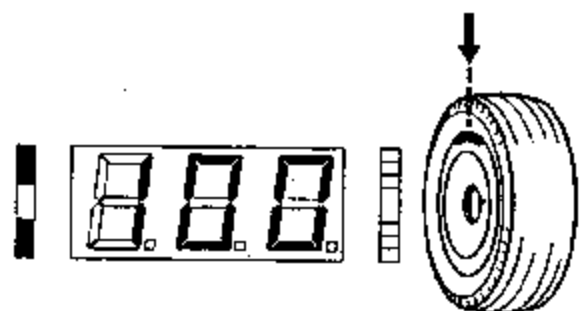
- Pull the rim offset scale arm out and position the tip against the rim flange surface (regardless of where the inner weight will be placed).
- Read the rim distance value off the scale arm at the point where it enters into the housing.
- Set the Offset Knob to the rim distance value.

6. Spin the Wheel.

- Lower the hood to automatically spin the wheel. When the measuring cycle is complete the wheel stops.

Note: Do not interfere with the machine or wheel during the measuring cycle or wrong readings can occur.

7. Attach the Weight.



- Starting with either side of the wheel, rotate the wheel until all 6 LED Indicators for that side of the wheel are lit. The correct balance weight will now be displayed.
- Securely apply the displayed weight at the top-dead-centre position on the indicated side of the wheel.
- Repeat steps 7a and 7b for the other side of the wheel.

8. Do a Check Spin

Repeat the spin cycle (step 6). Zero weight readings should appear for both sides of the rim.

Optional: If desired wheels may also be Fine Balanced to 2 gram accuracy. Press the Fine Button on the Control Panel. It is not necessary to spin the wheel again, as the balancer calculates the fine balancing requirements from the previous measurements, and the Display will show the weight requirements. If a repeatable balance can not be achieved, there is a possibility of foreign material moving around inside of the tyre causing a different imbalance every time. This material must first be removed before the wheel can be balanced.

Balancing Errors.

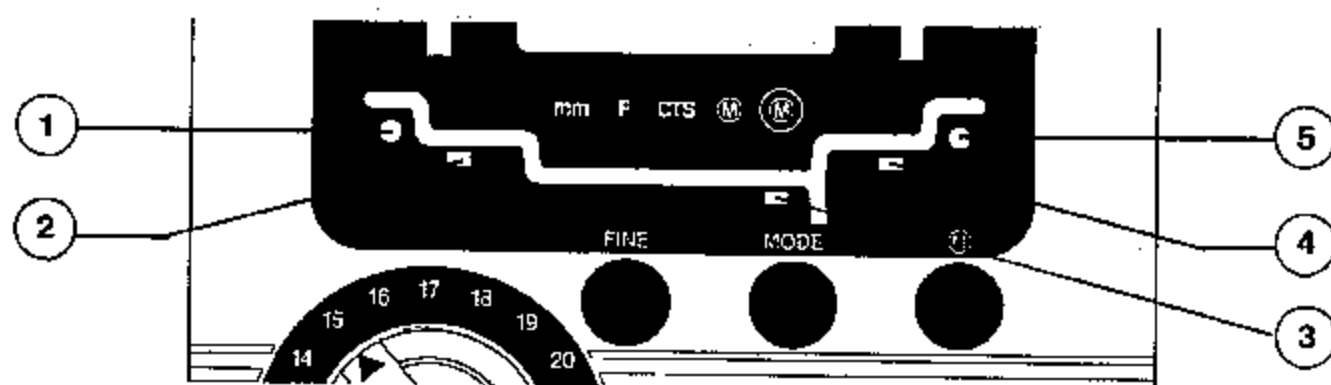
If the wheel is intentionally or accidentally slowed or stopped during the measuring cycle, 'EEE' will appear in the Display Window.

Spinning the wheel up to balancing speed will remove this error and allow the balancer to function normally.

Weight Location Modes

The Sun balancer features one Normal (clip-on), four Custom (Alu/Mag) Modes for combinations of clip-on and stick-on weights and a CTS Mode for the Continental Tyre System wheels. A static balancing mode is also included.

As the Mode Select Button on the control panel is pressed, the Weight Location LED Indicators on the Display Panel indicate the desired weight location. When placing the weights for any of the Alu/Mag modes, observe the location dimensions shown opposite. The balancer is programmed for these dimensions, other placement locations will require different weights.



Normal: LED's 1 and 5 light to indicate standard clip-on weights on the inner and outer rim flanges.

Alu/Mag 1: LED's 1 and 4 light to indicate a standard clip-on weight on the inner flange and a stick-on weight on the outer bead seat of the rim.

Alu/Mag 2: LED's 2 and 4 light to indicate stick-on weights on the inner and outer bead seat areas of the rim.

Alu/Mag 3: For this hidden weight method, LED's 1 and 3 light to indicate a standard clip-on weight on the inner flange and a stick-on weight towards the centre area of the rim.

Alu/Mag 4: For this hidden weight method, LED's 2 and 3 light to indicate a stick-on weight on the inner bead seat area and a stick-on weight towards the centre area of the rim.

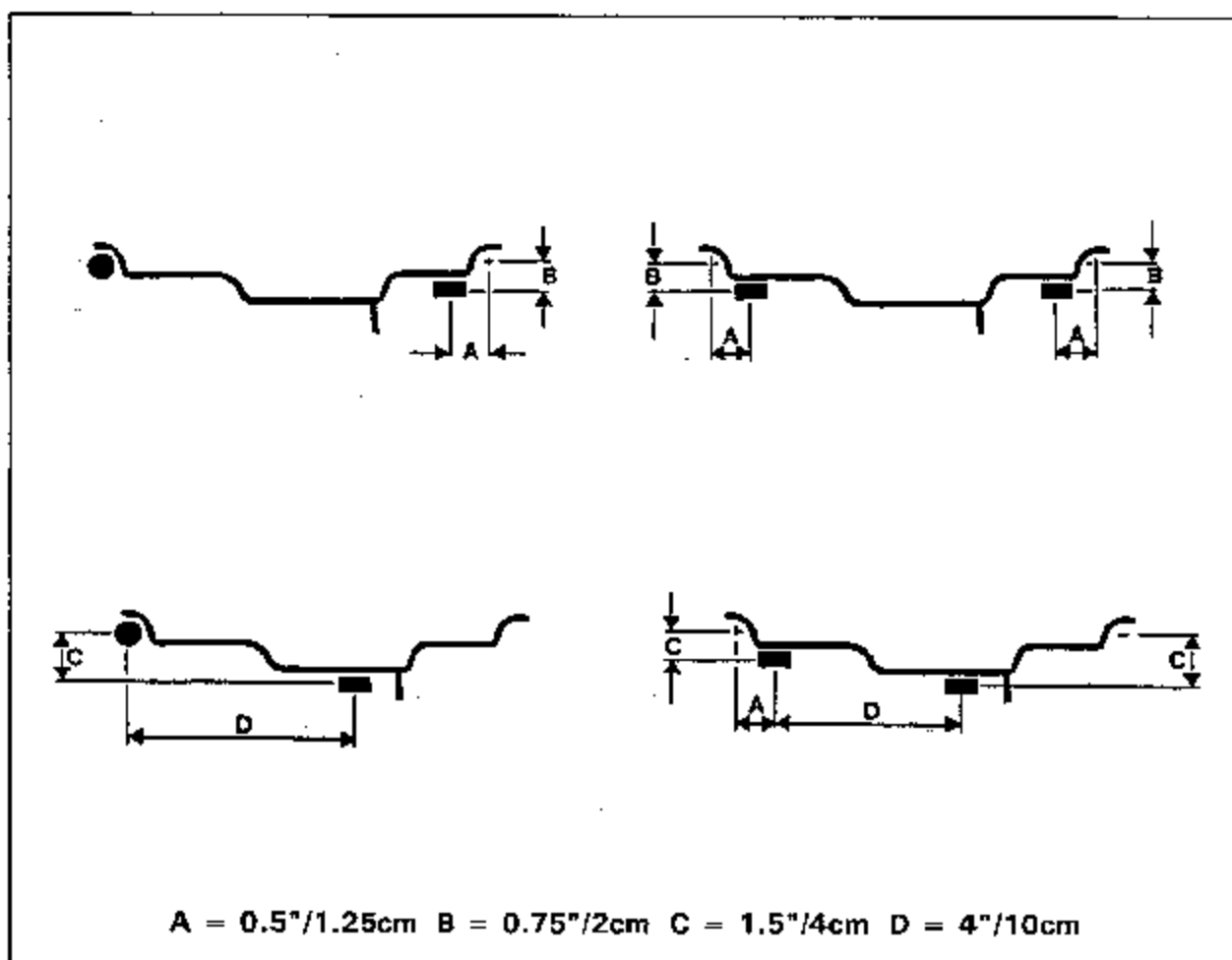
When using the Alu/Mag 3 or Alu/Mag 4 Modes, the inner and outer weights **MUST** be placed the correct distance apart longitudinally (dimension "D"). The balancer is programmed for this distance when using these Modes. If it is necessary to use weight placements not catered for in the section, refer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

CTS Balancing: For this method, LED 2 and 4 (as per Alu/Mag 2) and the CTS LED on the display window light. The weights should be placed in the grooves on the inner and outer well areas as shown opposite. Use the rim diameter as shown on the tyre sidewall (millimetric).

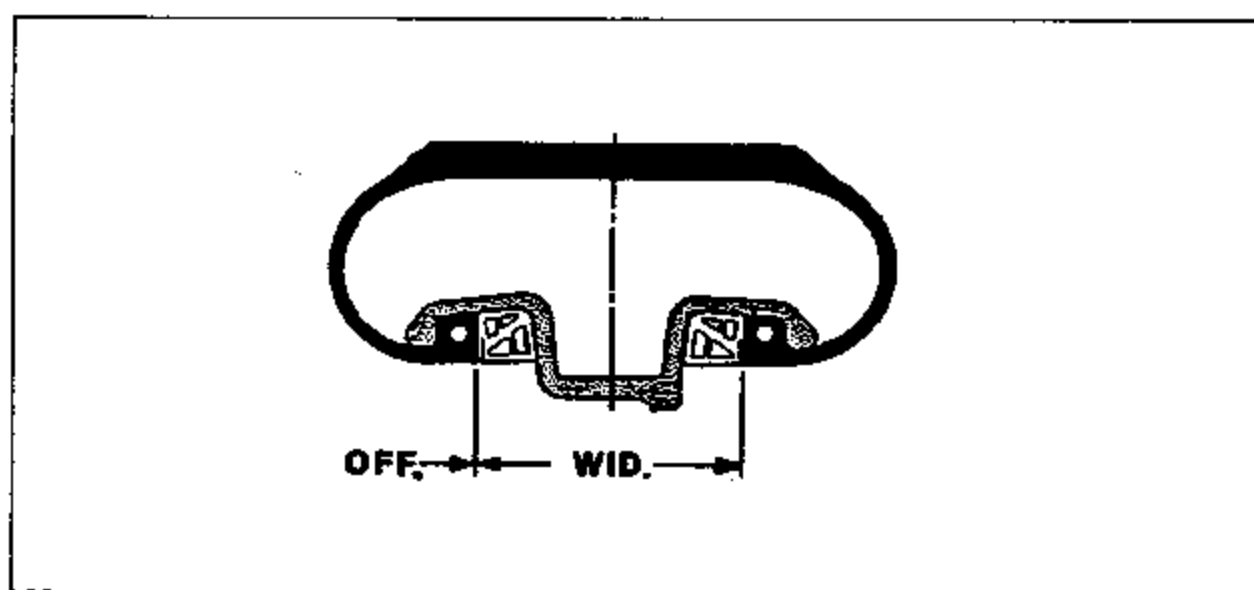
Static Balancing: For this method, only LED 3 lights to indicate a single clip-on or stick-on weight. The weight can be positioned on the inner or outer rim flange, or towards the centre of the rim. If the imbalance is large, the amount of weight required can be divided equally between the inner and outer rim flanges.

For static balancing, the rim width and offset dimensions do not need to be entered into the balancer, simply enter the wheel diameter. After the measuring cycle, the balancer display and the inner proximity LED's will light to show the required weight amount and position.

For simple and accurate balancing, the Normal mode can be used for all balancing measurements. After the balancing cycle, press the Mode Select Button repeatedly until the LED indicators light for the desired weight locations. The balancer will automatically recalculate the weight required for each mode.



Weight Location Dimensions for Alu/Mag Modes



Weight Location position for CTS Mode

Tyre and Rim Matching

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

Starting the Matching Procedure

To enter the Matching programme press the Match button on the Control Panel. The rim only LED in the Display Window lights. If you wish to spin the rim only, proceed now to the section Starting with Rim Only.



If you want to start with rim plus tyre, press the Mode Select Button on the Control Panel. This toggles the rim only and rim plus tyre LED's on the Display Window. Select the rim plus tyre LED and proceed to the section Starting with Rim plus Tyre.



To exit the Matching programme at any time, press the Fine Button on the Control Panel.

Starting with Rim Only

Ensure the rim only LED in the Display Window is lit.



1. Mount the rim on the balancer and spin. When the Rim stops move the valve to the Top Dead Centre (12 o'clock) position, and press the Match Button.



The rim only LED on the Display window switches off, and the rim plus tyre LED lights.

2. Dismount the Rim and mount the Rim plus Tyre and Spin. When the wheel stops, move the valve to the Top Dead Centre (12 o'clock) position, and press the Match Button.



The rim plus tyre LED switches off and rim only LED lights.

3. Rotate Rim plus Tyre until the display reads "888". Mark an 'X' on tyre at the Top Dead Centre (12 o'clock) position.



4. To match, move tyre on rim until 'X' on tyre is aligned with valve on rim.



5. Exit Matching by pressing the Fine Button on the Control Panel.



Starting with Rim plus Tyre

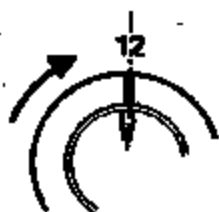
Ensure the rim plus tyre LED in the Display Window is lit.



1. Mark a line on the Tyre at the valve.

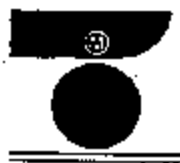


2. Mount the Rim plus Tyre on the balancer and spin. When the wheel stops move the valve to the Top Dead Centre (12 o'clock) position, and press the Match Button.



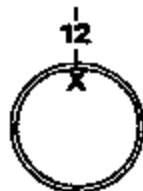
The rim plus tyre LED on the Display window switches off, and the rim only LED lights.

3. Dismount the Rim plus Tyre, mount the Rim only and Spin. When the Rim stops, move the valve to the Top Dead Centre (12 o'clock) position, and press the Match Button.



The rim only LED switches off and rim plus tyre LED lights.

4. Rotate Rim until the display reads "888". Mark an 'X' on Rim at the Top Dead Centre (12 o'clock) position.



5. To match.
(a) Superimpose Rim to Tyre ensuring the line mark on the tyre is aligned with the valve on Rim.



- (b) Mark 'X' on Tyre adjacent to 'X' on Rim



- (c) Fit Tyre to Rim with 'X' on Tyre aligned with valve on Rim.



6. Exit Matching by pressing the Fine Button on the Control Panel.



Special Applications

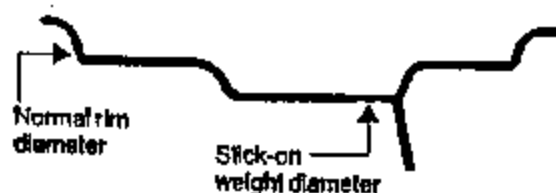
Occasionally it may be necessary to use weight locations which are different than those catered for in the standard Alu/Mag programmes. This will usually only occur for hidden weight methods, where the distance between the weights of 10 cm (4") is not suitable. If you encounter any situation where special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

1. Select Normal(clip-on) Mode



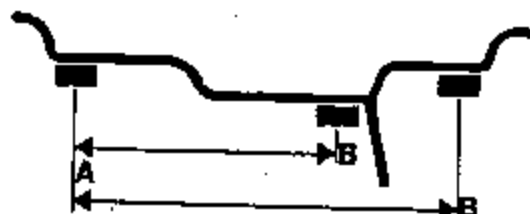
Press the Mode Select Button repeatedly until Weight Location LED Indicators 1 and 5 are lit.

2. Set the Rim Diameter Knob



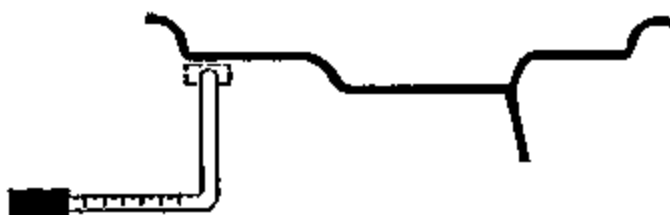
When using stick-on weights set the knob diameter to less than that indicated on the tyre sidewall. Typically on a 14" rim the diameter would be set to 12.5". For thicker rims the diameter may need to be set lower.

3. Set the Rim Width Knob



Measure the distance between the two weight locations A and B. If weight B is a hidden weight use a tape measure or rule. If weight B is on the outer the callipers can be used. Set the Width Knob as measured.

4. Set the Rim Offset Knob



Pull the rim offset scale out and position the tip at the point where the inner weight is to be located. Set the Rim Offset Knob to the distance measured.

5. Spin the Wheel

Complete normal balance routine.

6. Attach the Weight

Starting with either weight location, rotate the wheel until the TDC position is found. Attach the weight as indicated on the Display Panel. **N.B.** If the weight is not attached at the correct locations (as measured), accurate balance results will not be achieved. Repeat this step for the other weight location.

7. Do a Check Spin

Repeat the normal balance routine. Zero weight readings should appear for both weight locations.

Automatic Calibration

The CWB 1855 Wheel Balancer is calibrated by computer before shipment and should not require recalibration in normal service. If the P.C.B. assembly or the back panel assembly is replaced, the balancer should be recalibrated. Additionally, if balancing results appear to be irregular, the balancer may require recalibration. The balancer contains a program for automatic self-calibration, which can be performed in about the same time that it takes to balance a single wheel.

Calibration Procedure

Follow this procedure to calibrate your balancer:

1. Fine balance a Wheel

Balance a wheel in Fine resolution as explained in the *Balancing Operation* section. Use a wheel of the kind and size normally balanced on the balancer. The wheel must be balanced in the NORMAL (clip-on) mode. If the balancer is in the STATIC mode or any of the ALU/MAG modes, the calibration program will not operate.

Accurately set the knobs to the dimensions of the wheel.

2. Attach the Calibration Weight

Rotate the wheel until all six outer proximity LED indicators are lit. Attach a 100gram (3ounce) Weight to the outer wheel rim at the TDC position.

3. Enter the Calibration Program

Press and hold the Fine Button. While holding the Fine Button down, press and hold the Mode Select Button for 3 to 4 seconds. When the balancer enters the calibration program, the display will show a flashing 'ccc'.

4. Spin the Wheel at Least Four Times

Spin the wheel up to the normal balancing speed.

After the measuring cycle, a beep will sound and the flashing 'ccc' message will reappear on the display. Respin the wheel again. Calibration usually requires four consecutive, accurate spins.

After the final accurate spin, the calibration weight will appear on the display for the outer rim flange, and zero will appear for the inner flange at TDC. Calibration is now complete.

5. Remove the Calibration Weight

After successful calibration, the balancer stores the new calibration values in memory. Remove the calibration weight from the wheel and proceed with normal operation of your balancer.

If calibration is abandoned before completion, the original (previous) calibration values are retained.

Calibration Error

If an error occurs during any of the spin cycles, the 'EEE' error message appears on the display. The calibration program is aborted, and the balancer retains the previous calibration values.

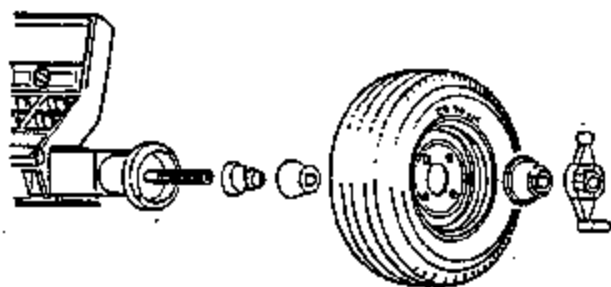
The 'EEE' error message may result from using an incorrect calibration weight. Accidentally bumping the balancer during calibration also could cause an error message. To correct a calibration error, remove the calibration weight and spin the wheel to remove the 'EEE'. Then verify that the wheel is still Fine balanced and repeat the calibration procedure.

If calibration fails, try the calibration program again from the beginning. Changing the wheel and the calibration weight may correct a calibration failure. If the balancer repeatedly fails the calibration program, contact your distributor for assistance.

Wheel Mounting Methods (Automobile Wheels)

Back Cone Mounting

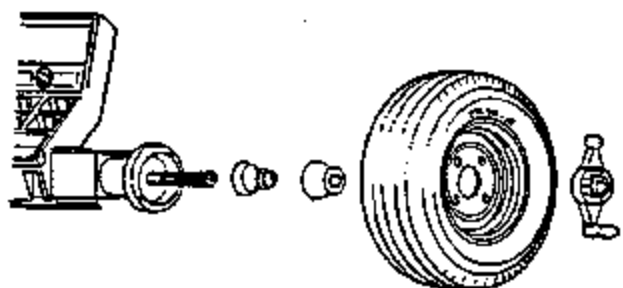
Back cone mounting is the most common way to mount automobile wheels. Choose the cone that fits best when placed through the wheel centre hole from the rear. Slide the cone spring and cone on the shaft. Place the wheel on the cone and be sure that the cone centres the wheel when you tighten the handle.



The pressure drum should contact the wheel on a flat surface. Do not centre 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.

Back Cone Mounting without Pressure Drum

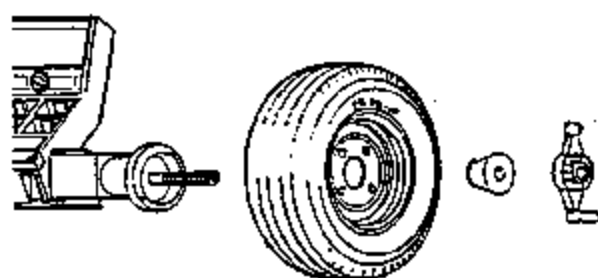
CAUTION: Be sure that the handle does not contact the cone, or the wheel will not be centred and mounted securely. Attach the Spacer Ring to the Hub Nut to if this situation occurs.



On some extended-centre 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. Be sure that the handle contacts the wheel centre evenly and that the wheel is centred on the cone.

Front Cone Mounting

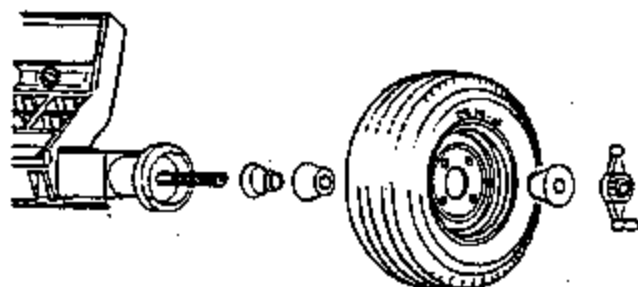
Front cone mounting is required when using the light truck wheels and is also an acceptable alternative for many automobile wheels. The wheel centre hole must be true on the outside of the wheel to use the front cone mounting method.



Choose the cone that fits best when placed through the wheel centre 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 that the cone centres the wheel and that the wheel is squarely against the mounting flange when you tighten the handle.

Double Cone Mounting

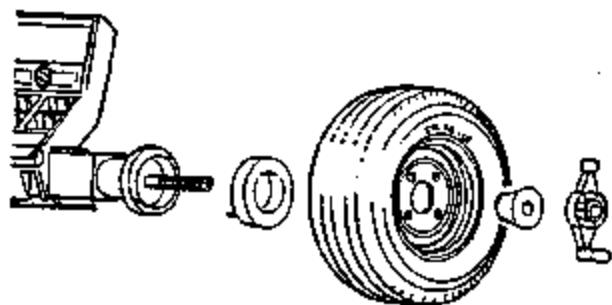
CAUTION: The cones must not touch each other. If the cones touch, the wheel will not be centred and mounted securely.



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

Front Cone Mounting with an Extension Adapter

The extension adapter may be required for some light truck wheels and reverse-offset wheels that must be moved away from the balancer mounting flange. The extension adapter is often used with the 5-1/2-inch diameter light truck cone.



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

Universal Wheel Adapter

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

Metric Bolt Plate Adapter

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

Mounting Errors

Regardless of the mounting method used, the wheel must be centred before balancing. A wheel should be mounted on the appropriate cone or adapter and tightened carefully to ensure proper centring 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 adapter 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 15 grams (0.50 ounce) or more on automobile wheels and 30 grams (1 ounce) 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.

Rotational Errors

When a wheel is mounted on the balancer—whether on a cone or an adapter 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 15 grams (0.50 ounce) for cone-mounted automobile wheels, and 60 grams (2 ounces) 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.

Specification:

- **Rim diameter range:** 10" to 17"(Car wheels).
Up to 24" for special applications.(i.e. Motorcycle)
- **Rim width range:** 3" to 14".
- **Rim offset range:** 2" to 14".
- **Max. wheel diameter:** 40" (1016mm).
- **Max. wheel width:** 19" (483mm).
- **Max. wheel weight:** 154lbs (70kg).
- **Power requirements:** Operates from 100/110 volt 50/60 Hz or 220/240 volt 50/60 Hz single phase mains supply. (Check machine serial label).
- **Balancer size:** Floor space required.
45"(1145mm)wide x 50"(1270mm)deep x 50"(1270mm)high.
- **Balancer weight:** 60kg.(132lbs)
- **Balancing modes:**
Normal (clip-on), 4 Alu/Mag, CTS and static.
- **Balancing accuracy:**
Standard resolution: 5 grams (0.25 ounce).
Fine resolution: 2 grams (0.10 ounce).
- **Balancing cycle:** Less than 8 seconds.
- **Calibration:** Automatic self calibrating.

Specification subject to change without notice

