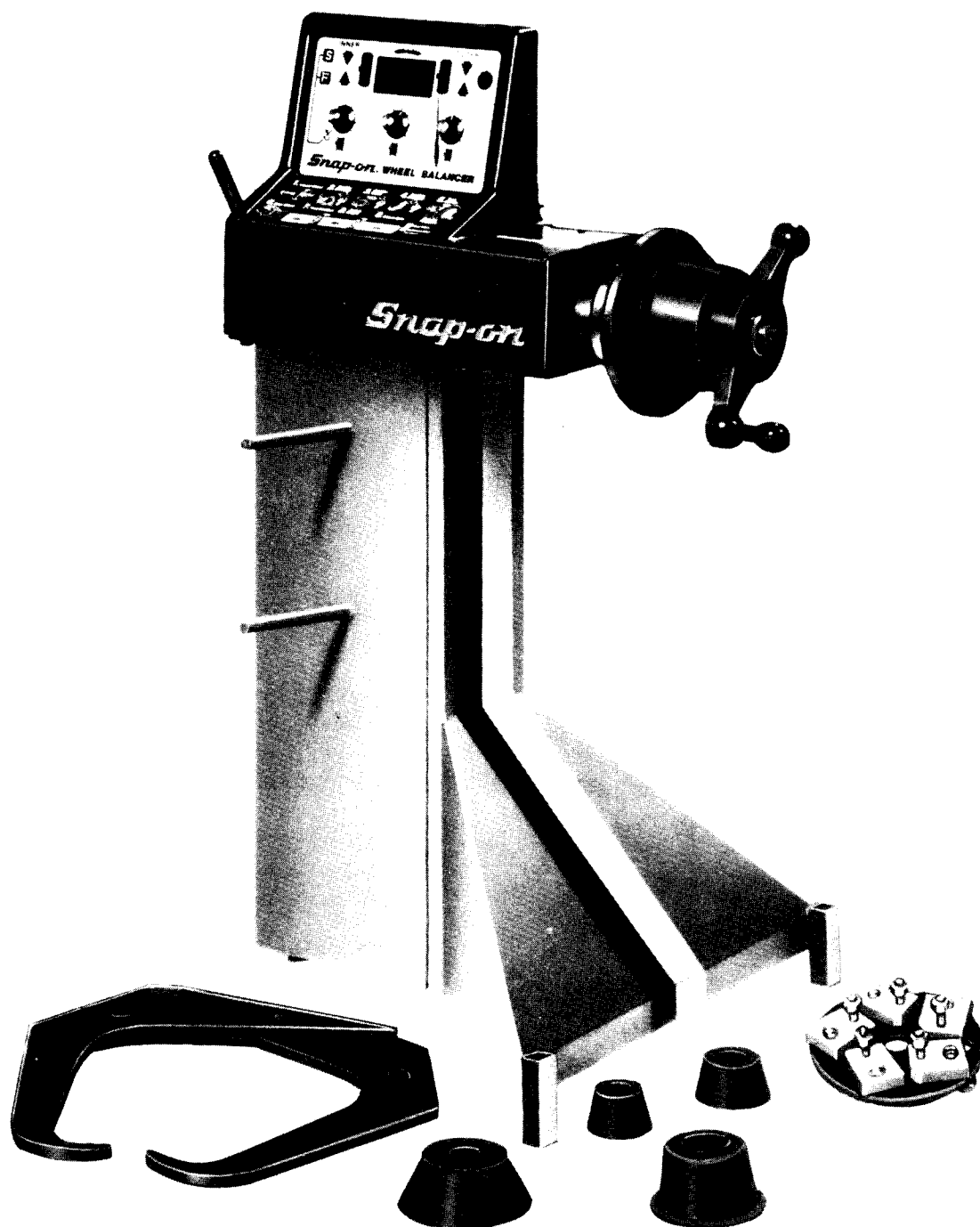


Instructions



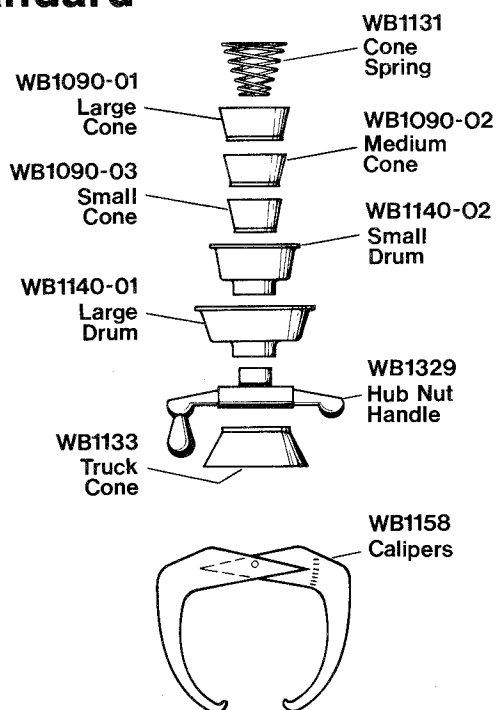
Snap-on® WB200
Computer Wheel Balancer

Operator Tips

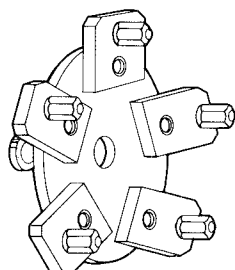
1. Read this instruction manual completely before balancing wheels with the WB200.
2. Wear approved eye protection when removing weights and using a hammer to attach them.
3. The standard voltage converter supplied with the WB200 operates off a 115 VAC, 50/60 HZ power source and converts line voltage to 8.5 VAC. A 230 VAC, 50/60 HZ converter is available (WB6605-03).
4. The WB200 will automatically return to the "normal" balancing mode, from either the "static" or "fine" balancing modes, if the power supply is interrupted, or if the balancer is idle for 30 minutes.
5. The WB200 has no power switch, but can be left plugged in at all times, as it consumes only 5 watts of power.
6. Be sure balancer is sitting squarely on all three feet.
7. Remove all stones, old weights, and other foreign material from the wheel before balancing.
8. Keep the area under the balancer free from old wheel weights, stones, etc.
9. The wheel must be centered and tightened down snugly onto the shaft of the balancer before spinning.
10. Check that all wheel weights are properly applied and secured.
11. If balancing larger truck tires, be sure to use truck size wheel weights.

Equipment Accessories

Standard



WBA2 Universal Wheel Adaptor

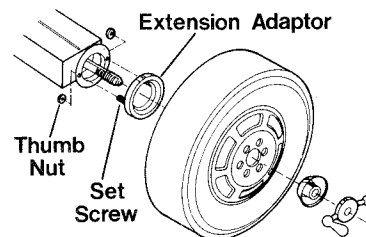


Universal wheel adaptor fits 3, 4, 5, 6, 8, 10 hole patterns. This adaptor is used on wheels with untrue center holes, and wheels with closed centers, i.e., Citroen, Renault, Peugeot. (See WBA2 instructions on pg. 12.)

Optional

WBA1 Extension Adaptor

(Available from your Snap-on representative)



The extension adaptor is used for some duplex light truck wheels, after-market reverse offset wheels, and any application where the wheel must be moved away from the machine. Attach the extension adaptor using the thumb nuts. Use the cones and hub nut in the normal method.

Specifications

- Dynamic and Static, Twin Plane Balance
- Single spin cycle
- Weight displayed in quarter ounce increments
- Accuracy to .1 ounce (2 grams)
- Ounce-gram conversion by activating switch
- Rim width 3½—10" (89—254 mm)
- Rim diameter 10—20" (254—504 mm)
- Maximum tire diameter 44" (1117 mm)
- Maximum tire weight 150 lbs. (68 kg)
- Shipping weight 95 lbs. (consists of two boxes, each within UPS shipping limits)
- Power requirements 115V or 230V single phase 50/60 HZ.

Voltage converter supplied with machine will convert line voltage to 8.5VAC. 115V converter is standard; 230V converter available.

Contents and Installation

- A. Remove base and measuring head and all accessories.

Should the WB200 ever require servicing, it is recommended that the measuring head carton and packaging be saved for convenient and safe shipment.

- B. Check list of contents:

Qty.	Item
1	Measuring head, including four hex screws and washers 5/16-18 UNC x 5/8".
1	Base
1	Stub Shaft
1	Bolt 3/8-24 UNF x 6"
1	Power Converter
1	Cone Spring
1	Large Cone
1	Medium Cone
1	Small Cone
1	Small Drum
1	Large Drum
1	Hub Nut Assembly
1	Truck Cone
1	Pair of Calipers
1	Universal Wheel Adaptor
1	Manual

- C. Remove screws and washers from measuring head and align measuring head with base as shown. Note that two dowel pins on bottom of measuring head will pre-align head to base.

- D. Re-install washers and screws to firmly attach measuring head to base. Recommended torque: 100-120 in. lbs. (115-140 kpcm)

- E. Place balancer on firm floor. Note: Balancer need not be bolted down; however, to assure proper function the balancer must rest on *firm* floor. Concrete is strongly recommended.

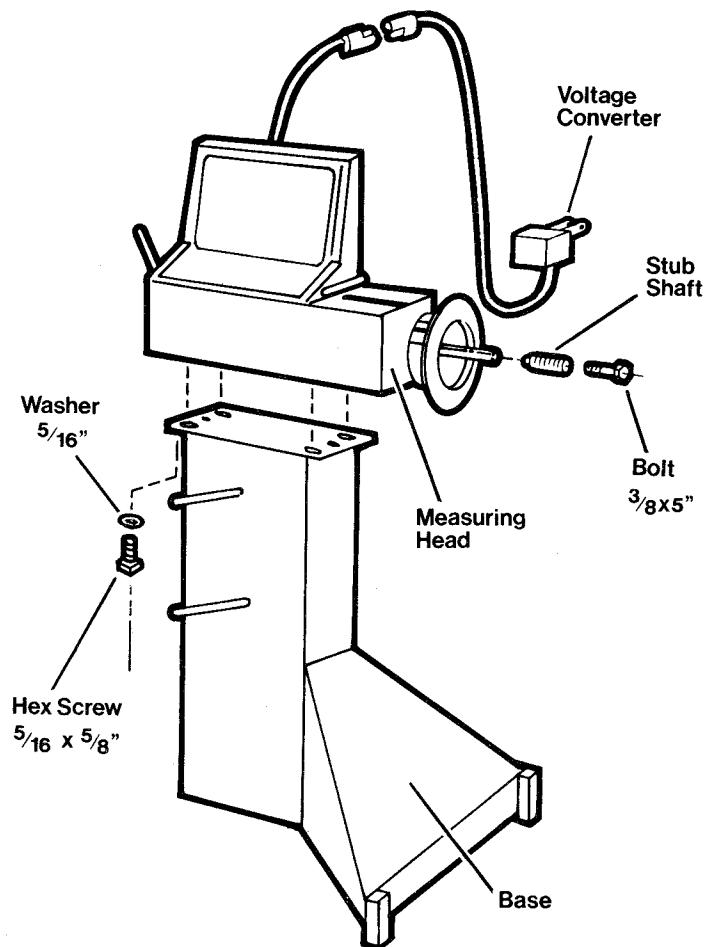
- F. Plug in voltage converter to line voltage power outlet. Note: Verify correct converter to line voltage as shown on converter housing.

- G. Connect cord from voltage converter to connector on back of measuring head. Note: This is only 8.5 VAC. Buzzing sound will be heard briefly and position lights will come on.

The balancer may be left plugged in at *all* times. It consumes only 5 watts.

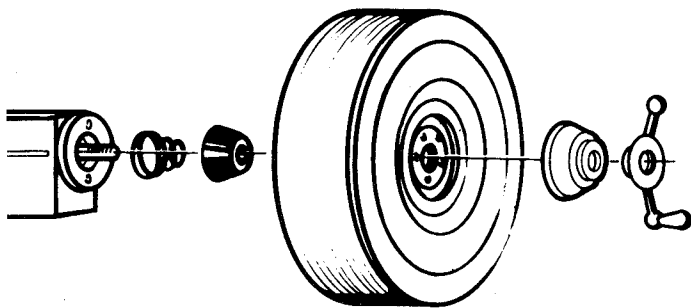
- H. Install stub shaft as shown. Torque to 250-300 in. lb. Brake handle may be pulled to counteract torque on bolt.

The balancer is now ready to go to work!



Operation

1. Mount Wheel



- A. Choose cone that fits best when placed through wheel center hole from rear, and slide the cone on the shaft as shown. The cone must center the wheel.

Light truck wheels are mounted using truck front cone. (Front cone mounting does not require use of cone spring or pressure drum.)

Use Universal Wheel Adaptor on wheels with untrue centers and wheels with closed centers.

Duplex wheels can be mounted using optional extension adaptor (WBA1).

- B. Choose a pressure drum that contacts wheel on a flat surface to avoid centering wheel with pressure drum.

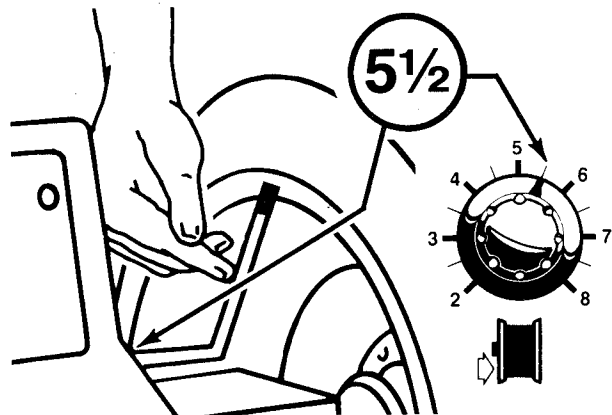
Most wheels should use a pressure drum, with the exception of extended center wheels.

- C. Tighten wheel firmly against face plate - Hold hub nut handle in place and rotate the wheel when tightening.

Wheel must be firm against face plate and threads must engage a minimum of three turns.

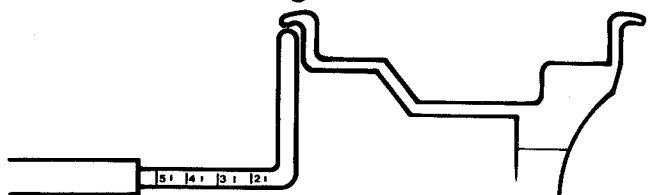
With few exceptions, all known original equipment wheels and most after market wheels can be mounted using some combination of the standard adaptors.

2. Set Rim Distance

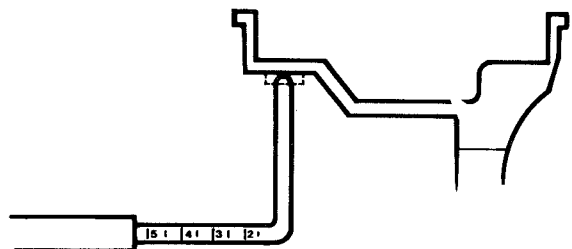


- A. Pull rim distance gauge arm out and position the tip against the rim bead surface at which inner weight is to be placed.
- B. Read the rim distance value off the gauge arm at the point where it enters into the tubular housing.
- C. Set the rim distance knob on the control panel to the rim distance value.

For Clip-On weights:



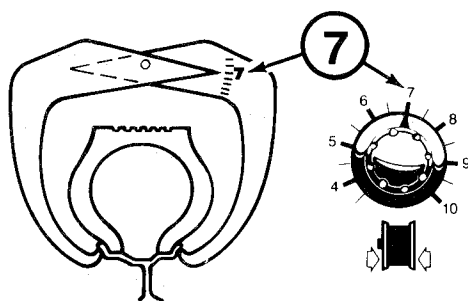
For Stick-On weights:



Pull gauge arm out to center area where the "stick-on" weight is to be placed.

Operation (continued)

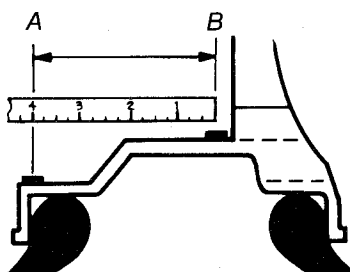
3. Set Rim Width



Measure wheel with caliper. Set width knob to width measured.

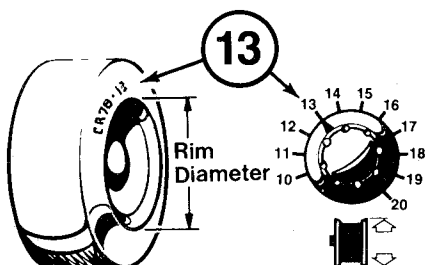
Dynamic Mag Wheel Mode:

For hidden weights, measure between A and B in inches and set this width. Attach weight at points A & B.



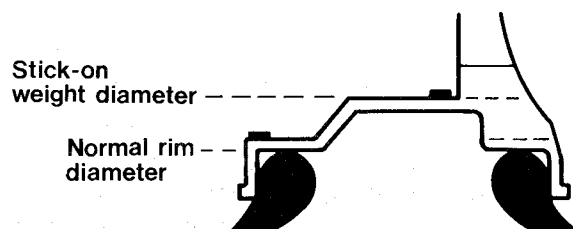
This method is used when a dynamic 2-plane balance is required, but no weight may be placed on the outer edge of the wheel.

4. Set Rim Diameter



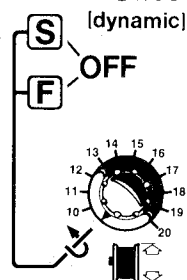
Note rim diameter on tire sidewall. Set diameter knob to diameter noted.

When using stick-on weights, set knob 1-1/2 less than diameter noted on tire sidewall. The "thicker" the rim, the lower the rim diameter setting must be.

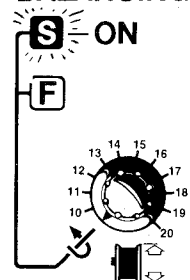


5. Select Balance

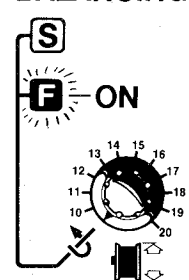
NORMAL BALANCING



STATIC BALANCING




FINE BALANCING



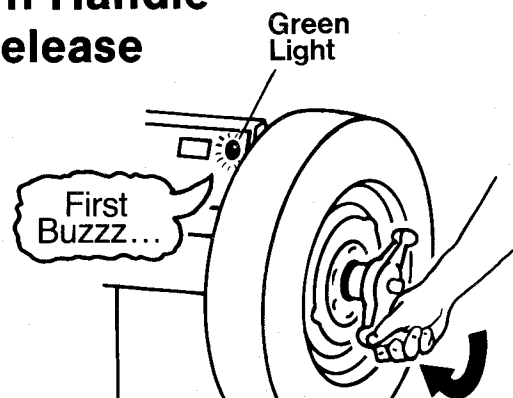
The rim diameter knob is used to select the method of balancing - "normal", "static", or "fine".

Most balancing is usually done in the "normal" dynamic setting. The balancer is set for "normal" balancing when the "S" and "F" indicators are not lighted.

To select the balance method, rotate the rim diameter knob counterclockwise past the  and clockwise back to the rim size setting.

* For static and fine balancing, see Special Modes Section.

6. Turn Handle ...Release

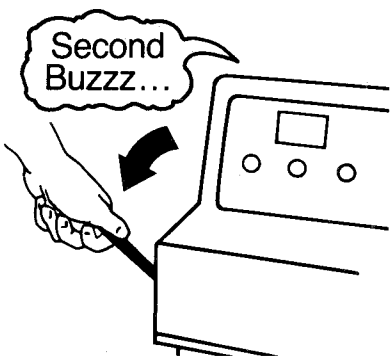


Turn crank handle on hub nut until buzzing sound is heard and green light comes on. Release handle immediately. Allow wheel to spin freely until second buzzing sound is heard and green light goes off. Balancer has now measured and stored the required balancing values.

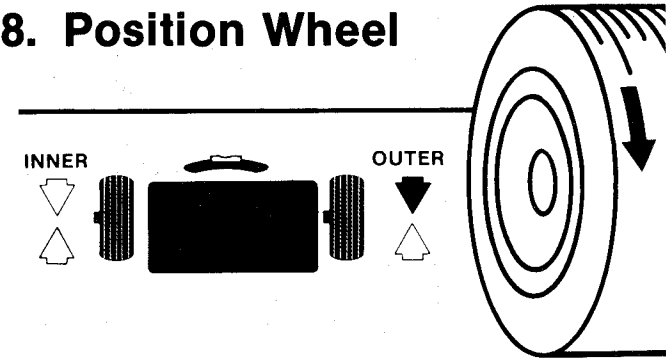
Note: Do not lean on machine during measuring cycle; otherwise wrong readings may result.

7. Stop Wheel

Do not touch the brake until the second buzz. Long readings may result. When the green light goes out and the buzzer sounds for the second time, pull brake handle forward until wheel comes to a complete stop and release.

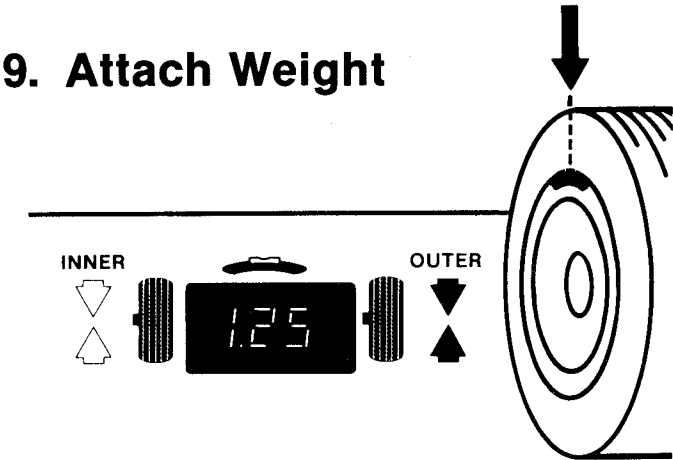


8. Position Wheel



Starting with either inner or outer side of wheel (outer shown), rotate wheel in direction of lit arrow until both arrows are lit.

9. Attach Weight



When both arrows are lit indicating correct position, the weight will be displayed. Securely apply indicated weight at top dead center (outer shown). Repeat for other side.

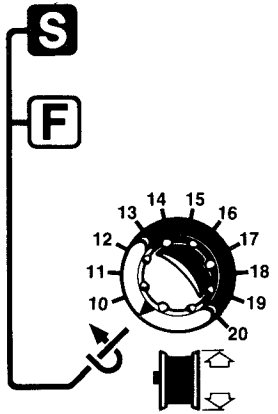
10. Check Spin



Repeat spin cycle. Zero weight readings should be displayed. Occasionally it will be necessary to add small additional weights.

Special Modes

Static Balancing Mode



For static single-plane balance, rotate rim diameter knob counterclockwise past No. 10 to line as shown and return to original diameter setting. "S—window" will light up to indicate that machine will now operate in *static* mode.

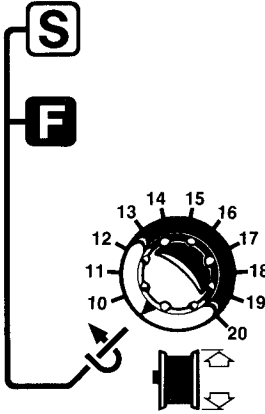
Rim distance (Step 2) and Rim width (Step 3) need not be set in static mode.

Only the inner display of position and weight will show. The static weight may be placed on the inner, outer or center of rim.

Static balancing is useful when weights can only be placed in one location, i.e. specialty mag wheels or motorcycle wheels.

Note: Always make sure that the stick-on weights will clear the car's disc brake calipers.

Fine Balancing Mode



Rotate rim diameter knob past 10 again to switch from Static to Fine balance mode. Always return rim diameter knob to original position. F—window will light up to indicate that machine will now operate in the *fine balancing* mode. Rotate knob once more to convert back to *normal* mode.

This mode allows balancing to an even higher degree of accuracy than is possible with the smallest commercially available weights. Accuracy is improved to 0.1 oz. or 2 grams. This degree of very fine balancing is seldom necessary. It is useful to balance racing tires, tires of cars with extremely sensitive suspension systems and for machine calibration.

Note: When fine balancing, it is usually necessary to trim the smallest standard weight in order to obtain the weight needed for a zero check spin.

Operational Check and Calibration Procedure

1. Make sure the balancer is resting on all three feet and is located on a flat concrete floor.
2. Plug the balancer in; the position indicator should light. If not, check the building circuit breaker, the power plug and cable. If defective, correct the problem.
3. Mount a 195-14 or similar size wheel and tire and balance it according to the "Operation" instructions on pages 4-6.

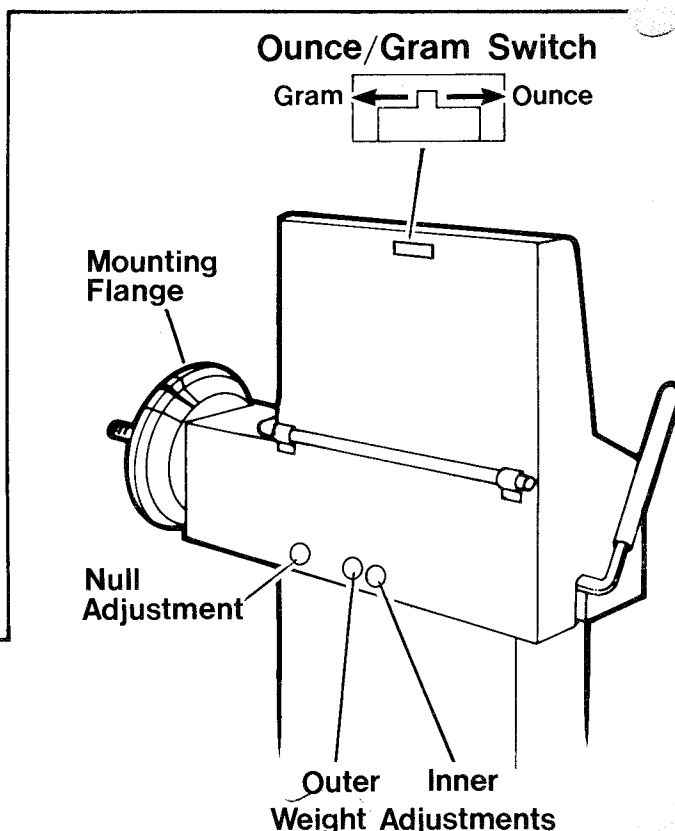
Using the fine balancing feature on the rim diameter knob, fine balance the wheel according to the instructions. When the wheel is fine balanced, reset from fine balance mode to normal mode.

4. Turn the wheel until both outer arrows are lit and attach a 4-ounce weight (100 gram) on the outer rim at the 12 o'clock position. Re-spin. The outer reading should be 3.75 or 4.00 (090 or 100) and the inner reading should be 0.00 or 0.25 (000 to 010). Rotate the wheel so both outer position arrows are lit; the 4-ounce weight (100 gram) should be at the 6 o'clock position.

If the inner weight reading is higher than 0.25 (010), remove the 4-ounce weight and carefully fine balance the wheel again. Repeat step 4 above. If the inner weight reading is still higher than 0.25 (010), use a small screwdriver and turn the null adjustment pot on the back of the balancer (see figure) to obtain the lowest reading. The lowest reading will be somewhere in the mid range of the adjustment and will increase as the pot is adjusted either clockwise or counterclockwise from the position of the lowest reading. *Disregard the outer reading at this time.* After null is adjusted for lowest reading, re-spin and check the outer weight reading. If outer reading is incorrect, re-set the outer weight adjustment pot on the back of the balancer (see figure) with a small screwdriver to 3.75 or 4.00 (090 or 100).

Note: The inner and outer weight adjustments are made as follows: turn the pot screws clockwise to increase and counterclockwise to decrease.

5. Remove the outer 4-ounce weight (100 gram) and spin the wheel. Now turn the wheel until both inner arrows are lit. Attach a 4-ounce weight (100 gram) on the inner rim at the 12 o'clock position and re-spin the wheel. The inner reading should be 3.75 or 4.00 (090 or 100). Rotate the wheel so both inner position arrows are lit; the 4-ounce weight (100 gram) should be at the 6 o'clock position. *Do not adjust null pot with weight on inner side.* If the inner reading is wrong and test procedure is correct, reset the inner weight adjustment pot on the back of the balancer until the reading is 3.75 or 4.00 (090 or 100). See figure.
6. Remove the 4-ounce weights (100 gram) and spin the wheel. Rotate the zero balanced wheel 180° in relation to the mounting flange and re-spin. The total between the inner and the outer readings should be 0.50 (015) or less. If total is higher, repeat this step, making sure the wheel is centered on the adaptor properly when tightening the hub nut. Clean mounting surface, spindle, cones and wheel. If still too high, repeat steps 1—6 with a new wheel. If still high, see your Snap-on representative.



Ounce/Gram Switch

The WB200 Computer Wheel Balancer will provide readouts in either ounces or grams. Set the recessed Ounce/Gram Switch, located on the back of the

balancer, to the measurement unit of the balance weights being used.

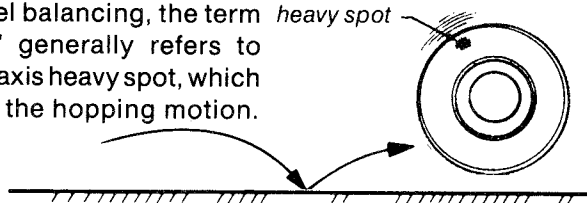
Move the switch to the right to measure in ounces, and to the left to measure in grams (see illustration).

Theory of Operation

The WB200 Computer Wheel Balancer is a two-plane balancer. It uses computer electronics to determine and display dynamic and static out-of-balance in a single spin.

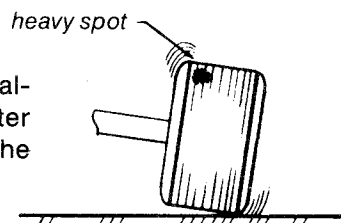
"static"

In wheel balancing, the term *heavy spot* "static" generally refers to the off-axis heavy spot, which causes the hopping motion.



"dynamic"

The term "dynamic" generally refers to the off-center heavy spot, which causes the wobbling motion.



A tire and wheel may have only a static imbalance, or only a dynamic unbalance, but usually will have some combination of both.

The weights to correct the imbalance are attached to the wheel in two "planes". These two "planes" are generally the lip at the bead seat at the inner and outer sides of the wheel rim. The corrective weights can be attached at different planes; for example, when "hiding" the weights on mag wheels. It is important to note that when "hiding" weights on the back side of a wheel, that there must still be two separated "planes" to achieve a dynamic balance. For most mag wheels, these "planes" should be at least three and a half inches apart. The closer together the balance planes are, the more weight will be required. If less than 3½" width, the static (single plane) mode should be used. To correct static balance, only one plane of weight is required.

On the WB200 Wheel Balancer, setting the rim distance tells the computer the location of the inner balancing plane. Setting the rim width tells the location of the outer plane. Setting the rim diameter tells the computer the distance from the center of the wheel to where the weight will be attached. When the wheel is spun, the computer calculates and displays the amount and position of the correction weights according to the settings the operator has made for the wheel.

Causes of Vibration

Wheel balancing is the quickest, most cost-effective method of solving vehicle vibration complaints. The greatest majority of vibration complaints will be solved by wheel balancing; however, there are other causes of vibration.

The most common are listed below:

- Tires not properly inflated to seat bead, changing balance soon after car is driven.
- Excessively heavy, stiff section in tire.
- Excessive wheel run-out.
- Heavy out-of-balance trim rings or wheel covers.
- Poorly centered after marked wheels.
- Brake drums or rotors out-of-true.
- Loose wheel bearings.
- Drive train out-of-balance.
- Loose or broken motor mounts.

Maintenance

1. Clean mounting adaptors, mounting surface, and spindle of balancer regularly. Grease and oil accumulate dirt (causing out-of-balance) and act as a grinding compound (resulting in premature wear).
2. Remove wheel weights and trash from under balancer and remove tires, tools or parts that may be leaning against balancer. Make sure the balancer rests only on the 3 foot pads.
3. Clean control panel with window cleaner.

Service & Repairs

The WB200 is completely field serviceable. Do not return the balancer repairs. Replacement parts and service assistance are available from your *Snap-on* representative.

To make minor external repairs, such as replacing: control knobs, stub shaft, voltage converter, gauge arm assembly and other repairs of this nature, refer to *WB200 Field Service* (pg. 10) and check for available instructions.

For internal repairs, contact your *Snap-on* representative for replacement parts and repair service.

If erroneous digital readouts occur, always perform the *Operational Check and Calibration Procedure*. If this does not correct the problem, refer to *Troubleshooting the WB200* to locate and correct the problem.

Troubleshooting the WB200

Problem	Probable Causes and Remedies
<p>I. Inconsistent readings</p> <p>If inconsistent readings are suspected, check as follows: Spin wheel 10 times. Write down weight readings of inner and outer plane. Check position at same time. Readings must be within $\pm .25$ oz. (± 10 grams).</p>	<ol style="list-style-type: none"> Occasional occurrences could be related to a tire or wheel problem. Check for loose material inside tire. Change tire if necessary. Make sure that wheel is properly mounted onto shaft. Check spindle and cones for residue buildup. Clean these parts and the inside flange of wheel. If using Universal Wheel Adaptor, make sure that it is mounted correctly and the nuts are torqued properly (see page 12). Make sure that the base stand is resting firmly on the floor and not on loose material. Check the stub shaft to make sure it is not loose or bent. Tighten or replace as necessary. To tighten or replace, refer to page 3 - H. Rotate spindle shaft by hand and feel for friction or rough bearings. If found, replace main housing assembly (see page 10). Remove cover assembly (see page 10) and check if brake band is touching brake bushing when brake lever is fully released. If so, correct or replace as necessary (see page 11). With cover assembly removed, check timing disc, located just inside of brake assembly. If dirty, carefully wipe clean with a cotton ball. If damaged, replace (see page 11). <p>Note: If none of the above corrects problem, replace the circuit board.</p>
<p>II. Digital display, location arrows and buzzer are all dead.</p>	<ol style="list-style-type: none"> Check AC power converter at connector near rear panel. An AC voltage tester should read approximately 10 VAC. If not, replace AC power converter. If correct, remove top cover and check plug connection to circuit board. If OK, replace circuit board (see page 10).
<p>III. Some digits, location arrows or mode indicators fail to light when signaled.</p>	<ol style="list-style-type: none"> Replace circuit board (see page 10).
<p>IV. Buzzer is dead.</p>	<ol style="list-style-type: none"> Ensure wheel is rotated fast enough. Replace circuit board if buzzer is still dead. <p>Note: Until repair is made, balancer can still be used by referencing green light.</p>
<p>V. Mode change not working right.</p>	<ol style="list-style-type: none"> Ensure that instructions on page 5 are followed. If problem still exists, replace circuit board.
<p>VI. Balancer will zero balance wheel, but takes too many spins to do so.</p>	<ol style="list-style-type: none"> Calibrate outside plane, null and inside plane following operational check and calibration procedure. If calibration problems are encountered, review troubleshooting procedures.
<p>VII. Can not calibrate as per operational check procedures.</p> <p><i>Pre-calibration Procedure:</i></p> <ol style="list-style-type: none"> Zero balance 195-14 wheel using correct rim size and normal mode setting. Select "F" mode and fine balance wheel to obtain zero balance on both planes. Select "normal" mode (both mode indicators not lit). Follow calibration procedure. 	<ol style="list-style-type: none"> Check for inconsistent readings (see Problem 1). Ensure pre-calibration procedure was followed in order to obtain a zero balanced wheel for calibration purposes. Ensure all wheel size controls are set to correct size of wheel. Check alignment of inside plane gauge tube to rear panel. When correct, the end of the tube nearest to gauge arm will extend 1/8" beyond edge of rear panel. Adjust tube if not correct.
<p>VIII. Brake will not stop wheel.</p>	<ol style="list-style-type: none"> Replace brake assembly (see page 11).

WB200 Field Service

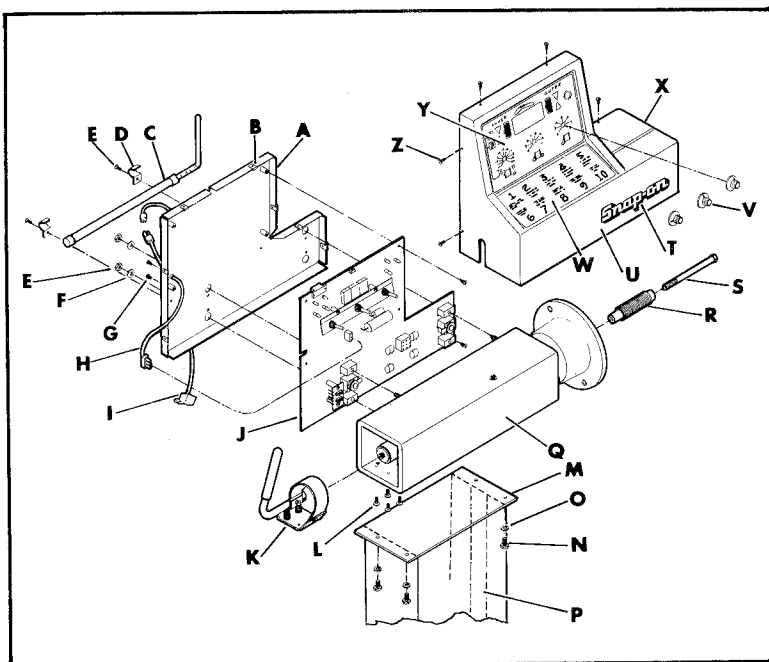
Removing Cover Assembly (WB1327-02)

Remove the Cover Assembly (U) for the following repairs:

- Replacing Printed Circuit Board (WB5010)
- Replacing Main Housing Assembly (WB1322)
- Replacing Brake Assembly (WB1308)
- Replacing Timing Disc (WB1277)

To remove Cover Assembly:

1. Disconnect Voltage Converter (I).
2. Remove Control Knobs (V) from front panel (requires small tip screwdriver).
3. Remove Phillips Screws (Z) from Cover Assembly [(U) - 7 screws].
4. Move Cover Assembly forward slightly to clear Control Knob shafts and lift upwards to remove.



Replacing Printed Circuit Board (WB5010)

1. Remove Cover Assembly (U).
2. Disconnect Cable Assembly (H) at PC Board (J) by pinching the releases and pulling outward.
3. Remove Back Panel Assembly (A) and PC Board by removing the four 1/2" hex size nuts (E) and washers (F). Then pull panel straight back.
4. Remove the four screws below the Offset Scale (C), located nearest to the four large holes in the Back Panel.
5. Remove the four slotted screws from the PC Board side that attach to the Back Panel standoffs.
6. Separate PC Board from Back Panel, insert replacement PC Board, and reassemble by reversing the above disassembly procedure.

If replacement PC Board does not have inner Control Knob position indicator over knob shafts, remove indicator from old PC Board and install on replacement PC Board.

WB200 Components

Key	Part No.	Description
A	WB1326	Back Panel Assembly
B	WB3700-0002	Speed Nut (7 req.)
C	WB1325	Offset Gauge Assembly
D	WB1338	Offset Gauge Clamp (2 req.)
E	ME4A10	5/16"-18 Hex Nut (4 mt. Back Panel)
F	ME5A8	5/16" Flat Washer (used with each ME4A10)
G	ME3J27	8-32 x 5/16" Binder Head Screw (10 req.)
H	WB7203-08	Cable Assembly
I	WB6605-01	Voltage Converter (115V., 50/60 Hz)
J	WB6605-03	Voltage Converter (230V., 50/60 Hz)
K	WB5010	Printed Circuit Board Assembly
L	WB1308	Brake Assembly
M	ME3C5	10-32 x 5/8" Flat Hd. Screw (4 req.)
N	WB1279-02	Base
O	ME3A73	5/16"-18 x 5/8" Hex Bolt (4 join Base and Main Housing)
P	ME5B5	5/16" Lockwasher (used with each ME3A73)
Q	WB1371	Decal (Decorative Stripe)
R	WB1322	Main Housing Assembly
S	WB1179-02	Stub Shaft
T	ME3A72	3/8"-24 x 6" Hex Bolt
U	KN300R	Logo Package
V	WB1327-02	Cover Assembly
W	WB1190	Control Knob (3 req.)
X	WB1353-02	Decal (Instructions)
Y	WB1354	Decal (Top Dead Center Indicator)
Z	WB1298-02	Decal (Control Panel)
	ME3L19	8-18 x 1/2" Self Tap Screw (7 mt. Cover)
	WB1277	Timing Disc (not shown)

Replacing Main Housing Assembly (WB1322)

1. Follow Steps 1 thru 3 of Replacing Printed Circuit Board.
2. Loosen Stub Shaft Bolt (S) and Remove Stub Shaft (R). Brake handle may be pulled to counteract torque on bolt.
3. Remove Main Housing Assembly (Q) from Base (M) by removing four 1/2" hex size bolts (N) and washers (O). Lift assembly from Base.

4. Remove four Brake Assembly screws (L) from bottom of Assembly (1/8" hex wrench) and slide Brake Assembly off the shaft.

5. Replace Brake Assembly on replacement Main Housing Assembly.

Note: After tightening Brake Assembly screws firmly, pull brake handle several times and make sure that brake band does not touch shaft when brake is released.

6. Replace Main Housing Assembly on Base, using dowel pins for alignment, and torque bolts 100 - 120 in. lb.
7. Install Stub Shaft and torque Stub Bolt to 250 - 300 in. lb. Brake handle may be pulled to counteract torque on bolt.
8. Reverse Steps 1 thru 3 of Replacing Printed Circuit Board.

Replacing Brake Assembly (WB1308)

1. Remove Cover Assembly (U).
2. Remove complete Measuring Head Assembly from Base (M) by removing four 1/2" hex size bolts (N) and washers (O). Lift assembly from Base.
3. Lay Measuring Head Assembly on Back Panel, with bottom of Main Housing Assembly (Q) facing you, and remove four Brake Assembly Screws (L -using 1/8" hex wrench).
4. Slide Brake Assembly (K) off Shaft.
5. Reassemble by reversing Steps 1 thru 4. Use dowel pins for alignment when mounting Measuring Head Assembly on Base and torque bolts (N) to 100 - 120 in. lb.

Note: After tightening Brake Assembly screws firmly, pull brake handle several times and make sure brake band does not touch shaft when brake is released.

Replacing Timing Disc (WB1277)

1. Follow Steps 1 thru 4 of Replacing Brake Assembly.
2. Remove brake bushing retaining screw and washer (1/4" hex wrench). Torque screw to 100 - 120 in. lb. when reassembling.
3. Remove brake bushing.
4. Remove shaft key.
5. Gently slide Timing Disc from Shaft.
6. Install replacement disc with the side marked "BEARING SIDE" facing in, and reassemble by reversing Steps 1 thru 4.

Replacing Offset Gauge Assembly (WB1325)

1. Remove Offset Gauge Clamps (D) and Offset Gauge Assembly (C).
2. Install Replacement assembly and clamps loosely.
3. Adjust tube end of assembly nearest to scale so that it extends 1/8" (3 mm) past edge of Back Panel, and tighten clamp screws.

Replacing Stub Shaft (WB1179-02)

Follow instruction H on Page 3.

WBA2 Universal Wheel Adaptor

IMPORTANT:

This Universal Adaptor is a high quality precision instrument and should be handled accordingly. To maintain accurate results, please

- Keep all components clean and dry
- Follow instructions
- Avoid abuse
- DO NOT USE IMPACT TOOLS

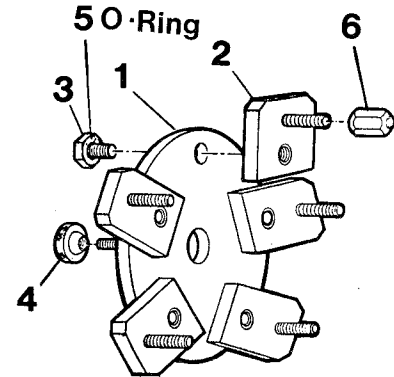
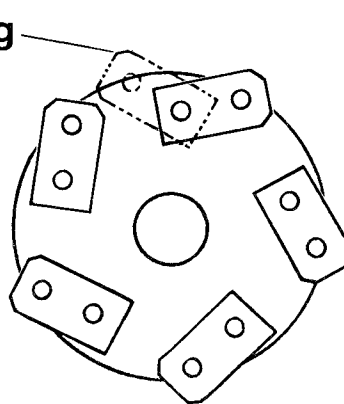
INSTRUCTIONS:

RECOMMENDED TOOL 3/4" HEX LUG WRENCH OR 3/4" HEX SOCKET.

1. Select lug pattern, i.e.; three, four or five lugs. (For six lugs select three, for eight select four, etc.) Follow stamped numbers on back of adaptor plate to match selected lug pattern.
2. Install swivel plate **Item 2** to adaptor plate **Item 1**. Insert swivel screw, **Item 3**, tighten snug, then back off just enough so that swivel plate **Item 2** still moves freely.

Wrong

3. Move all swivel plates into same direction and to approximately the diameter of the hole pattern of wheel.



4. Insert into mounting holes of wheel from back of wheel. NOTE: This is done best with wheel laying on bench or floor, with front facing down.

5. Tilt wheel into vertical position and hold wheel and adaptor together while installing wheel nuts **Item 6**. For best results set all wheel nuts hand tight, then apply firm and uniform torque. Recommended torque 100 in. lbs.

Note that wheel nut (Item 6) has one tapered and one spherically shaped end. Use tapered end on all wheels except on certain Porsche and old style VW wheels.

6. Tighten swivel screws firmly in back of adaptor. DO NOT USE IMPACT TOOLS.
7. Check cleanliness of rear surface of adaptor and flange surface of balancer prior to mounting. Otherwise adaptor might not sit firmly, resulting in erroneous readings.
8. Mount wheel and adaptor assembly to balancer.
9. Install and tighten two flange nuts **Item 4** firmly by hand on back of flange of balancer.

It is absolutely essential that flange nuts (Item 4) are completely tight. Otherwise fluctuating, erroneous readings may occur. If in doubt double check tightness of flange nuts after first spin cycle.

10. Proceed with balancing.

NOTE: Any subsequent wheel of same size can be mounted directly to adaptor without readjusting swivel plates and without removing adaptor from balancer.

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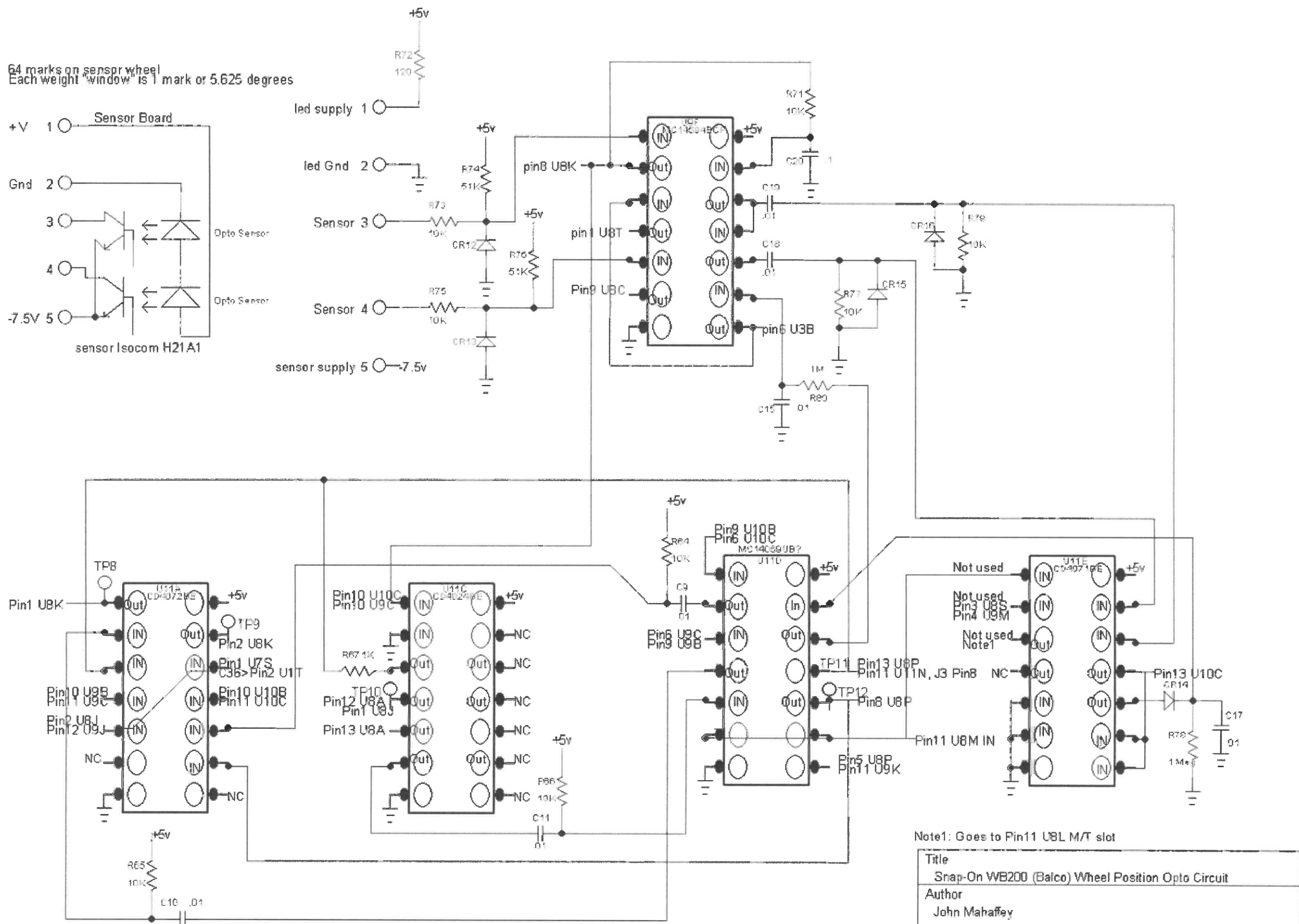
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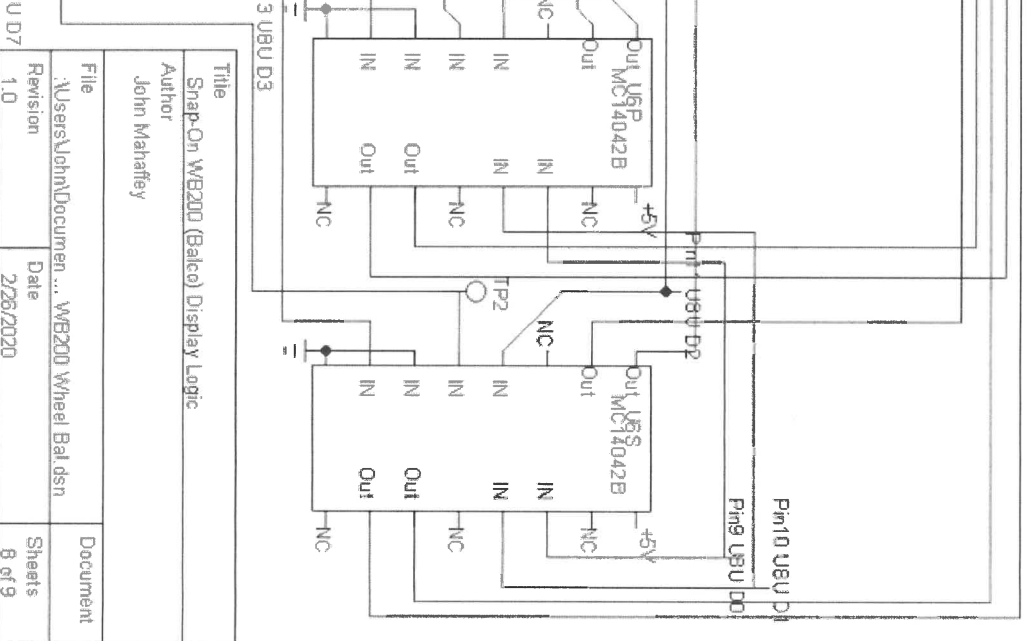
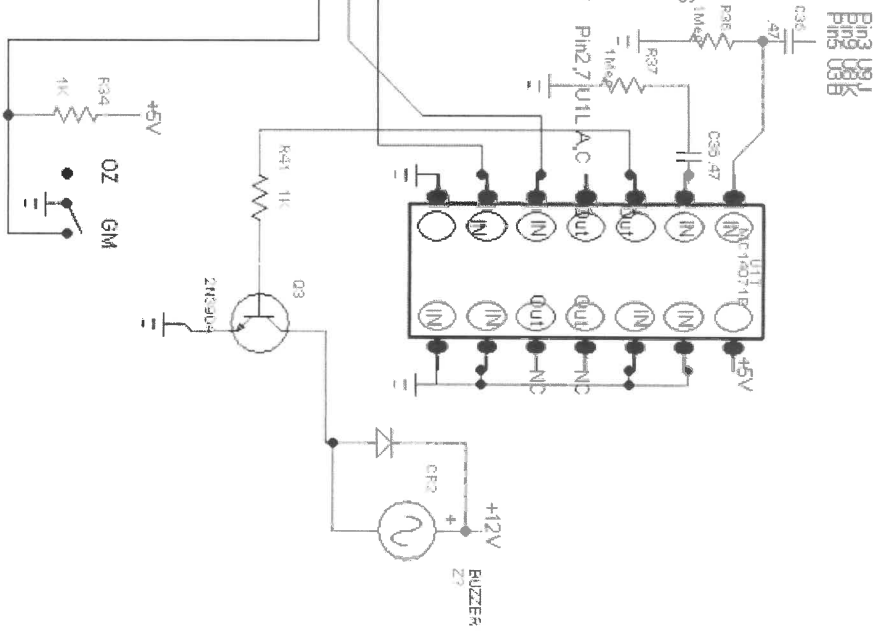
Insurgentes Norte 514-D, Col. Sta.
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Mexico 4, D.F.

The diagram shows a sensor board with five pins. Pin 1 is labeled '+V'. Pin 2 is labeled 'Gnd'. Pin 3 is connected to the emitter of a transistor. Pin 4 is connected to the base of a transistor. Pin 5 is labeled '-7.5V'. The circuit includes two opto sensors connected to pins 3 and 4. The sensor is labeled 'sensor Isocom H21A1'.



Note1: Goes to Pin11 USB M/T slot

Title		
Snap-On WB200 (Balco) Wheel Position Opto Circuit		
Author		
John Mahaffey		
File		Document
:Users\John\Documen ... WB200 Wheel Bal.dsn		
Revision	Date	Sheets
1.0	2/7/2020	3 of 9



Title		
Snap-On WB200 (Balco) Display Logic		
Author		
John Mahaffey		
File		Document
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Revision	Date	Sheets
1.0	2/26/2020	8 of 9

U1G,U1L,U2L SN74LS47N

U3A MC14071B

U3B MC14081B

U8A MC14081B

U8B MC14584B

U8C MC14069UB

U9A CD4516BE

U9B CD4078BE

U9C CD4516BE

U9F MC14584BCP

U10A CD4516BE

U10B CD4078BE

U10C CD4516BE

U11A CD4072BE

U11C CD4024BE

U11D MC14069UB?

U11E CD4071BE

U8J CD4024BE

U8K MC14081B

U8M MC14040B

U8N MC140??

U8P MC14071B

U8S

U8T MC14075B

U8U 2716

U9J MC14013B

U9K

U9M HCF4069UBE

U9WADC0804LCN

U10K TL074CN

U10T TL074CN

U10W TL074CN

U11K TL074CN

U12 MC14053B

U1T MC14071B

U2S MC14081B

U2T MC14081B

U3S MC14519B

U3T MC14078B

U4S MC14519B

U4T MC14078B

U5S MC14042B

U5T MC14042B

U6P MC14042B

U6S MC14042B

U7S MC14081B

Test Point (TP)

TP1- OZ- set for OZ or Grams

TP2- LOTR

TP3- LINR

LAMP1- Opto sensor out upper

LAMP2- Opto sensor out lower

TP6- OTR0

TP7- INR0

TP8- SINR

TP9- SOTR

TP10- INDX

TP11- INR

TP12- OTR

TP20-

TP21- PWR ON

TP24- IX- Marks peak Inner imbalance.

TP25- OX- Marks peak Outer imbalance.

TP26- INTR

TP27- WR- records peak Inner/ Outer imbalance.

TP28- WT- Amount of imbalance.

TP29- VREF 1-2.6VDC 2V/16" Rim

J3 Test Plug

1- pin14 U10T- Inner weight analog waveform

2- TP28 WT pin6 U9W- Weight into CPU waveform

3- Gnd

4- pin1 U10T- Outer weight analog waveform

5- pin12 U8T- Weight display "on".

6- TP27 WR- Records peak Inner/ Outer imbalance

7- TP26 INTR pin5 U9W

8- TP11 pin11 U11N- Inner Hi/ Outer Lo switching waveform

9- +5v

Use J3 pins 2,5 for INR0 and OTR0 scope synchronizing

To record a good waveform pattern using a digital scope connect to desired test points, spin wheel to slightly faster than the beep, THEN start the recording. This eliminates useless cranking waveforms but gets the full balancer cycle of measurement then display. Use 1/2 second timebase for WT, WR, INTR signals or INR0/ OTR0 window synchronizing.

Connect pads for:

LAMP TEST- lights 7 segment displays
BUZZER TEST

Wheel Balancer checks:

- 1- Check mounting flange runout. Machine or draw file if necessary.
 - 2- Check calibration.
 - 3- Check U10K,U11K,U10W,U10T op amp outputs for noise, replace if noisy. See replacement notes on sheet 1.
- Should replace C4 with at least 2500uF 25V and C5 with at least 10000uF 15V.

INR0 adjustment:

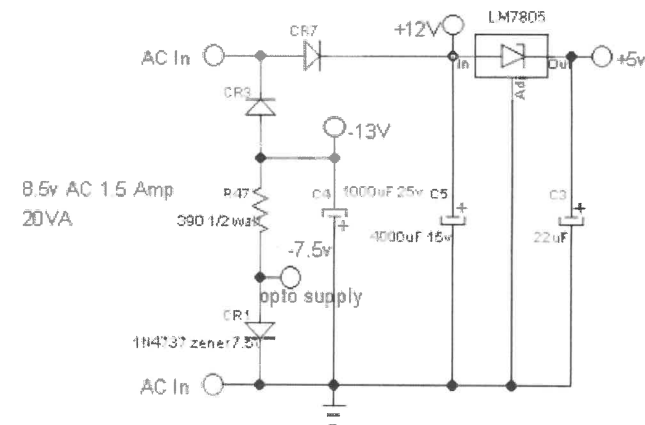
- 1- Balance wheel to zero in Fine Mode.
- 2- Mark control panel side weight position and remove.
- 3- Spin wheel, if "weight window" falls at mark adjustment is OK. If it falls to the left (control side view) of the mark turn INR0 pot left (counterclockwise). If "weight window" falls to the right of the mark turn INR0 pot right (clockwise).

OTR0 adjustment:

- 1- Balance wheel to zero in Fine Mode.
- 2- Mark wheel mounting nut side weight position and remove.
- 3- Spin wheel, if "weight window" falls at mark adjustment is OK. If it falls to the left (wheel nut side view) of the mark turn OTR0 pot left (counterclockwise). If "weight window" falls to the right of the mark turn OTR0 pot right (clockwise).

Scope INR0 and OTR0 adjustment:?

- Use out of balance wheel
- 1- Channel 1 to J3 pin 2, Channel 2 to J3 pin 5. Mark pot positions for reference.
 - 2- Spin wheel, save waveform.
 - 3- The objective is to center the weight readout pulse on the weight signal zero crossing using the INR0 and OTR0 pots. Must respin after each adjustment to see the resulting change.
 - 4- Verify proper adjustment using the first procedure (INR0 and OTR) adjustment).



Pots on back side



Outer Weight
position
zero



Inner Weight
position
zero

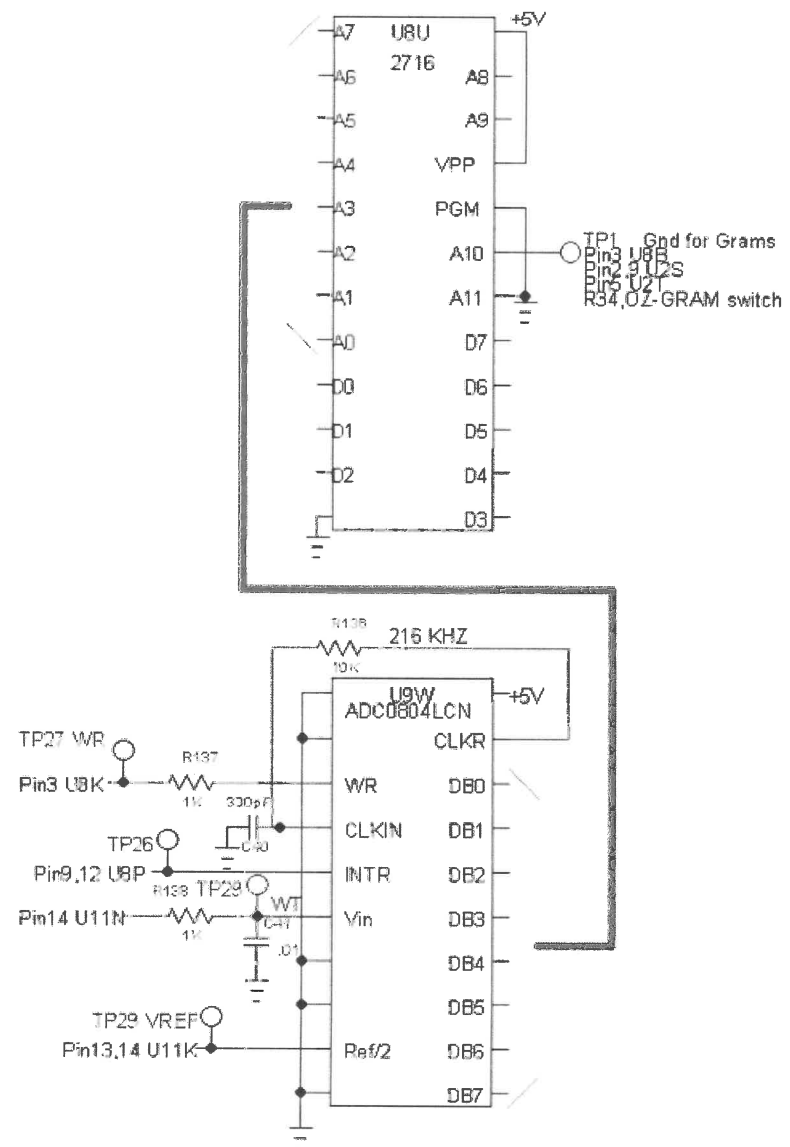


Outer Weight

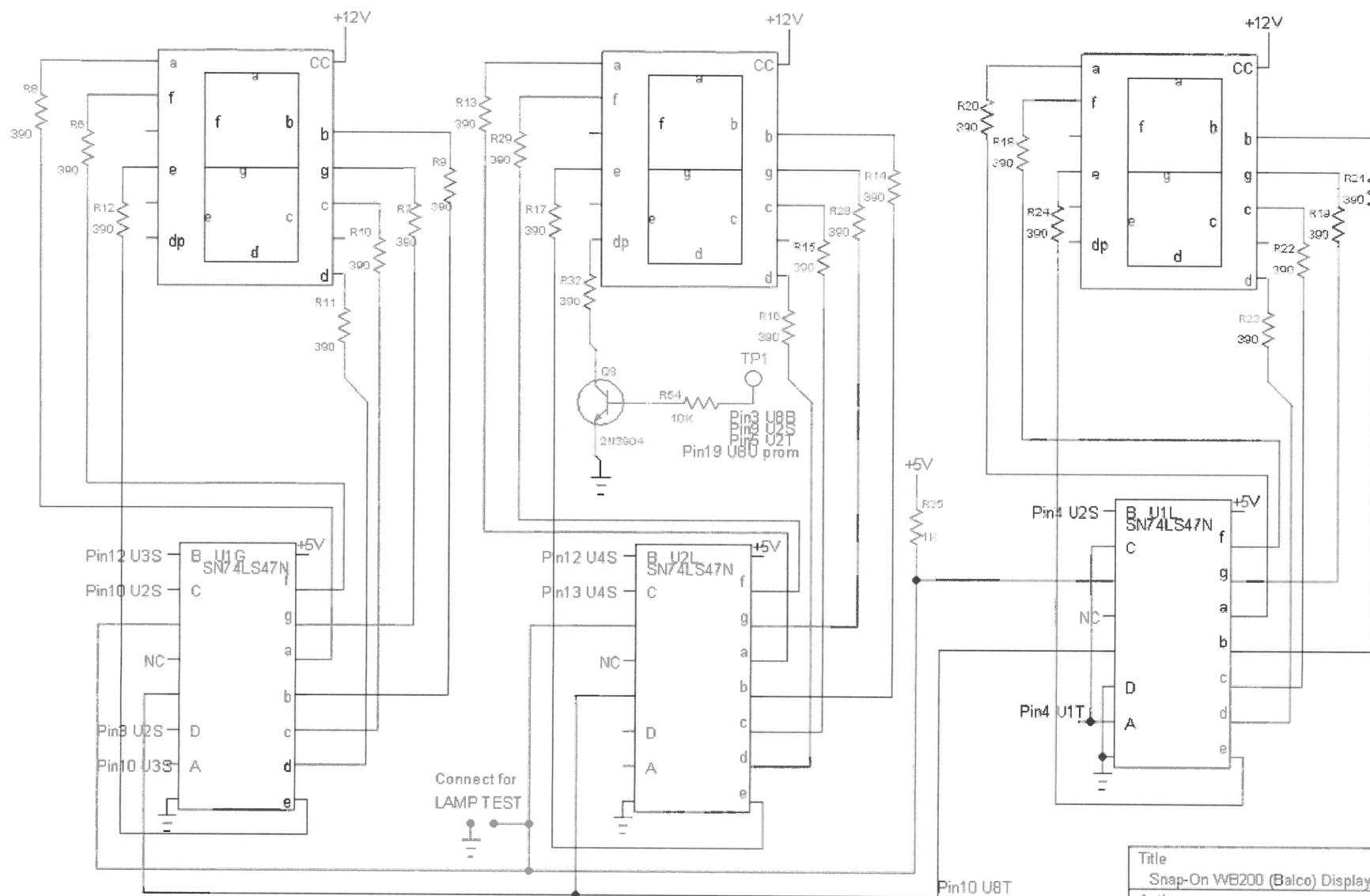


Inner Weight

Title Snap-On WB200 (Balco) Power Supply, IC list, Test Points		
Author John Mahaffey		
File .:Users\John\Documen ... WB200 Wheel Bal.dsn	Document	
Revision 1.0	Date 4/15/2020	Sheets 2 of 9



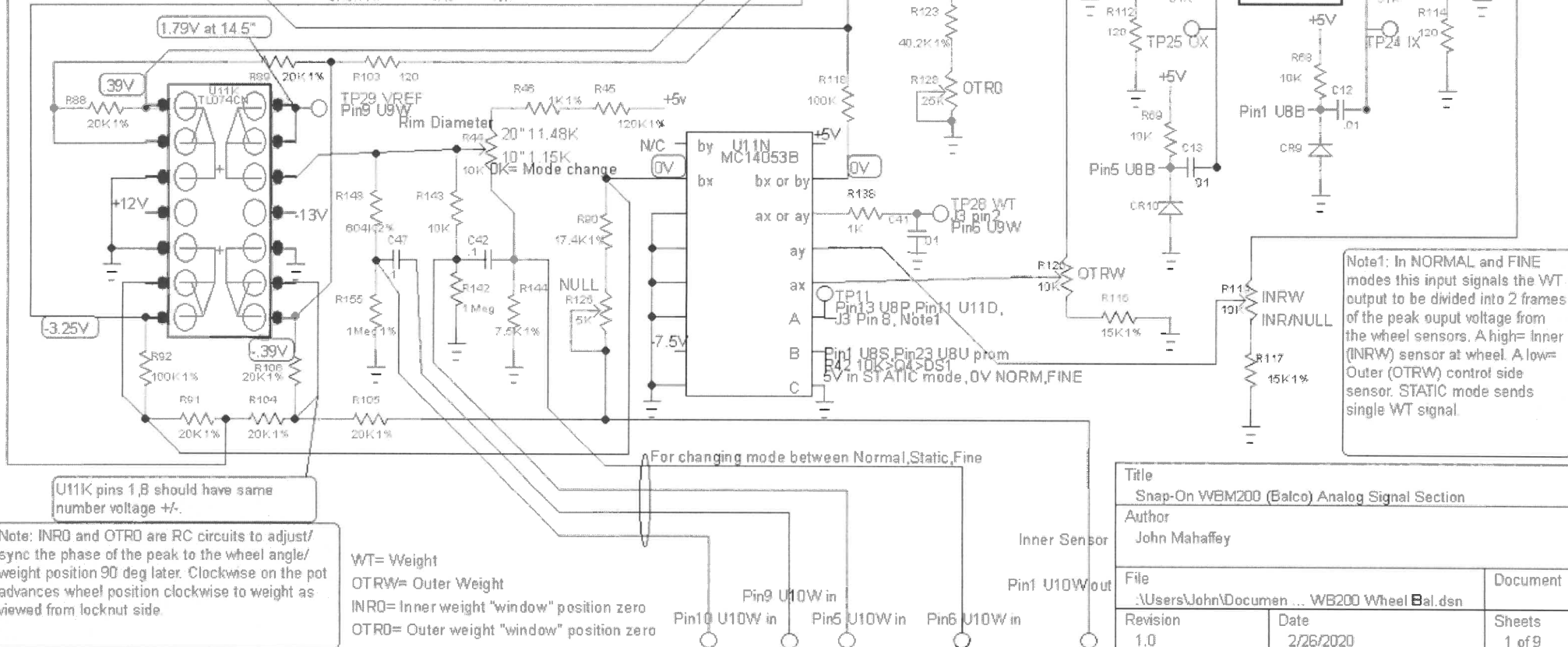
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Snap-On WB200 (Balco) CPU, Prom		
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John Mahaffey		
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Revision	Date	Sheets
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Title Snap-On WB200 (Balco) Display Logic		
Author John Mahaffey		
File .\Users\John\Documen ... WB200 Wheel Bal.dsn	Document	
Revision 1.0	Date 2/15/2020	Sheets 9 of 9

Rim Diameter adjusts overall sensitivity.
Rim Width adjusts AC voltage difference between sensors.
Rim Distance adjusts DC bias voltage for the Rim Width AC signal. It effectively shifts rim right or left on shaft.

Replacing U10K, U10W with new TL074CN op amps will probably result in greater than required bias voltages (~0V) at the output pins 7. It will probably be necessary to replace R97 and R141 with 2.2 meg resistors (or less) and C25, C45 with 1uF ceramic caps. Voltage readings taken with new U10K, U11K, U10W op amps and resistors replaced. INRD and OTRD should be checked for accuracy. See sheet 2 for adjustment.



Note1: In NORMAL and FINE modes this input signals the WT output to be divided into 2 frames of the peak output voltage from the wheel sensors. A high= inner (INRW) sensor at wheel. A low= Outer (OTRW) control side sensor. STATIC mode sends single WT signal.

Title		
Snap-On WBM200 (Balco) Analog Signal Section		
Author		
John Mahaffey		
File		Document
\\Users\John\Documents\WB200 Wheel Bal.dsn		
Revision	Date	Sheets
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