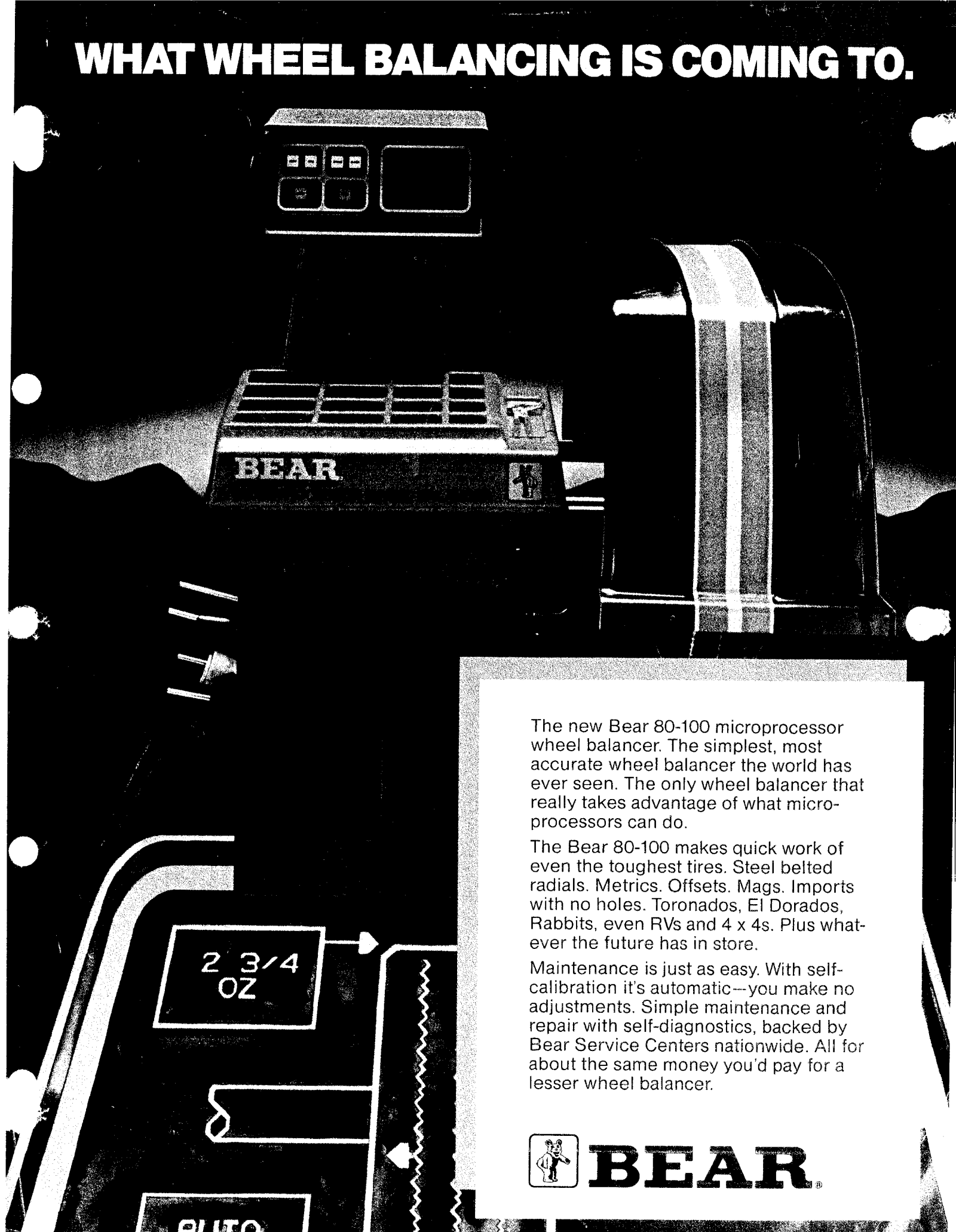
WHAT WHEEL BALANCING IS COMING TO.



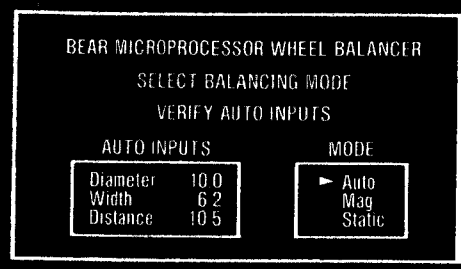
The new Bear 80-100 microprocessor wheel balancer. The simplest, most accurate wheel balancer the world has ever seen. The only wheel balancer that really takes advantage of what micro-processors can do.

The Bear 80-100 makes quick work of even the toughest tires. Steel belted radials. Metrics. Offsets. Mags. Imports with no holes. Toronados, El Dorados, Rabbits, even RVs and 4 x 4s. Plus whatever the future has in store.

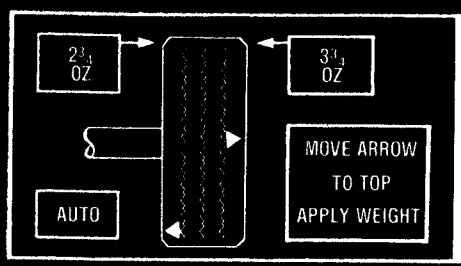
Maintenance is just as easy. With self-calibration it's automatic—you make no adjustments. Simple maintenance and repair with self-diagnostics, backed by Bear Service Centers nationwide. All for about the same money you'd pay for a lesser wheel balancer.

BEAR®

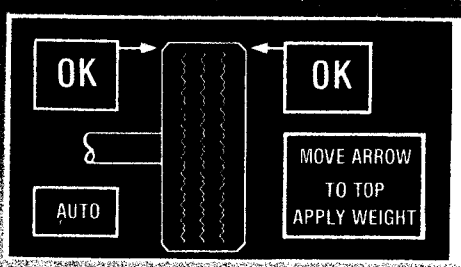
80-100 BEAR Microprocessor Wheel Balancer gives it to you on TV.



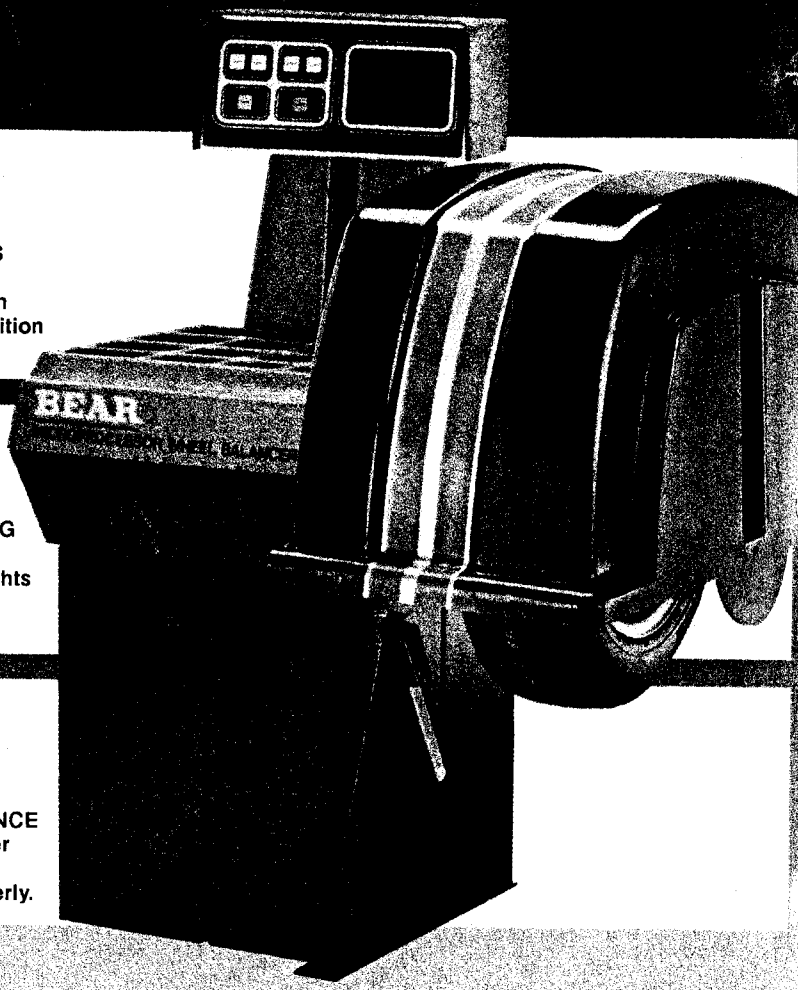
AUTO INPUTS verify rim diameter, width and wheel position (distance.)



AUTO CYCLING results in this display of weights and position arrows.



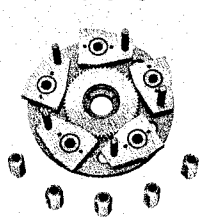
CHECK BALANCE shows customer wheel is balanced properly.



The CRT screen leads the technician through three simple steps which can only be done correctly. In simple English. No codes or abbreviations. With automatic inputs for tire position, rim width and diameter. There are no numbers to remember, no dials to twiddle. Almost twice the accuracy of weight positioning. So every mechanic does it right. First time, every time.

Other features:

- Computerized self calibration
- Self diagnosis—problem/solution analysis
- Reverse mount spring encapsulated in backing plate.
- Break away shaft for centerless wheels.
- Disc brake holds top dead center location.
- Balancing modes—auto, static, mag.
- Two reverse mounting cups, two passenger car cones and one truck cone included.
- Self centering universal adapter optional. Order No. 82-001.



Specifications:

- Rim width 3-12 inches
- Maximum wheel width 18 inches
- Rim diameter 10-17 inches
- Maximum wheel diameter 40 inches
- Maximum wheel weight 135 lbs.
- Balancing speed 460 rpm
- Cycle time 7.5 seconds*
- Weight 525 lbs.

Electrical Specifications:

- 115/208/230 volts, 60 Hertz, single phase

*varies with wheel size and weight

BEAR®

Bear Automotive Service Equipment Company
12121 West Feerick Place
Milwaukee, WI 53222

Bear Automotive, Inc.
305 Progress
Scarborough, Ontario, Canada
MIP2Z8

It's a BEAR! The brand your customers know.

B-195-383-1

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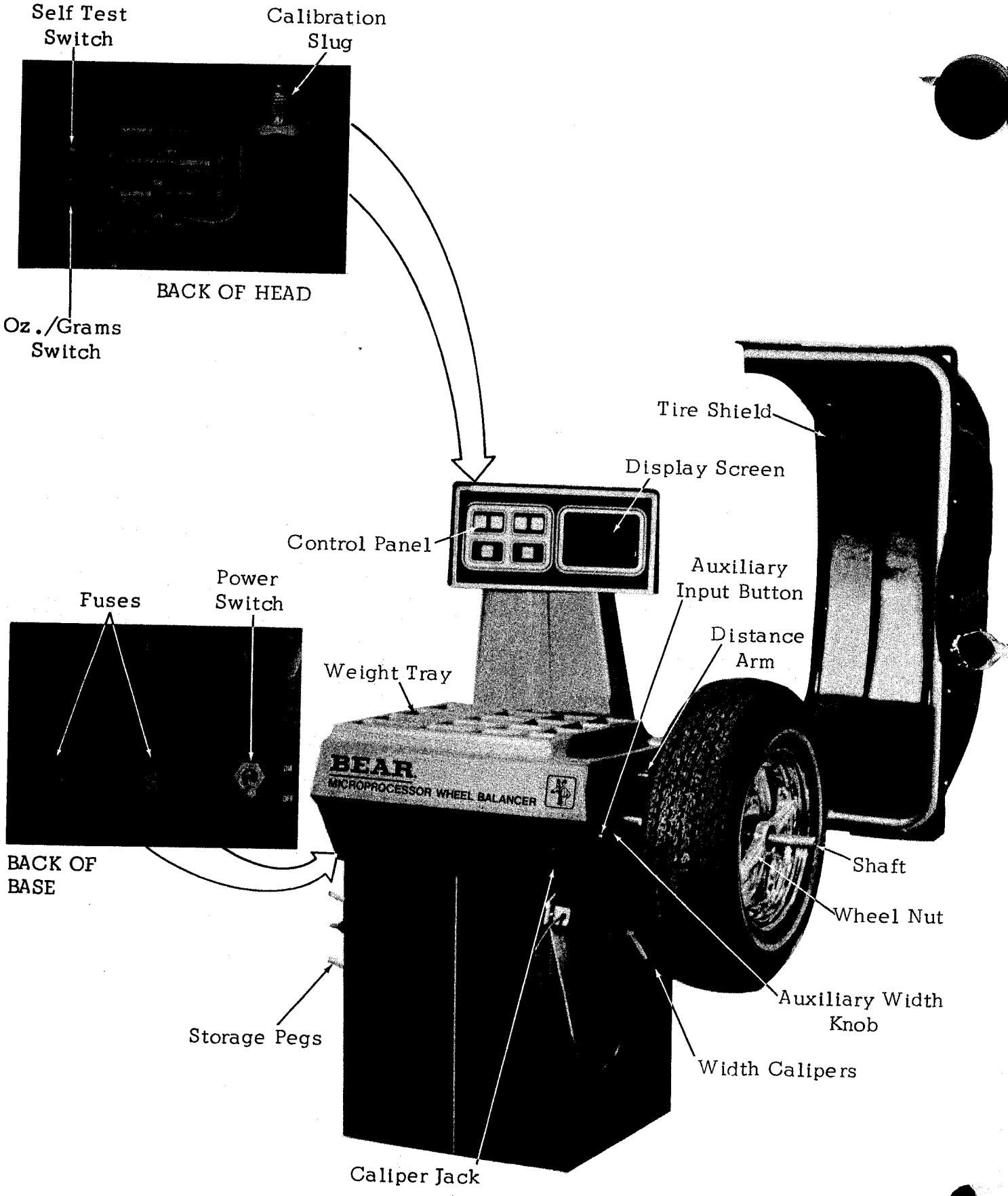
Operating Instructions

TABLE OF CONTENTS

620-85631 10/81

INTRODUCTION



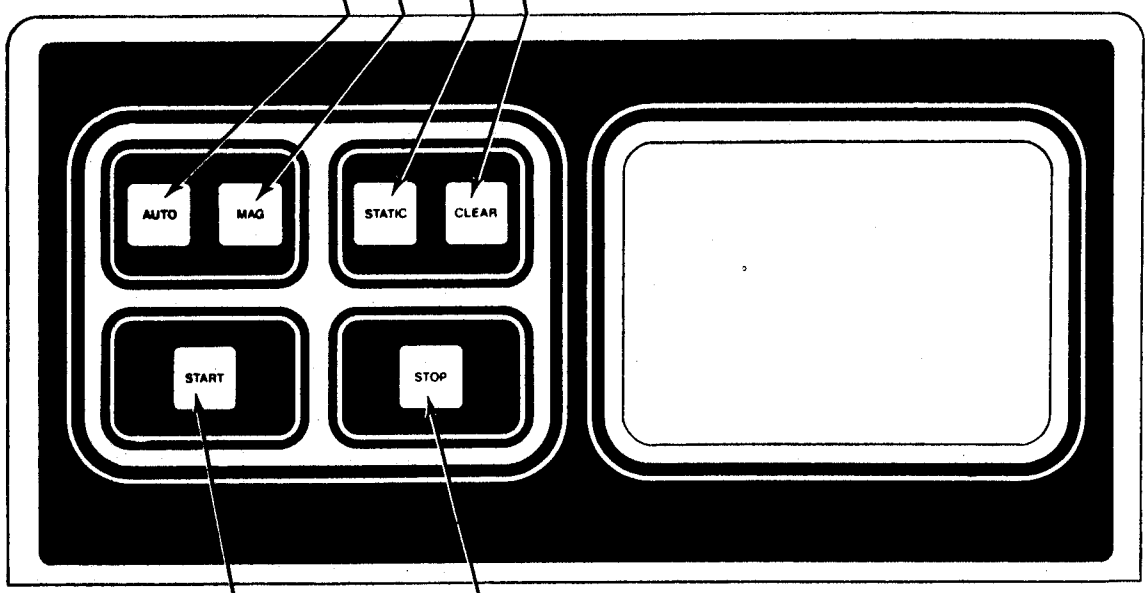
INTRODUCTION (CONT.)

AUTO - For Dynamic Two-Plane Balancing on Most Wheels

MAG - For Stylized Wheels Using One Hidden Weight

STATIC - For Wheel Requiring Equal Weight Inside and Outside

CLEAR - Resets Balancer to Continue Balancing (keeps wheel size inputs)



STOP - Emergency Stop

START - To Start Spins

S P E C I F I C A T I O N S:

* Rim width: Three to twelve inches (7.6 - 30.5 cm)
* Maximum wheel width: Eighteen inches (45.7 cm)
* Rim diameter: Ten to seventeen inches (25.4 - 43.2 cm)
* Maximum wheel diameter: Forty inches (101.6 cm)
* Maximum wheel weight: One hundred and thirty-five pounds (61.29 kg)
* Balancing speed: Four hundred and sixty rpm
* Cycle time: Seven point five seconds

SAFETY

READ ALL SERVICE PROCEDURES AND PRECAUTIONS, INSTALLATION INSTRUCTIONS AND EQUIPMENT OPERATING MANUALS THOROUGHLY. FAILURE TO OBSERVE THESE PRECAUTIONS, OR THE IMPROPER USE OF EQUIPMENT, COULD RESULT IN PROPERTY DAMAGE AND/OR SERIOUS INJURY OR DEATH. NEVER ALLOW IMPROPERLY TRAINED PERSONNEL TO PERFORM THESE PROCEDURES OR OPERATE EQUIPMENT.

ELECTRICAL SAFETY

When balancer power is "ON", do not touch circuitry, try to replace circuit boards, attempt to perform repairs, or replace parts.

The balancer must be plugged into a properly grounded outlet of the correct voltage supply and amperage rating. Balancers are normally shipped connected for 220 volt 60 Hz. operation. Do not cut off the grounding prong of the AC power cord. Ground adapters and/or extension cords are not recommended because of the heavy electrical duty cycle of normal balancer use.

The tire shield and weight tray are equipped with protective electrical interlocks. Do not attempt to operate the balancer through any means of by-passing these interlocks.

Contact a licensed electrical contractor regarding proper electrical installation and local code requirements.

Do not expose balancer to rain or moisture, or operate it on a wet floor.

Do not use a defective or incorrect ground circuit.

Do not install fuses of a higher ampere rating than specified.

PERSONAL AND EQUIPMENT SAFETY

Keep hands, hair, and loose clothing away from the spinning parts of the balancer.

Never wear a necktie or loose clothing when running the balancer.

Prevent damage to the distance arm by returning it to stored position after use.

Prevent damage to width calipers by properly hanging them on their storage peg.

SAFETY (CONT.)

Tire shield must be lowered all the way during an entire balance cycle, until the wheel comes to a complete stop.

All wheel weights must be firmly attached to prevent loss during operation. If using adhesive weights, be sure rim surface is clean to prevent loosening of weights.

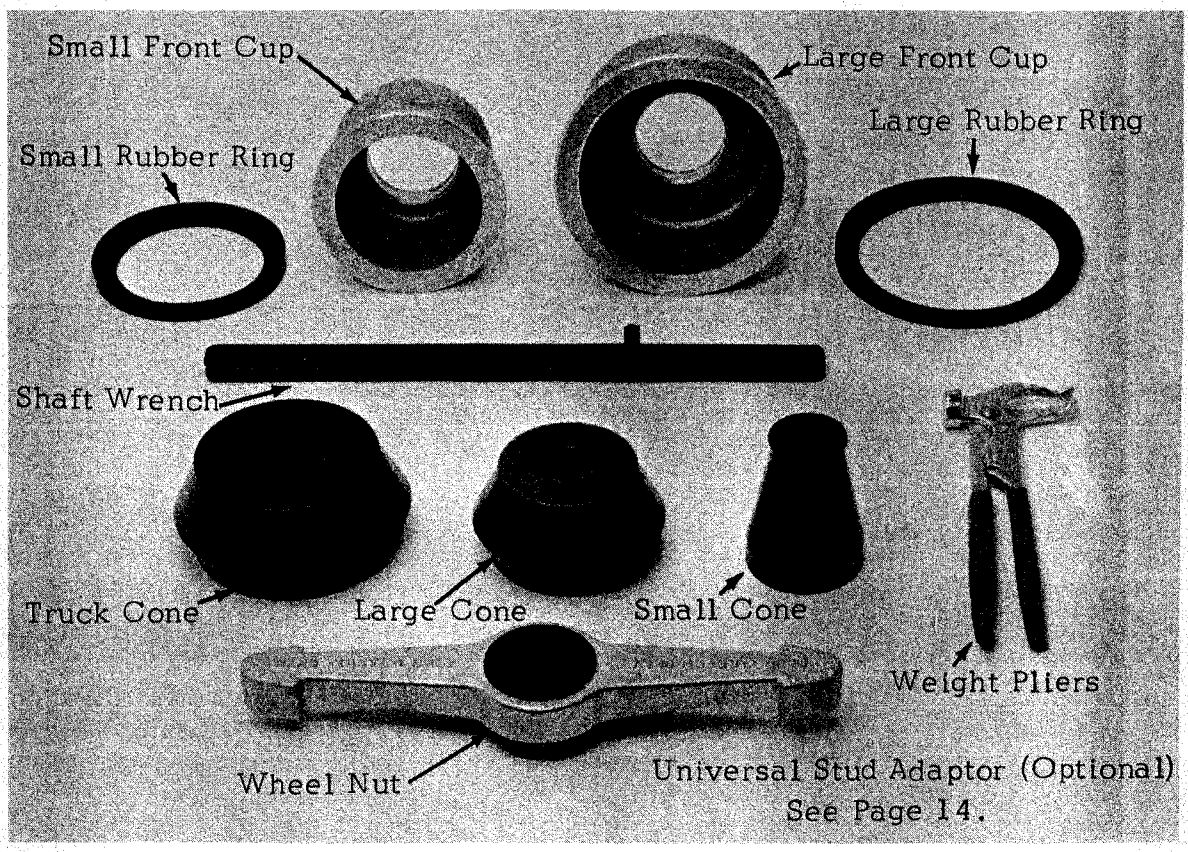
Concrete anchors and mounting nuts must be tight at all times to assure safety and accuracy.

Be sure to center mounting cone to wheel center hole and to securely tighten wheel nut before balancing. Loose wheel mountings give incorrect balance results.

Do not use an impact wrench to tighten the lug nuts on the universal stud adapter. Lug nuts should be firmly tightened using a hand wrench.

Handle any heavy component carefully to avoid injury.

ACCESSORIES:



OPERATING INSTRUCTIONS

P O W E R O N:

To turn balancer on, move ON/OFF switch on back of balancer base to "ON" position. Three "BEEP" tones show balancer computer circuits are O.K. After a few seconds warmup, display in Figure 1 will show.

N O T E: If a display message is different than shown in this normal operation section, refer to "ERROR MESSAGES" in the back of this manual.

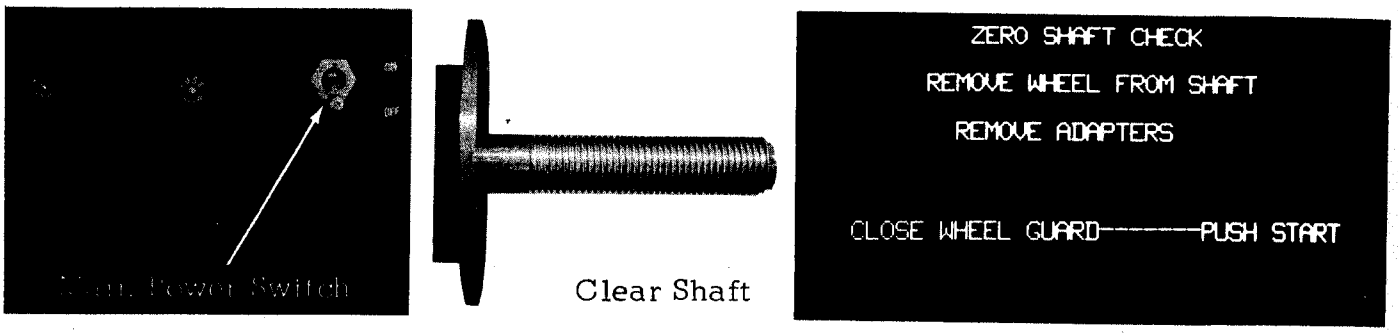


FIGURE 1. POWER ON

S T A R T I N G (Zero Shaft Check):

Zero Shaft Check occurs each time balancer is turned on.

1). Make sure stub shaft is tightly mounted. See "Stub Shaft" on Page 15.

2). Remove wheel, any accessories, cone and wheel nut from shaft. Close the tire shield.

3). Push Start Button. Display shows Figure 2 while balancer is running. When shaft stops, display in Figure 3 will be shown.

N O T E:
If a new balancer is being started for the first time, or if new batteries for the computer memory have been installed, perform the calibration procedure on Page 17 before balancing.

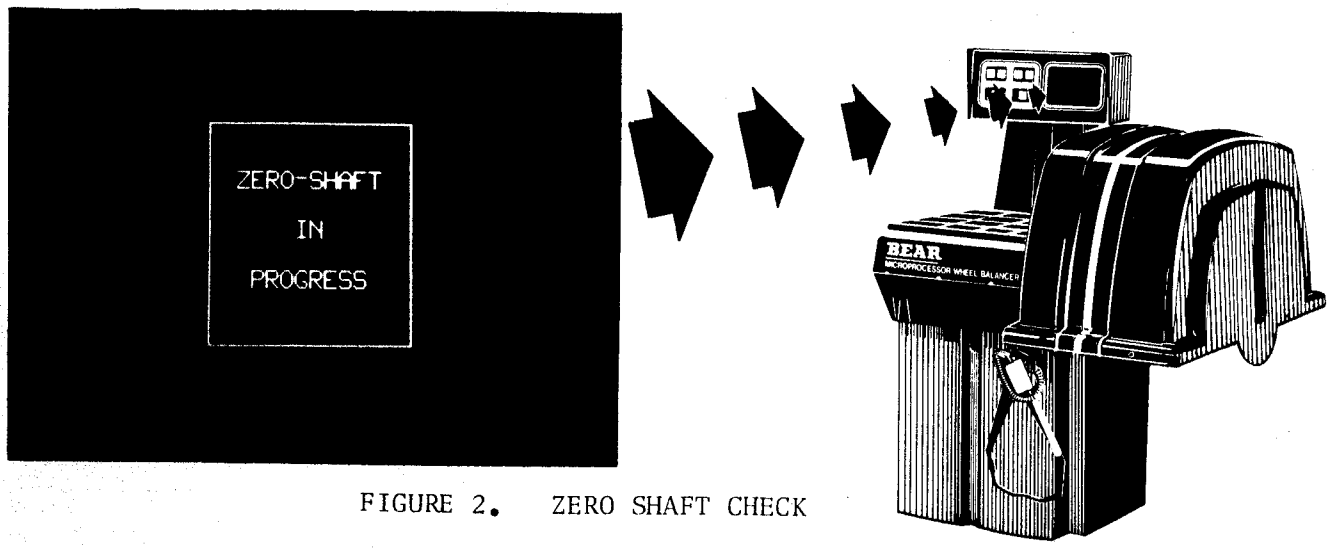


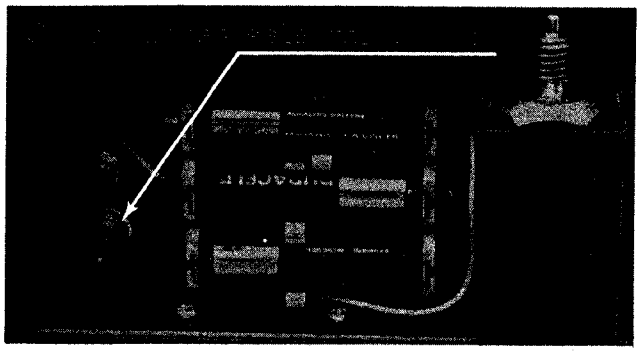
FIGURE 2. ZERO SHAFT CHECK

AUTO INPUTS:

On start-up, the "Auto Inputs" all display zero and the mode arrow shows "AUTO". To select a different mode, see "Mode Selection" on page 12.

The AUTO mode is for standard dynamic (two plane) wheel balancing. It points out size and placement of the weight needed on each side of the rim.

Select the Grams/Ounces switch position matching the type of weights available.



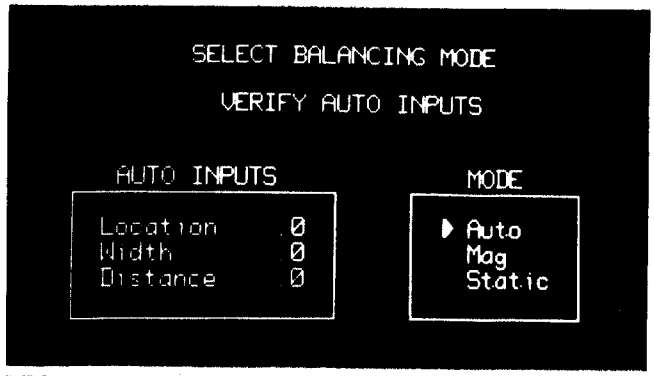
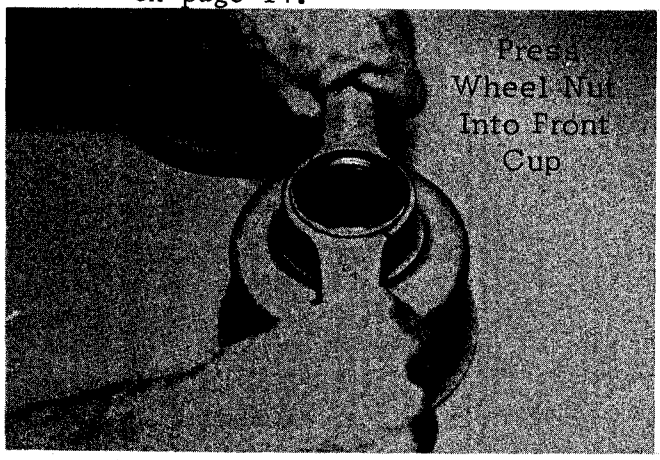


FIGURE 3. AUTO INPUTS

REVERSE CONE WHEEL MOUNTING:

Reverse cone mounting is recommended for most standard steel wheels. If a different method is desired for special wheels, refer to "Front Cone Wheel Mounting" on page 13, or "Universal Stud Adaptor Mounting" on page 14.



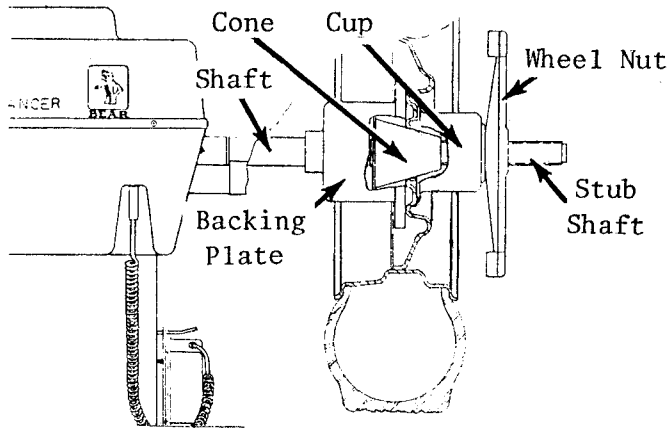


FIGURE 4. REVERSE CONE MOUNT

1). Mount cone onto shaft with wide base against backing plate. Coil spring comes permanently installed inside backing plate.

2). Mount wheel on shaft. Slide wheel until wheel center hole centers on cone.

3). Attach cup to wheel nut. Do Not use protective rubber rings on front cups when balancing normal steel wheels. The rings are for protection on highly finished wheel surfaces only.

4). Push wheel nut and cup over balance shaft until it rests against the rim. Tighten wheel nut securely by hand or rubber mallet.

BEFORE BALANCING:

1). Tire beads must be properly seated.
2). Correct inflation is essential.
3). Inspect for weaknesses or bulges in side walls.
4). If tires or rims are out of round, bent or not true running, replacement might be necessary.
5). Inspect hub and center hole for damage.
6). Right size tire must be mounted on rim.
7). Remove old weights.
8). Free tire of excess dirt.
9). Clear tread of stones.
10). Check for loose material inside tire. Loose material will cause changing balancing readings.

ENTER LOCATION AND DISTANCE:

Move distance arm until the guide touches against edge of the rim used for attaching weights. Refer to Figure 5. Both location and distance are measured at the same time. These readings will be displayed and a "BEEP" rings out. For example, if distance arm measures 15.3 inches Location and 4.8 inches in Distance, the Auto Inputs chart on the display will show these readings (Figure 5.).

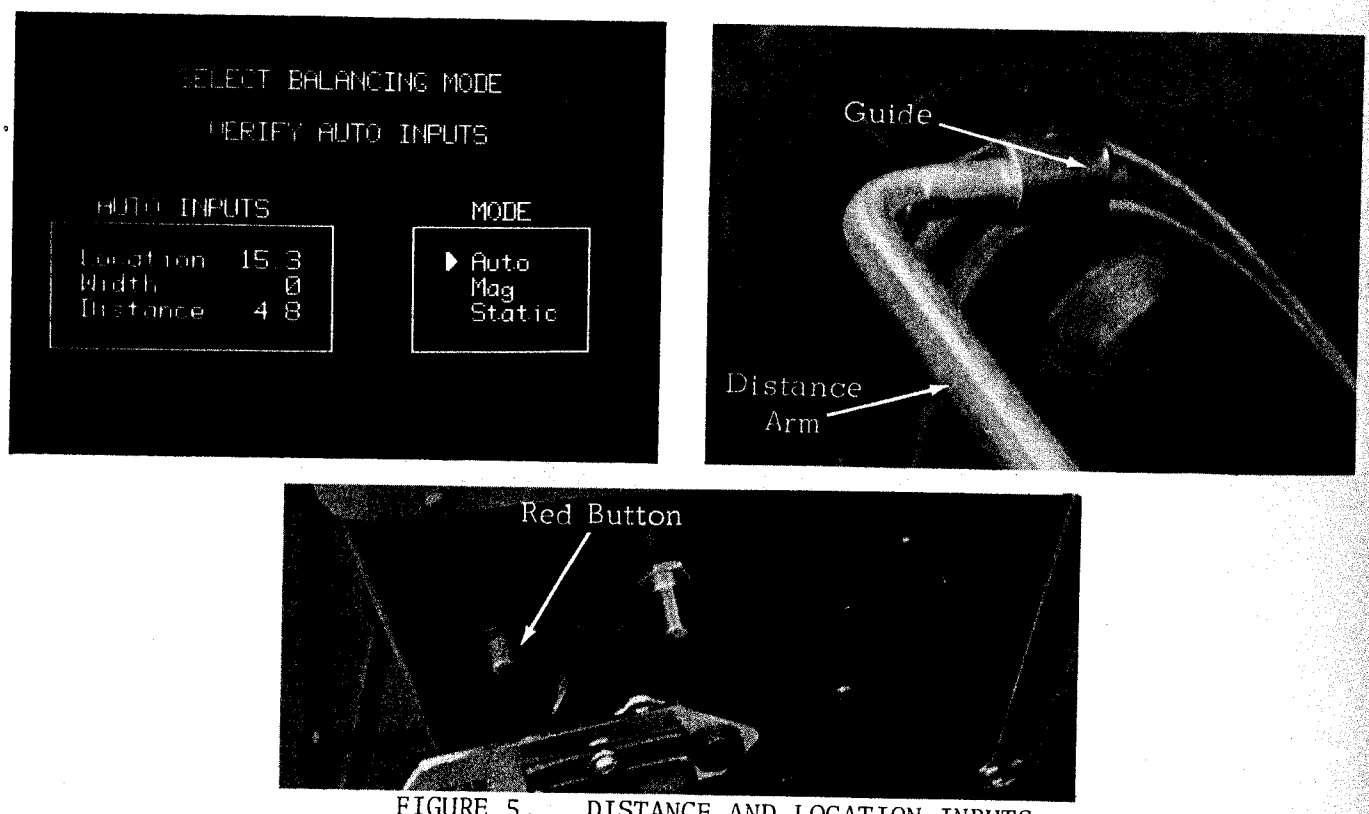


FIGURE 5. DISTANCE AND LOCATION INPUTS

Location and Distance can be entered again by pushing distance arm all the way in toward weight tray and repeating original measuring procedure.

Location and Distance may also be entered by placing the distance arm tip on rim. Press red button (on right side of base) when distance arm is correctly placed on rim.

Push Distance Arm all the way in toward weight tray. Balancer will not spin with Distance Arm extended.

ENTER WIDTH:

Use calipers to measure width of rim. Caliper jack must be inserted into plug on upper right front of base. Place calipers against rim like any ordinary balancer calipers. Position caliper tips as shown in Figure 6.

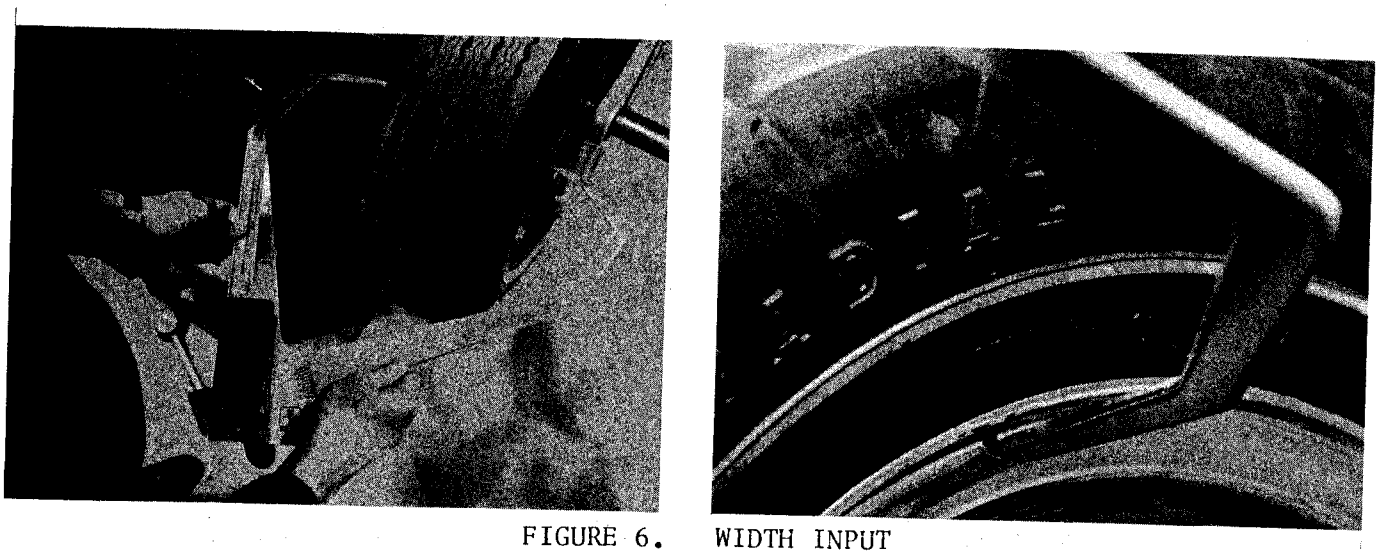


FIGURE 6. WIDTH INPUT

Press caliper tapeswitch. Width reading will be displayed, followed by a "BEEP". The example shown in Figure 7 displays a 6.3 inch rim width.

NOTE: Width measurement is the width used to determine weight placement, and will be different from the numbers provided on the tire or wheel. If the reading appears to be in error, repeat entering rim width.

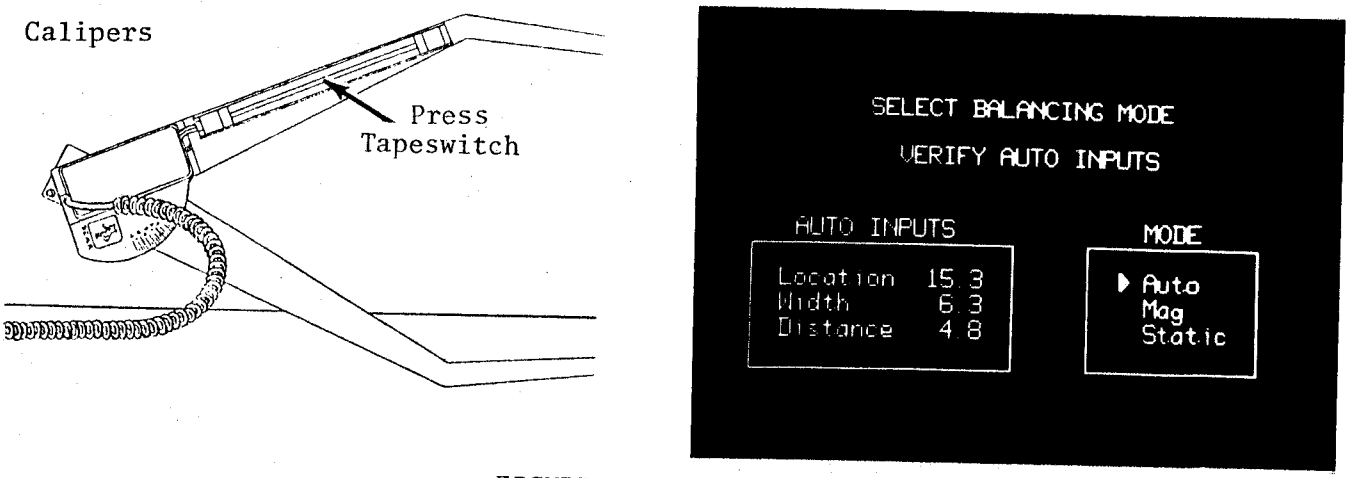


FIGURE 7. INPUTS "OK"

Replace Calipers on Peg.

Balancer saves the input numbers until new measurements are made, or until the power switch is shut-off.

BALANCING:

1). Lower the tire shield.

2). Press "Start" Button. Display shows Figure 8 until weight measurement is complete.

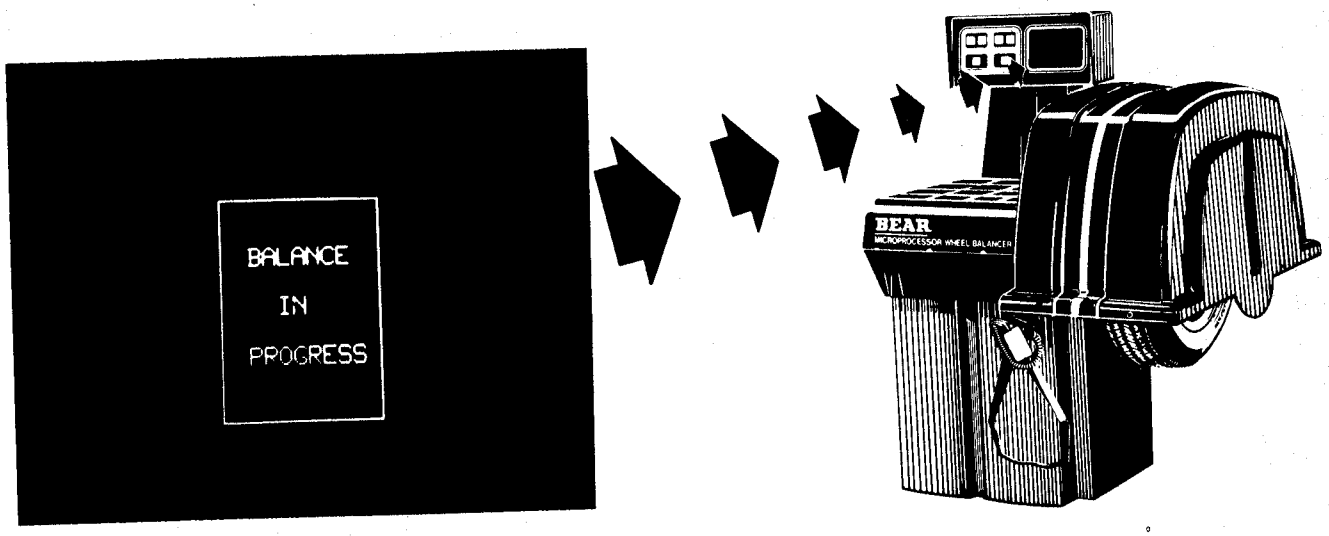


FIGURE 8. BALANCING IN PROGRESS

After spin, display shows weight or weights needed. Refer to the example in Figure 9. If display shows "OUT OF BALANCE WEIGHT TOO LARGE" message, refer to "ERROR MESSAGES" in the back of this manual.

3). Raise the tire shield. The display shows weight location pointers. Refer to the example in Figure 10.

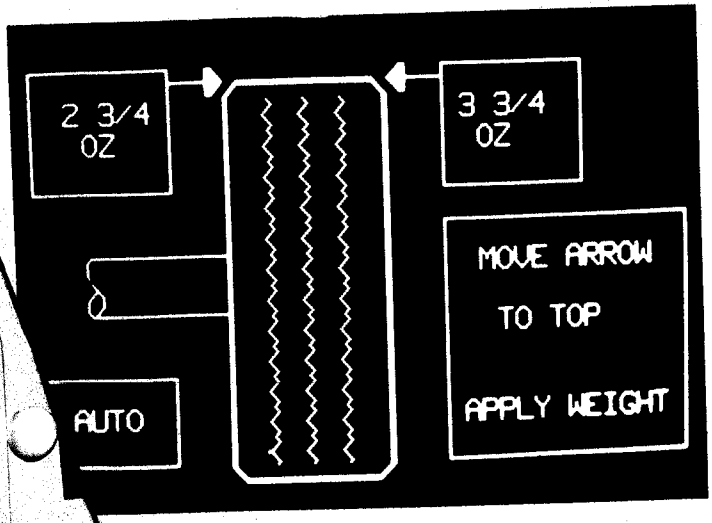


FIGURE 9. WEIGHT DISPLAY

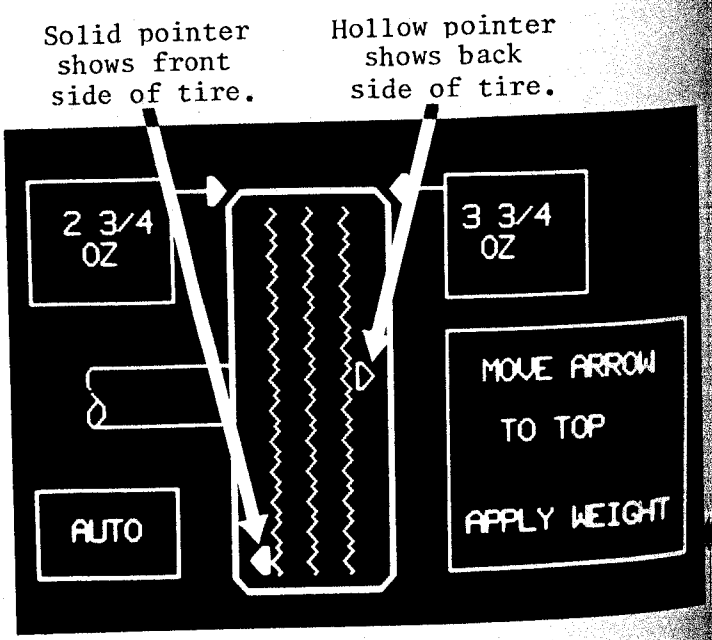


FIGURE 10. LOCATION ARROWS

ATTACHING WEIGHT:

1). Rotate tire until either pointer lines up with arrow from weight box. Balancer brake will hold wheel when either the inner or the outer pointer reaches top of tire on the display.

2). Select the weight in the weight box shown by pointer. Apply the weight to the correct side of the wheel, at the top, or 12 o'clock position.

3). Push wheel or press red button (right side of balancer) to release brake.

4). Rotate tire until other pointer lines up with other weight box arrow.

5). Select the weight in the weight box shown by pointer. Apply the weight to the correct side of the wheel, at the top, or 12 o'clock position.

Balancing is completed.

If very high accuracy (smaller than a 1/4 oz. out of balance) is desired, refer to the "Fine Balancing" on page 15.

CHECK SPIN:

1). If check spin is desired, lower tire shield. Push "Start" button.

If balancing weights and their positions are accurate, "OK" will appear in upper boxes. Screen displays Figure 11. If weights appear in upper boxes, balancing must be repeated.

2). Remove wheel from balancer.

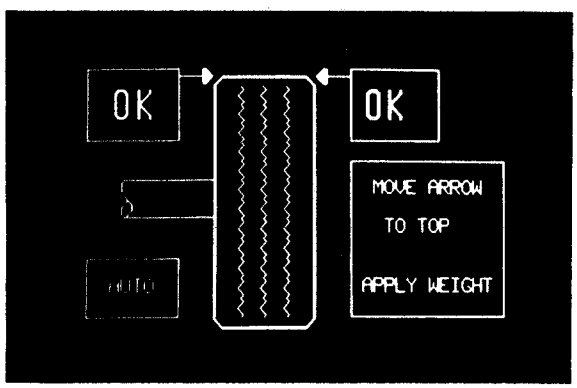


FIGURE 11. GOOD BALANCE

MERCHANDISING SIGN

Press "Clear" button to place sales message on display.

SPECIAL CONDITIONS

MODE SELECTION:

The display will agree with the chosen balancing mode, "AUTO", "MAG", or "STATIC"

"AUTO" displays a pointer and a weight for each side.
"MAG" shows one pointer and a single weight for the inside.
"STATIC" shows pointers together, with the proper weights to be applied to the inside and to the outside of the wheel.

The "AUTO" mode is for most standard dynamic (two plane) wheel balancing. It performs a dynamic balance and points out size and placement of the weight needed on each side of the rim.

N O T E: Adhesive Weights - To enter Auto Inputs for precision dynamic (two plane) balancing with adhesive weights, the distance arm guide and the caliper tips should be placed exactly on the wheel surface where the weight is to be applied.

The "MAG" mode is a fast and accurate form of single weight static balancing, for stylized wheels using one hidden weight for appearance reasons. This mode shows placement of a single weight on the inner side (hidden) of the rim. For Auto Inputs, the distance arm guide needs to be placed on the surface on the wheel where the weight is to be applied.

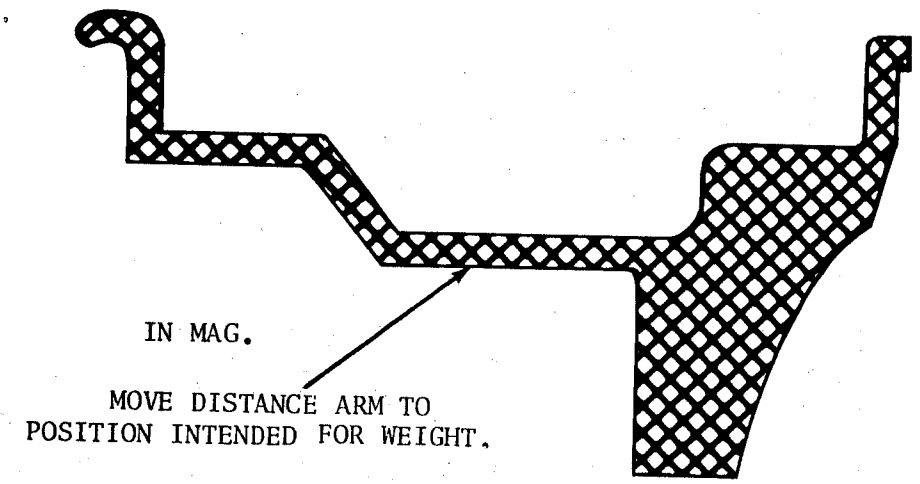


FIGURE 12.

The "STATIC" mode balances wheels by providing equal weight placement on both the inside and the outside of rim. It is equal to a bubble balance, but very fast and accurate. For Auto Inputs, the distance arm guide needs to be placed on the surface on the wheel where the weight is to be applied. Static balancing is used to correct for heavy spots centered on the tread or heavy spots covering the width of the tread, conditions sometimes found on recapped tires.

"STATIC" may also be used as a step to reducing extreme dynamic imbalance (over 8 oz.) found during balancing in the "AUTO" mode. In such cases, "STATIC" balance may be used before balancing in the "AUTO" mode.

SPECIAL CONDITIONS (CONT.)

FRONT CONE WHEEL MOUNTING:

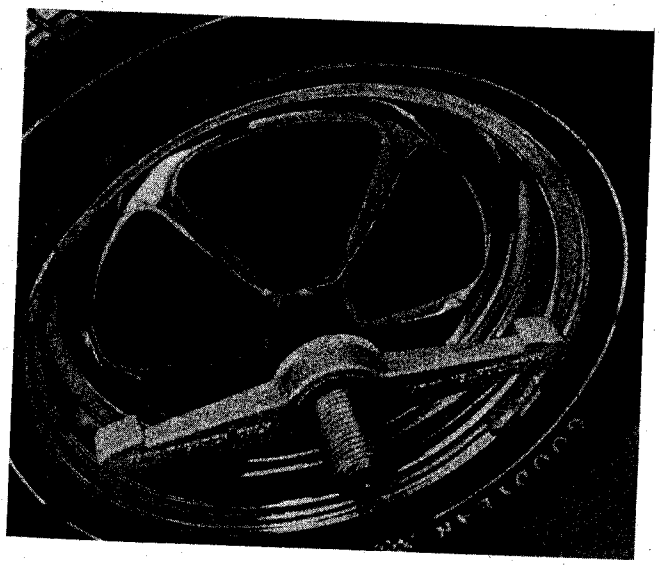
The front cone mount can be more convenient to use, depending on the rim being mounted, than the reverse cone mount.

PROCEDURE:

1). Install wheel on the shaft.

2). Fit cone, narrow end first, over the shaft and into wheel center hole.

3). Tighten with the wheel nut only (no cup used).



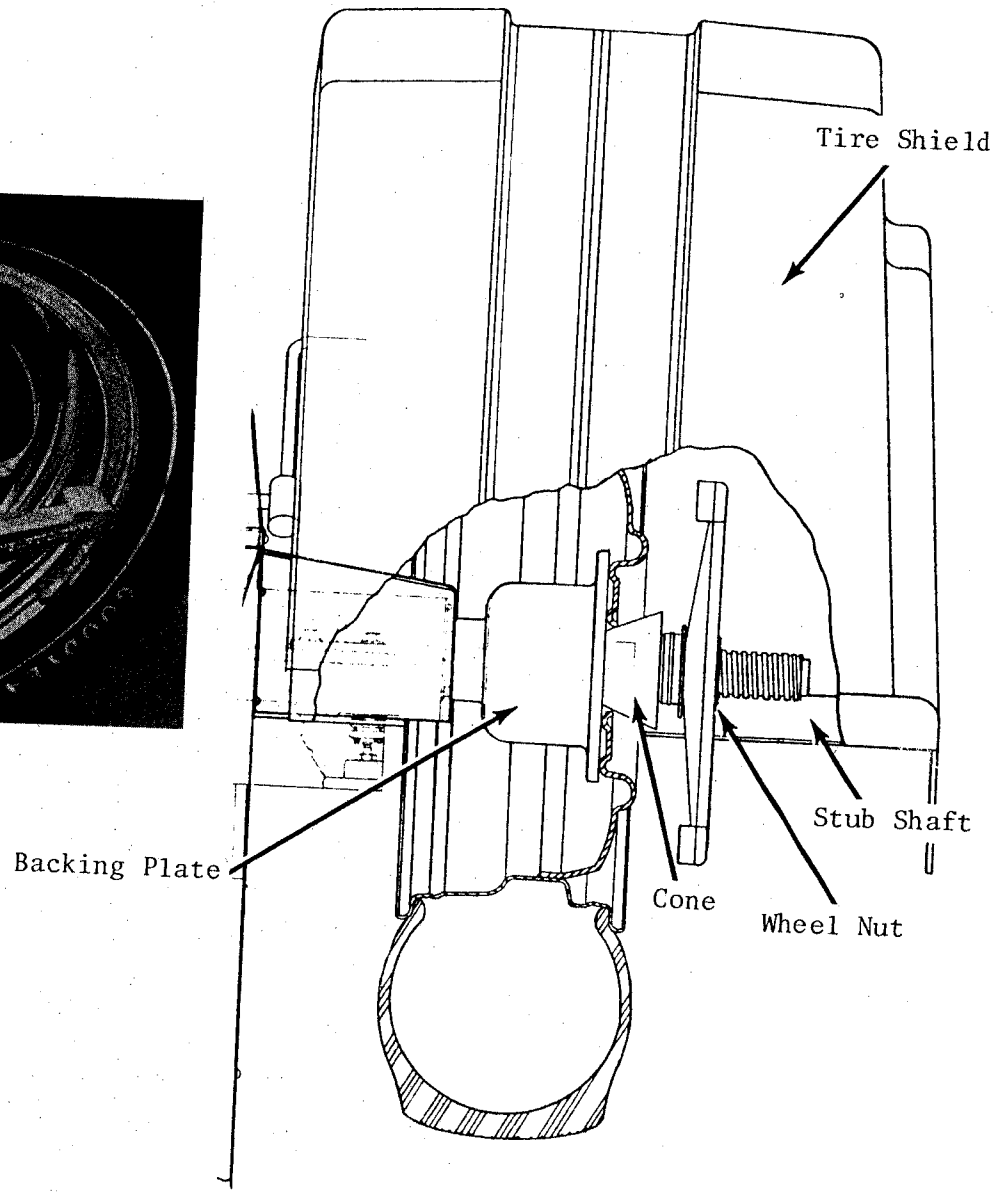


FIGURE 13. FRONT CONE MOUNTING

UNIVERSAL STUD ADAPTOR (Optional):

The universal stud adaptor is used on wheels which have unsuitable center holes for cone mounting or have no center hole at all. It is adjustable to fit three, four, five six, or eight studs. Refer to Figure 14.

PROCEDURE:

1). Remove the stub shaft. Use the shaft wrench to steady the backing plate and a one inch (26 mm) wrench, on the stub shaft end, to unscrew stub shaft. See Page 15.

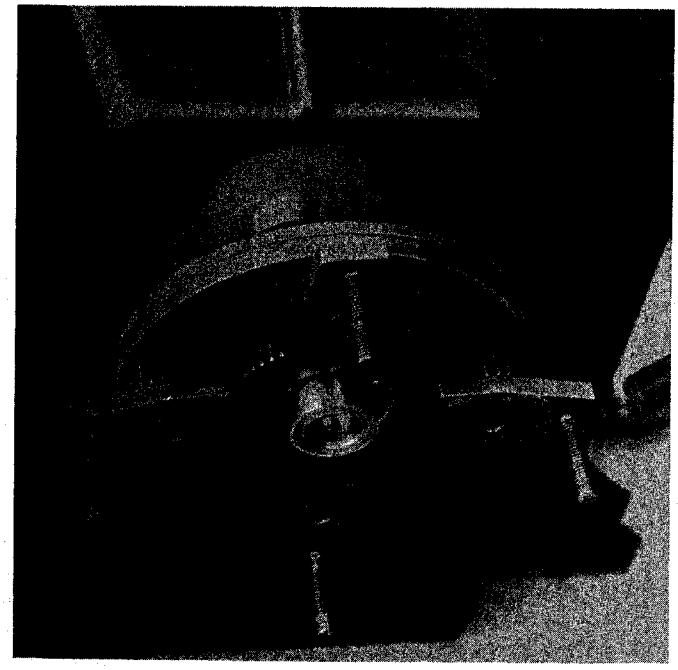
2). Set the adaptor to the right number hole setting on the back adjustments.

3). Mount adaptor onto the backing plate by inserting bolts from behind the backing plate and into the adaptor.

4). Mount the wheel and tighten adaptor nuts.

C A U T I O N: Do not use an impact wrench to tighten the lug nuts on the universal stud adapter. Lug nuts should be firmly tightened using a hand wrench.

SET FOR 4 OR 8 STUD WHEEL



SET FOR 5 STUD WHEEL

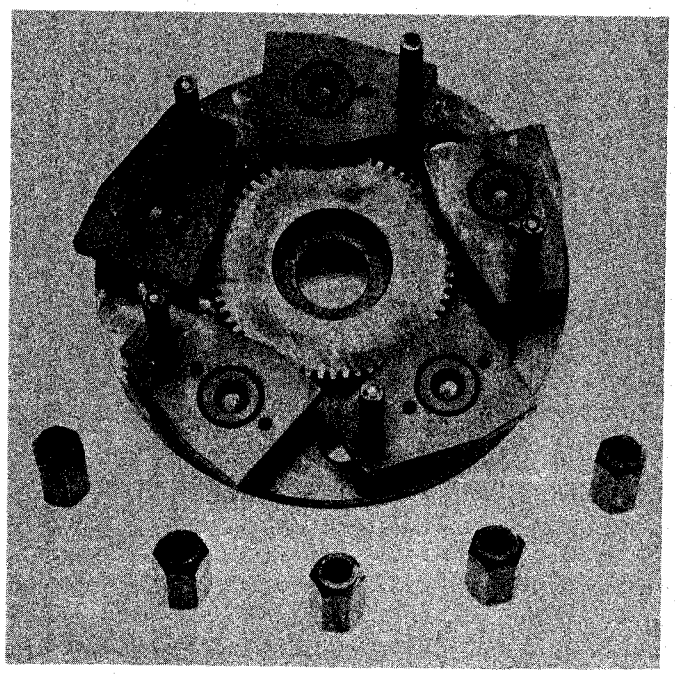
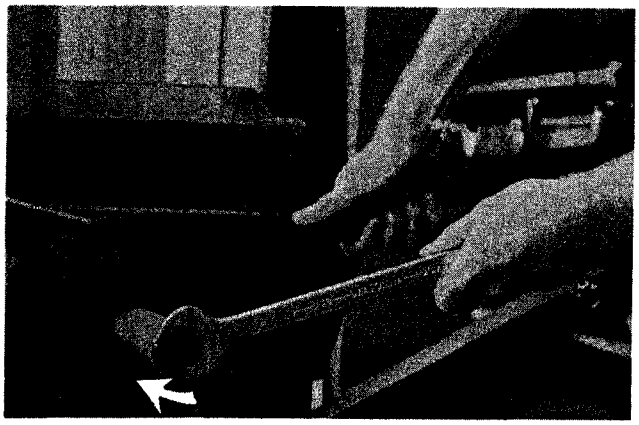


FIGURE 14. UNIVERSAL STUD ADAPTOR

SPECIAL CONDITIONS (CONT.)

STUB SHAFT:

Turn stub shaft clockwise to attach to balance shaft. Hold the backing plate and balance shaft using the shaft wrench (supplied in the parts box) while attaching or removing the stub shaft. A one inch (26 mm) wrench must be used on the rectangular end of the stub shaft to tighten it. See Figure 15.



Tightening Stub

Removing Stub

FIGURE 15. STUB SHAFT

FINE BALANCING:

A fine balancing procedure is available in all three modes. Regular balance measures within 1/4 oz. Fine balancing measures within 1/32 oz. Set for grams weight, regular balance measures within 5 gr., fine balancing measures within .75 gr. Only the sides that display OK from regular balancing can be fine balanced. See Figure 16.

PROCEDURE:

1). DO NOT LIFT TIRE SHIELD after regular balance is completed. If OK is displayed, press "START". (Balancer now calculates fine balance, but does NOT do a balancing spin.) If out of balance exceeds 1/32 oz. (.75 gr. on grams setting), a bar graph appears over the OK box. See Figure 17. The bar graph scale represents one quarter ounce (5 gr. on grams setting). Accuracy is displayed within one thirty-second of an ounce, measured between the 1/16 oz. divisions on the scale.

2). Make weight adjustments shown on scale. Bar graph scales will not appear when all out of balance is removed.

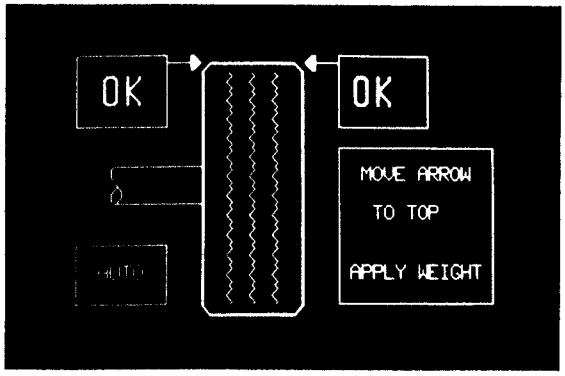


FIGURE 16. BALANCE "OK"

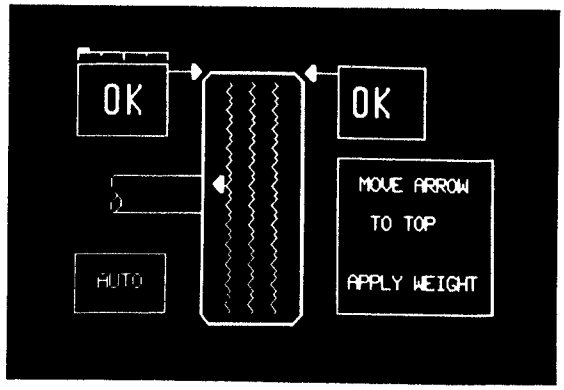


FIGURE 17. FINE BALANCE BARS

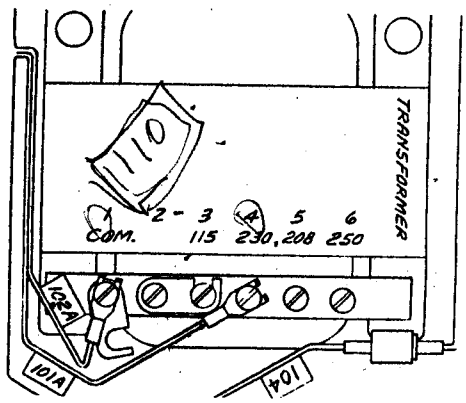
MAINTENANCE

VOLTAGE CONVERSION:

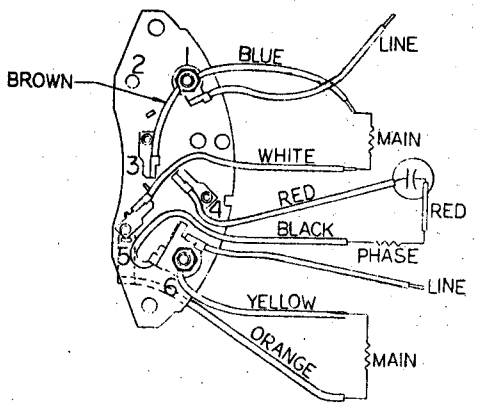
Balancer comes factory wired for 230V. These diagrams are provided for the use of a licensed electrical contractor. Be sure the balancer is installed in conformance with all local electrical codes.

C A U T I O N:

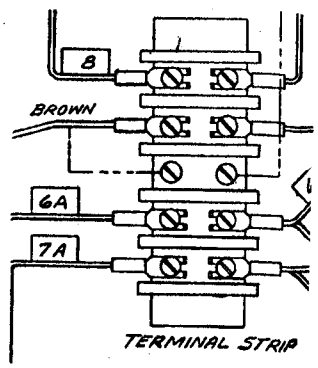
FUSES FOR 208 TO 250 VOLTAGE CONNECTION
8/10 AMPERE, 250 VOLT RATING



TRANSFORMER CONNECTIONS



MOTOR CONNECTIONS

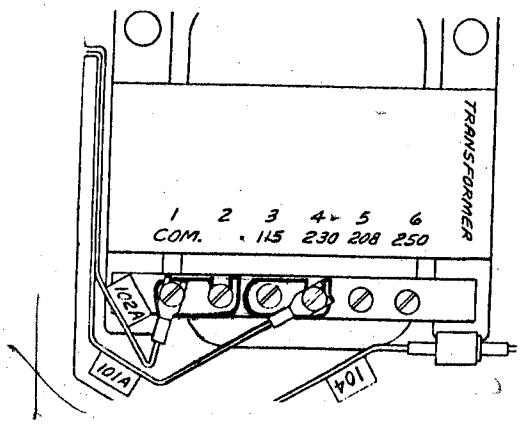


TERMINAL CONNECTIONS

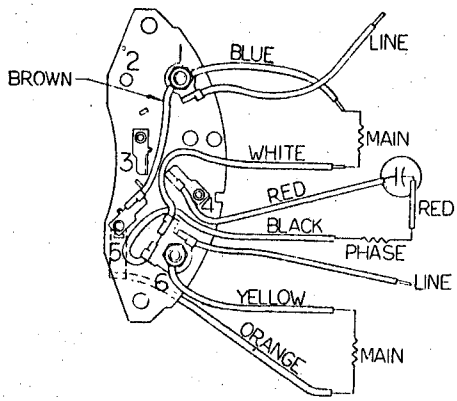
FIGURE "A" 208 TO 250 VOLT CONNECTIONS

C A U T I O N:

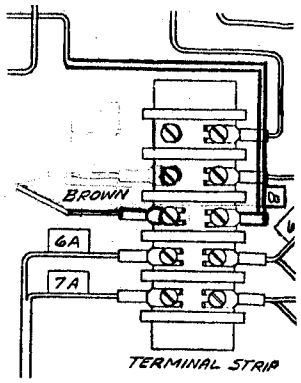
FUSE FOR 115 VOLTAGE CONNECTION
1.6 AMPERE, 250 VOLT RATING



TRANSFORMER CONNECTIONS



MOTOR CONNECTIONS



TERMINAL CONNECTIONS

FIGURE "B" 115 VOLT CONNECTIONS

MAINTENANCE (CONT.)

GENERAL:

The calibration procedure below should be performed weekly, to assure a very high degree of accuracy in balancing.

A non-abrasive, non-solvent cleaner must be used to clean the control panel and display.

Use light machine oil on shaft, wheel mounting hardware, and calipers to clean, prevent rust, and lubricate.

Periodically check the lug feet tightness to the floor.

CALIBRATION: (Perform weekly)

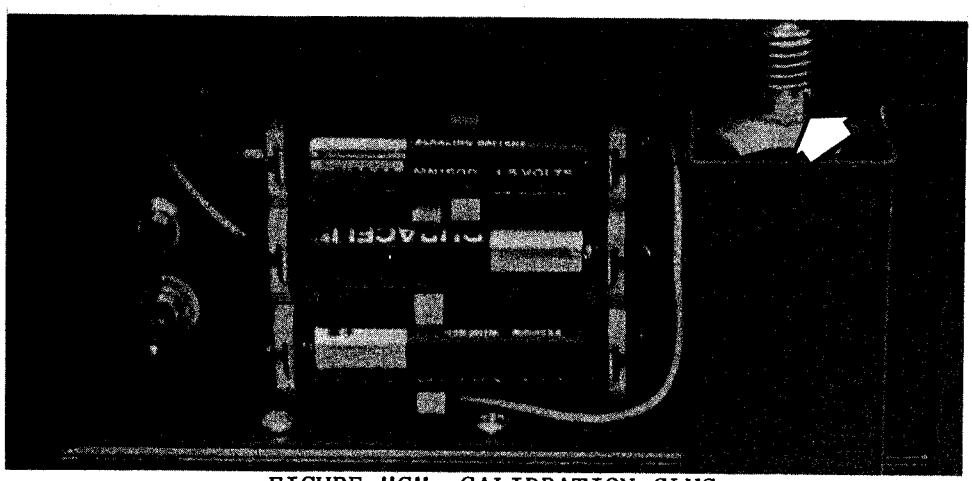
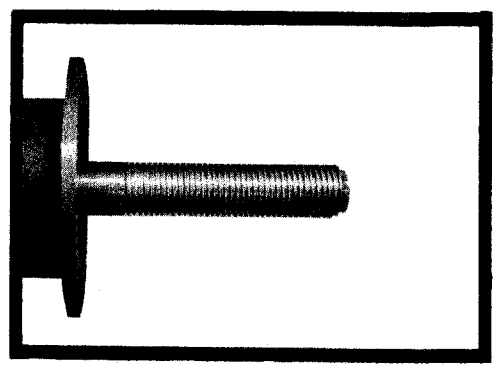


FIGURE "C" CALIBRATION SLUG

With balancer power switch in "ON" position, remove calibration slug from the slug holder on the back of the head. Calibration instructions will appear on the display:

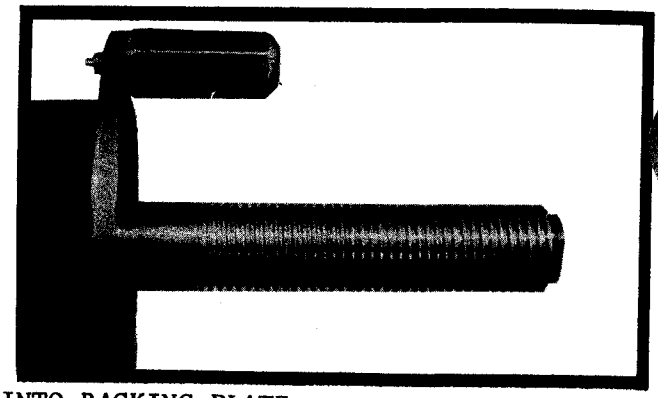


STEP -1- REMOVE TIRE AND ALL ADAPTORS

MAINTENANCE (CONT.)

COMPUTER CALIBRATION

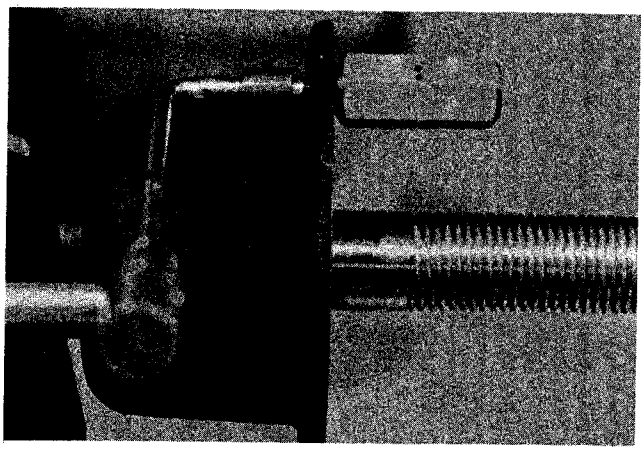
1 Remove tire and all adapters
2 Screw slug into backing plate
3 Insert distance arm into slug hole
4 Depress side button



STEP -2- SCREW SLUG INTO BACKING PLATE

COMPUTER CALIBRATION

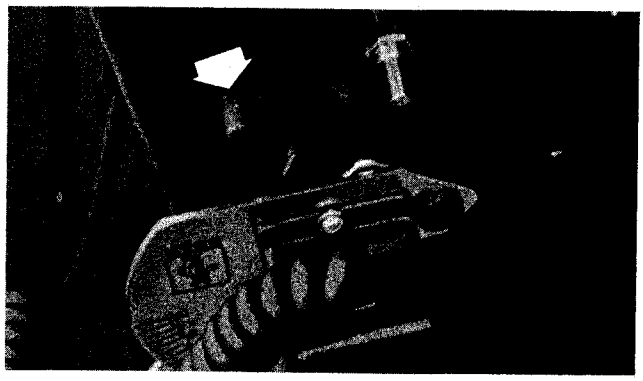
1 Remove tire and all adapters
2 Screw slug into backing plate
3 Insert distance arm into slug hole
4 Depress side button



STEP -3- INSERT DISTANCE ARM INTO SLUG HOLE

COMPUTER CALIBRATION

1 Remove tire and all adapters
2 Screw slug into backing plate
3 Insert distance arm into slug hole
4 Depress side button



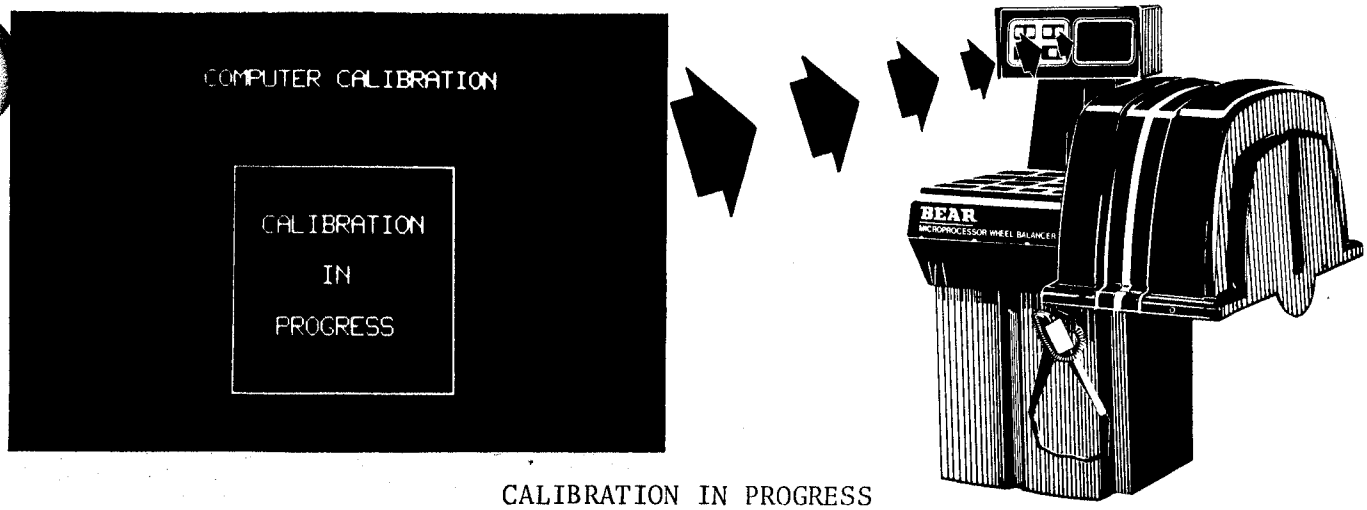
STEP -4- DEPRESS SIDE BUTTON

COMPUTER CALIBRATION

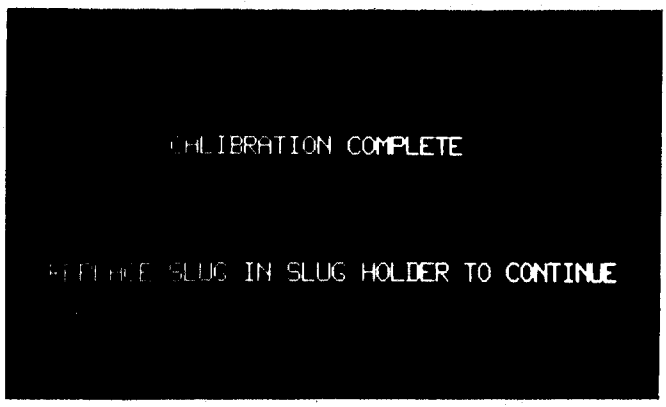
5 Retract distance arm
6 Lower tire shield
7 Push START

STEPS -5- -6- -7- RETRACT ARM, LOWER SHIELD, PRESS START

MAINTENANCE (CONT.)



CALIBRATION IN PROGRESS



When "CALIBRATION COMPLETE" appears on the display, place the calibration slug back in its holder. Balancer is ready for normal operation.

CALIBRATION COMPLETE

B A T T E R Y R E P L A C E M E N T:

When the Error Message "- BATTERY ERROR -" shows, the batteries powering the memory storage for calibration information are no longer usable.

1). Turn the balancer main power switch off.

2). Remove the old batteries from the holder in the back of the head. Replace them with new alkaline long life batteries, following the + and the - signs on the battery holder.

3). Perform the calibration procedure shown on Page 17.

B R A K E

Brake should be adjusted when it takes more than five seconds to stop a 15" wheel, or if brake pad rubbing affects shaft speed. Brake speed can be timed with a stop watch from the instant brake engages (indicated by a relay click near the end of a spin cycle) until wheel is completely stopped.

BRAKE ADJUSTMENT

The brake adjustment is reached through the hole in the side panel, under the balancer shaft.

1). Turn balancer power switch to "OFF" position.

2). To TIGHTEN brake, use a 1/2" socket wrench and extension to turn brake adjusting nut clockwise until balancer shaft does not turn using hand pressure on the backing plate. Turn adjusting nut counter-clockwise 1/4 turn to release shaft. Remove wrench and spin balance a tire, using normal safety precautions. Observe stopping time. Adjust again if necessary.

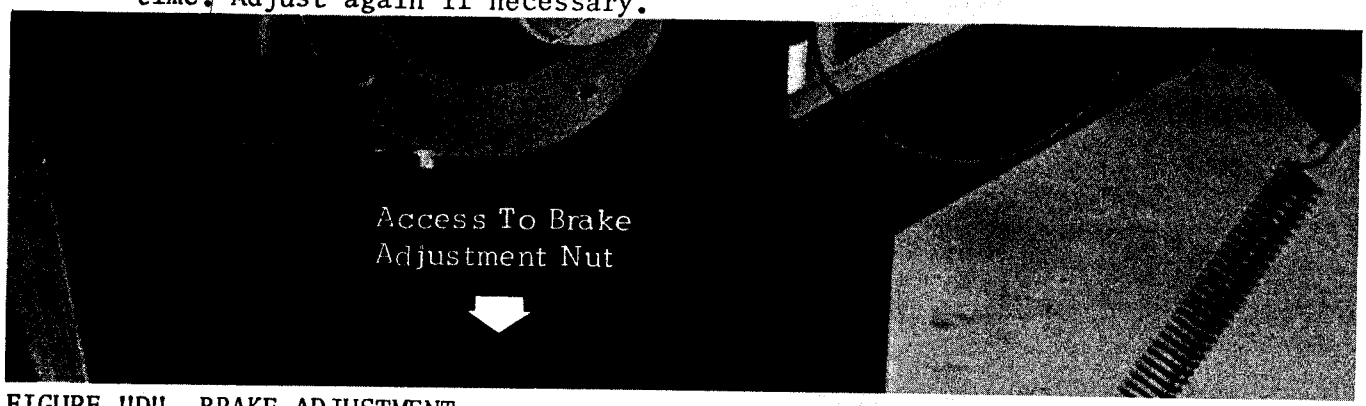


FIGURE "D" BRAKE ADJUSTMENT

CALIPER REPLACEMENT:

If the caliper gauge or cord is damaged, width entry can still be done by using the controls above the caliper hanging bracket. The caliper jack must be unplugged from the balancer. Turn the input pot while repeatedly pressing the red entry button next to it . . . while observing the display. When the display value matches the known width of the wheel, width entry is complete. Proceed to normal balancing.

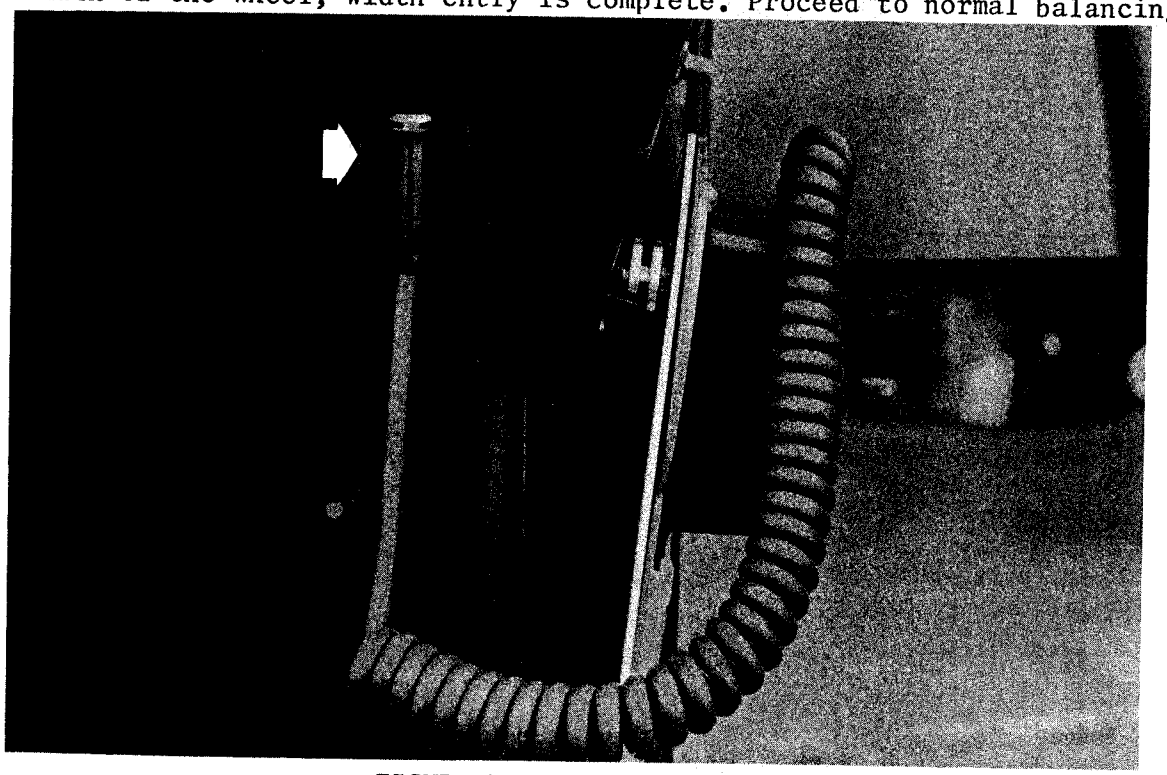


FIGURE "E" CALIPER JACK

TROUBLESHOOTING

ERROR MESSAGES:

MESSAGE: SHAFT SPEED PROBLEM - CALL SERVICE

CAUSE . . .
Dragging brake, contaminated or worn belt, voltage or motor problems.

Brake adjustment may fix this problem without a service call. Refer to "Brake Adjustment" on Page 20. If problem continues, call authorized serviceman.

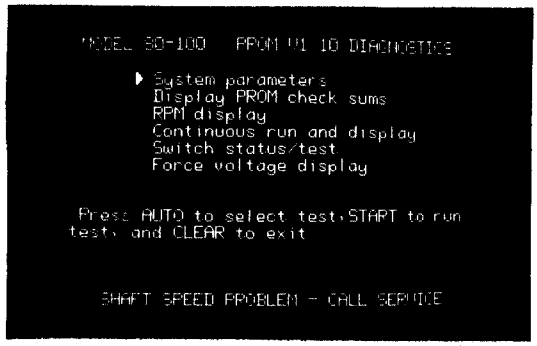


FIGURE "F" SHAFT SPEED PROBLEM

MESSAGE: CALIPER PROBLEM

CAUSE . . .
Caliper plug not fully inserted or caliper cable damaged.

FIGURE "G" CALIPER PROBLEM

MESSAGE : OUT OF BALANCE WEIGHT TOO LARGE

CAUSE . . .
Imbalance exceeds 8 ozs.

To correct, balance tire using "Static" mode; follow with normal "Auto" mode balancing.

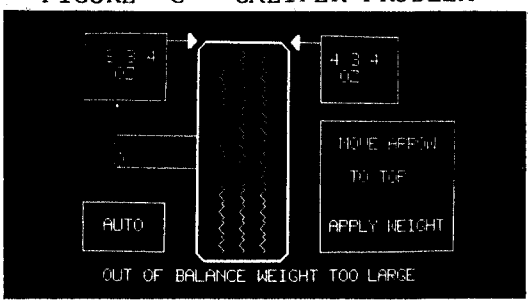


FIGURE "H" OUT OF BALANCE

MESSAGE: MOTOR IS OVER TEMPERATURE
CAUSE . . .

Motor overheated.

To correct, stop using balancer for a short period of time, then resume normal operation.

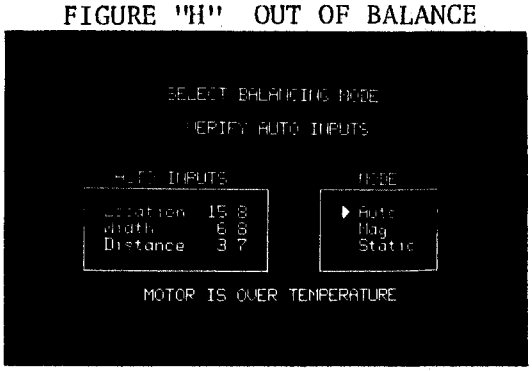


FIGURE "I" MOTOR OVERTEMPERATURE

MESSAGE: - BATTERY ERROR -

CAUSE . . .
Calibration data storage batteries not good.

To correct, replace batteries (refer to "Maintenance" section), and perform calibration.

FIGURE "J" BATTERY ERROR

TROUBLESHOOTING (CONT.)

MESSAGE: BAD SHAFT ENCODER. SEE SERVICE MANUAL

CAUSE . . . Serious problem

To correct, problem requires authorized serviceman repair

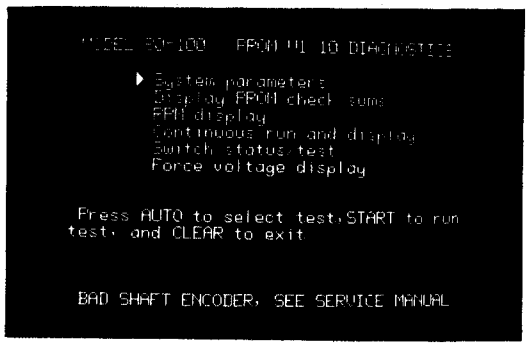


FIGURE "K" BAD SHAFT ENCODER

MESSAGE: FAST SHAFT/MISSED SLOT ERROR

CAUSE . . . Serious Problem

To correct, problem requires authorized serviceman repair

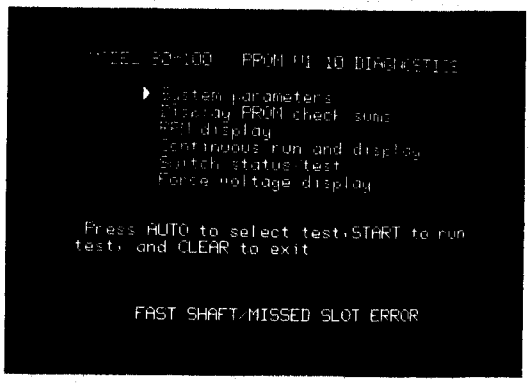


FIGURE "L" FAST SHAFT/MISSED SLOT