

⚠️ WARNING

PLEASE READ THE ENTIRE CONTENTS OF THIS MANUAL PRIOR TO INSTALLATION AND OPERATION. BY PROCEEDING YOU AGREE THAT YOU FULLY UNDERSTAND AND COMPREHEND THE FULL CONTENTS OF THIS MANUAL. FORWARD THIS MANUAL TO ALL OPERATORS. FAILURE TO OPERATE THIS EQUIPMENT AS DIRECTED MAY CAUSE INJURY OR DEATH.

REV A 05/28/2013

P/N 5900192

INSTALLATION AND OPERATION MANUAL

MODEL DST-64T WHEEL BALANCER

FOR BALANCING
AUTOMOBILE,
MOTORCYCLE
& LIGHT TRUCK
TIRES / WHEELS



READ FIRST



Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.

Keep this operation manual near the machine at all times. Make sure that ALL USERS read this manual.

SHIPPING DAMAGE CLAIMS

When this equipment is shipped, title passes to the purchaser upon receipt from the carrier. Consequently, claims for the material damaged in shipment must be made by the purchaser against the transportation company at the time shipment is received.

BE SAFE

Your new Ranger balancer was designed and built with safety in mind. However, your overall safety can be increased by proper training and thoughtful operation on the part of the operator. DO NOT operate or repair this equipment without reading this manual and the important safety instructions shown inside.



1645 Lemonwood Dr.
Santa Paula, CA. 93060, USA
Toll Free 1-800-253-2363
Tel: 1-805-933-9970
Fax: 1-805-933-9160
www.rangerproducts.com

Table of Contents

Operator Protective Equipment	2
Definition of Hazard Levels	3
Owner's Responsibility	3
Safety Instructions/Cautions	4
Before You Begin	
Receiving /Unpacking and Set Up	5
Electrical Requirements	5
Floor and Space Requirements	5
Anchoring the Balancer	5
Standard Accessories	6
Specifications / Features	6
Installation and Setup	
Installation of the Display	6
Mounting the Hood	7
Installing the Threaded Shaft.	7-8
Installing the Outer Gauge Arm	8
Initial Start-Up	8
AUTO HOOD START: Enable / Disable	8
Balancer Overview	
Determining the Planes	9
Control Panel and Display	9
Selecting Weight Positions	
FUNCTION Button Operation	10
GRAM / OUNCE Selection	10
MM / INCH Selection	10
Mounting Wheels	
Front Cone Mounting	11
Rear Cone Mounting	11
Dual Cone Mounting	11
Balancing Instructions	
Inputting Wheel Data Automatically.	12
Inputting Wheel Offset & Wheel Diameter.	12
Inputting Wheel Width	13
Inputting Wheel Data Manually	13
Spin Mode / Dynamic & ALU	14
Spin Mode / Static 1 & Static 2	14
Spin Mode / ALUS Exact Two Plane.	15
Spin Mode / HID (Hidden Weight).	16
Rechecking The Balance	17
STOP BUTTON / Identifying Remaining Weight	17
After Balance Vibration Problems	17
Maintenance and Calibration	
Trouble Shooting.	18
Weight Location Verification.	19
Calibration Procedure	19
Distance Slide Calibration Procedure	19-20
Outer Gauge Arm Calibration Procedure	20
Error Codes	21
Parts Breakdown	22-29
Tire & Wheel Data.	30-31



Failure to follow danger, warning, and caution instructions may lead to serious personal injury or death to operator or bystander or damage to property.

Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.

For additional copies
or further information, contact:
BendPak Inc. / Ranger Products
1645 Lemonwood Dr.,
Santa Paula, CA. 93060
1-805-933-9970
www.rangerproducts.com



OPERATOR PROTECTIVE EQUIPMENT

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



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH IF NOT FOLLOWED COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS AND CAN CAUSE PERSONAL INJURY OR DEATH. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE THIS MACHINE.



DEFINITIONS OF HAZARD LEVELS

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



DANGER!

Watch for this symbol. It means: Immediate hazards which will result in severe personal injury or death.



WARNING!

Watch for this symbol. It means: Hazards or unsafe practices which could result in severe personal injury or death.



CAUTION!

Watch for this symbol. It means: Hazards or unsafe practices which may result in minor personal injury or product or property damage.

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

WARRANTY!

Ranger® Wheel Service Equipment is warranted for one year on all operating components to be free of defects in material and workmanship. Ranger Products® shall repair or replace at their option for the warranty period those parts returned to the factory freight prepaid which prove upon inspection to be defective. Ranger Products® will pay labor costs for the first 12 months only on parts returned as previously described. These warranties do not extend to defects caused by ordinary wear, abuse, misuse, shipping damage, improper installation or lack of required maintenance. This warranty is exclusive and in lieu of all other warranties expressed or implied. In no event shall BendPak Inc. / Ranger Products be liable for special, consequential or incidental damages for the breach or delay in performance of the warranty. BendPak Inc. / Ranger Products reserves the right to make design changes or add improvements to its product line without incurring any obligation to make such changes on product sold previously. Warranty adjustments within the above stated policies are based on the model and serial number of the equipment. This data must be furnished with all warranty claims.

OWNER'S RESPONSIBILITY

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

- Follow all installation instructions.
- Make sure installation conforms to all applicable Local, State, and Federal Codes, Rules, and Regulations; such as State and Federal OSHA Regulations and Electrical Codes.
- Carefully check the unit for correct initial function.
- Read and follow the safety instructions. Keep them readily available for machine operators.
- Make certain all operators are properly trained, know how to safely and correctly operate the unit, and are properly supervised.
- Allow unit operation only with all parts in place and operating safely.
- Carefully inspect the unit on a regular basis and perform all maintenance as required.
- Service and maintain the unit only with authorized or approved replacement parts.
- Keep all instructions permanently with the unit and all decals on the unit clean and visible.

READ FIRST



Do not operate this machine until you read and understand all the dangers, warnings and cautions in this manual.

IMPORTANT SAFETY INSTRUCTIONS! READ BEFORE OPERATING UNIT!

- Protective goggles, safety glasses, or a face shield must be worn by the operator. Care should be taken to see that all eye and face safety precautions are followed by the operator. **ALWAYS WEAR SAFETY GLASSES.**
- Keep guards and safety features in place and in working order.
- Wear proper protective clothing. Safety toe, non-slip footwear and protective hair covering to contain hair is recommended. Do not wear loose clothing, or jewelry when operating the balancer.
- If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
- Do not disable hood cover operation, or in any way shortcut safety controls and operations.
- Be sure that all wheels are mounted properly, the hub nut engages the arbor for not less than four turns, and the hub nut is firmly tightened before spinning the wheel.
- Read and understand this manual before operating.
- Be sure the balancer is properly connected to the power supply and electrically grounded.
- Do not operate damaged equipment or if the power cord is cut or worn.
- Keep work area clean and well lighted. Cluttered and/or dark areas invite accidents.
- Avoid dangerous environments. Do not use power tools or electrical equipment in damp or wet locations, or expose them to rain and moisture.
- Avoid unintentional starting. Be sure the balancer is turned off before servicing.
- Disconnect the balancer before servicing.
- Use only manufacturer's recommended accessories. Improper accessories may result in personal injury or property damage.
- Repair or replace any part that is damaged or worn and that may cause unsafe balancer operation. Do not operate damaged equipment until it has been examined by a qualified service technician.
- Never overload or stand on the balancer.
- Do not allow untrained persons to operate machinery.
- To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids.
- Adequate ventilation should be provided when working on operating internal combustion engines.
- Keep hair, loose clothing, fingers, and all parts of body away from moving parts.
- Use equipment only as described in this manual.
- Use only manufacturer's recommended attachments.



CAUTION!

DAMAGE CAUSED BY STRIKING OR HITTING THE QUICK-NUT WITH HAMMER, TIRE IRON OR HEAVY OBJECT IS NOT COVERED UNDER WARRANTY!

**KEEP ALL INSTRUCTIONS PERMANENTLY WITH UNIT
AND ALL SAFETY DECALS CLEAN AND VISIBLE !**

BEFORE YOU BEGIN

Receiving

The shipment should be thoroughly inspected as soon as it is received. The signed bill of lading is acknowledgement, by the carrier, of receipt in good condition of the shipment. If any of the goods called for on the bill of lading are shorted or damaged, **do not accept them** until the carrier makes a notation of the shorted or damaged goods on the freight bill. Do this for your own protection.

NOTIFY THE CARRIER AT ONCE if any hidden loss or damage is discovered after receipt. **IT IS DIFFICULT TO COLLECT FOR LOSS OR DAMAGE AFTER YOU HAVE GIVEN THE CARRIER A CLEAR RECEIPT.** File your claim with the carrier promptly. Support your claim with copies of the bill of lading, freight bill, invoice, and photographs if possible.

Unpacking and Setup

Handling of the machine must be performed only with an appropriate lifting device such as a forklift or pallet jack. Only personnel who are experienced and qualified on material handling procedures should handle any transportation or moving of machine.

1. Remove the carton from the pallet.
2. Remove the shipping bolts making sure to keep hands clear of all pinch points.
3. Remove straps and plastic wrap holding the hood and other components in shipping position.

NOTE:

The Accessory Box is packaged inside the Balancer. When lifting the Balancer off the pallet, remove the Accessory Box from the inside of the Balancer.



- Do not use the, face-plate, hood or threaded shaft to lift the balancer.
- Use help to remove the balancer from the pallet. The unit is heavy and the weight is not evenly distributed.
- Dropping the unit from the pallet may cause personal injury or equipment damage.

Electrical Requirements

STANDARD WIRING IS 220 VOLT 50/60Hz.

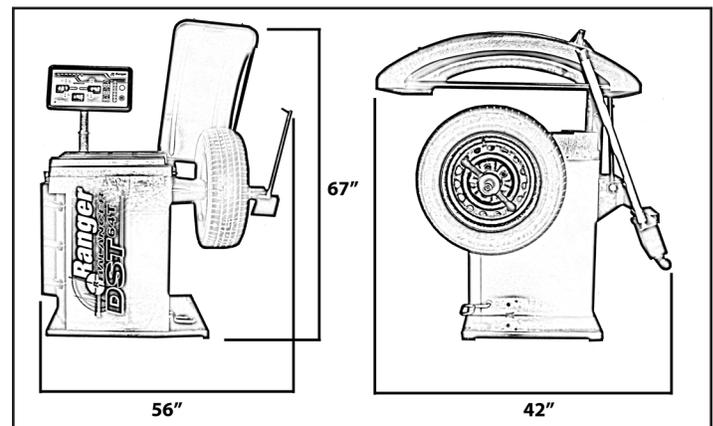
Consult a licensed electrician for electrical hook-up according to local electrical codes. Operation with no ground can damage electronics and will create a shock hazard for the operator or bystanders. Damage caused by improper electrical installation may void warranty. Most electrical codes require "hard-wiring" when machine is bolted to the floor. Consult a licensed electrician regarding specific codes.



Floor and Space Requirements

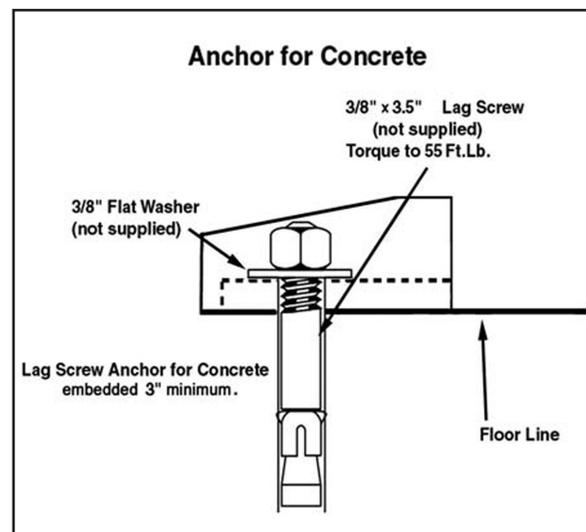
The balancer **MUST** be located on a flat floor of solid construction, preferably concrete. The balancer **MUST** sit solidly on the floor. If the balancer is not level, or is placed on an unstable floor, the balancer will not function properly and will produce inaccurate balance readings. The balancer may be bolted down. It will NOT function properly if operated on the pallet.

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



Anchoring the Balancer

The balancer can be bolted to the floor using concrete anchors through the holes in the base.



Standard Accessories

- Graduated Cone Assortment (hardened, 4-piece)
- Wheel Weight Pliers
- Rim Width / Diameter Caliper
- Quick-Release Hub-Nut
- Spacer Cup With No-Mar Ring
- Mounting Spring
- Calibration Weight
- Hex Head wrenches
- Spacer Ring
- Anchor Bolts
- Motorcycle Scale Extension
- Weight Removal Tool
- Outer Gauge Calibration Kit
- Inner Gauge Calibration Kit



Technical Data / Features / Specifications

- Motor: 1.5 HP, 208-230V, 50/60HZ 1Ph.
- Working Temperature: -5C / 27F to 50C / 82F
- Drive System: Serpentine Poly-V belt
- Cycle time: 6-12 seconds (avg.) Depending on Wheel
- Modes: 1 Dynamic / 2 Static / Multi-Variable Alloy
- Top Positioning Weight Locator: Standard
- Inside & Outside Measuring: Standard
- Millimeter / Inches Selection: Standard
- Ounce / Gram Selection: Standard
- Hidden Weight Function: Standard
- Match Mount Function: Standard
- Wheel Offset Distance Data Entry: Automatic
- Wheel Diameter Data Entry: Automatic
- Wheel Width Data Entry: Automatic
- Self-Calibration Function: Standard
- Auto Start When Hood is Lowered: Standard
- Wheel Spin Braking: Automatic / Pulse Electronic
- Wheel Restraint Pedal: Standard
- Maximum Tire Diameter: 50" / 1270 mm
- Max Tire Weight: 150 pounds (68 kg)

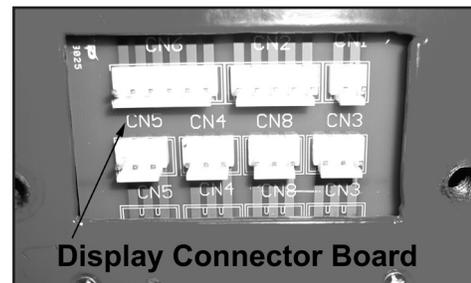
- Max. Wheel Diameter: 10" - 30" / 254 - 762 mm
- Wheel Width Capacity: 1.5" - 20" / 38 mm - 508 mm
- Balancing Increments: 0.25 or 0.01 ounce
- Balancing Speed: 180 RPM
- Accuracy: +- .5 Gram / .025 Oz.
- Resolution: (Round Off Mode) 5 Gram / .25 Oz.
- Shipping Weight: 498 pounds / 226 kg.

INSTALLATION OF THE DISPLAY

1. Locate the display assembly and carefully remove all the bubble wrap and plastic from the assembly.
2. Using a helper have them hold the display in place while you put the pin connectors in place.



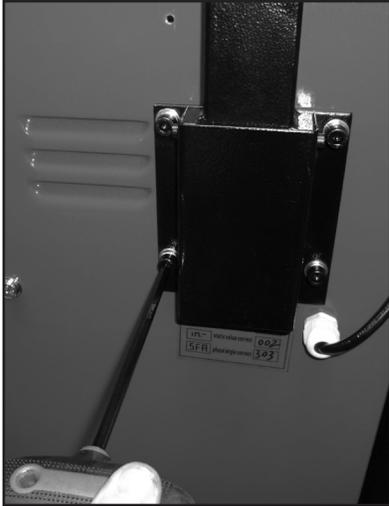
3. Locate the 2-pin connector, place this on CN1 on the display connector board.



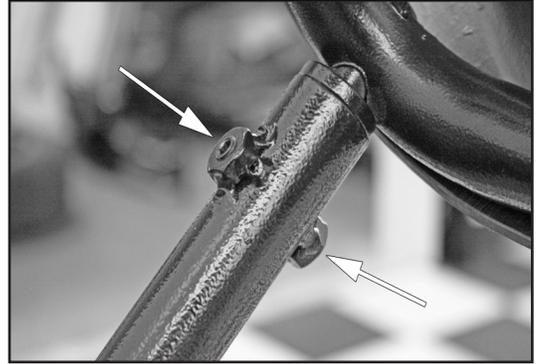
4. Locate the 5-pin connector, place this on CN2 on the display connector board.
5. Locate the 6-pin connector, place this on CN6 on the display connector board.
6. The next 4 connectors are all 3-pin connectors. These connectors have been marked to easily identify there CN number. Connect them to there matching number on the board.



- Secure the display in place using the four socket head cap screws and washers provided.

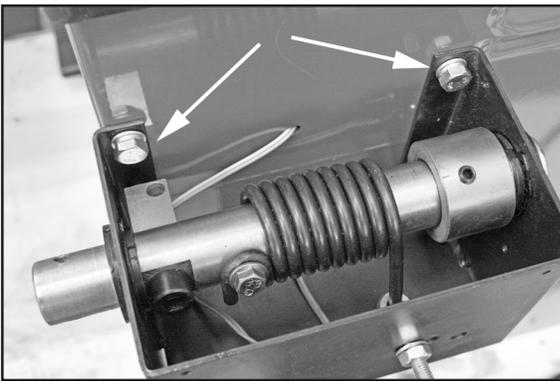


- Raise the hood and hold it up. Use help to hold the hood while attaching the hood to the Hood Arm.
- Slide the Hood Pin into the hole on the end of the hood arm and align the holes with the Allen bolts and secure in place using the two Allen set screws.

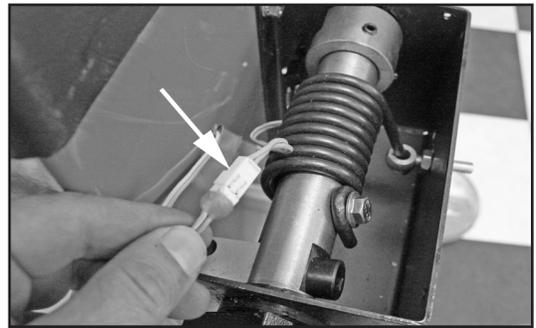


INSTALLATION AND SET UP MOUNTING THE HOOD ASSEMBLY

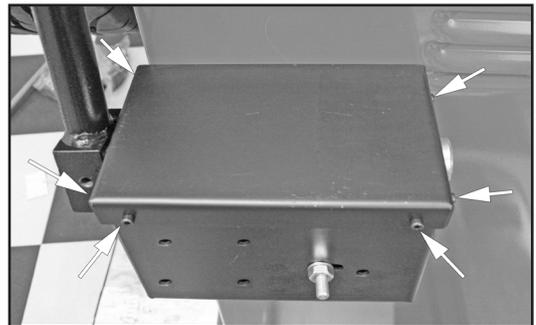
- Locate the Hood Assembly and open the accessory box and remove the Hood Mounting Bracket and hardware.
- Use help and carefully assemble the Hood as described below.
- Remove the Hood Bracket Mounting Cover and attach the Hood Mounting Bracket to the rear of the balancer cabinet using the 4 bolts and washers.



- Connect the hood switch wires as shown.



- Tuck the wire into the Hood Switch Box and install Hood Switch Box Cover and tighten Allen bolts.



- Slide the Hood Arm over the Hood Axle, align the holes in the Axle with the Allen bolts then secure in place using the two Allen set screws.

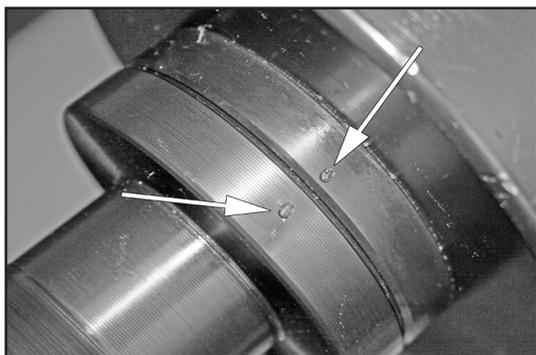


INSTALLING THE THREADED MAIN SHAFT

- Locate the Face Plate / Threaded Main Shaft and mounting bolt in the accessory box and install as shown.

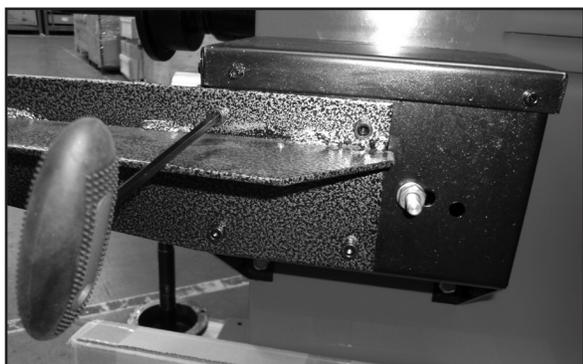


2. Locate and align the witness marks on the Face Plate and Shaft Assembly.
3. Be sure to tighten the bolt firmly. Step on the manual brake to hold the shaft while tightening the bolt.

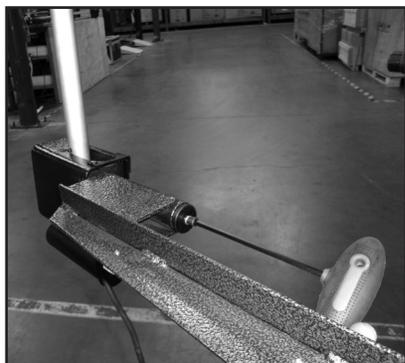


INSTALLING THE OUTER GAUGE-ARM

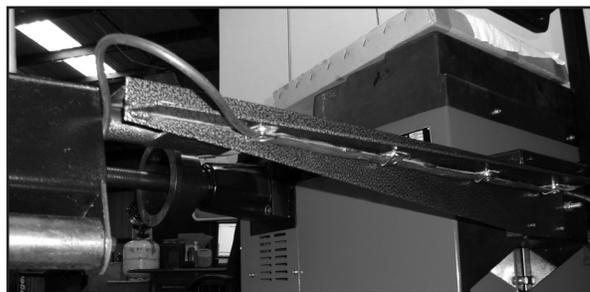
1. Locate the mounting arm for the outer gauge-arm.
2. Attach the mounting arm onto the hood switch box using the 4 provided socket head cap screws.



3. Locate and unpack the outer gauge-arm.
4. Attach the outer gauge-arm to the mounting arm using the provided socket head cap screw and washer.



5. Run the wire coming off the gauge-arm thru the clips on the underside of the mounting arm.



6. Attach the end of the wire to the connection on the back side of the balancer.



INITIAL START-UP

1. Turn the balancer ON/OFF switch to ON.
2. The LED Display will show BAL. 04
3. Mount a standard steel wheel (of a size most often balanced).
4. Lower the Hood to check the activation of the **AUTO-HOOD START**. The Main shaft should spin when the hood is lowered.
5. The threaded main shaft should spin **CLOCKWISE** when viewed straight on. If the faceplate spins counter-clockwise, turn the balancer off and consult the factory.
6. To enable/ disable **AUTO HOOD START** feature press and hold the **STOP** Button and then the **C** button.



BALANCER OVERVIEW

This machine is a two-plane, microprocessor-based computer balancer. Any imbalance in a wheel, either static or dynamic, is detected into two correction planes (the inner and outer) where corrective weights can be applied. Pressing the **F** button selects either **DYNAMIC** or **STATIC** modes and pressing the **ALU** button selects the **ALU** modes, all of which change the location of the planes.

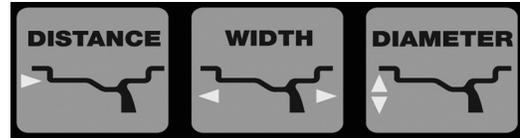
Determining the Planes

When the distance gauge is pulled out and held against the wheel flange, the distance measurement shown on the pull out slide refers to the **DISTANCE OFFSET MEASUREMENT**. This measurement tells the computer the location of the **INNER** plane of the wheel for Dynamic and/or Alloy balancing.

By using the **WHEEL CALIPERS** and / or the **OUTER GAUGE-ARM**, the wheel width or the **WIDTH MEASUREMENT** tells the computer the location of the **OUTER** plane of the wheel for Dynamic and/or Alloy balancing.

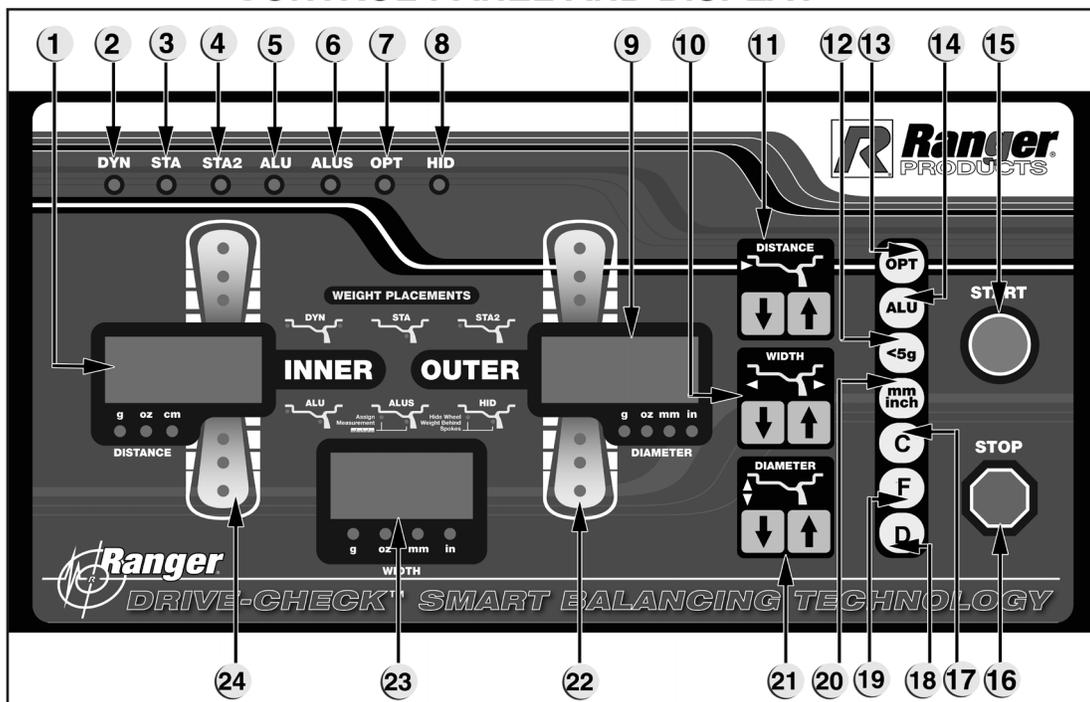
The wheel diameter will be referred as the **DIAMETER MEASUREMENT**. This is the diameter of the wheel at the weight location. You can determine the diameter of the wheel / tire on the tire sidewall to determine the wheel diameter. Or you can use the calipers. This tells the computer how far from the center of the hub the weights will be applied.

Balancing a Wheel



When a wheel is spun, the balancer detects any imbalance present. The computer calculates the weight needed to correct the imbalance and the location for weight application. The weight required to correct the imbalance is displayed on the control panel, and the weight positioning lights assist the operator in positioning the weight application location at top-dead-center. Weight displays and positioning lights are provided for both inner and outer planes of the wheel.

CONTROL PANEL AND DISPLAY



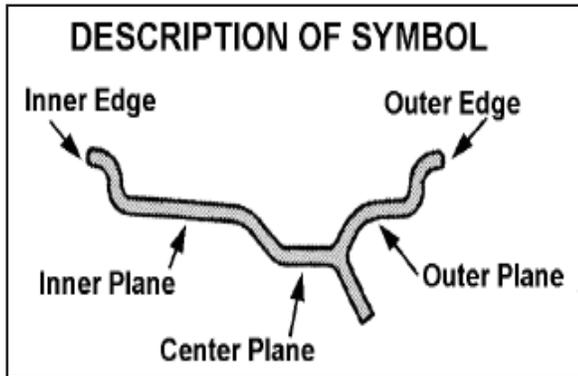
Control Panel Legend

1. Weight reading or information display window. INNER
2. DYN mode indicator.
3. STATIC 1 mode indicator.
4. STATIC 2 mode indicator.
5. ALU mode indicator.
6. ALUS mode indicator.
7. OPT mode indicator.
8. HID mode indicator.
9. Weight reading or information display window. OUTER
10. Rim WIDTH setting keys.
11. Wheel OFFSET setting keys.
12. FINE button (<5g.) for identifying remaining weight.
13. OPT button for optimizing the match of tire and rim.

14. Selector key for DYNAMIC, ALLOY and ALLOY-S modes.
15. START button for activating spin cycle.
16. STOP Button for stopping spin cycle.
17. C button for selecting G / OZ .
18. D button for running the balancers self test.
19. F button for selecting DYNAMIC, STATIC-1 & STATIC-2 modes.
20. Toggle between MM and INCH settings.
21. Rim DIAMETER setting keys.
22. OUTER weight position indicator LEDs.
23. WIDTH reading or information display window.
24. INNER weight position indicator LEDs.

SELECTING WEIGHT POSITIONS FOR DIFFERENT WHEEL TYPES

Prior to balancing, a specific function must be chosen for each particular wheel. The function settings automatically compensate weight location requirements for a particular wheel type. These settings can be selected by depressing the **F & ALU** buttons.



DYNAMIC

For balancing standard steel or alloy wheels using clip-on weights attached to Inner and Outer Edges.



STATIC 1

This function is used if stick-on weights can only be mounted on a single center plane on the wheel.



STATIC 2

This function is used if clip-on weights can only be mounted on a single inner edge on the wheel.



ALU

This function is used if clip-on weights are to be mounted to the Inner Edge of the wheel and stick weights are to be mounted to Center Plane of the wheel.



ALU S

This function is used if stick-on weights are to be mounted to both the Inner Plane and Center Plane of the wheel. The distance and width parameters are accurately defined for a more exacting weight placement, therefore improving the likelihood of a single spin balance.



HID

This function is used if stick-on weights are to be mounted to the Inner Plane and then stick-on weights are to be split and mounted behind spokes on the Center Plane of the wheel.



GRAM / OUNCE SELECTION

This machine is capable of registering **GRAM** or **OUNCE** readings. To select either **GRAM** or **OUNCE** settings, follow the procedures below.

1. First press the “**STOP**” button.



Then press the Distance  “+” Button at the same time. The weight readings will change in the **INNER** and **OUTER** windows to register the applicable setting as soon as the stop button is released.

NOTE:

When set to Ounces or Inches the displayed values contains a decimal point.

MM / INCH SELECTION

To select either **MM** or **INCH** for your wheel measurement reading push the **MM INCH** button. This will toggle between metric and standard readings.

NOTE:

When set to Ounces or Inches the displayed values contains a decimal point.

MOUNTING WHEELS

Select the most appropriate mounting method for the wheel you are balancing. Using the proper method ensures secure mounting, accurate displays and safe balancer operation. It also prevents damage to the wheel. On most wheels, the inner side of the wheel hub usually has the most uniform surface for wheel balancing. Always center the wheel by the most uniformly shaped side of the hub to achieve the most accurate balance.

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

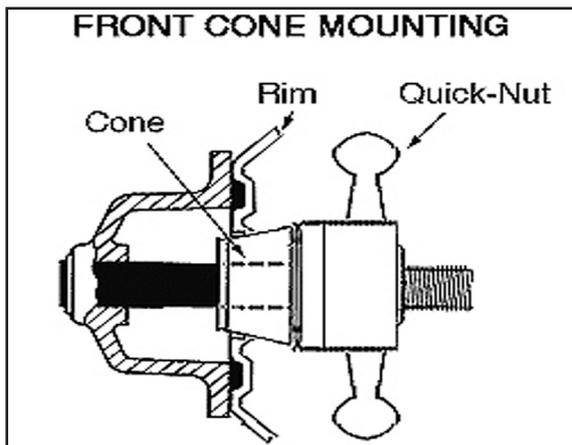


CAUTION!

DAMAGE CAUSED BY STRIKING OR HITTING THE QUICK-NUT WITH A HAMMER, TIRE IRON OR HEAVY OBJECT IS NOT COVERED UNDER WARRANTY!

Front Cone Mounting

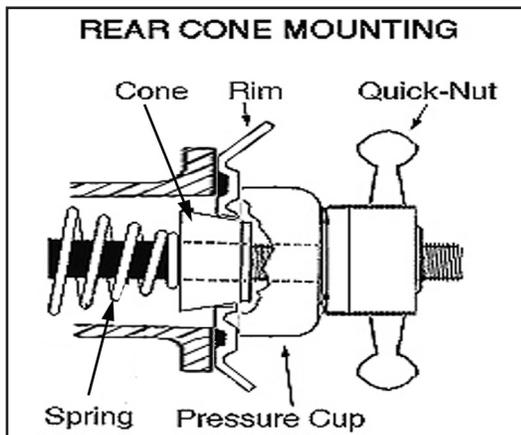
1. Front Cone Mounting is the most accurate method
2. Select the cone that best fits the center hole in the wheel.
3. Lift the wheel onto the arbor and slide it back against the arbor faceplate.
4. Slide the cone onto the arbor and into the center of the wheel. Then lift the tire to seat the cone in the center hole.
5. Spin the Quick-Nut (without the pressure cup) onto the arbor. Tighten it securely against the cone.



Rear Cone Mounting

The wheel is centered on a cone from the inner side of the hub.

1. Place the cone spring on the arbor with the large end towards the balancer.
2. Select the cone that best fits the center hole in the wheel. Slide the cone onto the arbor with the large end towards the spring.
3. Lift the wheel onto the arbor and center it on the cone.
4. Attach the pressure cup to the Quick-Nut and spin the assembly onto the arbor. Tighten securely.

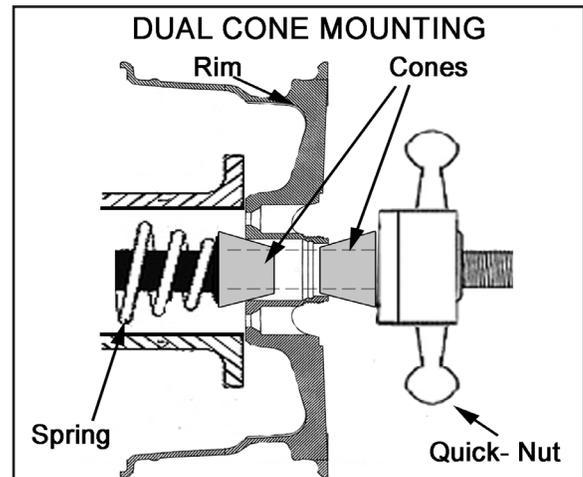


Dual Cone Mounting

Some aftermarket or OEM performance wheels have a center hole that is deep enough to allow the use of two cones to mount it to the threaded shaft. The factory recommends that dual cone mounting is used in this situation. The cones must not contact each other and a correct cone combination is critical to correctly mount a tire using this method.

(Extra centering cones are available though Ranger Products)

1. Slide the Spring onto the Arbor.
2. Select the cone combination that best fits both sides of the center hole in the wheel. (Note: You may need two cones that are identical in size)
3. Place the rear cone on the arbor and against the Spring.
4. Lift the wheel onto the arbor and slide it back against the rear cone.
5. Place the front cone on the arbor and slide it into the center hole of the wheel.
6. Spin the quick nut (without the pressure cup) onto the arbor. Tighten securely.



BALANCING INSTRUCTIONS

1. First determine which mounting method you will use for the wheel.
2. Select a centering / mounting cone that best fits the center hole of the wheel.
3. After installing the necessary mounting hardware, lift the wheel onto the threaded shaft and slide it back against the arbor hub. It will be necessary to lift the wheel slightly when positioning the cone in the center of the wheel hole.



CAUTION!

DAMAGE CAUSED BY STRIKING OR HITTING THE QUICK-NUT WITH HAMMER, TIRE IRON OR HEAVY OBJECT IS NOT COVERED UNDER WARRANTY!

4. While holding the wheel and hardware in position, thread the Quick-Nut over the arbor and secure tightly. Never hammer or hit the Quick-Nut to tighten.



WARNING!

Always make sure that the Quick-Nut engages the arbor threads by at least four (4) full turns. It helps to spin the wheel while at the same time tightening the Quick-Nut. Never exceed weight capacity of balancer! Never hammer or strike the Quick-Nut to tighten.



CAUTION!

DAMAGE CAUSED BY STRIKING OR HITTING THE QUICK-NUT WITH HAMMER, TIRE IRON OR HEAVY OBJECT IS NOT COVERED UNDER WARRANTY!



WARNING!

Do not attempt to balance wheels that are larger than the machine was designed for.

Inputting Wheel Data Automatically

Prior to balancing any wheel, specific data relating to that particular wheel must be entered into the computer. If the data displayed on the screen does not match that of the wheel you are attempting to balance then the wheel will not be accurately balanced. The three data requirements are; **Distance/Offset, Width and Diameter**.

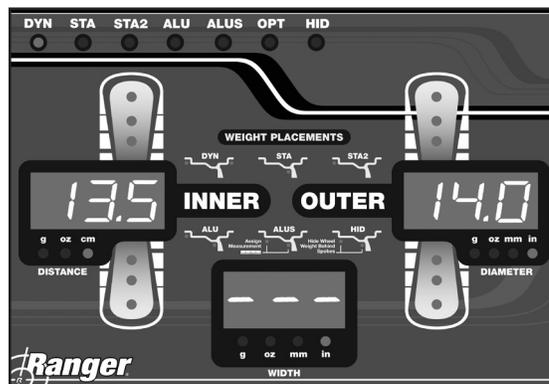
Wheel Offset & Wheel Diameter Data

DIS is the distance between the side of the balancer and the inner edge of the wheel. **DIA** is the diameter of the wheel at the rim flanges. To enter Wheel Offset & Wheel Diameter data automatically, refer to the instructions below.

1. Turn the machine on.
2. Pull the index arm out from the side of the machine until the tip touches the inner edge of the wheel, hold it there until you hear a beep.



3. The offset reading will be displayed in the inner window and the diameter reading will be displayed in the outer window.



NOTE:

If these numbers are not correct you will need to perform the distance slide calibration procedure.

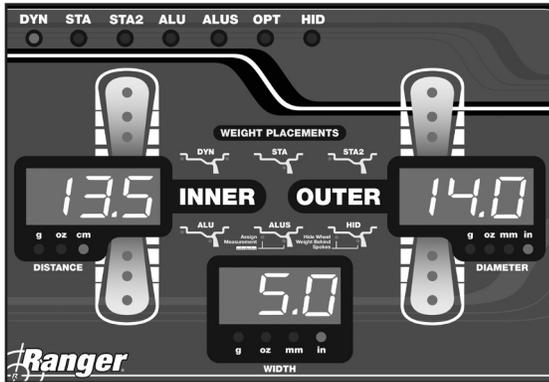
NOTE:

If the index arm is not returned to the full resting position the balancer will not spin. Make sure when not in use the index arm is always resting in its holder.

Wheel Width Data

This is the width of the wheel at the inner edges. To enter Wheel Width data refer to the instructions below.

1. Position the outer gauge arm against the outside edge of the wheel, hold it there until you hear a beep.
2. The wheel width reading will be displayed in the lower width window.



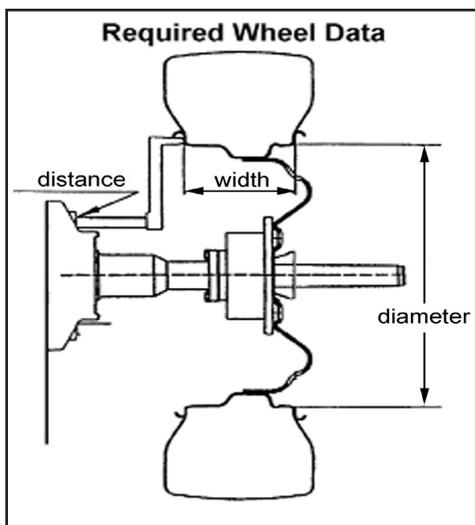
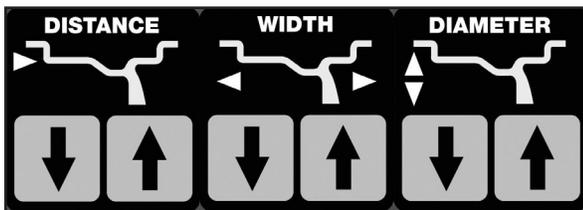
NOTE:

If this number is not correct you will need to perform the outer gauge arm calibration procedure.

Inputting Wheel Data Manually

If there ever comes a time when the automatic data input is not working correctly you can input the information manually following the steps below.

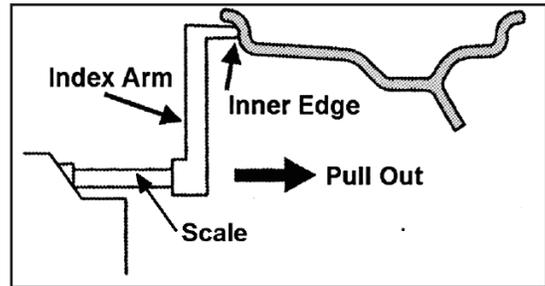
WHEEL DATA KEY BOARD



dis - Wheel Offset

This is the distance between the side of the balancer and the inner edge of the wheel. To enter Wheel Offset data refer to the instructions below.

1. Turn the machine on.
2. The offset data will be displayed in the **INNER** window.
3. Pull the index arm out from the side of the machine until the tip touches the inner edge of the wheel

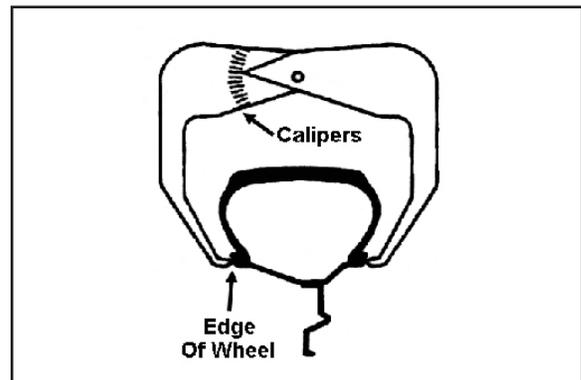


4. Read the offset measurement as displayed on the scale directly on top of the index arm. Press the corresponding + - buttons below  to enter the correct data.

L - Wheel Width

This is the width of the wheel at the inner edges. This distance is measured with the calipers. To enter Wheel Width data refer to the instructions below.

1. Position the calipers over the wheel and touch the tips against the wheel edges.



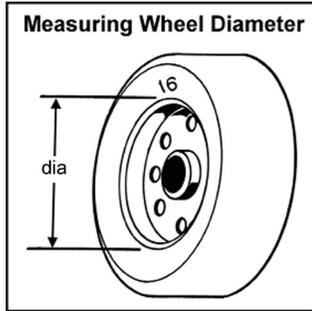
2. Read the measurement for Wheel Width shown on the calipers. (Use the proper scale for Width)
3. The width data will be displayed in the **INNER** window.
4. Press the corresponding + - buttons below  to enter the correct data.

IMPORTANT NOTE: The standard setting for this operation is shown in **INCHES**. If metric is desired, new calipers with metric readings will have to replace the calipers that accompanied the unit. (See page 10 for changing "L" reading to **MM** or **INCH** setting.)

“dia” - Wheel Diameter

This is the diameter of the wheel at the rim flanges. This measurement can be read on the tire sidewall or measured. To enter Wheel Diameter data, refer to the instructions below.

1. Read the diameter of the wheel as shown on the tire sidewall or use the Calipers to measure the wheel diameter. (Use the proper scale for Wheel Diameter)



2. The diameter data will be displayed in the lower diameter window.
3. Press the corresponding + - buttons below  to enter the correct data. (See page 10 for changing “d” reading to **MM** or **INCH** setting.)

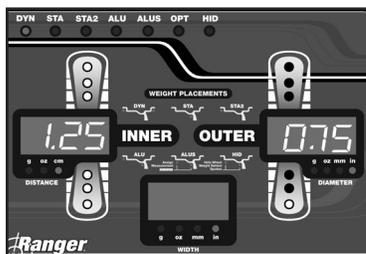
Spin Mode / DYNAMIC & ALU

1. Once the correct wheel data and **FUNCTION** have been programmed, lower the hood to begin the spin mode.

WARNING!

Before initiating the spin sequence, make sure that the Quick-Nut is secure and engaged on the arbor threads by at least four (4) full turns. Never hammer or hit the Quick-Nut to tighten.

2. After the hood is lowered, or the **START** button is depressed, the wheel will spin for approximately six seconds then stop automatically.
3. After the wheel stops, weight readings for each side of the wheel (**INNER** and **OUTER**) will appear in the center display screen.
4. Turn the wheel by hand until the weight position indicator lights on the side marked **INNER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the inner weight position.



5. Attach the specified weight for the appropriate **PLANE** position at top-dead-center.

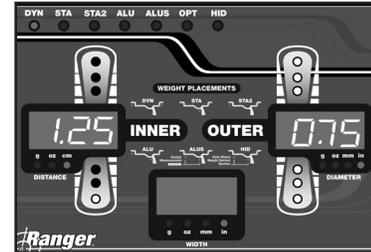
NOTE:

To hold the wheel in position when installing weights, press down on the **TIRE STOP PEDAL** located on the right side of the machine.

NOTE:

All weight positions are located at **TOP-DEAD-CENTER**. The more accurate you are in selecting the exact weight and position, the more accurate the wheel will be balanced.

6. After the **INNER** weight is properly installed, turn the wheel by hand until the weight position indicator lights on the side marked **OUTER** are fully illuminated. This indicates the position specified by the balancer for the **OUTER** weight position.



7. Attach the specified weight for the appropriate **PLANE** position at top-dead-center.

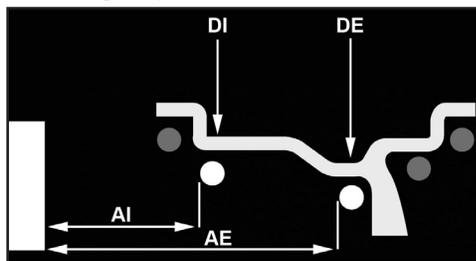
Spin Mode / STATIC 1 & STATIC 2

This function is used if weights can only be mounted on a single plane of the wheel.

1. Once the correct wheel data has been programmed, lower the hood to begin the spin mode.
2. After the hood is lowered, or the **START** button is depressed, the wheel will spin for approximately six seconds then stop automatically.
3. After the wheel stops, a weight reading will appear in the center display screen marked width.
4. Turn the wheel by hand until the weight position indicator lights on both the **INNER & OUTER** are fully illuminated.
5. This indicates the position specified by the balancer for the desired weight location on the chosen **PLANE**.
6. Attach the specified weight on the **PLANE** of the wheel at top-dead-center.

ALUS EXACT TWO PLANE MODE

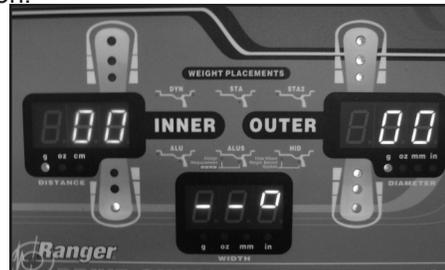
This is a mode used if stick-on weights are to be mounted to the Inner and Center plane's of the wheel. Both the distance and width parameters are accurately defined for a more exacting weight placement, therefore improving the likelihood of a single spin balance.



1. Press the **ALU** button until the light next to the **ALUS** is illuminated.
2. You can also enter the **ALUS** mode from **DYNAMIC** mode by following the steps below.
3. Pull the index arm out from the side of the machine and touch the position of the left weight position or inner plane. Wait for a beep. From the left weight position pull the index arm out to the right weight position or center plane. Wait for the beep. **ALUS** will display on the screen, return the index arm to the rest position.
4. The inner plane data will read in the **INNER** window and the center plane data will read in the center **WIDTH** window.
5. The diameter reading shown in the **OUTER** window is the diameter for the inner plane.
6. Lower the hood or press the **START** button to spin the wheel.
7. After the wheel stops, weight readings for the wheels inner plane will read in the **INNER** window and readings for the center plane will read in the **OUTER** window.
8. Turn the wheel by hand until the weight position indicator lights on the side marked **OUTER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the right weight position or center plane. Step on the foot brake.
9. Attach the specified weight for the **CENTER PLANE** position to the weight applicator at the end of the index arm.



10. Pull the index arm out to the center plane position, the center **WIDTH** window will count down for you and display --0 when you have approached the correct position.



11. Push up on the weight applicator at that position making sure the weights are fully adhered to the wheel, return the index arm to the rest position. Release the brake.

NOTE:

If the index arm is not returned to the full resting position the balancer will not spin. Make sure when not in use the index arm is always resting in its holder.

12. Turn the wheel by hand until the weight position indicator lights on the side marked **INNER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the left weight position or inner plane. Step on the foot brake.
13. Attach the specified weight for the **INNER PLANE** position to the weight applicator at the end of the index arm.
14. Pull the index arm out to the inner plane position, the center **WIDTH** window will count down for you and display --0 when you have approached the correct position.
15. Push up on the weight applicator at that position making sure the weights are fully adhered to the wheel, return the index arm to the rest position. Release the brake.

HID MODE (HIDDEN WEIGHT)

This function is designed to “hide” outer plane corrective weight by placing the required weight behind selected spokes in order to retain the esthetic appeal of the wheel.

1. Make sure you are in **ALUS** mode and all the correct parameters have been programmed, lower the hood to begin the spin mode.
2. After the hood is lowered, or the **START** button is depressed, the wheel will spin for approximately twelve seconds then stop automatically.
3. After the wheel stops, weight readings for the wheels inner plane will read in the **INNER** window and readings for the center plane will read in the **OUTER** window.
4. Turn the wheel by hand until the weight position indicator lights on the side marked **INNER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the left weight position or inner plane. Step on the foot brake.
5. Attach the specified weight for the **INNER PLANE** position to the weight applicator at the end of the index arm.
6. Pull the index arm out to the inner plane position, the center **WIDTH** window will count down for you and display --0 when you have approached the correct position.
7. Push up on the weight applicator at that position making sure the weights are fully adhered to the wheel, return the index arm to the rest position. Release the brake.

NOTE:

If the index arm is not returned to the full resting position the balancer will not spin. Make sure when not in use the index arm is always resting in its holder.

8. Press and hold the **D** and **OPT** buttons, release. This should illuminate the **HID** mode light.
9. Turn the wheel by hand until the weight position indicator lights on the side marked **OUTER** are **FULLY ILLUMINATED**.
10. Press the **ALU** button.
11. Make sure the **OUTER** marks are still **FULLY ILLUMINATED**. Pull the index arm out to the center plane position, use a piece of tape or something else to make a mark at the position where the weight should be.
12. Stand on the hood side of the balancer facing the outer edge of the wheel, move the spoke that is to the left of that mark to top deed center.

13. Press the **ALU** button.
14. Return to the hood side of the balancer, now move the spoke that is to the right of the mark to top deed center.
15. Press the **ALU** button.
16. Turn the wheel by hand until the weight position indicator lights on the side marked **OUTER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the first spoke position. Step on the brake.
17. Attach the specified weight displayed in the **OUTER** window to the weight applicator at the end of the index arm.
18. Pull the index arm out to the center plane position, the center **WIDTH** window will count down for you and display --0 when you have approached the correct position.
19. Push up on the weight applicator at that position making sure the weights are fully adhered to the wheel, return the index arm to the rest position. Release the brake.
20. Again turn the wheel by hand until the weight position indicator lights on the side marked **OUTER** are **FULLY ILLUMINATED**. This indicates the position specified by the balancer for the second spoke position. Step on the brake.
21. Attach the specified weight displayed in the **OUTER** window to the weight applicator at the end of the index arm.
22. Pull the index arm out to the center plane position, the center **WIDTH** window will count down for you and display --0 when you have approached the correct position.
23. Push up on the weight applicator at that position making sure the weights are fully adhered to the wheel, return the index arm to the rest position. Release the brake.
24. Lower the hood, the wheel will spin for approximately twelve seconds then stop automatically.
25. The machine will automatically switch back to **ALUS** mode.
26. After the wheel stops, weight readings for the wheels inner and center planes should be zero.

Rechecking the Balance

After installing the weights in the proper positions, lower the hood or press **START** to begin the spin mode. The weight display windows should display **0 -- 0** to indicate a perfect balance.

If the balancer indicates that an additional weight is required in the same position as the first weight, then the first weight installed was not heavy enough. Install a new weight or add additional weight to the same area. Re-spin the wheel and check again.

If the balancer indicates that an additional weight is required opposite the position as the first weight, then the first weight installed was too heavy. Correct the first weight and re-spin the wheel.

If the balancer indicates that an additional weight is required in a different position as the first weight, then the first weight was installed in the wrong position. Correct the first weight and re-spin the wheel and check again.

IDENTIFYING REMAINING WEIGHT

Your balancer is set to read **0 -- 0** if the wheel is balanced within 5 grams on either side. If you wish to see what remainder is left on each side (less than 5 grams) press the **FINE** button.

After pressing the **FINE** button, residual weight readings will appear in the display windows.

STOP BUTTON

The **STOP** button **IS** an emergency stop button. It will immediately shut down the shaft and wheel rotation. For emergency situations that require immediate shutdown of rotation, it is recommended that you use the **STOP** button and the **TIRE STOP PEDAL** located on the right-front side of the unit.



After Balance Vibration Problems

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

1. A weight has come off the wheel. Remove the other weights from the wheel and rebalance.
2. Tire slippage on the wheel. Remove and remount the tire using proper tire lubricant and inflate to 40 PSI. Do not over-inflate. Rebalance the wheel and reduce air pressure to recommended PSI.
3. Stones or other foreign objects caught in the tire tread.

Remove the objects and repair tire as necessary. Check and rebalance if needed. If the balancer still indicates the

wheels are balanced to within 5 grams on both inner and outer displays, the problem is not in the balance of the wheels. Check the following possible sources of vibration:

1. Tire pressure. Bring all tires up to the recommended PSI.
2. Radial or lateral runout in the tire or wheel. Replace the damaged part.
3. Foreign material inside the tire. Remove the tire from the wheel, remove the material, and remount. Remove wheel weights and rebalance the wheel.
4. Imbalanced wheel covers or trim rings. Remove the wheel covers or trim rings and test drive, balance the wheel with the wheel cover or trim ring attached to the wheel.
5. Incorrectly mounted wheel. Remount correctly.
6. Damaged wheel bolt holes. Replace wheel.
7. Worn universal joints. Replace as required.
8. Drive shaft imbalanced or damaged. Balance, repair, or replace.
9. Imbalanced brake rotor(s) or drum(s).
10. Suspension out of alignment. Align the vehicle and replace any damaged or worn parts.

TROUBLE SHOOTING GUIDE.

Perform the following checks if you are experiencing balancing problems.

PROPER INSTALLATION / ASSEMBLY

Confirm that the balancer is bolted down. Confirm the location and alignment of the witness marks on the Face Plate and Shaft Assembly. (See Page 8.)

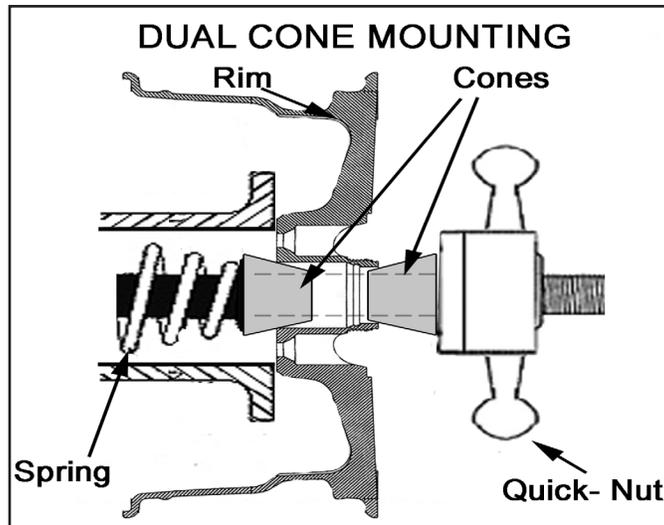
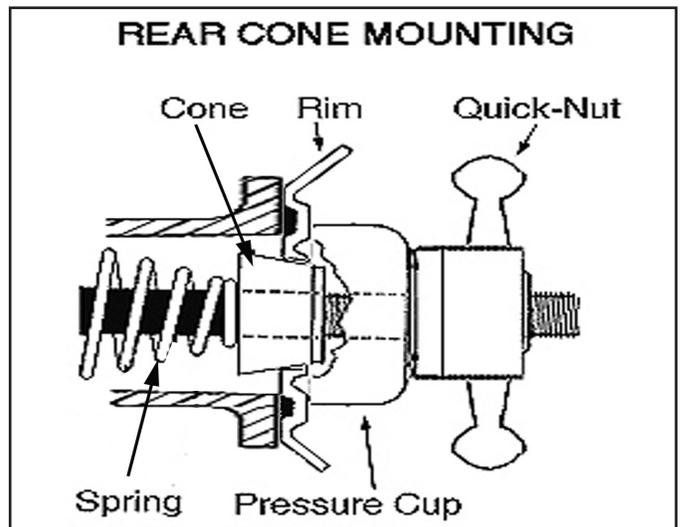
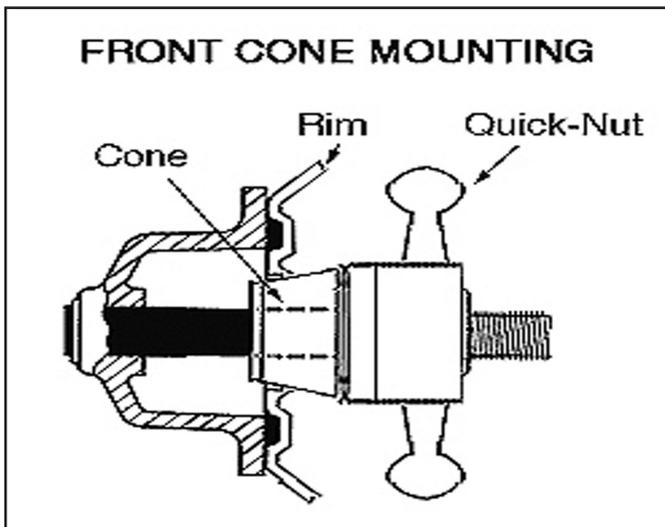
CALIBRATION

It is recommended that the Weight Location Verification Test be performed on a monthly basis following the procedure found on the following page.

The calibration should be performed with a **steel wheel with a tire of the most commonly used size.**

NOTE: It is good practice to keep a known good tire and rim combination of the most commonly used size to use as a calibration /reference tire to assist in any trouble shooting.

Ensure that the calibration weight used is a 100 gram or 3.5 oz weight and that is mounted correctly during the calibration procedure.



PROPER MOUNTING

The recommended method for mounting of a tire and wheel for calibration and balancing is the Front Cone Mounting. (Using the cone to secure against the flange) for the most security and stability. (Rear Cone Mounting uses the Pressure Cup assembly.) (Extra centering cones are available though Ranger Products.)

If any the above conditions were found, the condition must be remedied and the balancer must be re-calibrated.

WEIGHT LOCATION VERIFICATION TEST

NOTE:

Before performing the Weight Location Verification Test, make sure the balancer is bolted down and/or rigid to the floor and that the shaft and centering cones are clean and undamaged. Even the slightest dirt or damage can cause inaccurate readings. **PAY CLOSE ATTENTION** to the following procedure. If not followed correctly, the balancer will not perform accurately.

NOTE:

A steel wheel with a tire of the most commonly used size balanced to within 5 grams on either inner or outer with minimal wear or damage to the tire or wheel is required for this procedure.

1. Balance an average size tire and wheel to "00"—"00"
2. With the correct parameters DIST, DIA, and WIDTH programmed into the balancer add a 100 gram wheel weight to the outer edge of the wheel.
3. Press the Start button (close Hood). Wheel will spin and stop.
4. The balancer should call for 100 grams on the outer indicator and "00" on the inner indicator.
5. Rotate the wheel until all the LEDs on the outer indicator are lit.
6. The 100 gram wheel weight should be at 6(o'clock) Bottom Dead Center.
7. Remove the 100 gram wheel weight from the outer edge of the wheel.
8. Install the 100 gram wheel weight on the inner edge of the wheel.
9. Press the Start button. Wheel will spin and stop.
10. The balancer should call for 100 grams on the inner indicator and "00" on the outer indicator.
11. Rotate the wheel until all the LEDs are lit on the inner indicator are lit.

The 100 gram wheel weight should be at (6 o'clock Bottom Dead Center.

If the location is not as Bottom Dead Center (6 o'clock), please contact the Ranger Products Customer Service Department.

BendPak Inc. / Ranger Products
1645 Lemonwood Dr.,
Santa Paula, CA. 93060
1-805-933-9970
1-800-253-2363
www.rangerproducts.com

CALIBRATION PROCEDURE

NOTE:

Before performing this procedure, make sure the balancer is bolted down and all mounting surfaces are clean and undamaged. **PAY CLOSE ATTENTION** while following this procedure or balancer will fail to perform accurately.

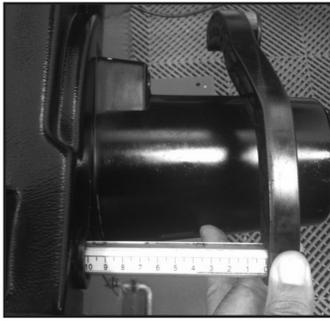
1. A standard steel wheel (of a size most often balanced) with minimal wear or damage is required for this procedure.
2. Following all standard operator warnings, select the type of adapter most often used that will accurately fit the center hole.
3. Place wheel onto arbor then position firmly against hub plate. Cone from the outside. Tighten hub adapter nut to secure wheel.
4. Enter correct wheel data (distance, width, diameter).
5. Press "C" button. While holding "C" press the "D" button until "CAL-CAL-CAL" is displayed and LED's stops flashing.
6. Lower hood then press "START" to begin calibration procedure.
7. The wheel will spin briefly then stop – "ADD 100" will be displayed if Grams is selected. NOTE: If Ounces is selected "ADD 350" will be displayed.
8. Place one 100 Gram / 350 Ounce weight (included with balancer) on outer edge of wheel.
9. Close hood then press "START" button. The wheel will spin and stop.
10. "END-CAL" will be displayed. Calibration procedure is complete.

NOTE:

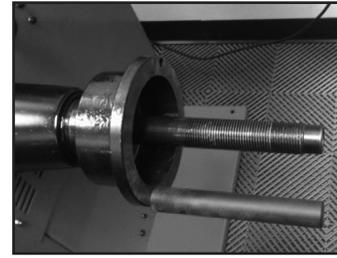
It is a good idea to keep the known good "calibration tire" set up for the monthly calibration procedure.

DISTANCE SLIDE CALIBRATION PROCEDURE

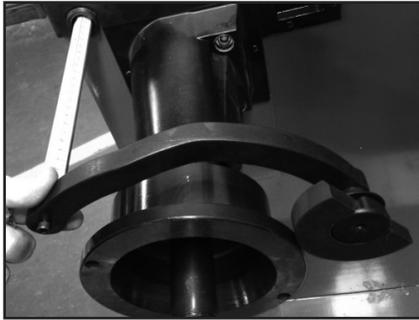
1. Start without a wheel mounted on the shaft.
2. Press and hold the **STOP** button then press the **FINE** button.
3. **CAL-100-DIS** will be displayed.
4. Pull the distance slide ruler out to 10cm / 100mm.
5. While holding the distance slide ruler out at 10cm / 100mm, press the **ALU** button.



2. Install the 200mm calibration attachment onto the shaft flange



6. **CAL-235-DIS** will be displayed.
7. Install the calibration disk to weight applicator at the end of the index arm.



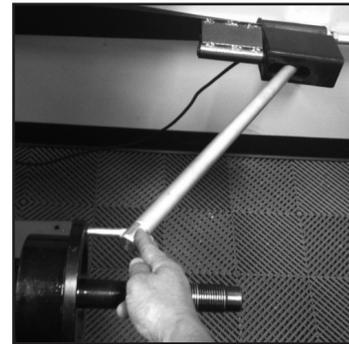
3. Press and hold the STOP button then press the OPT button.
4. **CAL-OF** will be displayed.

NOTE:

If **CAL-OF** is not displayed then the outer gauge arm is turned off and cannot be calibrated. Contact the manufacturer for direction on turning the gauge arm back on.

8. Pull the distance slide ruler out to 23.5cm / 235mm and rest the calibration disk against the flange.
9. While holding the distance slide ruler out at 23.5cm / 235mm, press the **ALU** button.

5. Place the tip of the outer gauge arm onto the shaft flange.



10. Mount a 20" - 22" tire-wheel assembly onto the shaft.
11. Set the diameter setting to the same diameter as on the wheel you are using.
12. Press the **ALU** button.
13. Place the distance slide ruler handle onto the inner edge of the wheel
14. While holding the distance slide ruler onto the inner edge of the wheel, press the **ALU** button.
15. Distance slide calibration is now complete.

6. While holding the tip of the outer gauge arm onto the shaft flange, press the **ALU** button.
7. **CAL-200** will be displayed.
8. Place the tip of the outer gauge arm onto the 200mm calibration attachment mounted on the shaft flange.

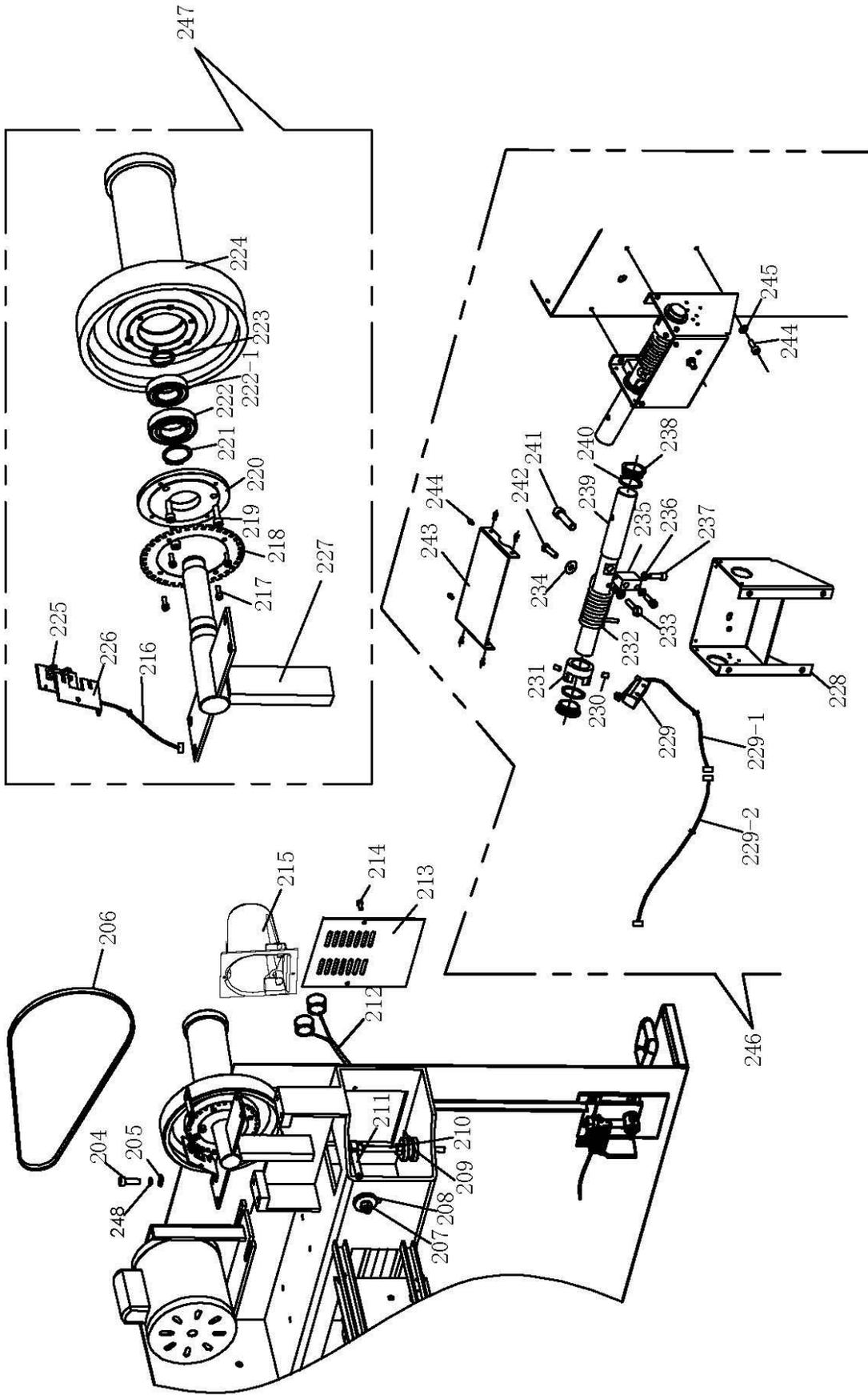


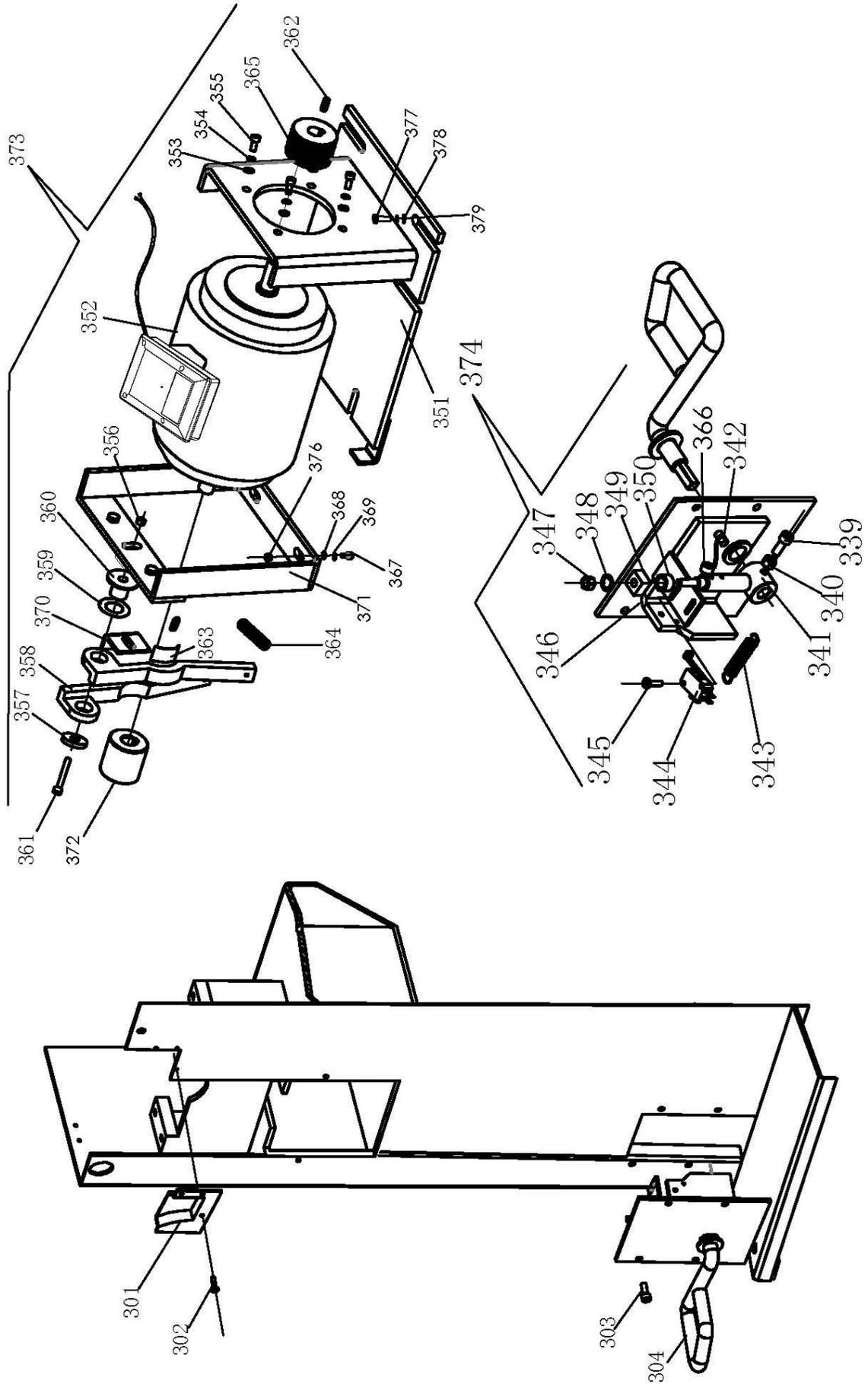
9. While holding the tip of the outer gauge arm onto the 200mm calibration attachment, press the **ALU** button.
10. **CAL-END** will be displayed.
11. Outer gauge-arm calibration is now complete.

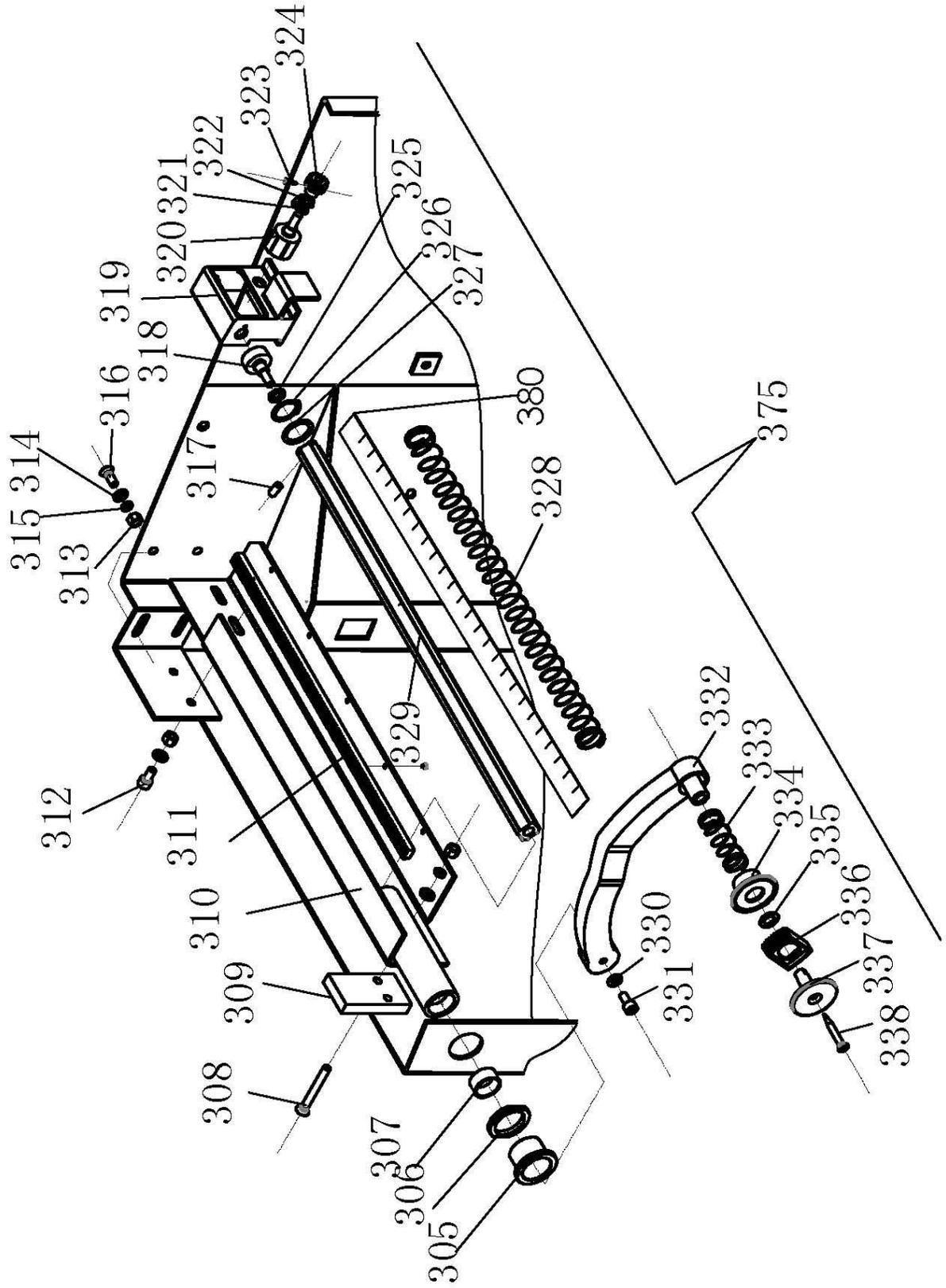
OUTER GAUGE ARM CALIBRATION PROCEDURE

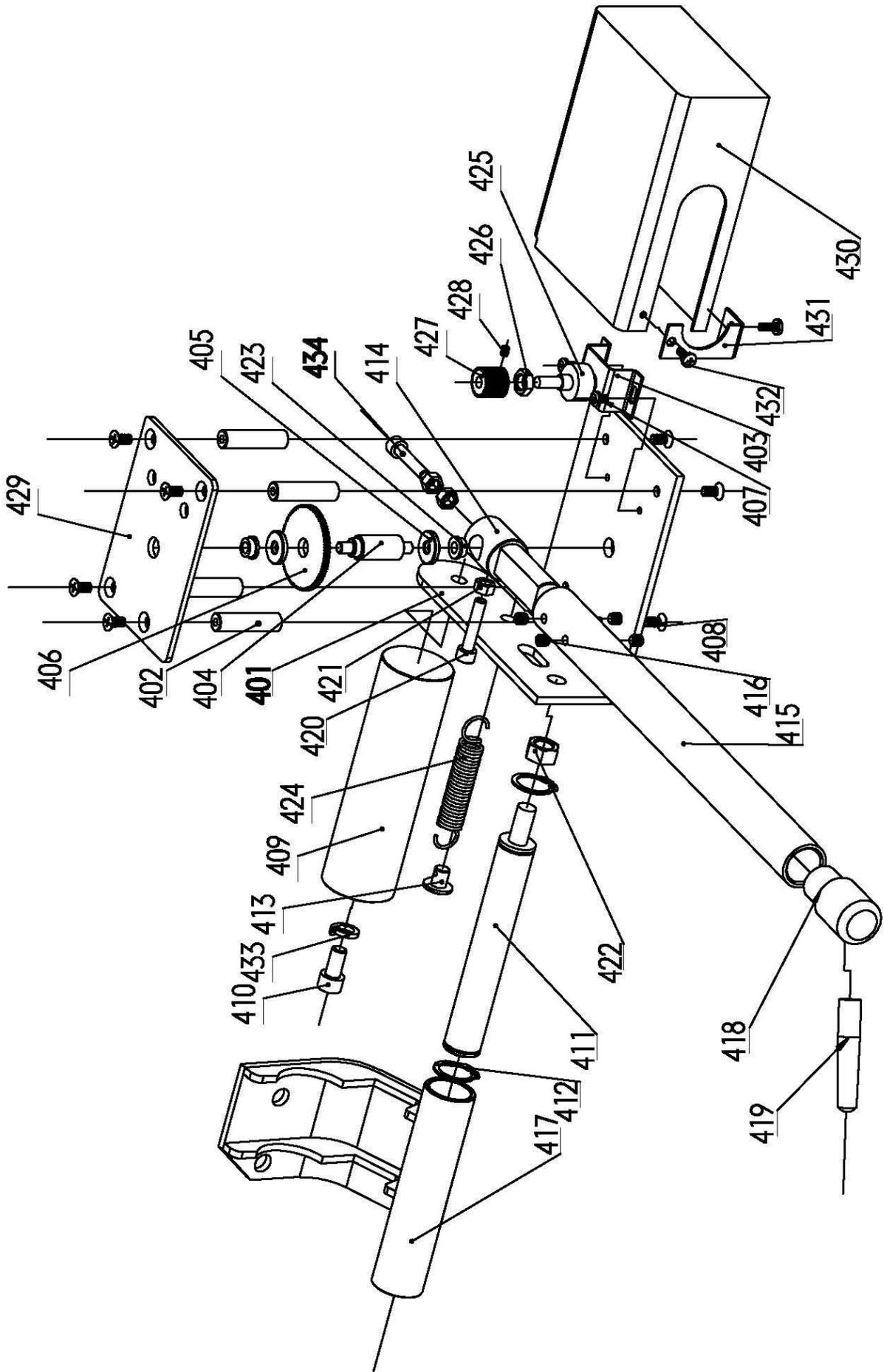
1. This procedure is done without a wheel mounted on the shaft.

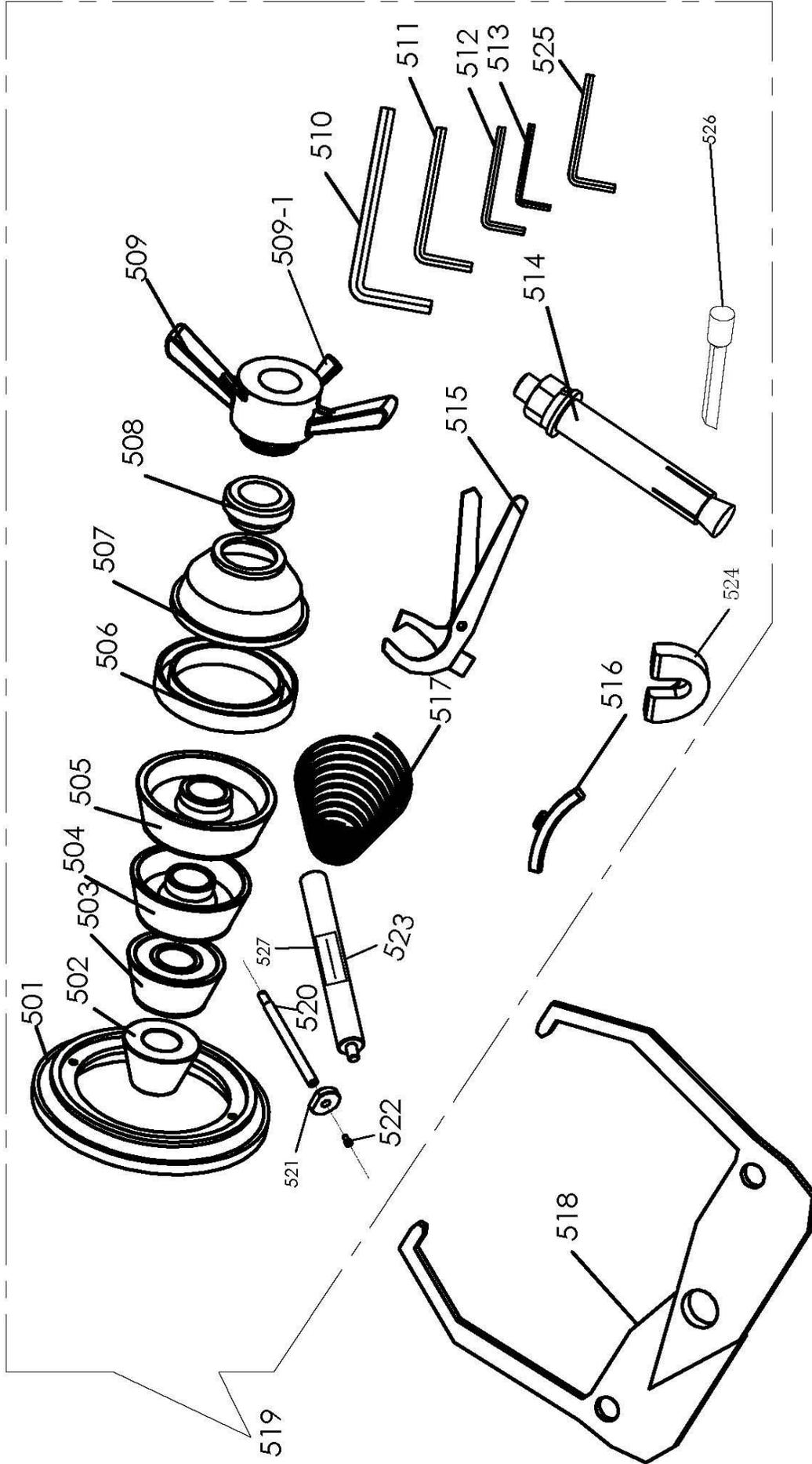
Err. -1-	1. Balancer Shaft Does Not Rotate.	<ol style="list-style-type: none"> 1. Check the electrical connection. 2. Replace the Power board. 3. Replace the Electrical Motor.
Err. -2-	<ol style="list-style-type: none"> 1. A wheel is not installed on the balancer. 2. A wheel is installed on the balancer but there is no tire. 3. The quick nut is not tight and/or the wheel is not correctly installed on the balancer. 4. The Electrical Motor belt tension is not correct. 	<ol style="list-style-type: none"> 1. Install a wheel on the balancer. 2. Install a tire on the wheel. 3. Remove the tire from the balancer and re-mount it correctly. 4. Adjust the belt tension for the Electrical Motor.
Err. -3-	1. The wheel/tire combination has to large of an unbalance.	<ol style="list-style-type: none"> 1. Reposition the Tire on the Wheel to reduce the unbalance. 2. Use a different Tire and/or Wheel. 3. Redo the calibration procedure.
Err. -4-	<ol style="list-style-type: none"> 1. The wheel is rotating counter clockwise. 2. The wheel is rotating clockwise and the Encoder Board is malfunctioning. 	<ol style="list-style-type: none"> 1. Check the electrical connections for the Electrical Motor. 2. Adjust and/or Replace the Encoder Board.
Err. -5-	1. The protective Hood is Open.	1. Close the protective Hood.
Err. -6-	NA	NA
Err. -7-	1. The Computer/Display board memory was cleared.	<ol style="list-style-type: none"> 1. Check that the parameter setting match the sticker located inside the balancer and redo the factory calibration.
Err. -8-	<ol style="list-style-type: none"> 1. 100g weight was not attached during the calibration procedure. 2. The piezo sensor(s) wires are disconnected or it is malfunctioning. 3. Computer/Display board malfunction. 	<ol style="list-style-type: none"> 1. Do the calibration procedure and attach the 100g weight during the correct step. 2. Check the electrical connections for the piezo sensor(s). 3. Replace the Computer/Display board. 4. Contact Ranger Products.
Failed Calibration Check	<ol style="list-style-type: none"> 1. The wheel used for calibration was too large. 2. The wheel used for calibration had too large of an unbalance. 3. The wheel data was not entered correctly. 4. The SFA (Location) parameter setting is not correct. 	<ol style="list-style-type: none"> 1. Use a balanced 14-15 inch wheel and redo the calibration procedure. 2. Check the wheel information is entered correctly for the tire you are using for calibration. 3. Contact Ranger Products for instruction to modify the SFA (Location) parameter.
No Display	<ol style="list-style-type: none"> 1. The balancer is turned off. 2. The balancer has no power going to it. 3. The Computer/Display board is defective 	<ol style="list-style-type: none"> 1. Check that the balancer is turned on. 2. Check that the your balancer is connected to a live electrical source. 3. Replace the Computer/Display board.
No Weight Information Displayed	<ol style="list-style-type: none"> 1. The piezo sensor(s) wires are disconnected or it is malfunctioning. 2. The Computer/Display board has lost the parameter settings. 	<ol style="list-style-type: none"> 1. Check the electrical connections for the piezo sensor(s). 2. Check that the parameter setting match the sticker located inside the balancer edit them if necessary.





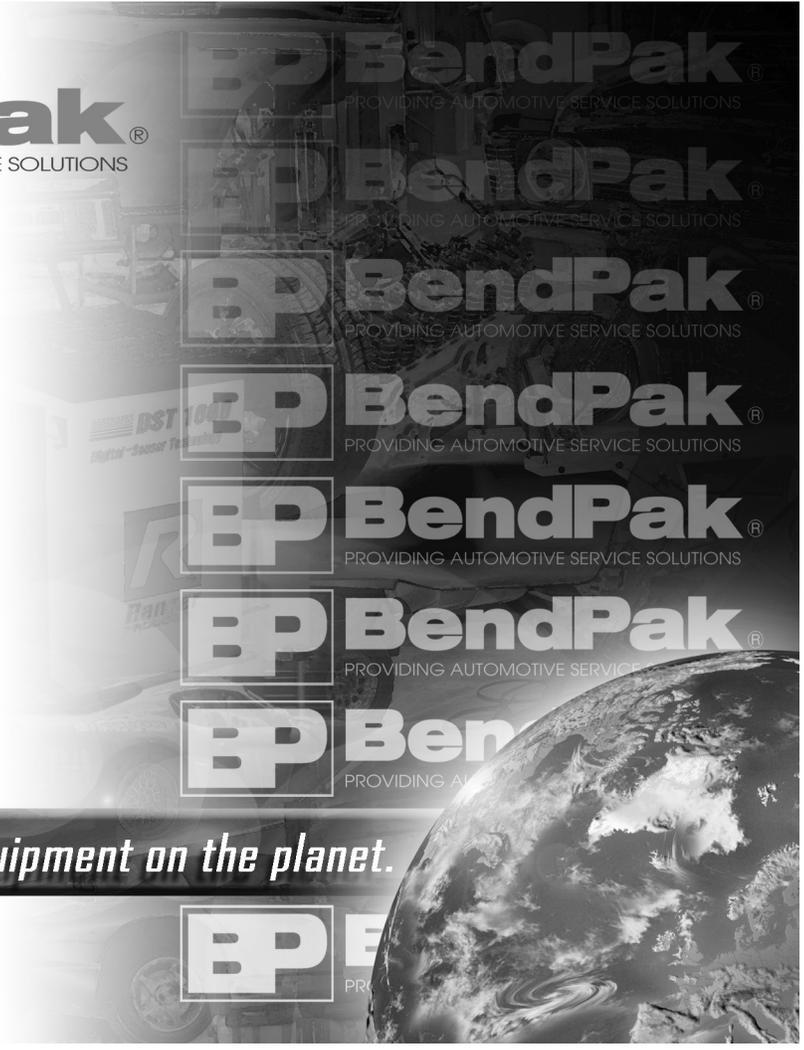






DRAWING #	DESCRIPTION	DRAWING #	DESCRIPTION
101	Display Assy; DST-64T	210	Pizo Vertical Shaft; DST-2420/64T
102	SHCS M6X20	211	Pizo Horizontal Shaft; DST-2420/64T
103	Side Storage Rack; DST2420/64T	212	Weight Indicator Light; DST-64T
104	Washer; 8mm flat	213	Chuck Guard; DST-2420/64T
105	SHCS M8X16	214	SSS ST4.8×16
106	Cone Hanger; DST-2420/64T/ZR650Z/RX3040	215	Thread Shaft Plastic Cover; DST-64T
107	Chassis Body; DST-64T	216	Pizo Sensors; DST-2420/64T
108	ON/OFF Switch; DST-64T	217	SHCS M4X12
109	Threaded Shaft/Spindle; DST-64T	218	tooth 64 ; DST-64T
110	Motor; DST-64T	219	SHCS M6X20
111	Power Board Assy ; DST-64T	220	Bearing Cover
112	Weight Tray; DST-64T	221	Snap ring; 30mm
113	Hood; DST-2420/64T	222	Bearing 6006
114	Upper Hood Mount Support; DST-2420/64T	222-1	Bearing 6005
115	SSS M8 x 1.25 x 12; DST-2420/64T	223	Snap ring; 25mm
116	Lower Hood Mount Support; DST-2420/64T	224	Spindle W/Position Board; DST-2420/64T
117	SSS M8 x 1.25 x 12; DST-2420/64T	225	Encoder Board; DST-64T
118	Touch Wand Arm Brkt; DST-64T	226	Encoder Board Mounting Brkt; DST-2420/64T
119	Bearing 2010; DST-64T	227	Deformation of Beams
120	Snap Ring 20X1	228	Hood Mounting Assy Bracket; DST-64T
121	Mounting Hood Cover	229	Hood Switch; DST-2420/64T
122	Cross recessed pan head screw M4X12	229-1	Short Hood Switch Wires; DST-2420/64T
123	O-Ring 4.2 x 3.5; DST-64T	229-2	Long Hood Switch Wires; DST-64T
124	Display Assy Sleeve; DST-64T	230	Hexagon socket set screw with flat point M8X12
125	Hexagon socket set screw with flat point M6x8	231	Hood Cam; DST-2420/64T
126	Display Assy Plug; DST-64T	232	Hood Spring; DST-2420/64T
127	Washer; 6mm Flat	233	Adjustable Eye Bolt M8X1.25; DST-2420/64T
128	Washer; 6mm Splick lock	234	Washer; 8mm
129	SHCS M6X16	235	Hood Cam Stop; DST-2420/64T
130	Washer; 3mm Flat	236	Nut M8
131	Washer; 3mm Splick lock	237	SHCS M8X25
132	Cross recessed pan head screw M3X30	238	Hood Shaft Bushing; DST-2420/64T
133	Membrane Switch; DST-64T	239	Hood Rotating Shaft; DST-2420/64T
134	Display Board Cover; DST-64T	240	Snap ring; 38mm
135	Cross recessed pan head screw M3X40	241	SHCS M12X40
136	Computer/Display Board; DST-64T	242	HHB M8X30
137	Display Board Box; DST-64T	243	Hood Mounting Assy Cover; DST-2420/64T
138	Washer; 6mm Flat	244	SHCS M8X20
139	SHCS M8X10	245	Washer; 8mm flat
140	Elastic washer	246	Hood Mounting Assy; DST-64T
141	Stator	247	Spindle assy
142	DISPLAY ASSY BRACKET; DST-64T	248	Elastic washer
143	DECAL 1	301	Cabinet Plate; 64T
144	Power Board; DST-64T	302	Cross recessed pan head screw M4X16
145	Electrical Mounting Plate; DST-2420/64T	303	SHCS M6X16
146	Resistor; DST-2420/64T	304	Brake Pedal; DST-64T
147	Transformer; DST-64T	305	Distance Arm Sleeve; DST-64T
148	SHCS M6X25	306	Distance Arm Sleeve Nut; DST-64T
149	Elastic washer	307	Bearing 2010; DST-64T
150	Washer	308	Cross recessed pan head screw M6X40
151	DECAL 2	309	Internal Pad 3; DST-64T
152	Patch board	310	Distance Arm Basement; DST-64T
153	Inner gauge wire	311	Gear Rail; DST-64T
201	SHCS M8X20	312	SHCS M6X16
202	Washer; 8mm splick lock	313	Nut M10
203	Washer; 8mm	314	Washer; 6mm Flat
204	HHB M8X20	315	Washer; 6mm Splick lock
205	Washer; 8mm flat	316	Cross recessed pan head screw M6X20
206	Belt; DST-2420/64T	317	Hexagon socket set screw with flat point M4x4
207	Nut M10	318	Wheel Diameter Potentiometer; DST-64T
208	Pizo Sensor Pad; DST-2420/64T	319	Distance Arm Slide Block; DST-64T
209	Pizo Sensors; DST-2420/64T		

DRAWING #	DESCRIPTION	DRAWING #	DESCRIPTION
320	Wheel Distance Potentiometer; DST-64T	402	External Support Column
321	Distance arm locking spacer	403	Potentiometer Bracket
322	Nut M8	404	Main Shaft
323	Cross recessed tapping screw ST2.9x9.5	405	Rotary Shaft Spacer
324	Distance Arm Gear; DST-64T	406	Touch Wand Gear; DST-64T
325	Lock Washer	407	Cross recessed pan head screw M4X6
326	Snap Ring 20X1	408	Cross recessed pan head screw M5X10
327	Distance Arm Rod Washer; DST-64T	409	Balancing Weight; DST-64T
328	Distance Arm Spring; DST-64T	410	SHCS M8X16
329	Distance Arm Rod; DST-64T	411	External Bracket Shaft
330	Washer; 6mm Flat	412	Snap Ring 20X1
331	SHCS M6X16	413	External Gauge Spring Hook; DST-64T
332	Distance Arm Head Connect Rod; DST-64T	414	External Gauge Connector
333	Distance Arm Head Spring; DST-64T	415	Touch Wand Rod; DST-64T
334	Distance Arm Head Bushing; DST-64T	416	Hexagon socket set screw with flat point M6x6
335	Washer; 12mm flat	417	External Gauge Baseament; DST-64T
336	Distance Arm Head Weight Holder; DST-64T	418	Touch Wand Pointer Coupling; DST-64T
337	Distance Arm Head Pivot Bushing; DST-64T	419	Touch Wand Pointer; DST-64T
338	Distance Arm Head Screw; DST-64T	420	SHCS M6X30
339	SHCS M6X25	421	Nut M6
340	Nut M10	422	Nut M10
341	Brake Pedal Link Weldment	423	Touch Wand Bearing; DST-64T
342	Brake Metal Thread; DST-64T	424	Touch Wand Return Spring; DST-64T
343	Break Pedal Return Spring; DST-64T	425	Touch Wand Potentiometer; DST-64T
344	Hood Switch; DST-2420/64T	426	Nut M8
345	Cross recessed pan head screw M3X20	427	Touch Wand Potentiometer Gear; DST-64T
346	Brake Bracket Kit; 64T	428	Hexagon socket set screw with flat point M4x5
347	Nut M10	429	Hood Mounting Assy Upper Plate; DST-64T
348	Washer; 6mm Flat	430	Touch Wand Bracket Cover; DST-64T
349	Presser	431	Touch Wand Bracket Side Cover; DST-64T
350	Rubber Bushing; 64T	432	Cross recessed pan head screw M4X10
351	Motor Bracket; 2420/64T	433	Washer; 10mm splick lock
352	Motor; DST-64T	434	SHCS M6X30
353	Washer; 6mm Flat	401-434	Touch Wand Assy; DST-64T
354	Washer; 6mm Splick lock	501	Spacer Ring; DST-2420/64T
355	SHCS M6X25	502	44.5-74.5mm CONE; DST-2420/64T 36mm
356	Nut M8	503	69-94mm CONE; DST-2420/64T 36mm
357	Brake Bracket Spacer; DST-64T	504	90-115mm CONE; DST-2420/64T 36mm
358	Right Brake Stop; DST-64T	505	110-134mm CONE; DST-2420/64T 36mm
359	Brake Shim; DST-64T	506	Quick Nut Cup Cover; DST-2420/64T
360	Brake Spacer Sleeve; DST-64T	507	Quick Nut Cup ; DST-2420/64T
361	HHB M8X60	508	Quick Nut Cover; DST-2420/64T
362	Motor Pully Key; 2420/64T	509	36mm Quick Nut; DST-2420/64T
363	Brake Pad; DST-64T	509-1	Quick Nut Release Cover; DST-2420/64T
364	Brake Spring; DST-6T	510	12mm Allen Wrench; DST2420/64T
365	Motor Pulley; DST-64T	511	6mm Allen Wrench; DST-2420/64T
366	Bolt	512	4mm Allen Wrench; DST2420/64T
367	SHCS M6X25	513	3mm Allen Wrench; DST-2420/64T
368	Washer; 6mm Splick lock	514	Anchor Bolt; 3/8 x 3 1/2; DST-2420/64T
369	Washer; 6mm Flat	515	Weight Hammer; Pliers
370	Left Brake Stop; DST-64T	516	100 Gram Calibration Weight
371	Brake Bracket; DST-64T	517	36mm Spring; Mounting DST / ZR
372	Brake wheel	518	Wheel Calipers; All DST / ZR650
373	Motor Assy; (110/220V 0.55KW)	519	Accessory Box; DST-64T
374	Brake Assy; DST-64T	520	Extension Lever; DST-64T
375	Distance Arm Assy; DST-64T	521	Distance Arm Head; DST-64T
376	NUT M6	522	SHCS M6X12
377	SHCS M8X25	523	Calibration Kit; DST-64T
378	Washer	524	DIAMETER CALIBRATION TOOL; DST-64T
379	Elastic washer	525	5mm Allen Wrench RB-24T/DST-64T
380	Distance Arm Sticker; DST-64T	526	WEIGHT SHOVEL
401	Hood Mounting Assy Lower Plate; DST-64T		



The best automotive service equipment on the planet.

**For Parts Or Service
Contact:**

**BendPak Inc. / Ranger Products
1645 Lemonwood Dr.
Santa Paula, CA 93060
Toll Free 1-800-253-2363
Tel: 1-805-933-9970
Fax: 1-805-933-9160**

www.rangerproducts.com