

Grizzly *Industrial, Inc.*®

MODEL H3022 MAGNETIC BASE / DIAL INDICATOR / CALIPER COMBO OWNER'S MANUAL



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REVISED DECEMBER, 2017 (HE)

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#JK7781 PRINTED IN CHINA

SECTION 1: INTRODUCTION

Foreword

We are proud to offer the Grizzly Model H3022 Magnetic Base/Dial Indicator/Caliper Combo. This Model is part of a growing Grizzly family of fine measuring tools. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

It is our pleasure to provide this manual with the Model H3022. It was written to encourage safety considerations and guide you through general operating procedures and maintenance.

The specifications, details, and photographs in this manual represent the Model H3022 as supplied when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly.

Contact Information

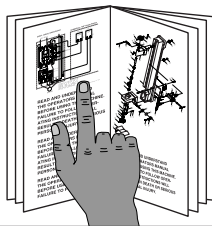
If you have any comments regarding this manual, please write to us at the following address:

Grizzly Industrial, Inc.
C/O Technical Documentation
P.O. Box 2069
Bellingham, WA 98227-2069

Most importantly, we stand behind our tools. If you have any service questions or parts requests, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com
Web Site: <http://www.grizzly.com>

WARNING



Read the manual before operation. Become familiar with these tools, its safety instructions, and its operation before beginning any work. Serious personal injury may result if safety or operational information is not understood or followed.

SECTION 2: IDENTIFICATION

Support Assembly Identification

(Figure 1)

- A. Support Column
- B. Lock Knobs
- C. Mounting Stud/Screw
- D. ON/OFF Switch
- E. Magnetic Base
- F. Fine-Tune Adjustment Knob
- G. Boom

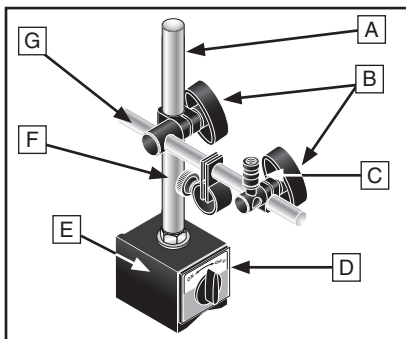


Figure 1. Support Assembly Identification.

Dial Indicator Identification (Figure 2)

- A. Dial Lock
- B. Rotation Counter (in 0.1" increments)
- C. Dial Numbers (in 0.01" increments)
- D. Dial Ticks (in 0.001" increments)
- E. Contact Point
- F. Adjustable Dial Markers

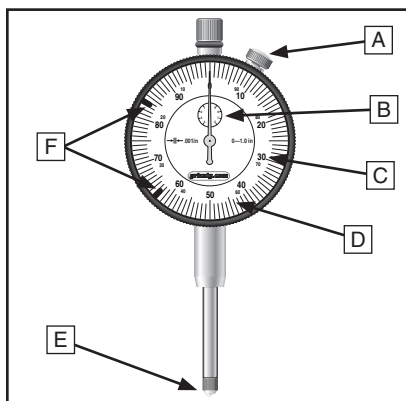


Figure 2. Dial Indicator Identification.

Caliper Identification (Figure 3)

- A. Internal Caliper Jaws
- B. Dial Needle
- C. Caliper Lock
- D. Thumb Wheel
- E. Depth Blade (retracted)
- F. Inch Numbers (in 1" increments)
- G. Ruler Ticks (in 0.1" increments)
- H. Dial Numbers (in 0.01" increments)
- I. Dial Ticks (in 0.001" increments)
- J. Dial Lock
- K. External Caliper Jaws

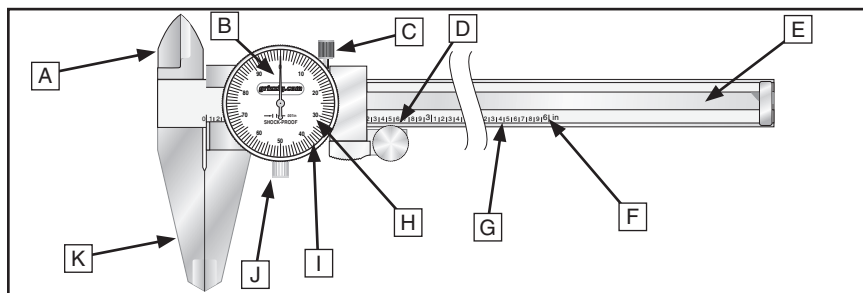


Figure 3. Caliper Identification.

SECTION 3: SET UP

Unpacking

Your magnetic base/dial indicator/caliper combo left our warehouse in a carefully packed box. If you discover the magnetic base/dial indicator/caliper combo is damaged after you have signed for delivery, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of the shipment, you should inventory the equipment.

Inventory

After you have unpacked the carrying case you should find the following.

Model H3022 Inventory (Figure 4)

- A. Dial Indicator 1
- B. Support Assembly 1
- C. Magnetic Base 1
- D. Flat Washer 10mm 1
- E. Dial Caliper 1
- F. Carrying Case (not shown) 1

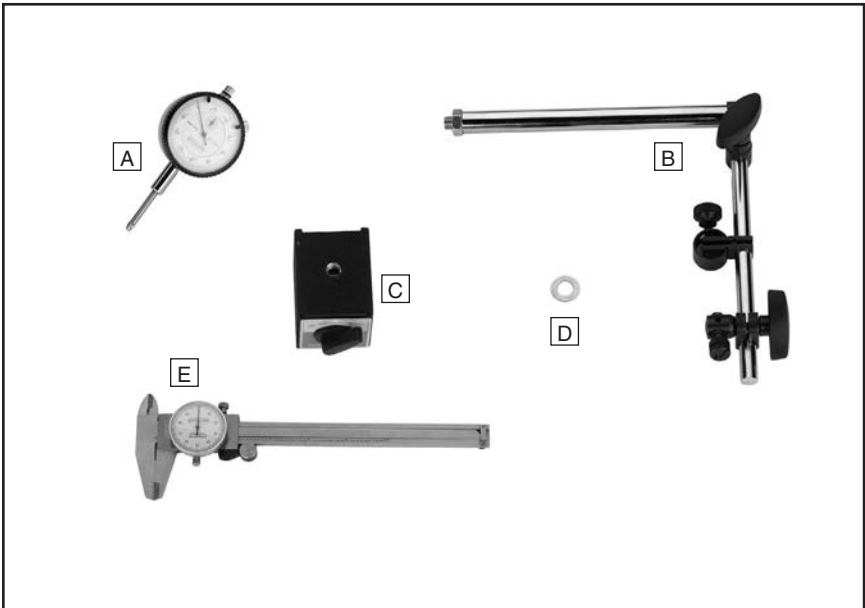


Figure 4. Model H3022 inventory

Base and Indicator Assembly

A drop of machine oil should be put on all connections during this process.

To attach the base to the support assembly:

1. Place the 10mm flat washer on the threaded end of the support column.
2. Thread the support column into the magnetic base, as shown in **Figure 5**, and tighten the jam nut against the washer.

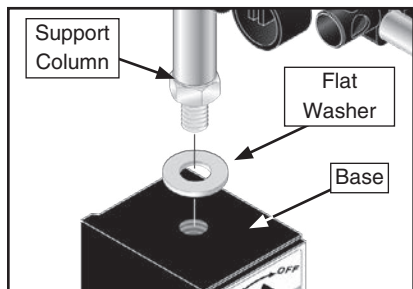


Figure 5. Magnetic base assembly.

To attach the dial indicator to the boom:

1. Loosen the lock knob that secures the mounting stud to the boom and remove the stud.
2. Unscrew and remove the knurled nut and flat washer from the mounting stud, and insert the threaded end of the stud into the flange on the back of the dial indicator, as shown in **Figure 6**.

Note: The stud can be inserted from the left- or the right-hand side depending on your mounting needs.

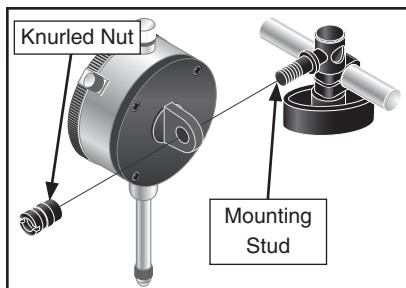


Figure 6. Dial Indicator installation.

3. Secure the dial indicator with the knurled nut.
4. Insert the mounting stud back into the large mounting hole and tighten the lock knob.

SECTION 4: DIAL INDICATOR

General Usage Tips

The dial indicator can be used for many precise measuring tasks. The magnetic base can be positioned on flat or round surfaces. Below are some tips to follow when using the dial indicator and base.

- Turn the magnetic base **OFF** when moving the unit to prevent damage to the current mounting surface, and to prevent sudden jarring that could damage the internal components of the dial indicator.
- Make adjustments to the support assembly only with the base magnetically secured to a steel or iron object.
- Always loosen the lock knobs when positioning the boom and dial indicator. Make sure they are tight before making fine adjustments to the dial indicator.

Adjusting the Assembly

The support assembly can be adjusted to provide a longitudinal reach of 21" and a 360° lateral reach of 11½", as shown in **Figure 7**. This means the contact point of the dial indicator can reach virtually any point within this space.

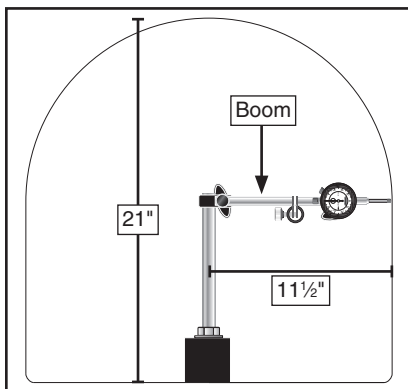


Figure 7. Support Assembly Reach.

To adjust the boom position:

1. Loosen the lock knob on the support column enough to allow the boom arm to pivot, and the lock knob to slide along the length of both the support column and the boom.
2. Set the boom height and rotation to the desired position, and tighten the lock knob so that it allows the boom to pivot with slight resistance.
3. Make any adjustments to the boom angle and tighten the lock knob completely.

Positioning the Dial Indicator

The dial indicator position can be fine-tuned to provide the optimum measuring conditions.

To adjust the dial indicator position:

1. Loosen the lock knob on the boom enough to allow the boom arm to pivot, and the lock knob to slide along the length of the boom.
2. Set the dial indicator position along the boom and tighten the lock knob so that it allows the dial indicator to rotate with slight resistance.
3. Loosen the knurled nut with a screwdriver or by hand so that the dial indicator can pivot freely. Set the dial indicator to the desired angle and tighten both the knurled nut and the lock knob completely.
4. If the dial indicator is in position but the measuring angle is still not exact, the fine-tune adjustment knob may be turned clockwise or counterclockwise to change the angle of the boom, as shown in **Figure 8**. It can also be used when setting the contact point, as shown in **Figure 9**.

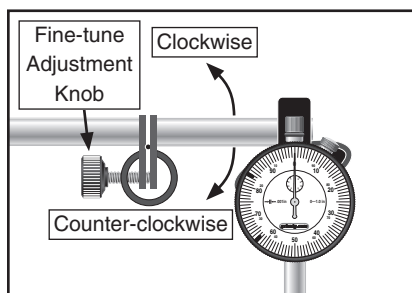


Figure 8. Fine-Tune Adjustment.

Setting the Contact Point

One of the most important setup considerations with a dial indicator is to ensure the contact point is perpendicular to the expected motion of the object being tested. Failure to ensure a proper setup will result in an error in measurement.

To set the contact point:

1. Follow all previous instructions about the positioning of the support assembly, boom and dial indicator.
2. Adjust the dial indicator so that it is perpendicular (at a 90° angle) to the object being measured. The contact point should touch the object, as shown in **Figure 9**.

Note: If the object being measured is cylindrical, position the dial indicator perpendicular to both the cross-sectional axis and the longitudinal axis of the object, as shown in **Figure 9**. When the object rotates, the needle of the dial indicator will show the lateral motion or deviation of the object.

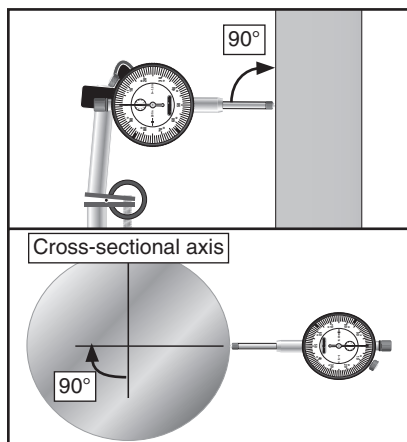


Figure 9. Positioning the contact point.

Zeroing the Dial

The dial can be adjusted by loosening the dial lock. This can be helpful for making comparison measurements or if the contact point has been set and the dial needs to be reset to zero.

To zero the dial:

1. Release the dial by loosening the dial lock a half turn.
2. Rotate the dial so the needle and the zero mark line up.
3. Tighten the dial lock to fix the dial in place.

Reading the Dial

The dial is relatively straightforward and easy to read.

- Every tick on the outer rim of the dial represents $\frac{1}{1000}$ " or 0.001". One complete revolution of the large needle is equal to $\frac{1}{10}$ " or 0.1".
- The small dial indicates the number of full revolutions made by the large dial needle; each full revolution is equal to $\frac{1}{10}$ " or 0.1". If the needle is situated between two numbers, then the dial is read as if it equalled the lower number. For example, if the dial needle was resting at any point between four and five, the dial reading would be $\frac{4}{10}$ " or 0.4".

Note: *It is important to remember the small dial needle rotates counterclockwise.*

- To read the dial as a whole, read the value of the small dial first, and then add the value of the large dial. The dial in **Figure 10** shows a reading of just over 0.886".

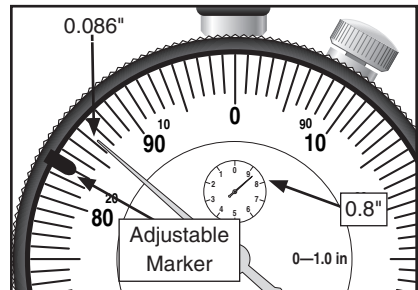


Figure 10. Reading a dial measurement.

Adjustable Markers

The rim of the dial indicator is fitted with two adjustable markers, which can be moved even with the dial locked in position. These are very useful when performing range testing. **Figure 10** shows one of the adjustable markers at the 0.083" position.

SECTION 5: CALIPER

General Usage Tips

- Use the thumbwheel to open and close the caliper.
- Always keep the jaws of the caliper clean and free of dust, grease, oils or grit. The calipers are accurate to 0.001", and even something as small as a grain of sand or human hair can cause a false measurement.
- Never drop, mishandle or otherwise jar the caliper. Jarring can damage vital internal components and cause the caliper to provide false measurements.
- Always store the caliper in a safe place where it will not be bumped by or beneath other objects.

Zeroing the Dial

The dial can be adjusted by loosening the dial lock. This can be helpful for making comparison measurements.

To zero the dial:

1. Release the dial by loosening the dial lock a half turn.
2. Rotate the dial so the needle and the zero mark line up.
3. Tighten the dial lock to fix the dial in place.

Locking the Caliper

The caliper lock can be tightened at any point to prevent the jaws from opening or closing. This is useful for performing manual measurement comparisons. The caliper can also be partially tightened to provide greater resistance, allowing for more precise manual measurements. The caliper lock is shown in **Figure 11**.

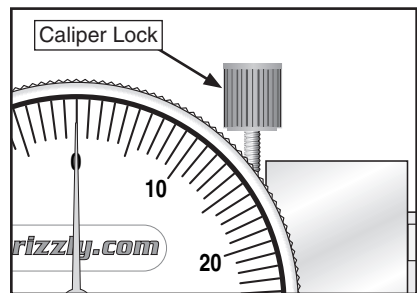


Figure 11. Caliper lock.

Reading the Caliper

The caliper is very straightforward and easy to read. Reading a measurement is the same for both internal and external jaw measurements and depth gauge measurements.

- Every tick on the caliper dial represents $\frac{1}{1000}$ " or 0.001". As with the dial indicator, each full revolution of the needle is equal to $\frac{1}{10}$ " or 0.1". The dial ticks are separated into units of ten for easy reading.

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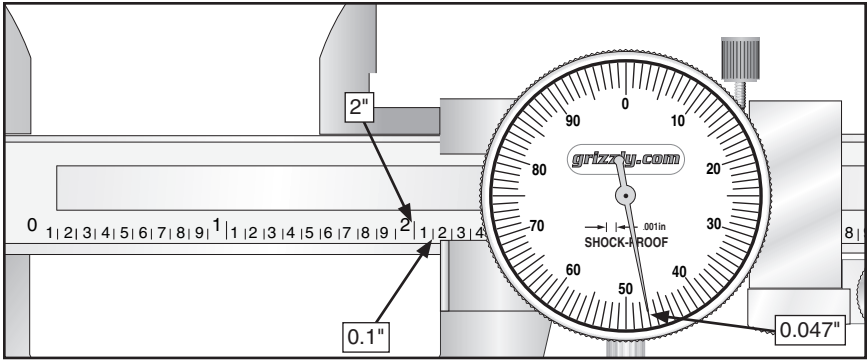


Figure 12. Reading a caliper measurement.

- The caliper ruler is marked with increments of $\frac{1}{10}$ " or 0.1". For every ten ticks, there is a raised number indicating 1" or one full inch. As the caliper jaws are opened, the ruler becomes visible to the left of the caliper dial. Read the numbers closest to the inner edge of the right jaw when taking a measurement.
- To take a measurement, first read the rightmost raised number (if any) to the inner edge of the right caliper jaw to determine the number of whole inches. Next, read the rightmost lower number to the left of the jaw edge for $\frac{1}{10}$ " or 0.1" increments. Lastly, read the dial itself to determine any remainder. **Figure 12** shows a caliper set to 2.147".

Measuring Objects

The caliper can be used to measure both internal and external dimensions of objects, as well as depth dimensions. **Figures 13, 14 & 15** show how to measure objects in this way.

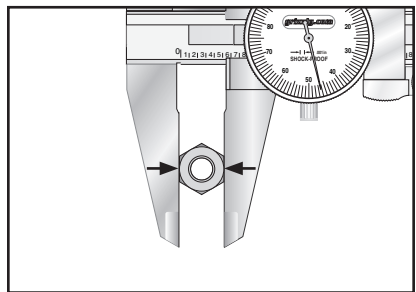


Figure 13. Measuring the outside of a nut.

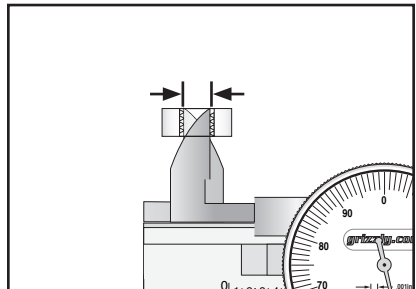


Figure 14. Measuring the inside of a nut.

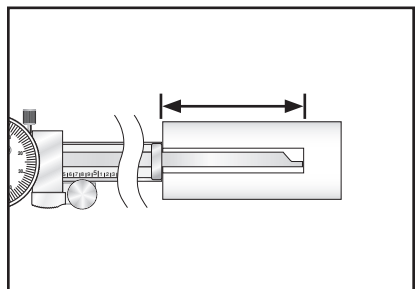


Figure 15. Using the depth gauge.

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Authorization Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

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Thank you again for your business and continued support. We hope to serve you again soon!