



All Industrial

TOOL SUPPLY

The Magnetic Base/Dial Indicator Combo features a 0.001" resolution, 1" range, and a 2" easy-to-read dial. The indicator is supplied with a decade counter, adjustable markers and a dial face lock. The magnetic base features an ON/OFF switch, a magnetic base for both tubular and flat mounting, a stout column, fine-tune adjustment knob and 2 positioning joints. This tool will allow you to accurately and quickly measure runout, lead, and motion. Please familiarize yourself with the terminology of the components to maximize the effective use of this tool.

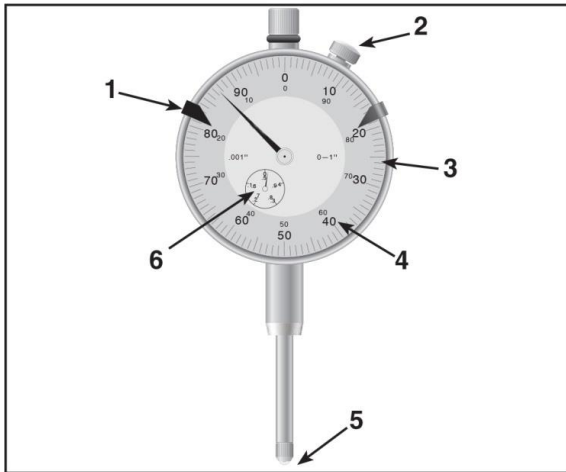


Figure 1. Indicator components.

Listed below are the dial indicator components. Match the description with the corresponding part number in the illustration above.

1. The *adjustable markers* can be moved along the circumference of the dial.
2. The *dial lock* secures the dial face after being rotated around the indicator body.
3. On the *scale*, the distance between the lines equals 0.001" (one thousandths of an inch).
4. These *numbers* represent 0.010" (ten thousandths of an inch).
5. The *contact point* touches the surface to be measured.
6. Each number on the *decade counter* represents one full rotation of the needle and is equal to 0.100" (one hundred thousandths of an inch).

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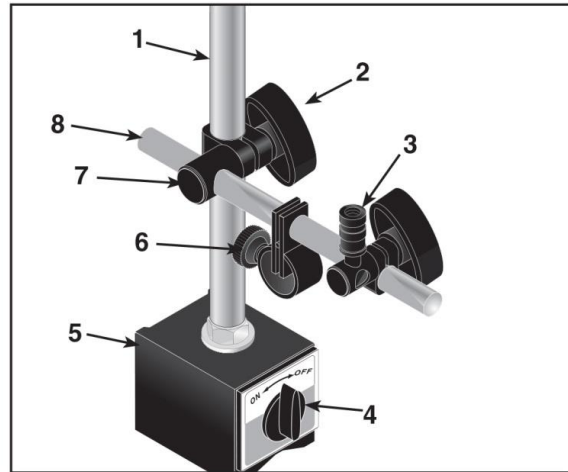


Figure 2. Magnetic base components.

Below is a list of the magnetic base components.

1. The *column* supports the mounting assembly.
2. The *lock knobs* secure the mounting assembly after adjustments are made.
3. The indicator *mounting stud* fastens indicator to the boom.
4. The ON/OFF *switch* for the magnet.
5. The *magnetic base*. One mounting surface on the back and one on the bottom.
6. The *fine-tune adjustment knob* allows the indicator to be adjusted in small increments.
7. One of 2 *pivot joints* that allows articulation of the mounting assembly.
8. The *boom* supports the mounting assembly.

Magnetic Base

The *magnetic base* supports the column and the mounting assembly. To assemble the column to the base:

1. Locate the flat washer in the package containing the column/mounting assembly and attach the washer to the threaded end of the column.
2. Thread the column into the threaded hole on the top of the *magnetic base* until it stops turning.
3. Finish tightening the column by turning the jam nut with an $1\frac{1}{16}$ " wrench.

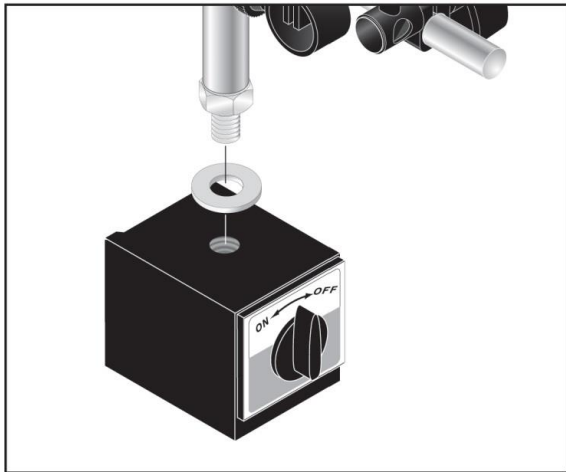


Figure 3. Mounting the *column*.

Dial Indicator

The indicator must be secured to the base prior to use. Please refer to **Figure 4** while reading these instructions.

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.

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

3. Attach the washer and thread the knurled nut back onto the threads on the stud. Insert the plain end of the stud into the *pivot joint*. Be mindful that this pivot joint has 2 holes and only one is sized correctly for the stud. Also, it may be necessary to rotate the sleeve on the *pivot joint* to correctly align the parts so the stud can be inserted.
4. Tighten the *lock knob* for the pivot joint.
5. Tighten the knurled nut with a flat blade screwdriver to lock the dial into place.

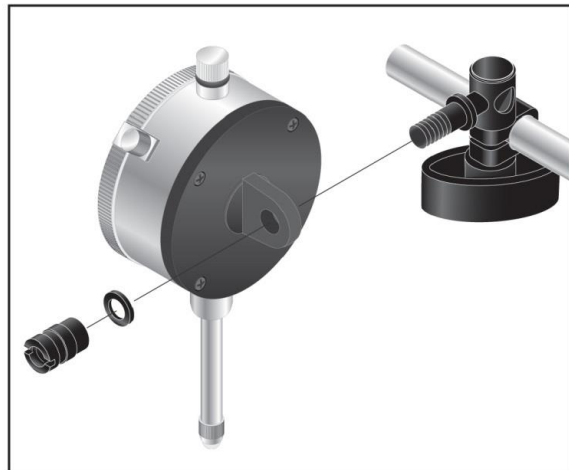


Figure 4. Mounting the indicator onto the *mounting stud*.

Basic Operations

The dial indicator can be used in many ways and the *magnetic base* can be positioned on flat or round surfaces. The list below detail guidelines for use:

1. Use the ON/OFF switch on the *magnetic base* whenever moving the unit to help avoid marring the surface that it is resting on and to prevent sudden jarring which could damage the internal components of the indicator.
2. Make adjustments to the support assembly only with the base magnetically secured to a steel or iron object. This will help guard against damage to the indicator should the base fall.
3. Loosen the *lock knobs* to adjust the height and angle of the support boom. Trying to defeat the locks to move the indicator a small amount will cause premature wear on the system.
4. Gently, try to rock the base after turning the switch to the ON position to ensure that the setup is secure.

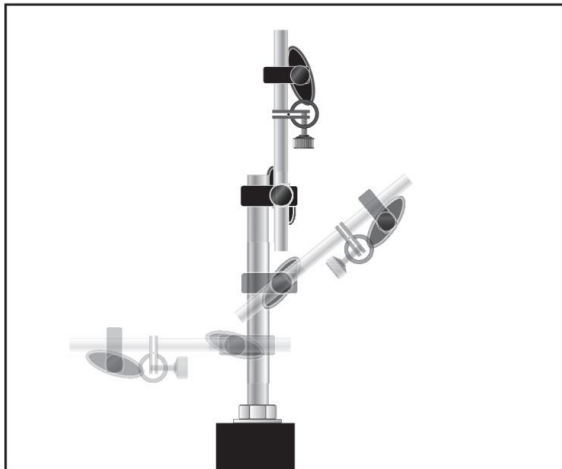


Figure 5. The support assembly can be positioned in any fashion by loosening the 2 *pivot joints*.

Adjusting the Assembly

The *magnetic base* and indicator can be positioned in many ways. The bottom of the *magnetic base* is notched to allow for mounting to curved surfaces as well as having a ground, flat surface. The back of the base is ground flat for mounting as well. **Care must be taken to secure the base to a suitable surface.** Hanging the base upside-down or from the side of a machine may cause the unit to fall. Also, sheet metal may not have the mass need to properly support the unit. Dropping the dial indicator will reduce its accuracy and may make it unusable.



Figure 6. The indicator can be oriented in any direction by loosening the *mounting stud*, loosening the *boom* and raising the *boom* along the *column*.

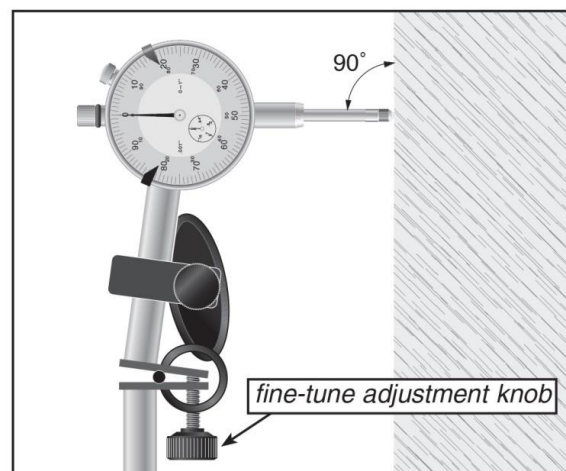


Figure 7. Fine tuning the dial to read zero or any other reference point is made easy with the *fine-tune adjustment knob*.

Setting the Contact Point

One of the most important setup issues with a dial indicator is to make sure the *contact point* is perpendicular to its expected motion or to the motion of the object to be tested. Failure to ensure proper setup will result in an error in measurement. Please refer to **Figure 7** and **8**.

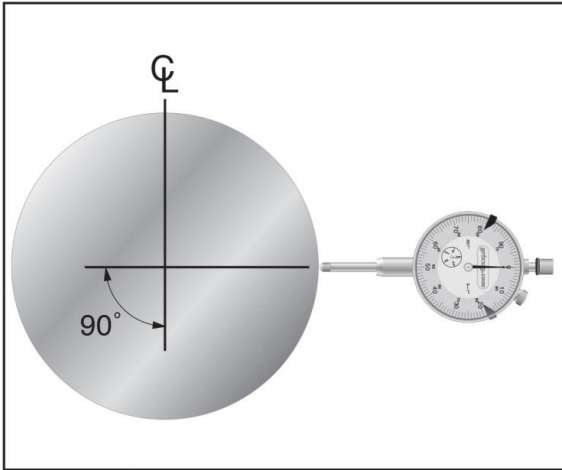


Figure 8. The indicator is positioned perpendicular to the axis of a round bar. When the bar is turned, the runout or lateral motion is indicated by motion of the needle.

Another important note about setup is that the *contact point* must be resting against the part before any change can be indicated. It is therefore necessary to adjust the unit so the needle has moved to ensure a proper measurement. Use the *fine-tune adjustment knob* illustrated in **Figure 7**.

Dial Lock

Loosening the *dial lock* allows the dial face to be rotated. This can be helpful when an absolute measurement is desired and changing the adjustments to the *column*, *boom* and *fine adjustment knob* are difficult or impractical. In **Figure 9** the dial face has been rotated.

Reading the Dial

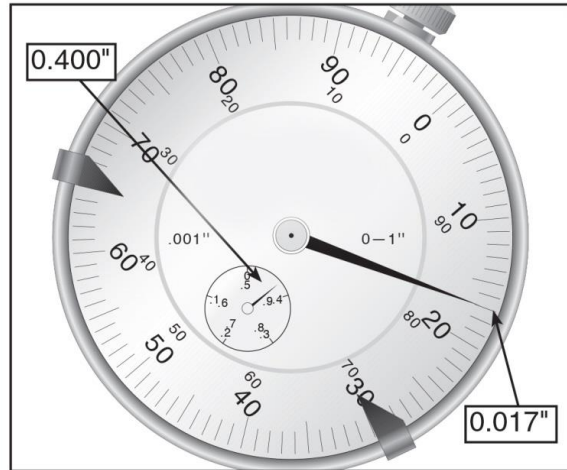


Figure 9. The dial reads 0.417".

The dial indicator is calibrated to read 0.001" and has a range of 1". When the *contact point* is not touching anything, the pointers for each dial will read "under" the zero inch mark.

It is important to understand that the pointers rotate in opposite directions as the *contact point* is depressed. The pointer for the large dial rotates clockwise and the pointer for the smaller dial rotates counterclockwise when the *contact point* is depressed. You must keep track of the number of revolutions for the smaller dial! The first revolution is indicated by the numbers on the outer ring of the numbers and the second revolution is indicated by the innermost numbers. The example in **Figure 9** indicates 0.417".

As with the *decade counter*, the main dial has a second set of numbers. These can be used to keep track of the actual motion of the contact point when it is released.

Adjustable Markers

The dial indicator can also be set up to be used as a range tester. There are 2 *adjustable markers* that can be positioned on the dial face. A range can then be checked. In the example in **Figure 9**, the *adjustable markers* have been set to measure between 0.030" and 0.065". Again, if a larger range than 0.100" is needed, the revolutions of the pointer on the smaller dial will have to be counted.