Dial In Setups with a Height Gauge

$40 tool eliminates test cuts

BY RICHARD J. BABBITT

Woodworkers can be a contradictory bunch. While we crave accuracy a machinist would envy, we seek it in curious ways: tapping tablesaw fences with the hand, eyeballing blade heights, and relying on those curious units of measurement, smidgens and tads. As a result, every machine setup requires a bucketful of test cuts.

There's a better way. While most woodworkers are familiar with the dial caliper, its cousin, the height gauge, has mainly been confined to metalworking. However, I think you'll be amazed at what this little $40 wonder can accomplish in a woodworking shop. With it, your depth of cut on the tablesaw will always be on the money, your jointer will be tuned to perfection, and you'll set up the fussiest router bit quickly and precisely.

Once you start using a height gauge, you'll wonder how on earth you worked wood without one. The only drawback is that without test cuts, I now have a shortage of kindling for my fireplace.

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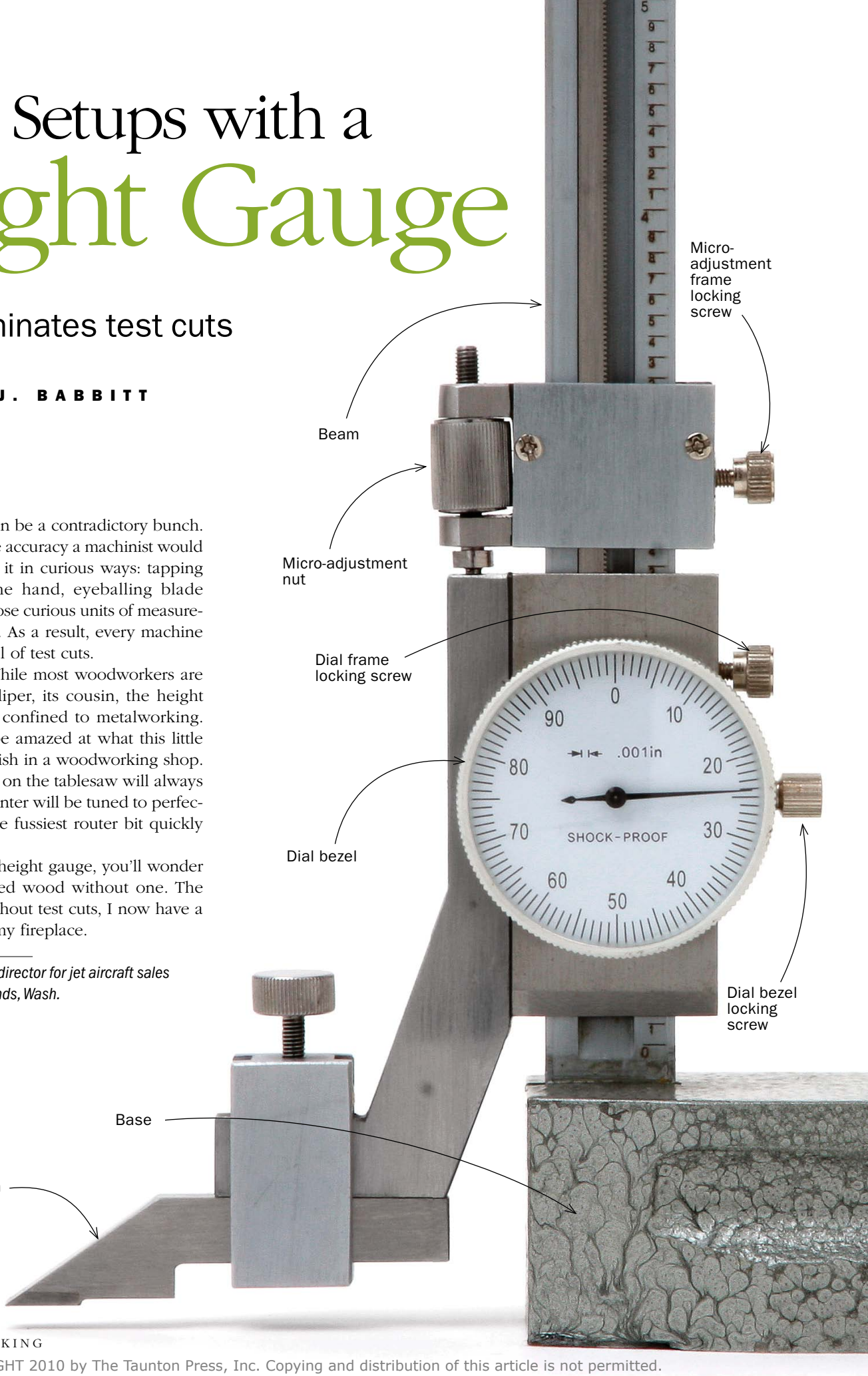
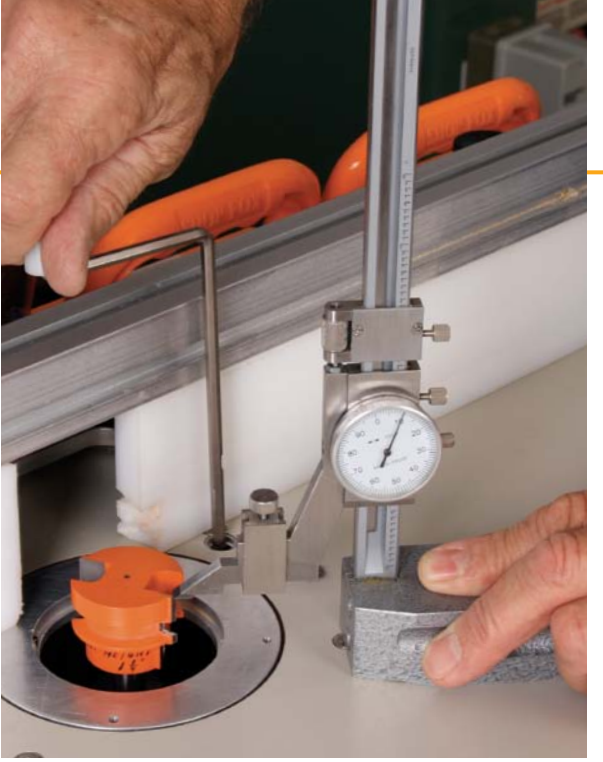


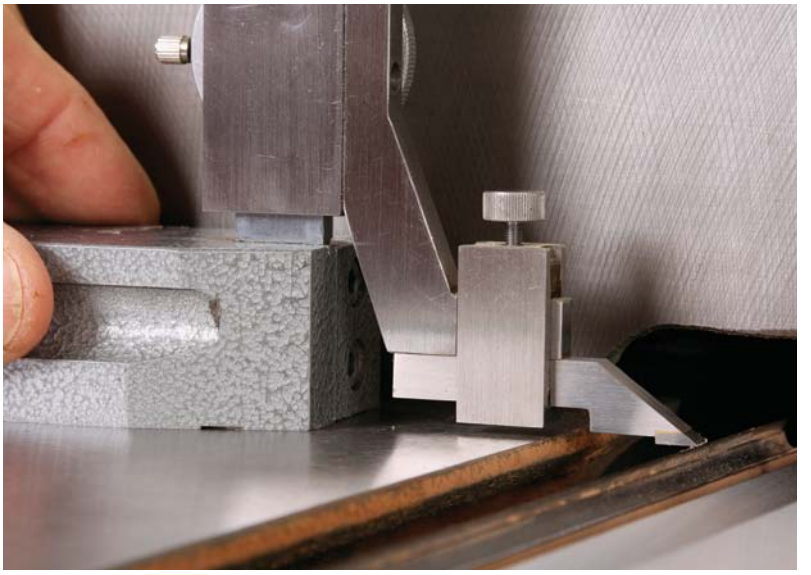
Precision at a glance

You'll get absolute accuracy if you use a height gauge for every vertical measurement. And you won't need the eyes of a hawk. I have a difficult time reading 1/64 in. on a ruler. However, setting the height gauge to within 0.001 in. is easy. Even if, like me, you're not an engineer, I hope the examples in this article will inspire you to put a height gauge to work in your shop.

Exact blade heights. *Very few tablesaws have a system to measure blade height, and using a rule or a combination square is not ideal. You can set the height gauge to the exact height you want the blade, and then raise the blade until the tip of a tooth just touches the probe. On a dado set, register the height of an inner chipper tooth, as they determine the core depth of the rabbet or dado, not the outside blades.*



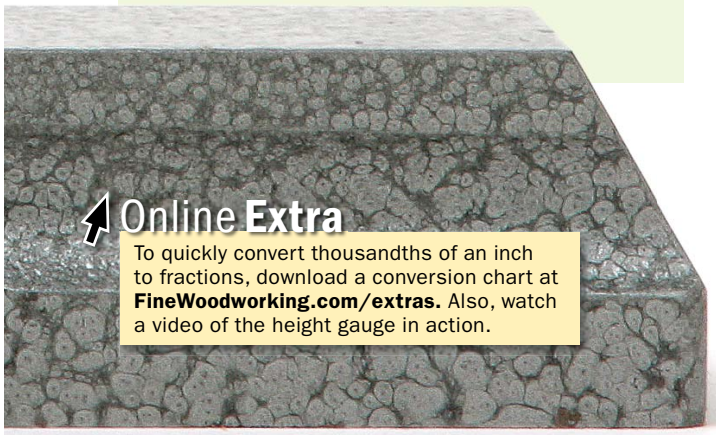
No more router-table test cuts. *Using the height gauge, router-cut rabbets and dadoes can be set to an exact depth, slot-cutting bits can leave a groove precisely bisecting the thickness of the workpiece, and joint-making bits such as the reverse-glue-joint and lock-miter bits can be set up right the first time.*



Tune up your jointer. *Dead-flat cuts require the outfeed table and the knives to be aligned. Use the height gauge to see if all the knives are the same height, check that the outfeed table is coplanar with the knives, and check the depth-of-cut scale. Be careful not to damage the jointer knives on the carbide-tipped probe.*

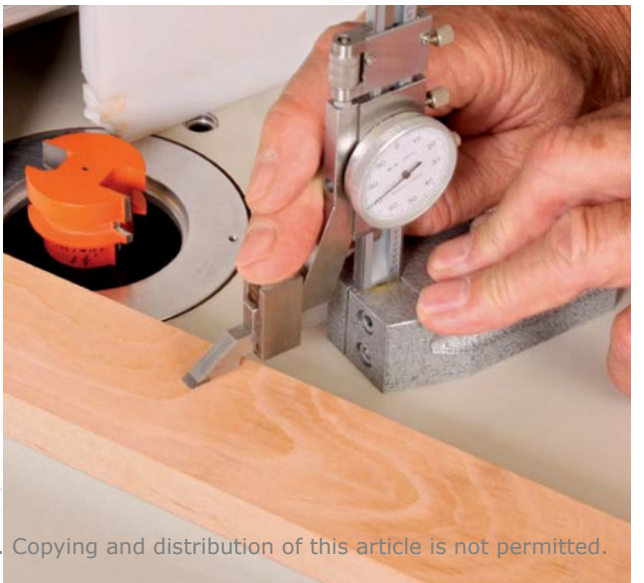
GUIDE TO THE GAUGE

Although you can get taller ones, this 6-in. gauge ($40 at grizzly.com; model No. G9618) is big enough for most woodworking needs. You can get digital versions that read in inches, metric, and fractions, but Babbitt prefers the dial indicator version that reads in thousandths of an inch.



Online Extra

To quickly convert thousandths of an inch to fractions, download a conversion chart at **FineWoodworking.com/extras.** Also, watch a video of the height gauge in action.

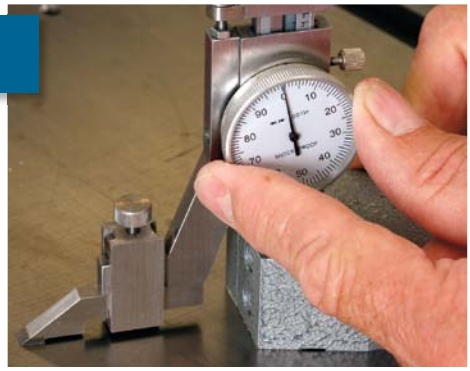


How thick is your stock? *The height gauge gives you a more accurate read on stock thickness than a dial caliper, which has very narrow points of contact.*

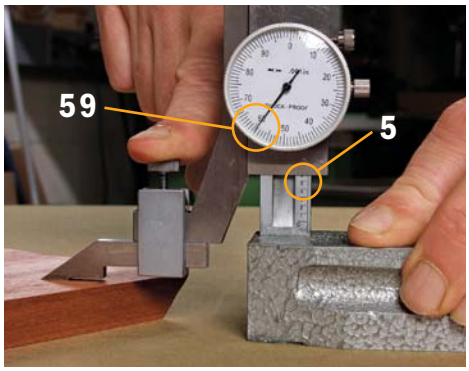
Measuring basics

Use the height gauge to measure an unknown such as the thickness of stock (1), or use it to set an exact measurement and then adjust a machine to match it (2).

1 START FROM ZERO

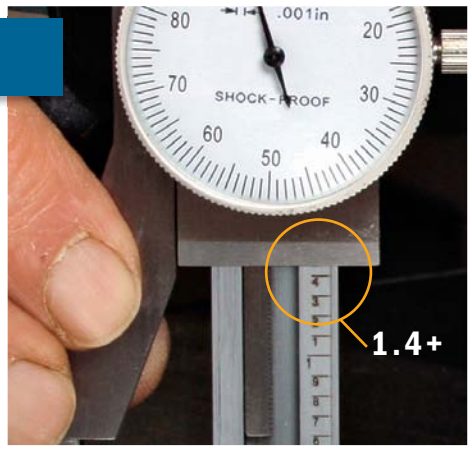


Touch it down. *Before you use the height gauge, first zero it to the reference surface. If the dial's indicator is not on zero when the probe bottoms out, rotate the bezel until it is, and then tighten the locking screw.*

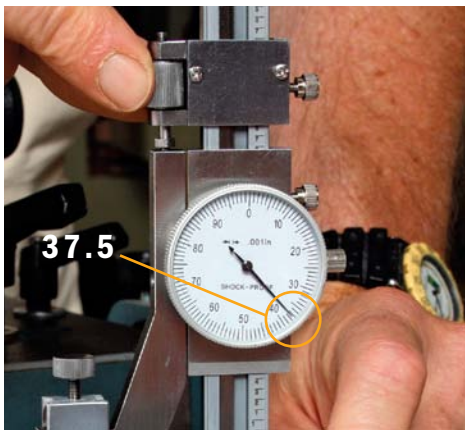


Raise it up. *Slide the probe up the beam and bring it down on the top of the component you wish to measure. To read the measurement, combine the top number visible on the beam (5) with the number on the dial (59) to give 0.559, equivalent to just under 9⁄16 in.*

2 OR DIAL IN THE HEIGHT FIRST

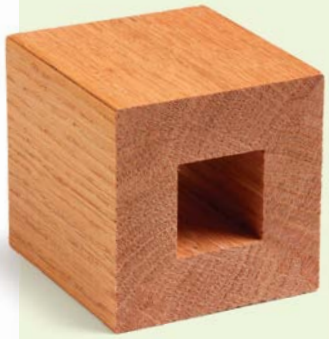


Set the approximate height. *Suppose you want to cut a tenon to 1 7⁄16 in. long. This equates to 1.4375 in. Loosen both locking screws and move the sliding body somewhere between the 1.4-in. and 1.5-in. marks. Now tighten the locking screw on the micro-adjustment frame.*



Dial in the exact height. *Turn the micro-adjustment nut to fine-tune the height until the dial reads 37½. You are now at 1.4375 in. Lock down the dial frame and you are ready to set the sawblade height to precisely 1 7⁄16 in.*

Lock-miter: A great joint that's now easy to make



The 45° lock-miter joint combines the clean-flowing lines of a miter joint with a locking mechanism that both makes the joint stronger and prevents the parts from sliding around during gluing.

Uses include contemporary cabinets with hardwood-veneered plywood and four-part legs for Arts and Crafts furniture where each face is quartersawn. One part of each joint is cut with the workpiece flat on the router table, while the other part is cut with the workpiece held vertically against the fence.

For the joint to work, the lock-miter bit's height and the location of the fence have to be set exactly. However, every manufacturer's instructions and every article I've read tells you to achieve this with test cuts—lots of them. This difficult setup has constrained the popularity of this bit, but the height gauge replaces trial-and-error test cuts with a few simple calculations. You will get the bit centered to your stock regardless of its thickness, providing that thickness is within the bit's capability. The key is finding the bit's midpoint, and aligning that with the midpoint of the stock.

Hidden strength. *The locking mechanism is concealed inside the joint.*

Measure the upper cutter first. *Lower the probe onto the horizontal surface of the lock-miter bit's upper cutter. Note the highest whole number on the vertical beam (7) and add this to the number on the dial (80), to give 0.780 in. By the way, the overall bit height or location doesn't matter right now.*

Next, measure the lower cutter. *Place the probe on the lower lock cutter and note the measurement, in this case 0.440 in. Subtract the 0.440 in. from your upper cutter's measurement of 0.780 in. to obtain 0.340 in.—the distance between the upper and lower cutters. Now divide the 0.340 in. by 2 to give 0.170 in.*

How thick is your stock? *Lower the probe onto your stock to measure its thickness. In this case it is 0.836 in. or a shade under 27/32 in. Divide this by 2 to give 0.418 in. Add 0.418 and 0.170 to get 0.588 in.*

Set the height. *Set the gauge to 0.588 in. and raise the bit until its upper horizontal cutter contacts the probe. The centers of the workpiece and the bit are now aligned. Later, write the formula on the bit to speed future setups.*

Set the fence. *Place the stock vertically against the fence close to the bit. Hold a rule against it with a couple of inches in front of the bit. When the bottom 45° cutter just misses the rule, lock the fence.*

Cut with confidence. *Make the horizontal cut on one long side of each piece of stock (right). Because the bit has a tendency to push the wood away, Babbitt uses a long featherboard of his own design (Methods of Work,* FWW *#206, p. 14) to keep the workpiece against the bit during both the vertical and horizontal cuts. During the vertical cuts, he places a spacer block under the featherboard so that it bears in the center of the stock (far right).*

Photos, except where noted: Mark Schofield; facing page (left column): John Tetreault