

# Wheel Marking Gauge Design Considerations



*Marking gauge examples in different woods and designs*

A marking gauge is an essential layout tool that should be in the toolkit of any hand-tool woodworker. They make it possible to produce the accurate, repeatable and well-defined layout marks needed for tight joinery and stock preparation. Marks left by a marking gauge can accurately locate and guide saws, chisels and planes. These gauges are especially useful for laying out dovetails, mortises and tenons and when dimensioning lumber.

A marking gauge consists of a few simple parts: a beam with a sharp pin or cutter on one end and an adjustable sliding fence. While numerous well-built and economical gauges can be purchased, nothing compares to making your own heirloom quality, accurate layout tool. Making your own also allows you to customize it for specific tasks and shape it to best fit your hand for optimal comfort and control. In a short evening, a small scrap of wood can be turned into a precision, easy-to-use layout tool.

A disc or wheel-cutter version was chosen for this kit over a pin or knife-cutter version for several reasons: 1) the disc-shaped cutter is always fully visible while scoring a line, 2) the hardened-steel cutter is sharp and easy to sharpen, 3) the round cutter can be rotated to expose a new cutting edge, 4) the disc is beveled and draws the fence tightly against the workpiece, 5) it can be used in either direction and by either right or left-handers, and 6) it effectively cuts across the grain, with the grain and on end grain.

A quality marking gauge possesses several characteristics: 1) the beam must be perpendicular to the fence, 2) the fence must easily adjust along the beam, 3) the fence must lock down securely and not move, and 4) the cutter must leave a crisp, distinct scribe line without wandering when marking with the grain, against the grain, and on end grain.

This marking gauge kit will enable you to easily and quickly make a marking gauge that meets all of the above requirements. The kit contains everything you need to make an heirloom quality marking gauge (minus the wood). All you need are a few simple tools, a short afternoon or evening and a small scrap of hardwood. Unlike so many tutorials on building a marking gauge, no grinding or heat treating of the cutter is required. You just need to shape a wood fence, drill a few holes and insert a threaded insert.

The kit contains the following:

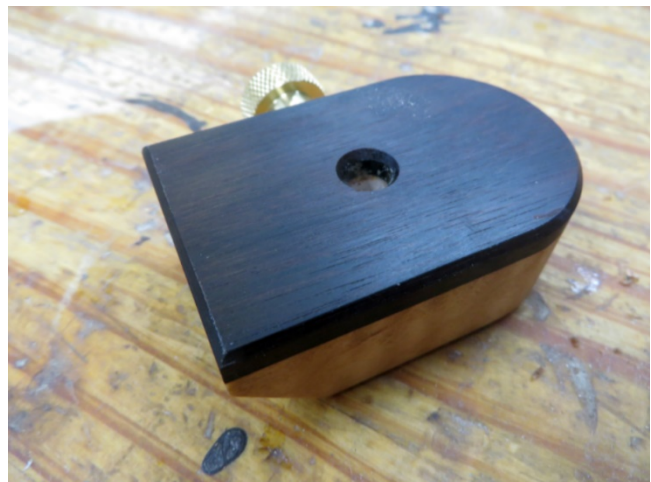
1. Marking gauge beam 8 mm in diameter by 8" long with a 1/2" round fixed cutter on one end.
2. 2 replacement high speed steel cutters.
3. One 1-1/2" long 1/4-20 solid brass knob with a 3/4" outside diameter knurled head.
4. 2 each 1/4-20 solid brass threaded inserts (an extra is provided for practice).



By design, this kit does not include a single detailed plan, but offers numerous historical models and design considerations to choose from. We leave the details for you to decide.

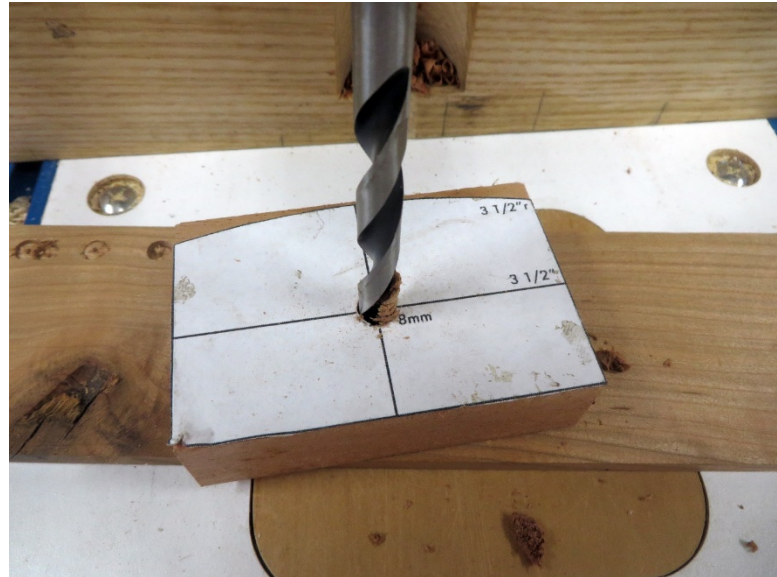
### Fence designs:

Your marking gauge will need a fence. Fences on historic models ranged from 1" to 1-1/4" thick, except in the case of Japanese designs which are closer to 3/4". Keep in mind that the head of the threaded brass knob in the kit is 3/4" in diameter, so any fence will need to be at least this thick to keep the knob from interfering with marking. Use a dense hardwood to minimize wear. If no 5/4 or 6/4 wood is available, one option is to laminate 2 species together (one hard wearing species on the reference face) to get the desired thickness. If you glue any type of oily exotic wood (e.g., Rosewood, Ebony, Ironwood, Colobolo, Cordia, Bocote, Ipe, Lignum Viaete, Katalox, Bloodwood, etc.) make sure to remove surface oils by wiping any glue surfaces with denatured alcohol, acetone or lacquer thinner and then scuff sand with 120 grit sandpaper just prior to gluing. Use slow setting 2 part epoxy for the best bond. Choose a design from the many full-size options in the appendix or create your own. Cut your stock to size. Stick the plan to the blank and orient the vertical or horizontal reference marks on the blank to mark the knob hole location. Install the threaded insert (see below). Bandsaw and sand the blank to final shape. Install wear plates if desired (see below). Route a small chamfer on both faces. You could add a larger profile to the back side for comfort or a better grip, but never profile the working face as this will just reduce the reference area.



### Drilling the beam hole:

For the best fitting beam hole use an 8 mm (.315") brad point drill bit. This is the perfect size that gives the best fit and offers the best sliding action. If you do not have an 8 mm bit, an O size (.316") drill bit will also work. Use a drill press to get the hole perfectly perpendicular to the fence. Back up the piece with a scrap of wood to prevent blowout as the bit exits the hole. Use a small countersink to put a small bevel on both sides of the hole. You could also create a large counter sink on one side to protect the cutter.



### Wear plates:

Most domestic hardwoods will perform for years of moderate use and show little to no fence wear. Super-dense imported hardwoods will provide added wear protection. You could laminate a hard wearing exotic to the wear face of the fence to minimize wear. For the best wear protection inset horizontal or vertical brass wear plates. To install, route slots in the fence to accept wear plates. Do a test cut on a scrap to ensure the slot is a tight fit and the brass is flush with the surface. Cut brass wear strips slightly longer than needed and clamp and epoxy in place. Trim the brass strips as you cut the fence to shape on the bandsaw. Brass cuts and sands easily using woodworking tools. If power sanding, proceed slowly as brass can heat up quickly and excessive heat build-up can affect the epoxy bond. To perform final leveling, sand fence faces with 220 then 320 sandpaper stuck to a piece of particle board or MDF. "Grain" the brass by sanding with 320 using a fence to keep the scratch marks parallel with the strips.



## Back bevel

A 45 degree bevel can be added to the back, lower portion of the fence to lighten the gauge and provide optimal gripping.



## Knob placement:

As stated previously, the head of the brass knurled knob is 3/4" in diameter, so the thickness of the fence will need to be greater than this to prevent the knob from interfering while marking stock. If all that is available is 3/4" thick stock, install the threaded insert slightly off center. The knob can be installed on the top or side of the fence, whichever location provides the best grasp.

## Cutter countersink

You can counter sink a small recess in the fence to protect the cutter when not in use. Far and away, the best countersink for wood is a single flute deburring tool designed for metal work. This type of countersink slices a smooth countersink in existing holes and leaves no chatter. These bits work by slicing wood instead of the tearing produced by most other multi-flute models.





## Sharpening the cutter

For the best performance the round cutting wheel will need to be sharpened from time to time. To sharpen, remove the cutter, lay the flat face on a sharpening stone and rub in circles until the face is polished and sharp. Use your finger or a pencil eraser to get a good grip on the small cutter. The marking gauge kit comes with 2 extra cutters in case one gets damaged.

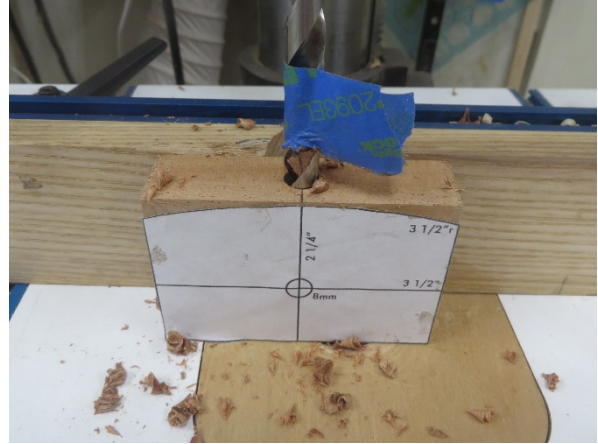
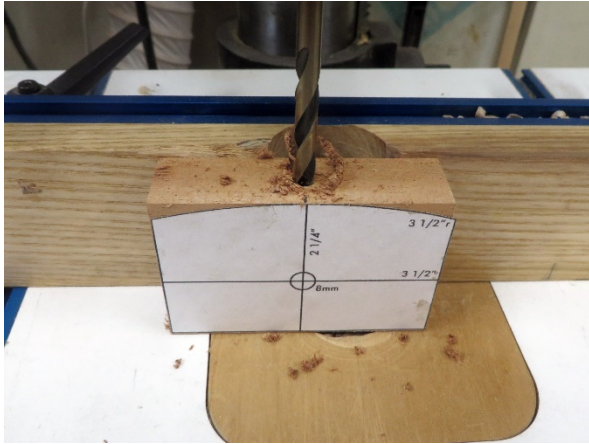
## Mortice / Tenon gauge options

You can use this kit to make a mortising gauge with 2 cutters that can each be adjusted independently, allowing both sides of a mortise or tenon to be marked at the same time. You can make one by drilling and installing 2 separate beams in a fence and orienting the cutters in opposite directions so that each cutter bevel faces the inside of a mortise or outside of a tenon. You could also install just one beam, and outfit it with a pair of mortise blades that can be independently adjusted and locked in place with setscrews.



## Installing brass threaded inserts

Install the brass threaded insert in the fence before profiling the final shape. Installing threaded inserts perfectly square to the edge of a board can be a challenge. If not careful, inserts can be started in the hole out of square making it nearly impossible to correct this misalignment. A crooked insert leads to an out of square and unsightly knob. To install correctly, use a drill press with a fence and drill a 1/4" pilot hole using a brad point bit at least 1-1/4" deep or until you reach the 8 mm beam hole. Switch bits to a 25/64" twist drill bit. Using the same fence setting drill a 1/2" deep hole around the existing 1/4" pilot hole. This will accept the brass insert. Thread an insert on a 1-1/4" long hex bolt with a washer with the slotted end entering the hole first. Install the insert by turning the bolt head with a wrench. The smaller 1/4" portion of the hole will guide the bolt and ensure the insert is installed straight and true.



### Finish:

Use the wipe on finish of your choice. Wipe on poly, Danish oil or shellac followed by a light coat of wax are all good choices.

### Supplies:

Marking gauge kit with 8 mm beam, 3 cutters, 2 brass inserts and brass thumb screw available [HERE](#)

8 mm brad point bit available [HERE](#)

1/4" brad drill point bit available [HERE](#)

25/64" twist drill bit available [HERE](#)

Single flute deburring chatter proof counter sink available [HERE](#)

1/8" x 3/8" x 6" solid brass wear plate material available [HERE](#)

Dual cutter mortise gauge attachment available [HERE](#)

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