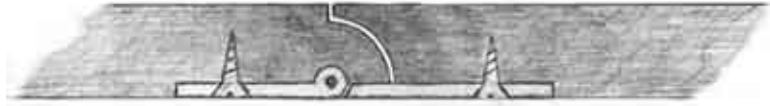
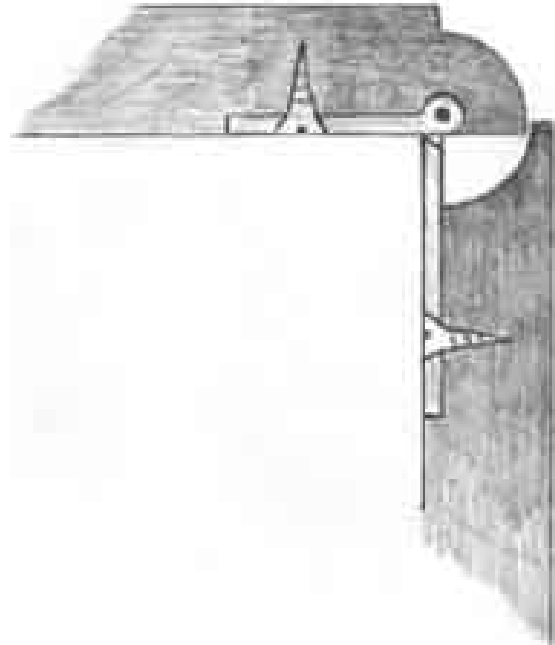


Installing a Drop Leaf Table Hinge – Drop Leaf Rule Joint

A rule joint seems simple, but the reality can be frustrating. The most common problems are scraping and binding when the joint is operated, or unsightly gaps when the leaf is raised. To get it right requires both an understanding and application of the geometry involved.



Few people have suitable molding planes for cutting the matching round-over and cove. Most people will use a router. Matching cove and bead sets are available for just this purpose, but I have successfully used a 1/2" radius cove cutter from one company and a 1/2" radius bead (round-over) cutter from another company. Although a router can quickly produce a very accurate pair of matching cuts, it can just as easily cut an unworkable joint, no matter how attractive the edge treatments may be.



Different hinges may require different router settings. Therefore, hinge selection must be the starting point. A rule joint hinge is specially manufactured with an extra wide leaf to span the joint. Because it is screwed into the underside of the table with the barrel facing up, the countersinks are on the reverse side.

By all means, follow detailed instructions such as those by Mac Campbell in Fine Woodworking. Also, make the joint on scrap before you try it on the workpiece.

1. Open the hinge and lay it barrel up on a flat surface. Accurately measure up from this surface to the center of the hinge pin. Normally, this measurement will be 1/8" (Alternatively, and assuming the hinge is a traditional flat back style you can simply measure the hinge barrel and divide by two). When this hinge is mortised into the underside of the tabletop the center of rotation of the table leaf will be 1/8" up from the bottom.

If the table top is 3/4" thick (or a bit thicker) you can use a 1/2" radius cutter for the joint. You must account for the center of rotation described above. If a 1/2" radius cutter is set correctly, with the center of its described circle raised 1/8" above the underside of the table, the fillet will actually be only 1/8", not 1/4" ($3/4" - 1/2" + 1/8"$). An 1/8" fillet is a workable minimum. When the bead is cut on the tabletop, the cove on the table leaf must match its profile with perhaps 1/32" clearance. (Recognize that some clearance must exist all along the joint.) With a full 3/4" material thickness, that will leave an edge of 3/32" which should be regarded as the absolute minimum. If the tabletop is thinner due to planing or sanding, then a 1/2" radius cutter will be too large and must be abandoned in favor of a 7/16" or smaller pair of bits. If the tabletop is much thicker than 3/4" then you will have to use a larger diameter cutter set or mortise the hinges that much deeper into the bottoms.

2. Joint the mating surfaces as if you were making a butt joint.

3. Cut the bead on the table top. If you are using a 1/2" radius cutter you will need to set the base of your router to cut a fillet of a thickness that is the result of the following formula:

Tabletop thickness (3/4") minus 1/2 hinge barrel diameter (1/8") minus cutter radius (1/2")

Make a series of passes to avoid tearing the wood. Also, cut the identical bead in a piece of scrap about 2-3" wide by 3-6" long. You will later need this to trim the cut.

4. Cut the mating profile in the table leaf. Ideally you would select a cutter with a 1/32" larger radius to provide a little clearance at the joint. Such cutters are not generally available, so in order to create the needed clearance, you will separate the leaves by this much when installing the hinges. Make multiple passes on the router table, and as you move closer to the final cut, check the fit with the top. Again, cut an identical profile in a 2 x 4 x 3/4" piece of scrap wood.

5. Lay out top and leaf, upside down. Put a spacer about 1/32" thick (use pieces of paper) in the joint and lightly clamp the pieces together. Lay out the hinges, about 1/4 of the way in from each end. Use additional hinges if the joint is longer than 48" or so. The short hinge leaf points toward the center of the table. Carefully mark the locations of one hinge and hinge pin. All subsequent marks should be copied from this one with a marking gauge.

6. The first cut will be in the table top and will accommodate the hinge barrels. This is best cut with a 1/4" straight cutter. The center of this cut should be a 1/64" outboard of a line drawn down from the vertical cut left by your radius cutter. With the table top upside down and with its leaf nesting in place but separated by 1/32", lay the hinge barrel in its mortise and with a sharp knife scribe its outline. Finally route a mortise to set the hinge flush with the table underside and screw into place. Make sure the table leaf remains firmly in place during this operation.

7. Drill only one hole per leaf for mounting screws. Attach the hinges and test the joint while the top lays flat on the bench. It might be well to use steel screws of the same size for this, so as not to wear out the heads of brass screws. Don't forget that the thickness of the table top is less than nominal because of the hinge mortise!

8. Glue 80 -100 grit sandpaper to the profiles you made earlier and use them to trim the joint until it works without binding. Any binding, squeaking, etc. May be worsened by the finish you will apply later.

Reference

The illustrations are taken from, and the text is based on, an online brochure from Whitechapel LTD: http://www.whitechapel-ltd.com/tech/drop_leaf_table_hinge.shtml

Campbell Mac. Routing a Rule Joint. Fine Woodworking Jan/Feb 1990. *This is an excellent, detailed explanation with useful diagrams.*