"The Donut" Compound Mount

Step by Step Machining Instructions

By John Pitkin

Here's the step by step on making the Donut Compound Mount. This is a supplement to the file *"The Donut Compound Mount for the 9X20 Lathe."*

1. Rough cut the oversize ring.

Get a piece of plate material about 4 x 4 x ¾ inch. Cut off the corners with hack saw or a band saw to reduce the amount of machining to make a round plate.

2. Mount it on the lathe.

Drill a 7/16 or 11 mm hole through the center.

Chuck a 7/16 x 3 inch bolt in the lathe with the head inside the chuck so it hooks onto the inside of the chuck jaws. Close the Jaws on the bolt. The threads of the bolt will be protruding.

Slip the workpiece over the bolt and up against the chuck jaws. Tighten with a nut firmly using a wrench.

3. Make the blank round

Begin by making an interrupted cut on the outside diameter to make the blank round. Go slowly as you cut off the corners. Do not try to take too deep a cut. A few thousands at a time is safe. The lathe will bang and thump throwing off small chips until the piece is round, then the cutting will smooth out and produce long curly chips.

4. Turn outside diameter to 3.5 inches and cut a clamping ledge.

Cut a clamping ledge on the outer edge. The ledge is 0.25 high and 0.25 deep. This means your major OD is 3.5 inches and your minor OD is 3.0 inches. Leave a bit of extra height to the ledge, as you will face the bottom in the next step.

5. Face the bottom

Remove the workpiece from the lathe.
Remove the bolt from the chuck.
Mount the workpiece in the lathe using outside jaws clamped in the ledge. The bottom of the workpiece is to the right.
Take a shallow face cut across the workpiece to flatten the bottom. Face cut enough to make the ledge 0.25 thick.

6. Face the top

Turn the workpiece over in the chuck. The top is to the right. Face the top to reduce the total thickness of the piece to 5/8 inch. (0.625)

7. Cut the center recess.

Machine a recess in the top center 1.90 wide x 0.315 deep.
Bore the center hole to 12mm
Remove the workpiece from the lathe.

8. Drill mounting holes

Remove the original graduated ring from the bottom of the compound and discard the original Allen head screws. These screws are much too soft to hold the base. Remove the original two bolt, or four bolt replacement clamp ring. It is not used.

Locate mounting holes to match your existing holes in the compound base.
The holes are NOT symmetrically spaced on my lathe. Yours may be different.
Drill counter-bores first. The counter-bores should be deep enough for M6-1.0x12 button head Allen screws. About 0.20 deep. Then drill through holes for the button head screws.

Tip: You can use the original graduated ring to locate the holes on the new ring base. You must remove the locating pin from the old ring in order to hold the parts together. Do not place the pieces bottom to bottom as the orientation will NOT be correct. They must be held bottom to top.

9. Install new oversize ring.

The original compound base rests on the outer ring of the new donut. The pivot sits inside the donut hole. The center 12mm stub of the compound protrudes through the bottom of the donut to act as a swivel on the cross slide. Attach the new oversize ring with new button head Allen screws. Use a bit of Loc-tite to retain the screws.

10. Make four small angle clamps from angle iron or aluminum.

Refer to the article to see the shape and size. The leg on the clamp is 0.25 high to match the height of the ledge on the new ring base.

11. Attach the compound assembly to the cross slide.

Use two or four angle clamps and bolts.

You’re done.