An Easy Way to Make Zero Clearance Throat Plates For the Ryobi BT3000SX

If you are not satisfied with the factory throat plates for your BT3K, here's an easy way to churn out zero-clearance throat plates in bulk for your BT3000. If you have a router mounted in the accessory table, so much the better. The one modification you will need to make to your saw is to tap the 4 holes in the inner area around the blade. If you make throat plates this way you will never need the three primary holes again. I believe I threaded mine for #10 screws, but #8 screws might provide a better fit. You can whip out several of these in an hour. There are seven easy to follow steps to making them: Rip your stock to width, cut it to length(s), mill the outer lip on the sides, mill the larger lip on each end, mill the recessed areas around the screw holes, drill the four countersunk holes in the milled plate and finish the throat plate with a few coats of paste wax.

First, select your wood source. You can use any stable hard wood, but I've had the best results using the "hobby board" material found at home centers. They usually have various thicknesses of oak and poplar in a bin with dowels and other smaller lengths of wood. Select the stock that is at least 4" wide since the width of your throat plates will be slightly less than that. You can get lengths in whatever size you want, but the longer you buy the cheaper it is for each throat plate. I like oak as a wood, but have had better results with the poplar because it is smoother and less brittle. Select a thickness that is greater than the distance from the table surface to the 4 screw holes. 1/2" thick should work, but you can also bump it up to 3/4" or 15/16" for more stability. If you are using your own stock, resaw it to the desired thickness and get a true face on the cut side.

Step 1: Rip Your Stock To Width

Line up one end and edge of your stock with one corner of your throat plate tray. Gauge the correct width and mark it with a pencil or scribe. Do the same for length, taking care to take the length measurement on the side that won't get trimmed off in the next step. If it is difficult to get a measurement you can remove the throat plate and the blade from the saw. Go for a tight fit because you can sand or plane the final fit. Now replace the blade and throat plate and set your rip fence for the correct width. Rip the full length of your stock. Save the waste if you are using 4" wide hobby board. It makes a good drawer slide or shelf cleat.

Step 2: Cut Your Stock To Length

Now that the stock is ripped to width, cross cut the length you marked in the previous step. Compare the dimensions of this blank to the opening of the throat plate for a proper fit. If everything checks out, use this blank to mark the length for the next one, then cut it. Use the original blank to gauge and cut additional blanks until your stock is too short. When finished you should have two or more blanks that fit in the throat plate tray, though they still stick up above the table. Remove the blade and throat plate to check the fit. You won't need them for a while, and you will be checking the fit a lot for the next few minutes.

Step 3: Milling the Outer Lip

Hopefully, you have a router mounted in the accessory table and ready to go. If not, mount one in your saw or router table. Chuck up a 1/2" mortising bit. Set up a fence that can be clamped in place. I just clamp a 1" thick piece of hardwood to the rip fence. Make sure your clamps don't interfere with the movement of your blanks across the router table and your fence is thick enough to cage the backside of the cutter.

Stand a blank up (tall) in the throat plate tray and mark the width of the outer lip of the tray (where the edges of the metal throat plate rest) on the blank. This will most likely be between 1/8" and 1/4", but take care to gauge this accurately since the machining varies from saw to saw. Set the fence at the correct distance required to form the width of the lip on the blank. Now set the depth of cut that will determine the thickness of the lip. Remember, since you are using a router it is a lot easier to sneak up on a final measurement than with a saw. There is no need to take it all in one pass. Mill a lip on all four sides of the blank, doing the end passes first and using backer boards to minimize tear out. A well placed featherboard is helpful here, however, too much pressure can cause your blank to tip toward the milled areas and centering it on your stock can make it difficult to push it past the cutter.

Turn the blank upside down so you are looking at the side that will face down toward the blade when it is installed. Set this into the throat plate tray and check the thickness of the lip you just routed. The lip should be perfectly flush with the tabletop, or slightly proud (you can sand the last 1/64"). If it is too much to sand, readjust the router depth and make new passes. Don't take so much material that these lips are too thin. They will crack when you screw the throat plate down. Once you have one blank with the correct lip milled, run all your other blanks over the cutter, doing the end passes first. Depending on the size and power of your router you may have to make multiple passes (and multiple adjustments) to get the depth of cut necessary. If you have a powerful router with sharp bits you can take it all in one pass if your wood isn't too thick.

Now look at your blanks. The long sides are finished at this point, but if you look at the throat plate tray you will see that the lips on each end still need to be milled, and the recessed area for the screw holes needs to be created. The ends come first.

Step Four: Milling the Ends

Set your blank in the throat plate tray standing up on one of the long ends and mark the back (inside) point where the ends are recessed. You only need to mark one since they are virtually the same on both ends. You can also make the fine adjustments easy enough by moving the fence, so take your time and sneak up on the mark you made. If you are doing this in one pass leave your cutter depth set where it is. If not, you will have to make multiple passes, but at least the fence setting shouldn't change. Readjust your fence and mill out the end areas, using a backer board to minimize tear out. Repeat this process for the remaining blanks.

NOTE: With the 1/2" cutter you will likely have to make multiple passes and nibble the remainder. Use the backer board and route the outside part first, then move the blank up to the

fence and mill out the inside. Eyeball the location of the middle strip and push it through with the backer board.

Step 5: Milling the Recessed Areas Around the Screw Holes

You now have a set of blanks, that when placed upside down in the throat plate tray will have a lip running the length of each side that is flush with the tabletop. Each blank should also have a wider lip on each end that extends to the point where the tray drops to the threaded holes. Flip the blank over (topside up) and check to see of the top of the blank is still flush with the tabletop. The blank should fit perfectly in the throat plate tray with minimal movement side to side and back and forth. If the fit is satisfactory the blank is ready for drilling. If the blank protrudes above the tabletop you need to mill out the tab shaped areas where the screws fit.

While the blank is in the throat plate tray take note of the distance from the tabletop to the top of the blank. This is the approximate distance the blank needs to drop, so don't try to do this in one pass. If you do take off too much material you can still shim the throat plate to make it flush, but doing it correctly from the beginning will yield better results when put to use.

There are two ways to do this. The first is to set the correct cutter depth and mill a strip wide enough get the blank to drop to the correct level, flush with the tabletop. A few simple passes and you are ready for drilling. The second is to mill individual pockets on each side of the blank, leaving the material in the middle for additional strength in the blade plane while the throat plate still rests against the screw tabs.

To mill out the pockets you will need to set up a stop block and mill diagonal corners, reset the stop block and fence, and do the other corners. It takes longer but it is worth it to get the tighter fit. Set the blank in the throat plate tray and stand it up on one of the long sides. Mark the inside areas on the blank where they will meet the screw tabs.

Set the fence adjustment first, before the stop block is in place, by putting one of the long sides of the blank against the fence and moving the fence toward or away from the cutter until it is enough to mill out the screw tab area. You will probably have to make a second pass to clear out a small strip that remains anyway, but you won't have to readjust the fence. Use the mark you made on the blank to set the distance for the stop block (Remember which way your cutter is spinning!!!) and clamp the stop block in place to the fence or table. You should now have the fence and stop block set so you can mill out a small area about 3/4" x 3/4" on the thickest corners on the underside of the blank.

Set the cutter depth, keeping in mind you don't want to take off too much here. Take your time and make multiple passes to get this as accurate as possible. The cutter depth won't change for any of the pockets. The fence and stop block positions will.

When you mill the pockets you can only mill diagonally opposite corners, i.e. opposite end corners or side corners, without readjusting the fence. The tabs and holes are not symmetrical. Feed the blank into the cutter. I used a backer board for the ends, but the lip you milled earlier now works against you. If you are really serious, you could make a backer board with it's own

lip and compensate for this. Repeat the process for the other blanks. You also might have a small bit of wood in the pockets that the cutter misses. To mill this out, nibble this away with a back and forth motion. Your fence and stop block will prevent you from taking too much, provided it is set correctly.

Now you have a set of blanks with side lips, end lips and two pockets milled in opposite corners. Because two pockets remain you can't drop this in the throat plate tray to check the depth accuracy. This is also the reason why you may have to make multiple passes and repeat these last steps more than once. What you can do is check the lateral fit of the pockets by setting the blank on edge and using your eyes to sight its position. If it looks like a good fit mill diagonal pockets in the remaining blanks.

Reset the fence and stop block for the two remaining pockets. The cutter depth doesn't change because you want pocket depth to be identical in all pockets. Mill out the last two pockets on your blanks, using backer boards when appropriate and nibbling away remaining bits of material.

Step 6: Drilling the Throat Plate Holes

All your throat plates should now fit snugly in the throat plate tray and be flush with the tabletop. Fine sanding can finish the fit if it is too tight; shims will be needed if you removed too much material from the underside. The only thing left is the drilling. This is the most difficult part for two reasons. The first is that the holes aren't going to be symmetrical so once you drill the holes your throat plate will only fit one way on the table. Remember this when you are slotting them for blades. They have to be perfect the first time. The second is that a screw up here is a lot harder to fix, especially if the wood cracks or you end up with a slot in order to get the screws to fit. When all is said and done it is better to drill and check the fit of each throat plate before moving on to the next one.

I tapped the four holes on the inside because the wood was so thin where the three factory holes are located. Because I used thicker stock I could drill the holes and countersinks without splitting the wood. There are several ways to find the location for the holes. I used two methods--one for an initial measurement and one as a double-check. I first used a framing square to get a straight edge bisecting the center of two holes in one direction and drew a line on the tabletop on either side of the holes. This is so I can center the holes on the top of the blank. I then used the framing square to find and mark the centers for all for holes in the other direction, ending up with line segments on the table that would intersect over the centers of the holes.

Set the blank back into the tray. Use the framing square and line it up to the lines you drew on your tabletop. Mark a pencil line on the blank at roughly the point where the hole is. Make this line about an inch long. Do this for the other hole along the same plane. Repeat the process for the other holes, and then repeat the process for the other blanks. There should be four crosses on your blank that theoretically are directly above the hold in the throat plate tray.

Check your measurements using the second method. Stand the blank up on end in the throat plate tray, directly above the holes in the screw tabs and sight down the top of the blank toward the hole. Make any adjustments to your marks on both holes on that side. Flip the blank over to

the other side of the tray and perform the same check on the other holes on the other end. Now stand the blank up on its long side in the tray and check the mark locations for the holes in that direction. Flip it and check the other side.

With all the holes checked, marked, and checked again, chuck up a countersink bit that matches the hole you threaded in the tabletop. The depth isn't too important here, but you can set it if you want to. Secure the blank to a surface and carefully drill out the holes. Make sure you countersink them enough for the screw heads, but not so deep you lose wood strength. Not that it matters once the hole is drilled, but you might also check the throat plate against the table after each hole. You might have to recheck the hole centers, and one screwed up hole is better than two or three screwed up holes. Once the holes are drilled check the fit on the table by screwing the throat plate down. It should fit perfectly and be perfectly flush. Some might say that you should account for wax build up, but it is up to you. Repeat the procedure for the remaining blanks.

Step 7: Finishing and Waxing

When you are finished, stain, oil and wax the blanks as desired. I waxed the undersides along with the top surfaces, and ended up applying about 4 coats of wax to each throat plate. This is something that is good to do during a movie or sporting event. When you are finished I recommend storing the throat plates until they are needed, then slotting them and labeling them just before first use. Store them carefully as the outer lip is fragile.

Slotting Your Zero Clearance Throat Plates

If you have had the problem with blade not lowering enough to get the unslotted throat plates to seat properly this might help. Remove the 7" blade from your 5/8" arbor circular saw and install it on your BT3000. The 7" blade should have the same kerf as the blade you will be using with the throat plate. With the blade installed and at the lowest setting pop in the throat plate and screw it down to the tabletop. Plug in the saw and turn it on. When the blade reaches maximum speed begin raising the blade with the crank handle. This would be a real bad time to realize you are tilting the blade instead, so make sure the lever is in the correct position before you begin this. You should hear the blade when it makes initial contact with the throat plate. Go slowly and keep raising the blade until it breaks the surface of the throat plate. At this point the kerf in the throat plate should be big enough to allow the 10" blade to fit when at its lowest position. If it isn't, switch out blades again and increase the slot a little more with the 7" blade. Always remember to lower the blade completely before turning the saw on or you could damage the throat plate or saw. Reinstall the 10" blade of choice then reinstall the throat plate. If everything fits turn the saw back on and raise the blade until you get the slot you want. Clean the saw and table, then slap a final coat of wax on the table and throat plate.

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