

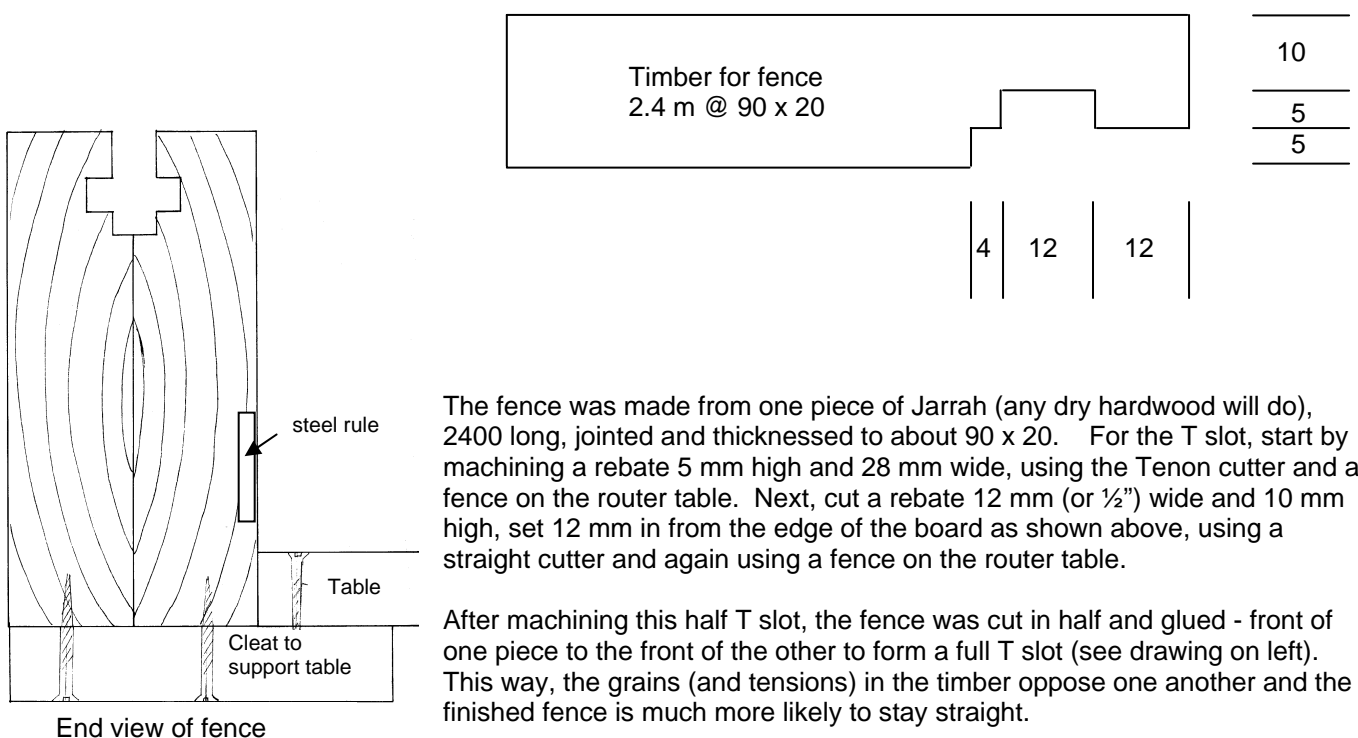
Custom Fence & Table for Drop Saw



Over the years I have tried lots of ways to cut small pieces of timber accurately to width, and it has usually come down to compromising accuracy to achieve safety or vice versa. For example, I am talking about the sort of timber I am cutting for the lid frame on the "Loose Lid" project (page 8, Dovetailed Boxes Plans) where the frame pieces are 96 mm long and only 22 mm wide. With workpieces this short and narrow it can be difficult to keep your fingers well clear of the blade, and push sticks on the table saw are often inadequate.

I have recently set up a drop saw with a custom table and fence for this small work, and it works just brilliantly, with a high degree of safety. However, like anything we do with machinery, there are dos and don'ts, and I will cover as many of these as I can think of in this article.

This set-up was built for a Hitachi sliding arm drop saw (model C10FSH) and may need modifying for other saws. The sliding arm is important as gives us the option to handle timber up to 300 mm long when trimming to width (or 300 mm wide when cross cutting). In fact, if the fence is set up accurately, we can trim timber up to 600 mm long to width, as we can trim half the length and then flip the timber end for end and trim the remainder. It is surprising how accurate this can be.



Before gluing up the fence, clamp the two pieces together (accurately aligned) and drill a hole through each end for a locating pin (I used 1/8" brass). This way the two pieces won't slide sideways when you glue and clamp them.

I set a 600 mm steel rule into the L.H. side of the fence so that its face was flush with the face of the fence. To do this, I used the tenon cutter, cutting a rebate 32 mm wide, 1 mm deep and 600 mm long. Carba-Tec sells some self-adhesive rules, which might be good for this. The rule should be positioned so that it sits about 10 mm above the table in the finished set-up, which will be 10 mm plus the thickness of the table up from the bottom of the fence. I glued the rule in for only 100 mm at the middle end, and held it loosely with a screw at the other end so it can expand and contract independently.

NOTE: I ground 5 mm off the zero end of the rule so there is no chance of the saw hitting the steel!

The fence itself is screwed down to the existing aluminium fences on the drop saw with 2 screws on each side (you may need to drill holes in the aluminium fences for this).

For the table, I used 16 mm MDF, 1200 mm long and 310 mm wide. This was fixed down to the saw with 4 hex head bolts (not countersunk), two into the rotating table and 2 into the side tables. For the rotating table, I used the threaded holes at the outside end of the table insert, and made the holes in the table a little oversize so the rotating table could still be turned a tiny bit to adjust the saw square to the fence. For the side table, I drilled holes and tapped a thread into the aluminium. I used a 70 x 19 mm cleat, about 380 mm long, at each end (below the Jarrah) to support the MDF. On my set-up, the L.H. cleat is hard up against the base of the drop saw, which locates the whole set-up sideways. This ensures accurate re-positioning if you need to remove the fence and table. I also screwed the table down to these cleats, with 2 screws at each end. This locks the whole structure together well, and also helps to keep the Jarrah straight.



Once the fence and table are set up, the depth of cut on the drop saw was set to 8 mm below the table surface, so it only cuts half way through the MDF table. This way the Jarrah fence and the table remain in one piece, with 8 mm left below the cut.

At this stage it is worth adjusting the saw to get the squarest cut possible. See the Dovetail Jig Instructions (note 23) for checking for square.

CROSS CUTTING:

For cross cutting timber, I made a sliding stop by dovetailing two pieces of 10 mm timber about 65 mm wide (see photo). The front piece of the stop was cut so it clears the table by 1 mm or 2 mm to allow clearance for dust and shavings. I drilled a hole in the top piece to take a knob with threaded insert, which screws

into a threaded block of hardwood (about 19 mm x 30 mm x 10 mm thick) which runs in the T slot. If you don't have any means of threading a block, set a nut into the bottom side by drilling away the bulk of the waste and then using a small chisel to make the hole hexagonal. Note: Knobs with M8 x 40 mm threaded inserts are available from Gifkins Dovetail.

RIPPING:

For ripping timber to width, I use a piece of 12 mm MDF (about 300 mm square) as a fence. Start by jointing one side straight and square, then clamp it to your saw table with this jointed edge against the fence, and trim an adjacent edge with the saw. This way the fence will be EXACTLY parallel to the saw blade, even if the saw is not set perfectly at 90°. This fence works brilliantly for trimming small pieces of stock to width accurately, and is safer than any other method I have tried!





When working with timber narrower than about 50 mm, I use a hold down to keep my fingers well away from the blade. My hold down is shaped, so I can hold workpieces thinner than the MDF fence (see photo on left).

With any ripping, it is vital that the offcut is not confined but is free to move away from the saw once cut free. Also, you must always hold the timber down between the saw and the rip fence. If you were to hold the workpiece on the right of the saw blade, with the rip fence to the left of the saw blade, then the offcut to the left of the blade would jam or be thrown out as it is cut free, with potentially dangerous consequences.

CUTTING MITRES

I have another MDF board set accurately at 45° , which clamps against the fence in the same way as the rip fence. This works well for cutting mitres for frames, and is much easier than removing all the custom fence setup so you can swivel the saw to 45° . There is no reason why you couldn't have boards cut for other angles too.



As it is difficult to cut this board accurately to 45° , it can be made adjustable. Cut a piece of 12 mm MDF at about 44° and insert a screw in the back corner as shown. You can then adjust this screw in or out till the fence is accurately set at 45° .



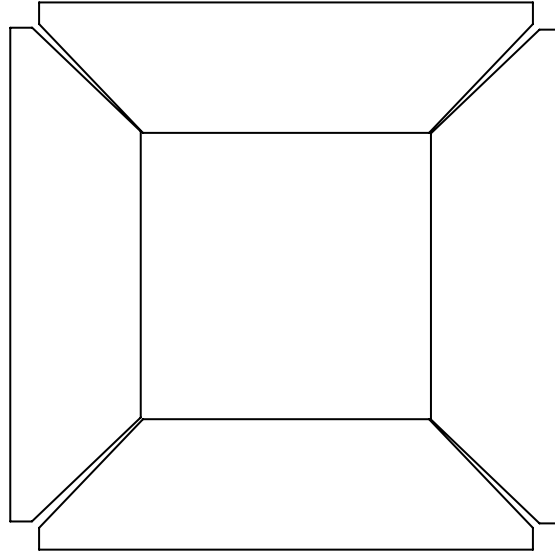
Close up of adjusting screw

When cutting the mitres, I find that the saw cuts best if you cut in towards the back fence rather than down.



I set the mitre fence about 2 mm along from the gap in the back fence (the one with the ruler), as shown above. This way it leaves a 2 mm flat on the end of the frame piece I am cutting, which gives a definite end to register against, rather than a point. This flat is vital if we want to keep all the frame pieces at their original lengths, and it also allows the mitres to be trimmed slightly to get a perfect fit without losing any length. This idea will only work if the back fence with the ruler comes right up to the saw blade.

To adjust the fence to 45°, start with 4 pieces of MDF about 300 x 100, and cut mitres on each end of all 4 pieces, leaving a 10 mm flat on the ends (that is, set the mitre fence 10 mm back from the saw blade). This will give us room to trim the mitres a few times without losing any length. Assemble into a frame (on a flat surface) and check all 4 corners for gaps. Adjust the mitre fence if necessary, turning the screw out if the joints are open on the outside (as in the drawing below). Check again, and repeat until you have perfect mitres. Once this fence is set up, you will always get perfect mitres as long as you don't change the angle of the drop saw from 90°. It is worth setting the saw as close as possible to 90° before adjusting the mitre fence.



To cut mitres in the thickness of a board rather than in the width, we can use the same idea but a higher fence.

You would use this if you were going to mitre the corners of a box or fit a mitred lining inside a box.

Start with a block of wood about 80 x 80 x 300 mm long (we would like this to be higher than the timber we wish to mitre). Dress the sides flat and square on the jointer. Set up the 45° fence on the drop saw and cut a mitre on one end of the block. It is worth doing this cut twice, once to remove the bulk of the wood and another cut just trimming off a fraction of a mm or so. This second cut should be flatter and more accurate.

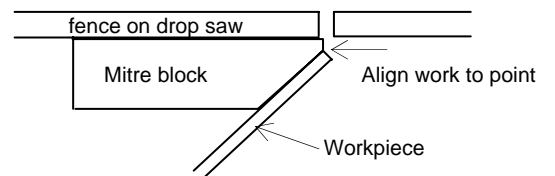


Cutting mitre on 80 x 80 block



Mitre block in use
Hold firmly with one hand while cutting

Clamp this block along the back fence with the point of the mitre over the saw kerf and trim this point off with the drop saw. This now gives a definite edge to set our work when cutting the mitres. It is worth setting up a good light beside the drop saw for this operation.



Position each end of each work piece against this mitre fence with the end accurately in line with the trim point on the fence, and hold the work firmly by hand whilst cutting down with the drop saw. Don't use the sliding arm to cut in towards the fence. We want the saw cut to leave each end mitred to a sharp point, without making the work any shorter than it was.

DUST EXTRACTION

I set up 2 hoses, one on the dust port on the saw and a PVC pipe behind the cut in the fence (the saw cuts into this pipe the first time it is used). However even with these 2 hoses it is difficult to pick up all the dust.

NOTES ON USING A DROP SAW

The workpiece must always be held against the table and against the fence when cutting. This can be by hand, there is no need to clamp the work, but if not held the saw will try to lift the workpiece up. This is because the teeth are going up at the leading edge of the cut. As long as the workpiece is held, the offcut will not try to lift.

With a drop saw, it is vital that the operator has a clear understanding of where to enter the work piece as well as the direction of the cut. The saw must always enter the work at the furthest point from the fence, and then cut towards the fence. You should continue this cut all the way through, till the saw reaches the stop on the back of its travel, and then lift out of the cut. If you entered the work on the fence side of the workpiece, and the saw was left to its own devices, it would fling itself away from the fence as the teeth ran across the wood, and it is potentially quite dangerous. This would be sudden and violent! The cutting action is a very definite, controlled action, cutting down to the bottom of the travel at the outside of the workpiece, then cutting in towards the fence slowly, **again with a very deliberate, controlled action** and finally lifting out of the cut once the saw has reached the back of its travel.

NOTE: The thing to keep in mind is that **you** are telling the **saw** what to do.

CUTTING MATERIALS OTHER THAN WOOD

Do not cut Polycarbonate or perspex (or any similar materials) on a drop saw. From experience, I have found that the shavings can melt and jamb in the kerf, causing the blade to fling the material up and away from the saw. Once again, this is very sudden and violent! The problem here is that, at the leading edge of the cut, the saw blade is cutting upwards, away from the table. If the kerf jamps, then the saw blade will lift the material with it. When this happened to me the material shattered, and pieces hit the wall 10 metres away!

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