

Workshop Tips #5 **Making Hydraulic Rams**

Today nearly all machinery has hydraulic rams to move dozer blades, loader shovel, crane jibs and whatever else needs to be moved or adjusted to do the job.

To make hydraulic rams for a wooden model or toy sounds easy: drill a hole in a dowel and insert a smaller dowel. That's right, but to drill the hole absolutely straight into the dowel is not easy.

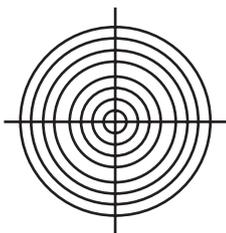
With our instructions it is possible to make hydraulic rams with little effort and in a reasonably short time even for inexperienced wood/toymakers.

The first and most important part of making rams is to make sure the drill press table is square to the drill. Next important is to use good quality, sharp drill bits. Only a sharp drill bit can drill the hole into a dowel without busting the thin walls. The drill bit has to be the right size for the dowel that is inserted into the drill hole. Test drilling into scrap wood will show clearly which size is the right one.

Making the jig is the easy. Use a bit of scrap wood, at least $\frac{3}{4}$ " (19 mm) thick, better a bit bigger than too small to avoid tilting movements during drilling. Drill a hole in the desired size for the ram, $\frac{3}{4}$ " (19 mm) or $\frac{1}{2}$ " (12 mm) for example and stick the dowel into it. Ensure, that the dowel is sitting firm.

Now begin drilling. On low speed, with gentle pressure bring the drill bit over the center of the dowel, double check it is the center. The jig board clamped secure in place, lower the drill slowly to avoid too much friction which would turn the dowel within the jig. The depth of the drill should be set to avoid drilling right thru, so we can use the end of the ram for sanding flat if needed and drilling the hole for the mounting. The inserted dowel

should move easily without being sluggish.



To find the center of the dowel is paramount. This little center finder, printed on transparent paper or just cut out will help to do a good job.

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