KNEW CONCEPTS

A Cut Above

Using the Knew Concepts Precision Die Saw, Mk IV

V1.1

Congratulations on your purchase of the Knew Concepts Mk4 die saw.

These setup instructions will explain the basics of the saw's setup and operation. Ther is a separate instruction sheet explaining how to cut blanking dies specifically. The best book form treatment of the subject is in *Hydraulic Die Forming for Jewelers & Metalsmiths* by Susan Kingsley.

There are 4 major parts in the box:

1: the guide tower.
2: the tilting bench pin
3: the saw
4: a pair of steel dovetails, or a pair of dovetails mounted on clamps

The important improvement in the Mk4 die saw is that it now uses a set of ball bearing guides. This lets the saw swing back and forth around the guide shaft, which allows for a much easier and more natural sawing motion, in comparison to previous die saws of any type. With this new design, the sawing will be easier and quicker than previous designs.

This new Mk. 4 version of the Precision Die Saw is designed to be removably mounted onto your workbench via a pair of steel dovetails. The Die Saw can be purchased in two configurations of dovetails: either bare dovetails which must be permanently mounted by screwing into the edge of the workbench, or with a pair of our clamps with the dovetails mounted to the front, allowing the saw to be moved to a different location, or mounted to a wider range of supports.

Either way, the mounting setup is the same. The guide tower mounts onto one dovetail, (usually the right one) and then the bench pin mounts onto the other one, usually left.

The first step is to mount the left dovetail so that the bench pin ends up in the most comfortable location for working.

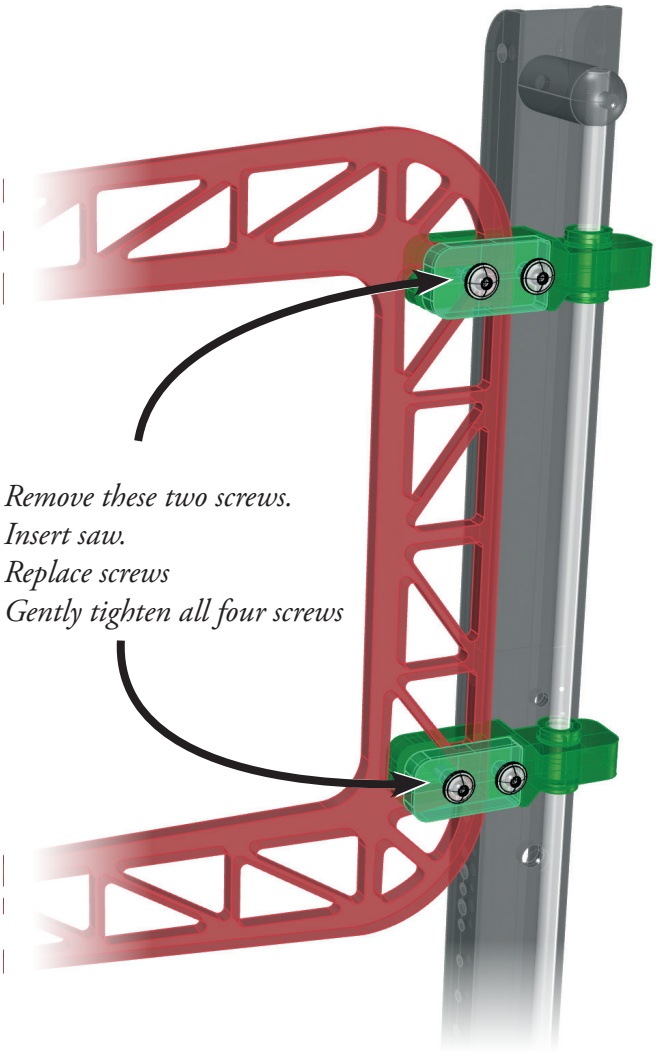
The next step is to mount the saw to the guide tower, and then use that to figure out where the right dovetail goes. After that, you're good to go for sawing.

To mount the saw:

Start out with the guide tower mounted to the dovetail you just positioned for the bench pin. This is OK, it's just to hold the tower upright while you install the saw.

On the guide tower are a pair of black aluminum slides mounted to the guide rod. There are 2 screws sticking out of each guide. Remove the outermost screw, so that the slot formed by the gap between the

main guide and the little 'paddle' is clear. Put the saw into the clamps with the spine up against the step at the back of the slot in the guide. Set it up so that the screw you removed will go back through just inboard of the continuation of the leg strut. (See picture.) Do the same with the other clamp. Once you have the screws back in, tighten all four screws.



Remove these two screws.
Insert saw.
Replace screws
Gently tighten all four screws

There is a removable alignment bar screwed into the backs of the slides when you first receive the saw. The bearings can only tolerate limited misalignment. The purpose of that bar is to hold the sliders in alignment so that the bearings line up on the rod properly. The slides leave Knew Concepts properly aligned. Try running the slides up-and-down the guide rod a few times to get a sense of how they feel, and what they sound like. Remember that sound and feeling. Once you have the clamp screws tight, test the alignment by running the saw up-and-down the guide a few times. Properly aligned bearings feel smooth, and make an even sliding noise. If you feel clicking or grinding, or the bearings sound like they are growling as they move, one or both of them is out of alignment. Running the saw like that will wear out the bearings very quickly. If that is the case, the next step is to loosen the slide clamp screws a bit, and try moving the saw again. If it sounds smooth now, that means one of the clamps is being forced out of alignment by the saw. Re-tighten the clamp screws, and watch the slides. If you see one twist as the clamps tighten, that's the one with the problem. If not, try tightening one, and then the other, to see if you can get smooth motion with one tight. If so, then the other one is the problem. From here it gets to be a case of adjusting the rotation of the clamps against the saw frame to get them to line up after the clamps are tightened. You may need to loosen the screws that hold the alignment tool onto the backs of the sliders to get everything to line up happily. Generally, the alignment bar holds the sliders in alignment, and no major adjustments are required. But it is important to know how to tell if adjustment is required, and how to go about it.

Once the saw is mounted into the clamps, and the sliders are moving smoothly, you have a choice: you can remove the alignment bar, or you can leave it in place. It's up to you. Leaving it in place adds a little weight to the saw, which you will have to move up and down with every stroke of the saw. Taking it off removes that weight, but makes it harder to realign the sliders if necessary. If you want to take it off, just unscrew it and remove. Put the screws back into the holes at the back of the sliders, to keep them safe for next time. For the upper screw, which also anchors the bungee cord, it is best to unscrew the bottom of the bungee cord first, so it is slack while you are unscrewing the upper screw. Reattach the bottom of the bungee cord once you have the upper screw reattached, and holding the top of the bungee cord.

The bungee cord system is designed to cancel out the weight of the saw frame. It can be adjusted to add or reduce the amount of 'spring' by simply moving the yellow knob, and adjusting the anchor point to a different hole along the bottom of the tower. Adjust to suit yourself. In testing, we have found that the best position for most people is to have the bungee set so that the saw's natural position is the top of the guide, so that the user pulls 'down' to cut, and lets the bungee pull the saw all the way back up. Try that, and then experiment if you feel the need.

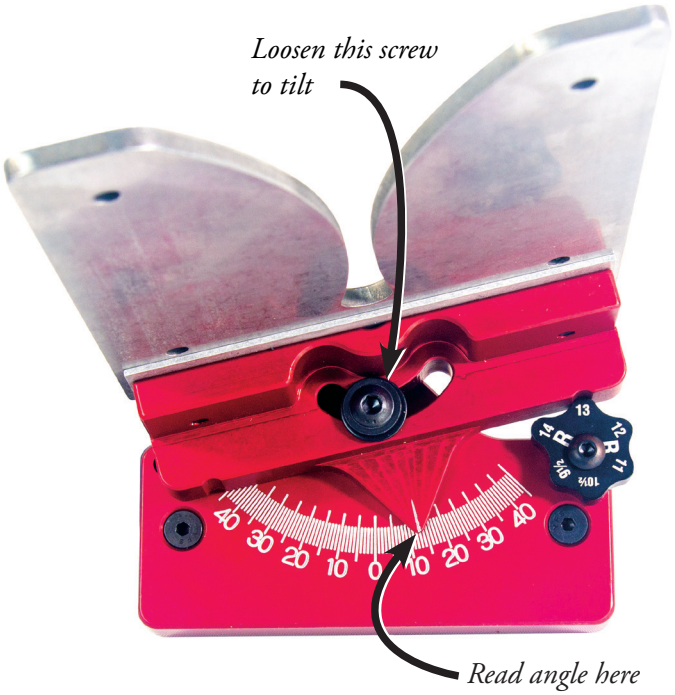
The spring tension of the bungee does make the saw want to swing out in front of the guide tower, like a barn door, when not held in the hand. The best solution we have come up with so far is to put a rubber band across the open end of the "V" of the bench pin when the saw is not in use, trapping the saw's blade inside the bench pin.

Once the saw and tower are set up properly, it is time to figure out where the dovetails should really go. Mount the first dovetail so that the bench pin is in a comfortable location for cutting. Typically, the tower is mounted to the right of where the work will be done. Now that the bench pin is mounted, you can get a rough sense of where the tower will go. Mount the tower dovetail so that the tower ends up in a space appropriate to get the saw blade into the center of the bench pin. Adjust it so that the saw blade swings down the middle of the slot in the bench pin.

Anchor the dovetail in that spot, and you are ready to go.

There are some details about the bench pin worth knowing:

1) The four holes in the top of the bench pin are there to allow you to screw on a wooden cover plate. You can then cut through that with your saw, so that you get a 'zero clearance' slot that follows exactly where your saw blade will cut. Use a thin sheet of Masonite or very thin plywood



2) The angle of the bench pin can be adjusted by loosening the screw in the center. Then rotate the pointer until it lines up with whatever angle you need. The black wheel on the side is a 'speed wheel' to give you 6 frequently used angles quickly and easily. The angles are marked on the wheel. Rotate the wheel so that the number for the desired angle is 'up', and then rotate the bench pin down on top of it, so that the node on the top of the wheel drops into the groove on the bottom of the tilting part of the bench pin. Then lock that in by tightening the main clamp screw in the center of the bench pin.

The bench pin can tilt either right or left, and the speed wheel will work on either side of the pin. Just remember to flip it over if you switch to the left hole on the bench pin. The faces of the speed wheel are marked with numbers and either "R" or "L". You want to see the "R" face if you are in the right hole, or "L" in the left one. You do not have to use the speed wheel, and in fact it will get in the way for angles less than 9 degrees. Unscrew it and set it to the side if necessary. There will be other speed wheels with different angles as demand requires.

3) The saw that comes with the Die Saw is a normal Mk4 Heavy Duty fret saw, with swivels. In normal use, those saws have the blade swivels set so that the blade cuts parallel to the spine of the saw. For use with the guide tower, you need to rotate the swivels so that the blade cuts at 90 degrees to the spine. To do that, loosen the tension lever. Then adjust one clamp at a time. To rotate them just push the black cap and the silver body together, and rotate. It's up to you whether you want the knobs parallel to the legs, or sticking out into the air, opposite the legs. Set the saw whichever way seems best to you. Either way, the knobs need to be in-line with the legs, it's just a question of whether you want them out in the air, or inboard, just above the legs. The inboard position is easier for right handers to tighten, but the legs get in the way.

To convert for left handed use:

The guide tower will work reversed for left handed use, but bungee system will have to be swapped to the other side. It may well be worth trying cutting with your left hand on the saw, but the tower to the right before taking it apart to switch directions. With the tower guiding the cut, it may end up that it doesn't make any difference to you which side the guide tower is on.

If it turns out that you would rather switch it, it's not difficult, but you will need a set of Imperial allen wrenches.

1) Unscrew the bungee knob from the bottom of the tower
2) Put the bearing alignment tool back on, if you removed it.
3) Unscrew the big central screw holding the pulley wheel at the top of the tower on. There is a second smaller screw holding the bottom of the red bungee cover in place. Remove that too.
4) Remove the pulley wheel and the red cover, and flip them around to the other side of the tower. Reinstall them on the other side of the tower.
5) There are small set screws in the ends of the black metal studs that hold the guide rod. Loosen both of them. (Needs 5/64" allen wrench.)
6) Pull the guide rod up until it comes up far enough to get the bearing sliders off the rod.
7) Flip the slider set vertically, so the bottom one is now on top, and put them back on the rod. The goal of this was to get them facing to the right, with the screws for attaching the saw facing the user.
8) Pull the rod back down, and re-tighten the little set screws in the ends of the standoff studs.
9) Remove the bungee mount from the new 'bottom' slider, and reattach it to the new top slider.
10) Reattach the bottom of the bungee cord. That should get you set up so that the tower is on the left now.
11) Get back to cutting great stuff!