SAWMILL FORUM

CASEY CREAMER

SAW DOCTOR

I recently bought a used circular saw at an auction, but it only has the small pin holes in it and my mill uses the bigger ones. Can I drill that myself with a hand held drill?

No.

The industry standard for inserted tooth head saws these days is a 2" bore with two 5/8 pin holes on a 3" bolt circle and two ¾" pin holes on a 5" bolt circle. Just the smaller holes were the industry standard up until about 10 or 15 years ago when using the larger pins started to become more common practice and brought about the change to the standard bore and pinhole configuration.

In your case, your saw undoubtedly has the two 5/8ths pinholes but lacks the two ¾" pinholes. That is not a big problem to rectify, bit it definitely isn't something you should be trying to do yourself with hand held tools.

Your saw needs to take a trip to a machine shop that has a big enough machine to do the job. They would either use a large radial drill--or better yet--a very large milling machine. There are a couple of things that will surprise a lot of people about getting something as simple as a couple of holes drilled in a saw.

The first is that assuming the job is done properly, the saw will definitely need to be rehammered. Some might think that would be because of the heat generated by the drilling process. Wrong. First, if it is drilled properly, there will not be enough heat to cause any problems. The biggest worry about heat from drilling would be the possibility of cracking later on. If the drilling is done in such a way as to cause enough heat to leave any part of the new holes blue, you are risking a cracking problem. So the machining has to be done in a manner that avoids generating any damaging heat, either by full flood coolant and just machining gently enough that there is not enough heat to have any of the metal change color at all.

The reason the saw will need to be retensioned after drilling is that metal has been removed from the saw. Anytime you remove metal from the saw, regardless of whether it is surface grinding, removing metal from the circumference (shoulders),

enlarging the bore, or drilling two holes (even if you had to drill the two 5/8ths holes) you have changed the tension in the saw. And I might add that it usually changes way more than you would think it would change. That's not a problem for a competent saw doctor as long as you know that it will need to be hammered.

How accurate do the new holes have to be?

Here comes the other thing that will surprise a lot of you. We all know that the pins that fit in those pinholes are quite a bit smaller than the holes. Calling that a sloppy fit would be an understatement. The 5/8ths holes use 9/16ths pins while the ¾" holes use 11/16ths pins. You would think that is enough slop that you could almost locate where to drill the new holes by using a carpenter's tape measure. While it is true that there is plenty of difference between the size of the holes and the size of the pins, it is of utmost importance that when you turn the saw back against the pins before tightening the nut, that both pins hit the saw at the same time. If one pin hits before the other, your saw will be driving on only one pin and that just won't be strong enough. The result will be a saw that shears pins on a regular basis for no apparent reason.

You routinely turn the saw back against the pins so that it can't get a running start as a result of its first shock load. With the saw firmly up against both pins the pins will only shear when you really need them to.

I know that nobody really wants to shear any pins because of the damage it does to the fast collar, but when you do shear the pins you can be thankful that you didn't break something a lot more expensive like the saw or the mandrel.

If both pins don't hit at exactly the same time, then you are driving with only one pin at a time. One pin by itself isn't strong enough to carry the load without shearing. And as soon as the first pin shears, the saw has enough momentum to easily shear the second pin.

Because of the amount of accuracy needed, using a radial drill isn't really the best method. It can be accurate, but it
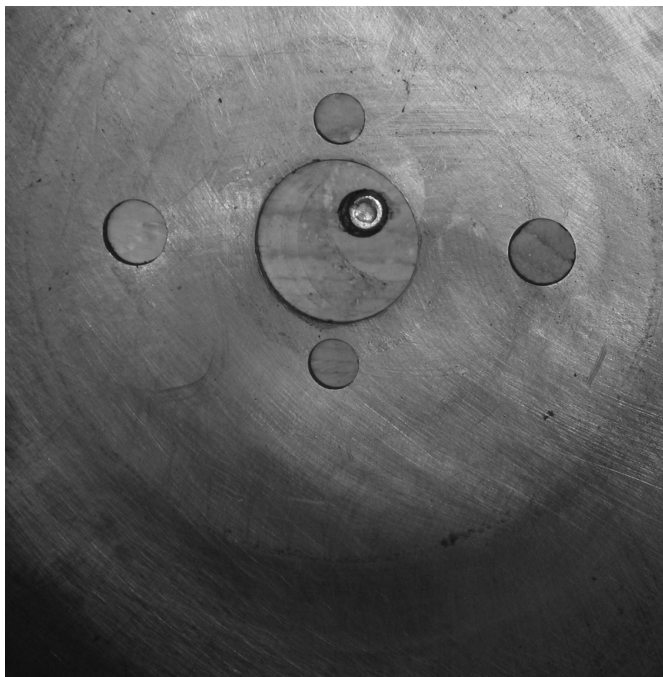
Standard 2" bore with two 5/8" pin holes on a 3" bolt circle and two 3/4" pin holes on a 5" bolt circle.

is extremely operator dependant and it is often difficult for sawmill people to convince machinists to locate the holes accurately when they know that you will be using pins that are 1/16th smaller than the holes.

With an old manual radial drill, the machinist must take a lot of extra care to layout and prick punch the holes in the right location, and then you have to worry about how much the carbide bit in the drill can deflect while cutting. Probably the biggest risk of inaccuracy happens while laying out the location of the holes.

If you are lucky enough to find a machine shop with a large enough CNC milling machine, you will have a much better chance of the holes being located properly and machined in a manner that won't heat the steel. The machine will know where the center of the saw is and then just mathematically locate the holes properly based on the programming.
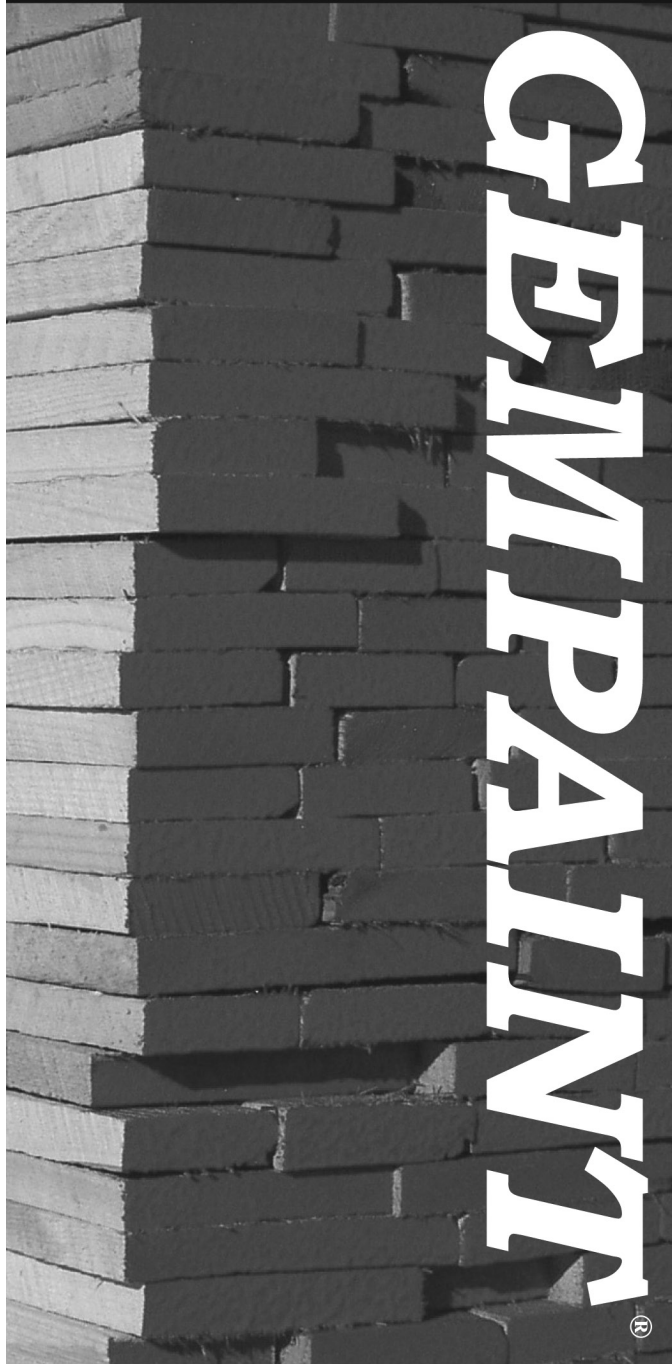
The other thing is that you have to tell the machinist that the saw is made of steel that is a hardness of 45 to 47 Rockwell. That hardness will require the machinist to treat it quite a bit differently than plain old cold rolled steel.

It's really not all that complicated as long as you can find someone with the right tools and expertise to do the job properly and then communicate to them as to what the expectations are, relative to accuracy and not heating the steel.

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Questions about sawmills and their operation should be sent to Forum, The Northern Logger, P.O. Box 69, Old Forge, NY 13420, FAX #315-369-3736.

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