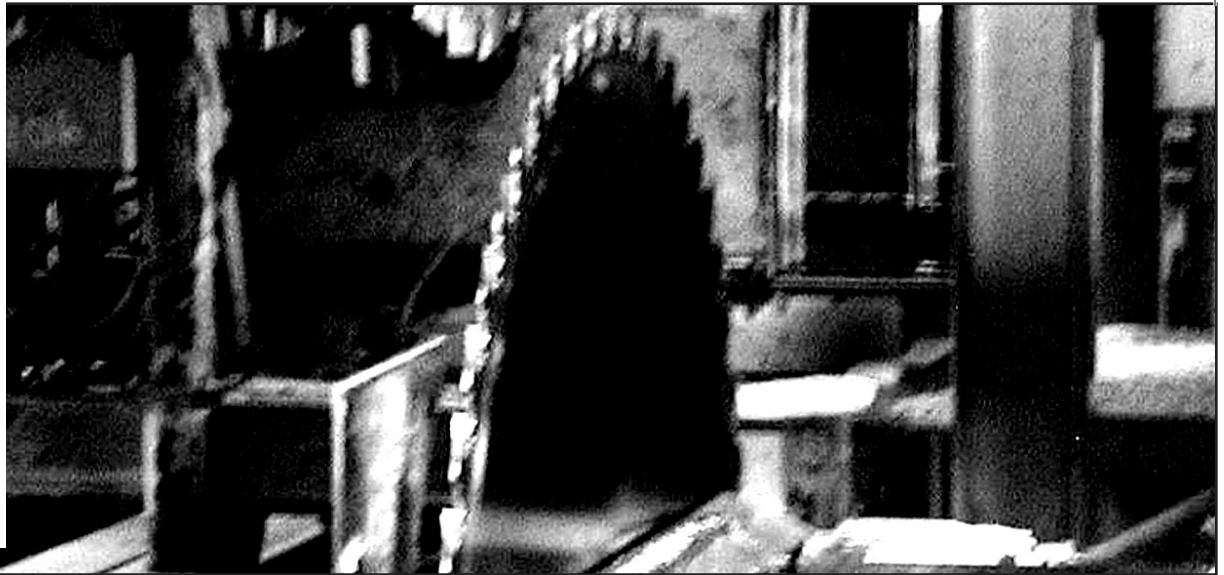


# SAWMILL FORUM

CASEY  
CREAMER

SAW  
DOCTOR



**I have an old mill that I work as a “hobby.” Although I don’t do production work, I do like to cut properly dimensioned lumber. This week I had just put in a new set of teeth and proceeded to cut a few red oaks. After sawing a few hundred feet of lumber the saw hit some metal—or so I thought. After close inspection of the log and the blade I discovered that one of the teeth had broken off and embedded in the log long enough for every other tooth to slam into it. On close inspection, the point of the shoulder (that’s where the back of the tooth meets the shoulder) is slightly nicked on one side. I took the circle out, put in another set of teeth and finished the log.**

**I would like you to look at this blade and if possible, repair it.**

Of course it would be best to have the saw looked at and inspected by a professional.

Based on what you said, I suspect that you won’t need to have that saw welded, although I reserve that opinion until I see the blade in person. My basic philosophy about welding these saws is that it is best to avoid it if possible. It’s not that I mind welding saws or making money, though.

A lot of structural welders will tell you that the weld is the strongest part of the structure. Not being a structural welder, I won’t comment on the validity of that statement, but I will tell you that when it comes to welding high carbon, high nickel, Swedish saw steel, the weld will not be the strongest part. In fact, no matter which welding process you use (oxy/acetylene, stick, TIG or MIG) the welded part will always be the weakest link in that saw.

When you completely rip a shoulder off of your saw, you will definitely need to have it welded. If it won’t hold a bit and shank, you either have to have it welded, or donate the saw to your local saw repair shop so that it can be providing needed shoulders to be welded onto other saws.

Although I said that the weld will be the weakest part of the

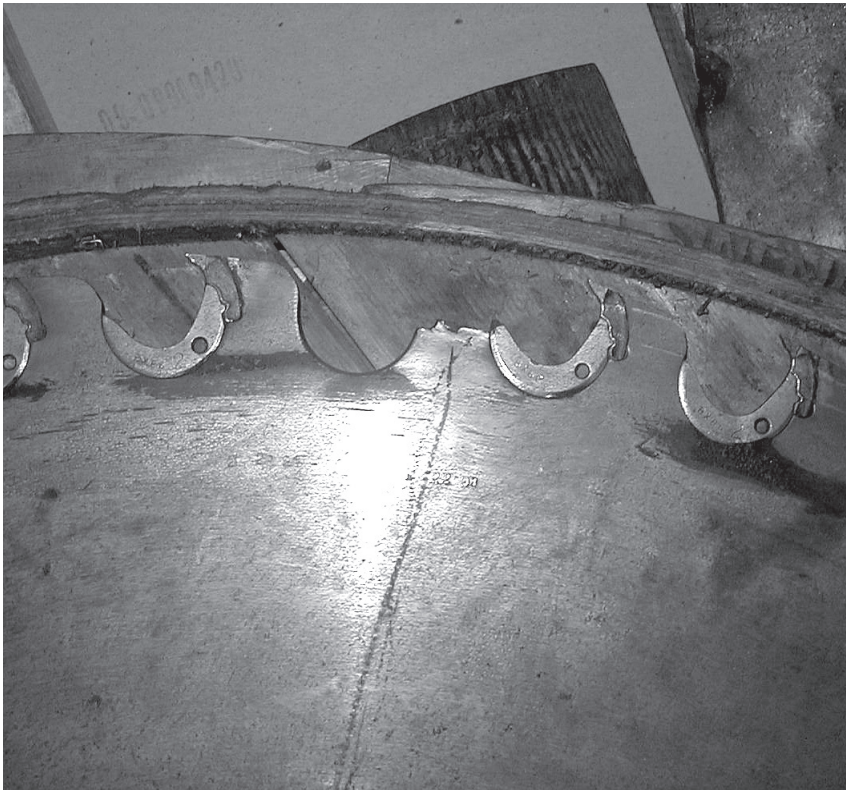
saw, that is not to say that saws shouldn’t be welded. One only has to compare the price of having a few broken shoulders replaced on a saw to the price of a new saw to understand why we would want to weld them in the first place. Economics aside, it is considered safe to have a saw welded as long as it is done by someone who actually knows specifically how to weld saws. Unlike welding plain old I-beams and angle iron, saw welding involves precision milling and fitting of the socket and also includes pre-heating, post heating, and annealing. When all of that is done properly and the weld itself is sound, you will have a saw that will perform properly in spite of it’s new weak link.

Of course any minor mistakes made during that involved process will transform that weld from a weak link to a serious liability and an accident waiting to happen.

When done properly, that weak link will only become a factor when you hit some metal. Of course even a strong shoulder is likely to break when the tooth encounters a hard enough object embedded in the log. But you will find that this welded shoulder will always have just a little higher chance of being the one that breaks when you hit the wrong thing. Some properly welded shoulders can even break when trying to saw frozen hard maple. We have all seen our share of virgin shoulders that have succumbed to that particular stress.

Getting back to your saw, assuming you just nicked the tip of the shoulder or even lost the first quarter inch or so, there will be a decision to be made.

First I would put what is known as a “plug gauge” into the socket to see if the shoulder has been distorted and pushed back during the process of breaking it’s tip. Not all breaks push straight back. Some tend to push the shoulder to the side before it gives in and breaks. So this shoulder would certainly have to be thoroughly inspected for socket geometry and also centrality. If the shoulder is bent a little to one side, that is an easy fix with a crescent wrench and a spider gauge. If it is bent a lot to one side, that is still a relatively easy fix with some heat and then following up with the annealing process after straightening.



**A typical broken shoulder requiring a replacement from a donor saw.**

If the socket geometry is badly distorted and the shoulder is badly stretched and pushed back, I would recommend cutting the shoulder off and welding on a new one. I say new one, but the reality is that it will be a shoulder from a donor saw.

On the other hand, if the proper socket geometry is pretty much intact and all you are looking at is a small missing tip, I would most likely leave it alone if it seems to hold and support the tooth properly. Sometimes it seems like a bit of a guessing game, but with years of experience, most saw doctors have already figured out what will or won't hold a tooth and basically where to draw the line between fixing it and leaving it alone.

It is my theory that a properly welded shoulder is still a little weaker than a shoulder that holds a tooth properly but is missing a bit of the tip. And worse yet, an improperly welded shoulder will certainly be a serious liability.

So, don't weld them unless you really have to, and by all means, if you are going to weld a shoulder, do make sure that you do it properly. I don't keep my saw welding recipe a secret, so for those of you who are bound and determined to weld your own saw, please talk to me first so that you can at least get the proper recipe. Saw welding is very specific and quite a bit different from structural welding. If someone is already good at structural welding, I can easily teach them how to weld saws. On the other hand I have seen a number of saws completely ruined simply because they were welded by someone who had a great deal of welding knowledge, but just wasn't aware of what you need to know to properly weld saws.

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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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