SAWMILL FORUM

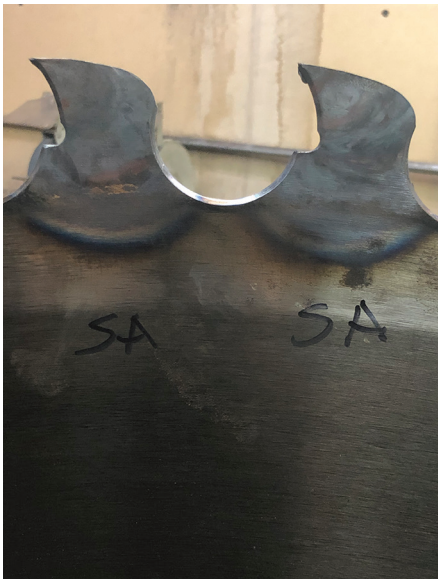
BY CASEY CREAMER

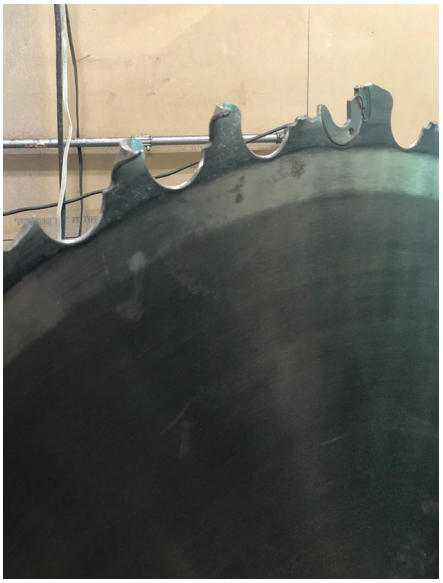
How do you straighten bent shoulders on an inserted tooth circular saw? Is this something I can do myself, or do I have to leave it to a pro?

The answer to both of your questions really depends on how badly bent the shoulders are. If the shoulder is just slightly bent to one side, it is a fairly simple fix and one that you should be able to accomplish on your own. On the other hand, if you have some shoulders that are just about turned around backwards, in a twisted fashion, that is a severe bend and also a compound bend that is going to require the expertise of your local saw doctor. I will, however, try to give you a decent explanation of the different ways to straighten shoulders on this type of saw.

Simple bend:
You will need a good crescent wrench to do the straightening and a spider gauge to do the measuring that is required to get the job done right. But before you touch that crescent wrench, get out your tooth wrench and roll out the bit and shank enough to unseat them and then put them back in and reseat them. There are times when just doing that will solve the problem. After doing that, check the suspected shoulders with your spider gauge, and see if they are still bent. Most likely they are.

If so, just pull on the shoulder with your crescent wrench and check to see if that straightened it or bent it over to the other side. There are two slightly tricky things to look for in this process. By using your spider gauge, you will have to determine if the whole shoulder is bent in a straight fashion toward one side, or if it is more like just the tip is angled off to one side. The difference will determine whether you hold your wrench straight up and down while gripping the middle of the shoulder or just grip the tip and hold the wrench at something close to the hook angle of the tooth. The second thing you have to worry about is how to not move the shoulder too far. Moving it too far means you then have to move it back. And bending these shoulders back and forth a few times will only weaken them.





As long as you are just working on what I call a simple bent shoulder, there should be no need to completely remove the bit and shank to fix the shoulder. The shoulders will certainly move a lot easier without their bits and shanks in them, but as long as it is in the simple bend category you should be able to accomplish the task without having to remove them other than to just unseat them and reseat them.

Now let's get to the fun part: the more seriously bent shoulders. In this situation just using a crescent wrench by itself is not going to get the job done. And we are now in the category where you should let your saw smith take care of this for you because this would be an opportunity for the do-it-yourself-er to completely ruin a saw.

Basically these severely bent shoulders will give you two options: a saw hammer or heat. If it's severe enough, you may end up using both to fix them. When you use a torch and a crescent wrench to straighten a shoulder, you are changing the hardness of the heat-affected area, so near the end of the process you have to go back and anneal that area to try to restore the steel to its original Rockwell hardness.

If you use a saw hammer and an anvil to do the straightening, you don't have to worry about changing the hardness, but there are two other things to be concerned about. The first is that if you are not really careful about how you use that hammer, you will risk distorting the socket geometry, which would render that shoulder unusable and you would have to cut it off and weld a new one on. The other thing that happens when you hit the shoulder with a hammer is that it affects the rest of the saw.

Let's say, for example, the shoulder you want to fix is severely bent toward the log side. By using a straight edge, you will first find the exact high spot of the bend on the shoulder, which will be on

the board side even though the shoulder is pointing toward the log side. Think of straightening a bent nail. You would put it on an anvil or hard surface with the bow facing down, and then you would hit the high part of the nail.

When you hit this shoulder with a hammer, you will be pulling some tension out of the saw in one area and dishing the saw towards the board side because you are hitting it on the board side. How much it pulls it in that direction and how much the tension changes are directly related to how many shoulders you are hitting with a hammer and how much you have to hit them to get them straight. But even hitting just one shoulder will affect the rest of the saw to some degree, and possibly enough that it will now need to be hammered. Of course, if you had an accident bad enough to bend a few shoulders so far that you need a hammer to fix them, chances are the saw needs to be hammered anyway.

As for fixing a shoulder with a torch, it won't affect the rest of the saw as much as hammering on a few shoulders will. What you have to do is use an oxy/acetylene torch with a brazing head, (not a cutting torch head) and very carefully heat the shoulder just barely to a dull red and use your crescent wrench to very carefully pull it around to being straight. Of course, if it's a compound bend, you have to figure out exactly where to move it to put it back where it belongs. After that, and after it is cooled, you have to go back in with the torch and just bring the color up to the second blue. As you apply heat, it will first turn a straw color, then a blue, then a second straw, and then the second blue. At that point , remove the torch and do not go past that second blue at all. That is how you anneal the steel in the heat-affected area. After it cools, you should very lightly sand the blued skin off so that you have uncolored steel again. Put the bit and shank back in, and you should be good to go unless you have to touch up the machining on the socket. And of course, if the shoulders were bent badly enough to require the use of heat to straighten them, it is a very safe bet that the saw now needs to be hammered.

The most important thing is that trying to do any of this by eye, without the aid of a spider gauge, is just not a good idea. You will end up doing more harm than good, and producing lumber that will have the excessive tooth marks to prove it.

Interested to learn more from Casey Creamer? You can watch our video on how Casey hammers circular saws on The Northern Logger *YouTube page. Just search for "The Northern Logger" on YouTube and click the video entitled "How to Hammer a Circular Saw with Casey Creamer." Please send future questions about sawmills and their operation to Casey Creamer, saw doctor and president of Seneca Saw Works, Inc., PO Box 681, Burdett, NY 14818, (607) 546-5887. You can also reach out by email: casey@senecasaw.com.*