BY CASEY CREAMER

Do solid tooth circular head saws get hammered any different from inserted tooth circular head saws?

Let me first say that a saw is a saw. That means that all saws—large diameter, small diameter, band, circular, inserted tooth, solid tooth, carbide tooth, wood cutting, metal cutting, rip, or crosscut—all get basically hammered the same way. Some of the differences have more to do with rim speed and feed rate, and there are a few differences based on what the saw needs to do. For example, some saws are handed, meaning there is a log side and a board side, while others—such as cross cutting saws like trimmers or even slasher saws on firewood processors—are generally meant to be even-handed.

Handed saws should generally be put up to be flat on the log side while even-handed saws should be hammered so that they look the same on both sides. Usually that means flat on both sides, but if the saw is slightly tapered, it will not be flat on either side, but rather it will look the same on both sides. And then there are the even-handed saws that are not intentionally tapered but might not measure exactly the same at the center and at the rim. In that case, you also have to make both sides look exactly the same.

There is an interesting difference between solid tooth and inserted tooth saws that has less to do with how to hammer them or what they have to look like when they are done, and more to do with what you are liable to have to do to them when they come in.

Inserted tooth head saws tend to come in being dished toward the board side and possibly with a little too much tension. (This is of course excluding saws that have had a major accident, such as being set while in the cut.) They are dished toward the board side because if they were still flat on the log side they wouldn't be making the trip to my shop. Some come in being dished toward the log side a little, but that is less common because saws generally tend to run out instead of running in, and if they happened to be slightly dished toward the log side, they won't heat in the body, so there will not be as much urgency to get them hammered.

Why do they tend to have too much tension? Two reasons. If they are dished toward the board side, they are also heating in the body. That tends to stretch the metal in that area, which is essentially adding unwanted tension to the body of the saw. Sometimes when they cool down, the tension will be back to where it was before they got hot, and other times the saw will retain some of that tension after it has completely cooled. Needless to say, the more you run the saw with heat in the body and the hotter you let it get, the more chance there is that it will have too much tension in it after it has cooled.

The other reason these saws tend to gain tension is a little more subtle. As your shanks wear, they lose some metal in the gullet area as they get a little thinner. This process of losing metal allows them to lose a little of their tension, which means that they fit just a little looser in the socket, so they are stretching the rim of the saw a little less. Less stretch on the rim is the same thing as stretching the body more because tension is mostly about the relationship between the length, or amount of stretch in the rim, to the amount of stretch in the body. Additionally, every time you replace the bits, you are wearing the vee groove of the shank a little, which has that same effect of taking some tension out of the shank and allowing the rim to relax slightly. The change in the tension as a result of wear in the shanks takes a lot of time and is a lot more subtle than the change in tension that happens as a result of heat in the saw. But if you are able to go a long time before the saw needs to be hammered, the gain in tension from wear in the shanks will become more apparent.

On the other hand, solid tooth saws will tend to come in low on tension. First, solid tooth saws should be checked at least after each sharpening. A solid tooth saw is like a band saw in that when you sharpen it, you are removing metal from the entire circumference of the saw. With an inserted tooth saw you are just removing metal from the face of the tooth, and that tooth isn't even part of the metal of the saw because it is a separate piece.

Whenever you remove metal from the entire circumference of the saw, you are doing what some would call stress relieving. Essentially that process is like taking tension out of the body of the saw. Anytime you remove metal from a saw, you will be changing the tension. If you have to re-bore the saw to a larger bore like going from 2" to 4", that will change the tension drastically as a result of removing that much metal no matter how little heat you generate in the process.

So, after completely sharpening and swaging a solid tooth saw, chances are you will also have to add some tension to the body in addition to any straightening it might need. However, if you are checking it for hammering every time you sharpen it, it might not have gotten dished in either direction yet.

Solid tooth saws are very interesting in that in some ways they are far superior to inserted tooth saws, although the solid tooth saws are quite rare in the American lumber industry. The good news is that when sharpened and benched properly, they will outperform an inserted tooth saw. But the bad news has a longer list. Every time you sharpen a solid tooth saw, the diameter gets a little smaller until it is too small to be useful for your mill. At that point you either find a mill that uses smaller diameter solid tooth saws, or you just take it out of service. By comparison an inserted tooth saw never changes its

diameter, so you can run it for many, many years if you can keep it away from metallic objects hiding in a log.

A solid tooth saw takes a real sawfiler with a proper automatic grinder and a real roller swage to properly sharpen it, whereas an inserted tooth saw is more or less designed to be sharpened by the sawyer or almost anyone with a hand held sharpener. Remember that you are only sharpening the face of the tooth, and after a number of sharpenings you just throw that tooth away and put in a new one. With the solid tooth saw you are sharpening the face, the top, the gullet, and the shoulder, and also swaging and shaping the tooth. That requires a properly equipped filing room and someone who knows how to do all of that and is also capable of benching the saw every time it is sharpened.

There is one more thing to consider when talking about solid tooth saws. Remember that we hammer saws for their rim speed (SFPM), not RPM. As a solid tooth saw decreases in diameter, if the RPM stays the same, then the rim speed actually decreases, so each saw will need a little less tension than it did when it was larger in diameter. The other way to handle that would be to put some sort of variable drive on the electric motor so you can vary the RPM based on the diameter of each saw so you are able to keep a consistent rim speed throughout the life of each saw.

To me, that would be the better way to run solid tooth saws, but then the price of that variable speed drive isn't coming out of my pocket.

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.*

Casey Creamer tensioning an inserted tooth circular saw.