NHLA – "Hardwood Matters"

Breaking-In Wide Bands

Breaking in a wide band is absolutely critical to the performance of the saw throughout its working life. Get it right and the saw can last hundred of working hours, barring catastrophe, and perform well from beginning to end. Don't break it in properly and you get to replace it, or worse limp along with it.

When a new wide band first arrives in the mill it has been hot rolled to near net shape, heat treated, and finish ground – all before it leaves the steel mill. These operations create internal stress in the raw material. Then the saw manufacturer puts in the teeth and the butt weld and proceeds to start stretching different parts of the blade to different lengths. Each of these operations add stress on top of what's already there.

A careful sawmaker uses many fairly light tensioning rolls to move the steel gently over the entire width of the saw. This helps stretch all of the steel uniformly and eliminate strips between the tensioning rolls that have not been stretched and will ultimately create large problems. These spots that are not stretched like the steel around them, "fast" spots, will draw tight when the saw is under load and carry way too much strain. Even with very carefully made saws these tight places will exist. It's only with several successive bench jobs that these spots all become visible and can be remedied. If a saw is made quickly and carelessly with a relatively few heavy rolls it may appear to have reasonable tension but in fact these un-stretched fast spots are dominant.

Every time a saw runs the flexing and vibration on the bandmill work to expose and relieve any stresses that are in the steel, in a new saw this includes both these tight spots from the initial benchwork and the residual stresses from the steel manufacture. Run the saw briefly (an hour is great, two is a compromise) on its first few runs, then let it rest, and the movement that the mill creates in the steel will equalize internal stress. Now work it up carefully on the bench, identifying and elimination the "new" fast spots, run it again for a short run, repeat this a couple times, and you'll have a saw with genuinely uniform even tension, relatively stress free, and easy to maintain. Make shortcuts here and you play a losing game of catch-up for the rest of the (shortened) life of the saw! Penny-wise, pound-foolish.

Getting the factory ground saw to match your tooth shape exactly is another really important, and patient, part of break-in. The factories work hard to send in saws with a tooth shape that is a close match, but it's never identical to what your grinder and grinding wheel shape produce. Generally saws should be ground in completely and carefully to your profile before they're run at all. It's vital to do this without creating excess heat and to grind the entire profile without any intermittent grind in the bottom of the gullet. If the grind has stops and starts anywhere in the deep part of the gullet cracks are certain and will start right at those transitions.

Grind the saws fully, wipe the burr off with a sharp wood chisel, then before you run them the first time dress the bottom of each gullet with a round hand file. If any hard spots remain from the manufacturing process, or from the initial grinding, the file will chatter over them. You can't miss these spots with a file, and you can't find them with an air grinder (or even the much beloved Proctor Roll). This little extra attention on brand new saws is a great investment and pays big dividends.

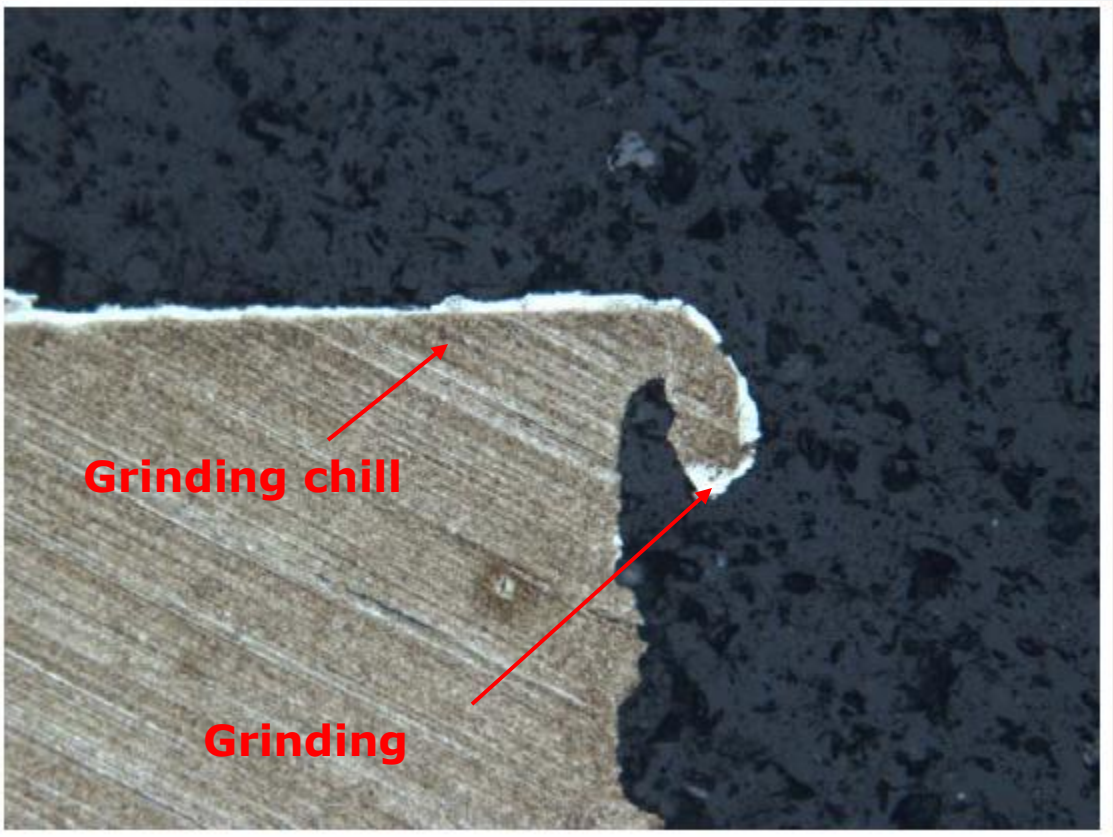

Figure 1 – Microphotograph of bandsaw steel showing grinding chill and burr from sharpening.

When I think about what wide bands endure it makes me think of the Concorde, the retired Super Sonic Transport. The Concorde would get several inches shorter in length and several inches larger in diameter in flight - every time it went up, every time it came down. Same with the fuel tanks on the SR-71 Blackbird, they leaked like a sieve when the airplane was on the ground, only sealing off after it reached speed and altitude somewhere way above mach 1, headed for the near reaches of space!

OK, maybe these analogies are a bit over the top, but name another device in the mill we expect to endure the internal structural movement of a wide band? It's got to flex over the wheels under huge strain, be ductile enough for us to cold form it every few hours (swage and shape), we expect its useful life to be several hundred hours, and ultimately this is all peripheral to the real work it does in the cut!

In some important ways brand new wide bands are in the worst shape they'll ever be in, but if you give them a little special attention during break-in it will pay off handsomely. If you don't – no problem – like the chip ad says "don't worry, we'll make more"!

I want to thank my friend John McCormick for sparking the conversation that led to this column. John sent along a delightful piece that one of the major saw companies put out in the 1920's on this topic, seems that the fundamentals are still the fundamentals.

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