

## **BRUSH CHIPPER KNIVES – STAYING SHARP**

by Jolene Priest

As is true with many tasks, there's more to brush chipper maintenance than meets the eye. Proper maintenance includes a daily inspection of chipper components, including but not limited to tires, safety chains, grease points and belts. However, there's one commonly missed feature hidden under the hood: chipper knives. By spending ten minutes each morning inspecting knives, operators will ensure a safer working environment, less down time, and a quality end product.

### **Knife Life**

Keeping chipper knives operating for their maximum life potential begins long before the morning chipper inspection. It starts right in the field during the actual chipping process. The quality of material chipped, the chipper style, and the type of wood being processed have a direct impact on the wear of chipper knives. Although operators don't have full control over the type of wood chipped, they can be mindful of possible contaminants.

Chipping material contaminated with rocks, pebbles, or even mud can reduce knife life. Under normal operating conditions, meaning running clean wood without any foreign contaminants, knife life can range from 50 - 60 hours per side on a drum-style chipper. Given no damage such as chips or cracks, knives on a disc-style chipper should be flipped or changed every 25 –30 hours. The differences in life span can be attributed to the angle in which the brush chipper chips material; a 37-1/2 to 45- degree angle on a disc-style chipper and a 90-degree arch angle on a drum-style. The 90-degree angle benefits the knives by ensuring a more even knife wear.

The type of wood being processed also has a direct impact on knife wear. Hard wood such as oak or maple dulls the knives quicker than soft wood like pine.

### **Daily Knife Inspections**

Before inspecting knives, it's important to adhere to the proper safety guidelines. Wear protective gloves and use lock pins and drum wedges where they apply.

Every morning before beginning a job, perform the 10-minute knife inspection. First, check each knife for dullness. If a dull knife needs to be flipped, inspect it for chips and cracks, and then remove debris that may have become wedged under the knife. Clean out the pocket with the dull side of the knife before putting the other side down or installing a new knife.

Next, check every knife for chips and cracks. Running a chipper with a chipped or cracked knife is dangerous, and can result in knife breakage. This can damage or even destroy the brush chipper.

During the knife inspection and whenever replacing or flipping a knife, make certain it is torqued to the manufacturer's torque specifications. An improperly tightened knife will allow wood to become wedged underneath, putting stress on the knife. It can also push the knife out to a point where it can strike the anvil.

### **Sharpening Knives**

Knife life isn't necessarily over once a chip or crack is found. If the knife is in good condition, it can be sharpened as many as three times per side. However, never sharpen a knife that has a chip or crack deeper than one-inch.

Only use an industrial knife grinder when sharpening a knife. This machine will keep the knife cool. If the knife becomes too hot during the sharpening process, the Rockwell hardness will be affected, resulting in premature wearing. An industrial knife grinder, unlike a hand-held grinder, prevents this from happening. An industrial grinder also holds the knife edge to a greater tolerance than a hand-held machine. It contains jigs made specifically to set the grade to a certain tolerance. The grinding wheel will not touch the blade once the tolerance is met. A hand-held grinder, however, doesn't hold an even cutting edge. It would be like trying to draw a straight line without a ruler or guide.

When grinding, remember the one-inch rule. Only sharpen the knife down one-inch from its original size. The cutting edge is hardened only to that depth. A hand-held grinder has no way to gauge that depth, and if the knife edge isn't ground evenly, chip quality will suffer.

Before reinstalling a newly sharpened knife, inspect it again for chips or cracks since even the smallest imperfection can lead to knife failure.

### **Anvil Clearance**

Inspecting knives each morning is not enough to ensure proper knife function. There's one more factor to consider: anvil clearance. It's recommended to check anvil clearance every time a knife is changed. Proper tolerances between the knife and anvil must be maintained for a smooth chipping process. All manufacturers give suggested tolerances between the knife and anvil. If the anvil is not reset after installing a knife that has been sharpened one or more times, the knife may hit the anvil and cause breakage.

When inspecting the anvil look for a sharp edge, which keeps the chipper efficient. Anvils generally have four sides and can be flipped two to four times, depending on the manufacturer. The final step is to check anvil bolts for proper torque.

By following these guidelines, as well as the guidelines found in manufacturers' operator's manuals, operators will reap the benefits of long-lasting chipper knives and a high quality end product. After all, spending 10 minutes a day on chipper knife inspection is a small price to pay for safety, less downtime, and money saved.