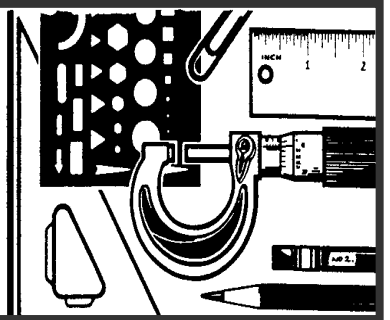




TECHFACTS

PRODUCT AND SERVICE NEWS



DATE: September 1999

Occasionally, users of OREGON[®] saw chain request information regarding chain to be used for racing. Most commonly, we are asked if we supply chain designed for racing, what chains we would recommend for racing purposes, and how they might be modified for speed cutting.

This bulletin is intended to address these questions.

OREGON[®] does not supply saw chain especially configured for racing but we do have insight into the kinds of changes that competition cutters make to increase cutting speed. The changes they make result in a chain that cuts more aggressively than it is designed to do by OREGON[®] from the factory. These changes increase risks that you should be aware of if you intend to engage in competition speed cutting.

The modifications identified in this document come with a strong warning that there is a significant increase in risk of serious personal injury or death when using modified saw chain. *You should be experienced in the use of chain saws and knowledgeable about the potential of bar nose kickback, chain breakage or other unexpected reactions when using chains modified for racing.*



WARNING

There is a risk of serious personal injury or death to operators or bystanders from kickback or from chain breakage when using saw chain modified for speed cutting. Do NOT use customized saw chain unless you are experienced & knowledgeable in the use of chain saws! ***Under no circumstances should modified chain be used for routine wood cutting purposes!***

BAR NOSE KICKBACK is the violent backward and upward motion of the chain saw guidebar occurring when the chain near the nose or tip of the guide bar contacts any object, such as another log or branch.

CHAIN BREAKAGE creates risk for the operator or bystanders from high-speed ejection of chain components.

WHICH CHAIN TO USE

We have observed that most competitive cutters modify 3/8" pitch chisel chains such as OREGON® 72 series, or similar chain from other manufacturers. In the OREGON® line, they appear to select OREGON® 72LP because it is a low vibration chain (it has the clipped-heel design) and because it is 0.050" gauge. The reason 3/8" pitch is chosen over 0.325" is that it has a taller cutter, which helps with chip flow.

HOW IS SPEED INCREASED?

Competitive cutters look to increase cutting speed through three basic mechanisms; optimizing cutting edge geometry, freeing up space for chip flow, and smoothing of surfaces for friction reduction. These are outlined in this bulletin. Each has advantages in increasing cutting speed, but they represent changes that shorten the life of the chain and make the chain useable only for speed cutting in the right angle nose clear bucking mode. They also notably increase the risk of serious personal injury or death from broken chain, kickback or other unexpected reactions of the saw.

OPTIMIZED CUTTING

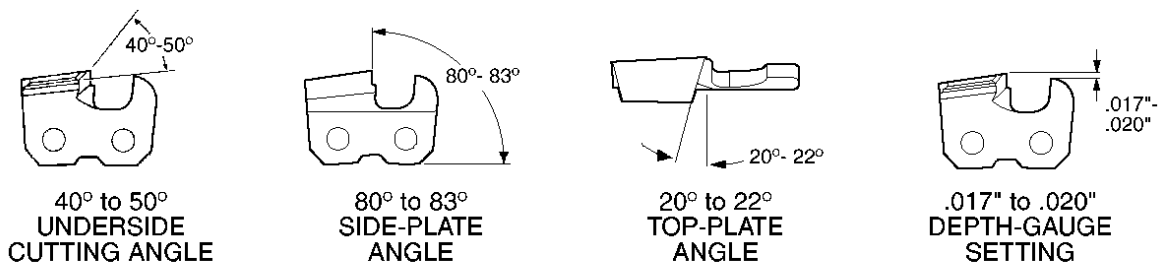
Most 3/8" pitch chisel chain is supplied in a round ground configuration, but for racing most competition cutters convert it to a square ground configuration. They also grind the cutter back to about half life, so there is plenty of allowance for conversion from round to square ground configuration. Filing angles are fine-tuned according to the type of material being cut – see Table 1 and Figures 1 & 2 for common settings.

The cutting edge can be sharpened to a square grind configuration by using a Silvey grinder, or by using one of several styles of chisel files. Three file types are generally available; double bevel, hexagon, and goofy. The double bevel is probably the most difficult to use, but gives the best results overall. The goofy file is the easiest to use. It produces a rounded hook angle on the side plate, but has all the advantages of a chisel file on the under side of the cutter top plate.

Using chisel files to sharpen your chains is very difficult and will require many hours of practice, while the chisel grinder is a faster and easier way to sharpen your chains.

After sharpening the cutting edge, the depth gauge setting is adjusted for the material being cut. See Table 1.

Table 1. Cutter Geometry



Even small changes in sharpening will affect how your chain performs. The table below gives two examples that can be used as a starting point for optimizing your chain.

MEDIA TYPE:	UNDERSIDE CUTTING ANGLE	SIDE PLATE ANGLE	TOP PLATE ANGLE	DEPTH GAUGE SETTING
Softwood	40°	80°	20°	.017"
Hardwood	50°	83°	22°	.020"

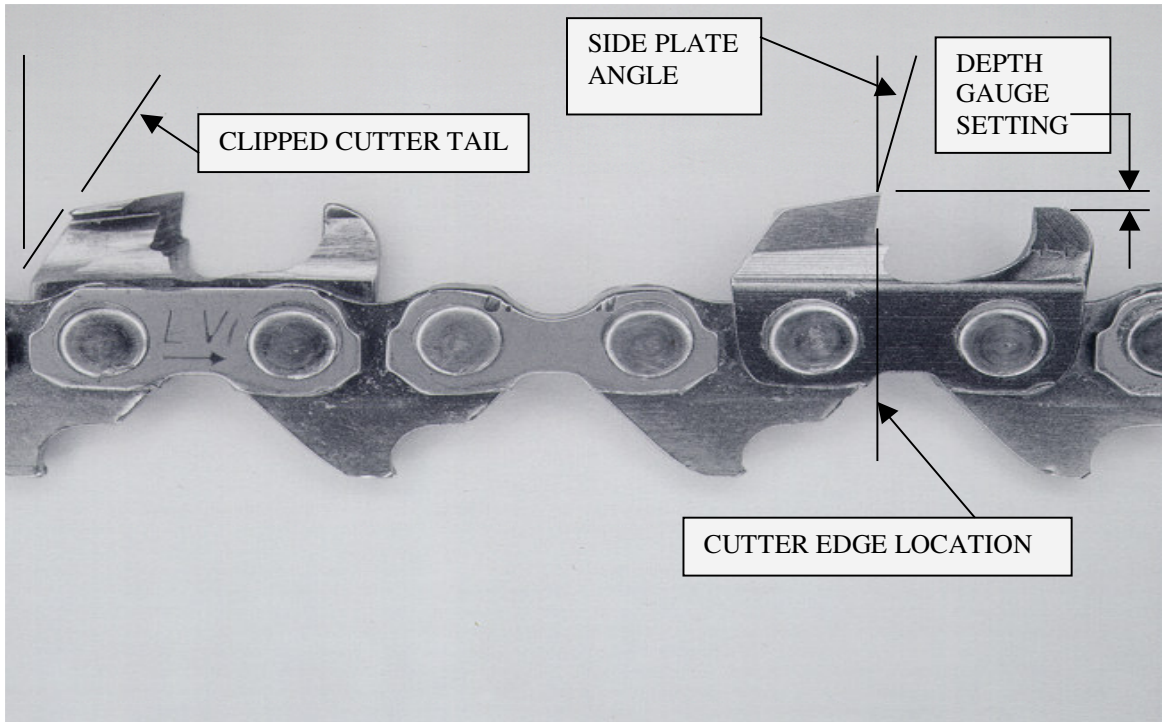


FIGURE 1. Cutter geometry, side view

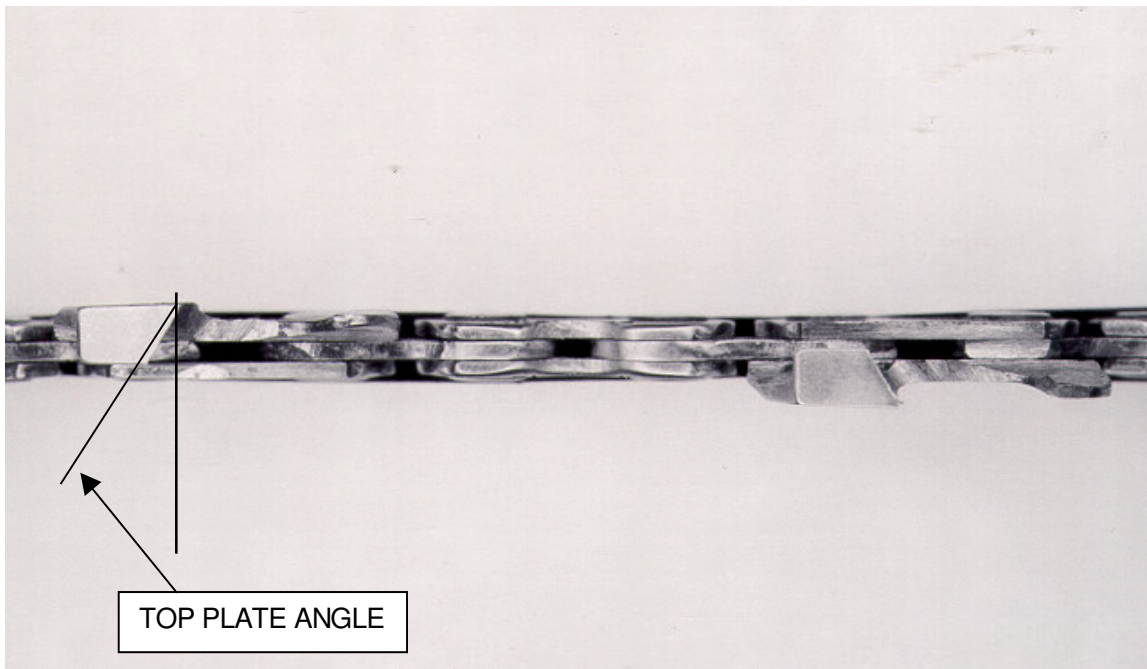


FIGURE 2. Cutter geometry, top view

CHIP FLOW

This discussion is based on using the 72LP style chain, which is produced with guard drive links for kickback control. Generally, competitive operators we have seen remove the upper ramped portion of the guard links by grinding or filing them down to the top of the tie strap. This greatly increases the severity of bar nose kickback, and the potential of severe injury or death, should one occur.

To improve chip flow, the trailing edge of the cutter top plate is clipped at about a 45 degree angle, generally as illustrated in Figure 1.

REDUCTION OF DRAG

In addition to optimizing the cutting edge and opening the chip channel, competitive racers round and polish sharp edges and corners, and reduce the height of the rivet heads to reduce drag, as illustrated in Figure 3. Do not reduce head height too much. Reducing the height of rivet heads weakens the joint, increasing the risk of chain breakage, which can lead to serious personal injury or death. An absolute minimum head height is 0.005 inch.

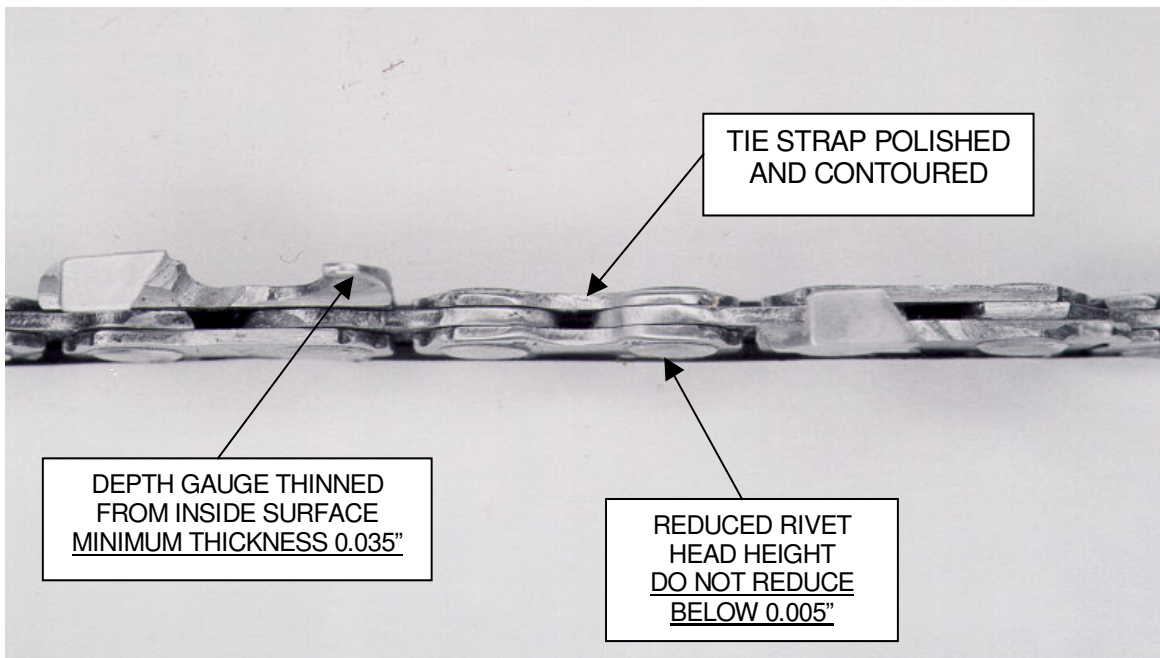


Figure 3. Features to reduce drag



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Note the tops of tie straps are contoured (also shown in Figure 1.) and the thickness of the depth gauge is reduced by grinding the inside surface. The depth gauge thickness should not be reduced beyond 0.035 inch; otherwise they may be prone to breakage and lead to injury and poor performance.

Finally, competition racers open the chip channel under the top plate by grinding or by filing with a small round file, as illustrated in Figure 4. This is generally referred to as tunneling. Note that if you remove too much material there is risk the cutter top plates will break off, obviously reducing the cutting ability of the chain.

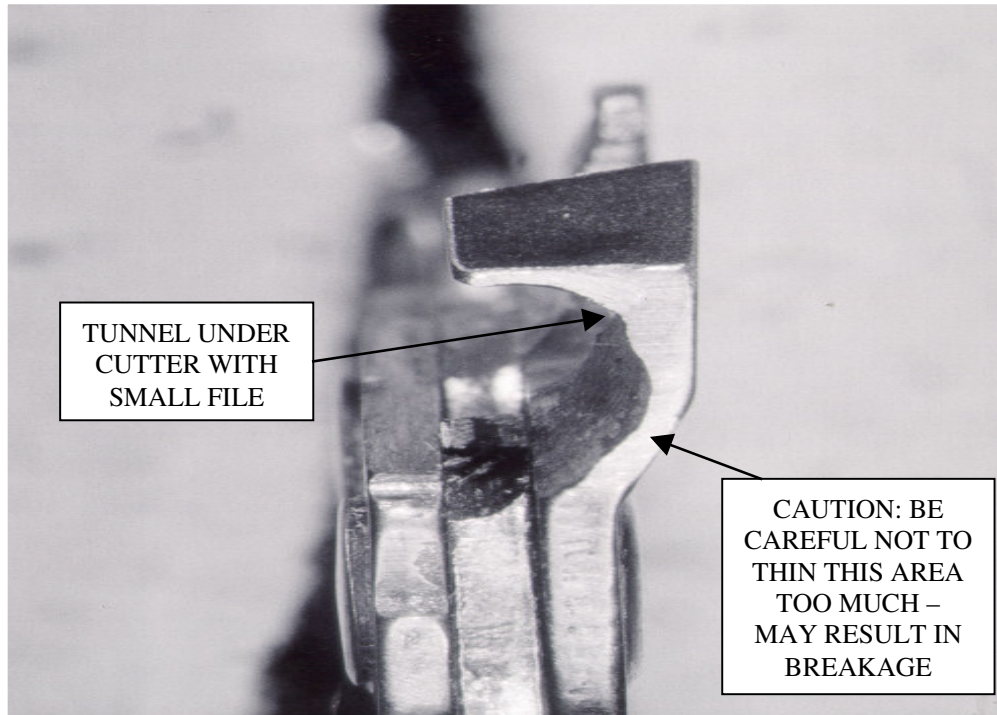


Figure 4. Cutter tunneling

If you decide to engage in competitive racing, we hope you will do so safely and maintain an awareness of the instructions included in this information sheet.



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