PACIFIC TRAIL
MANUFACTURING INC.

SAW CHAIN & SAW BAR MAINTENANCE GUIDE FOR CROSSCUT UNIT SAWS

(Give this 1st page to your saw chain sharpener)

1. ***Sharpening Parameters***
   a. Vise at 27° for the first new chain grind.
   b. Vise at 25° for all chain.
   c. Vise at 30º for all *carbide* chain **EXCEPT** 46RS-T & 46RMF-T (46RS-T / 46RMF-T remain at 25°)
   d. All cutter lengths need to be within a range of 0.010" of each other.

2. ***Do NOT file on rakers.***

For additional questions please contact
Pacific Trail Manufacturing Inc.
503-233-8952

SAW CHAIN & SAW BAR MAINTENANCE
GUIDE FOR CROSSCUT UNIT SAWS

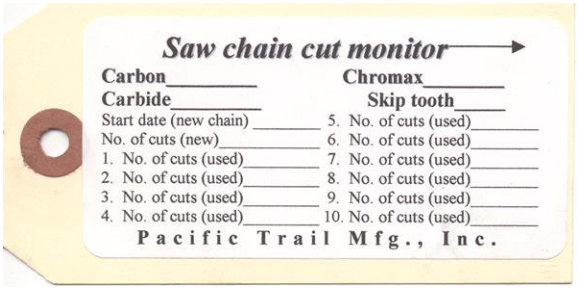
In-House Grinding Instructions

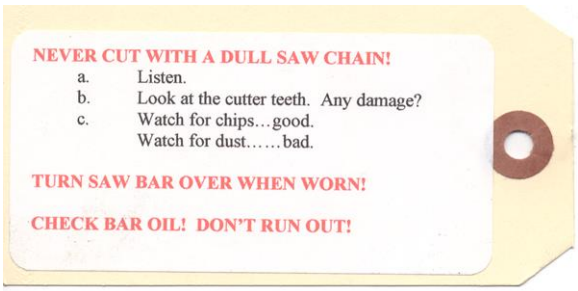
Cardinal Rules:

1. *Avoid cutting with a dull saw chain.*
2. *Turn saw bar over when rails are worn.*
3. *Avoid running saw on low oil.*

Saw Chain

Place a tag with each saw chain. This will help you monitor the life of these important wear items. This tag will come with every saw chain you buy from Pacific Trail Manufacturing:





These will also help compare the life of your sharpened saw chains with brand new ones and help indicate the quality of sharpening.

ALWAYS KEEP A NEW LOOP OF "CONTROL" SAW CHAIN TUCKED AWAY. If the saw begins to cut out of tolerance, check your saw chain sharpening. This "control" chain will help determine accurate sharpening. It is best to keep only two loops of saw chain in rotation at a time.

Change saw chain at approximately 85% of expected cutting totals. This will help ensure that excess pressure is not being used to make a cut when the saw chain becomes dull.

New Saw Chain Process:

1. When installing the 4th new/sharpened chain flip the chainsaw bar over.
2. At 150 cuts on a new chain, change the chain to new or resharpened chain.
3. A resharpened chain can last 100 – 150 cuts.
4. A new chain can last around 8 sharpenings.

Saw chain sharpening goals:

1. Accurately grind all right hand and left hand cutter teeth to within .005 - .010 in length.
2. DO NOT file the rakers. (Depth gauges)
3. **<u>Saw Bar</u>**

   Tag each saw bar.
   - Record the saw bar ID number on the tag.
   - Record the total number of cuts from all the saw chain used on each side of the bar.

   <u>Turn the saw bar over once per week!</u>
   This will give even wear to both sides of the bar before returning to Pacific Trail for reconditioning. Each saw bar should give you approximately 4000 cuts total before reconditioning.

   Check saw bar oil at the beginning of each shift to ensure proper amount.

Tools to have on hand:

a. Vernier calipers. *
b. Saw chain tension scale. *

** Call Pacific Trail Mfg., Inc. if you do not have these tools.*

Grinding Wheels (Borazon / Diamond):

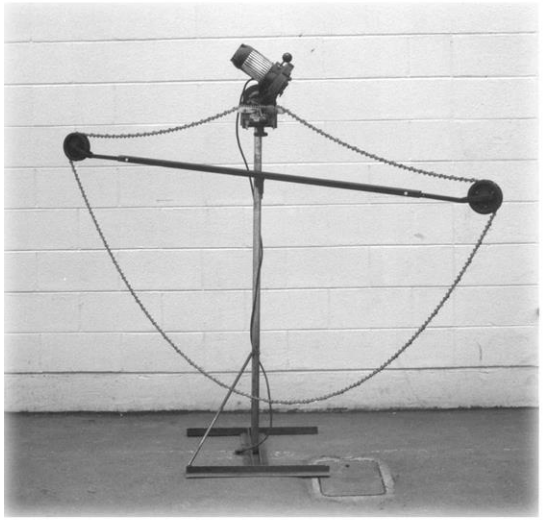
These preferred grinding wheels for Pacific Trail Mfg., INC. crosscut unit saws sharpens saw chain. When assembling the grinder, be sure a borazon / diamond grinding wheel is installed. The standard pink vitrified wheel is insufficient for sharpening saw chain.

A new grinding wheel has a break-in period of 3 – 6 grinds. During this time expect to leave a decreasing burr on the saw chain. This burr will decrease the number of expected cuts of 25% - 0%.
A grinding wheel has two effective sides. Turn the wheel over after 3 chain grindings. Repeat over the life of the wheel.

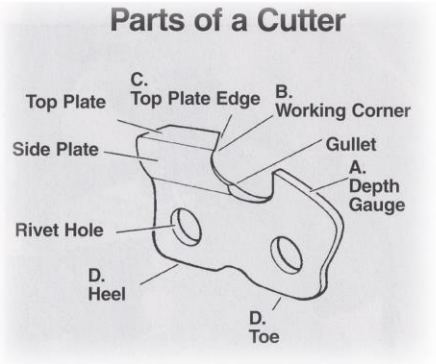
To clean, place wheel in flat pan and submerse with a cleaning solution (brake fluid). Allow to soak overnight. Afterwards, rinse with soap and water.
Clean after 3 grindings on each side.

- Borazon is used for *CARBON* saw chain.
- Diamond is used for *CARBIDE* saw chain.

Build a support stand before sharpening to help in the grinding process.
The following image will give you an idea of what works well.



Recommended support for saw chain grinder.
(We can fabricate a stand for you, if needed)



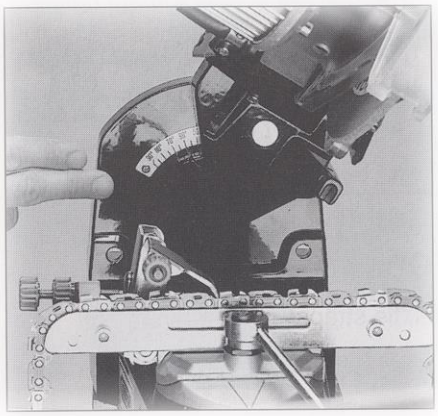
Grinding Procedure:

These images show an Oregon 511A saw chain grinder.
Yours may be different, but the settings still apply.

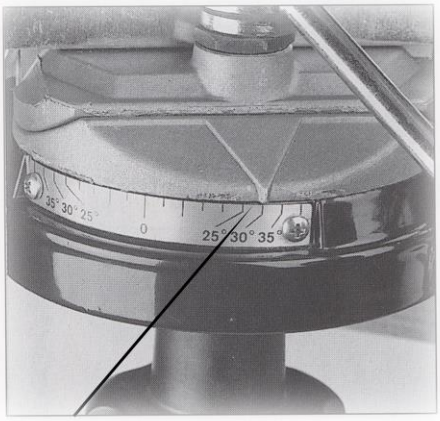
1. Remove bar oil from saw chain using solvent in bucket.

2. Blow dry with air.

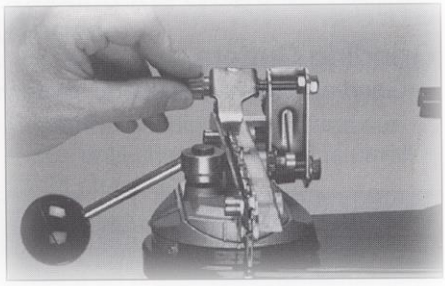
Load loop of saw chain into the vise as shown below.



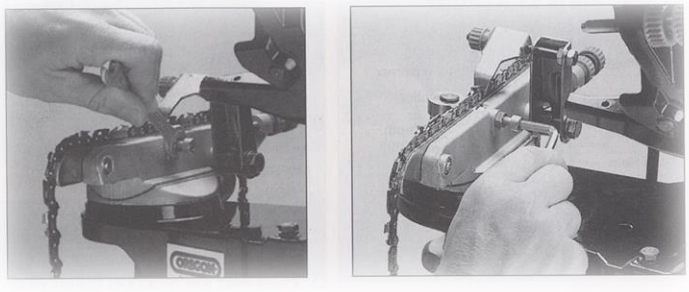
1. Position saw chain grinder motor head assembly to 57°. (New saw chain from the factory is set at 60º.) This will make the cutter just a hair sharper than a stock factory chain.



2. Position saw chain vise at 27° for the first new chain grind. When dull the second time, position vise at 25° for balance of all grinds. (Left hand cutter position shown. (New saw chain from the factory is set at 30º.)
46RS-T & 46RMF-T carbide chains remain at 25º.
Balance of all other carbide stays at 30º.



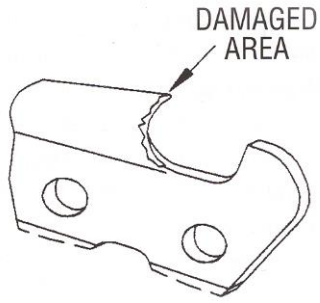
3. Using the centering knob shown above, center the saw chain cutter tooth stop directly behind the cutter tooth.



4. Center the saw chain vise as shown above to help keep the RH & LH cutters even during sharpening.

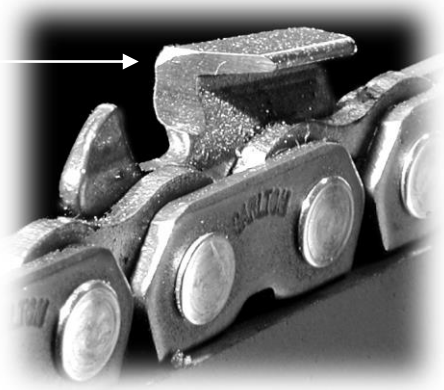
The following four images show you what conditions your cutter teeth may be in before starting the sharpening process.

Proceed to #5 after comparing these images to your saw chain.

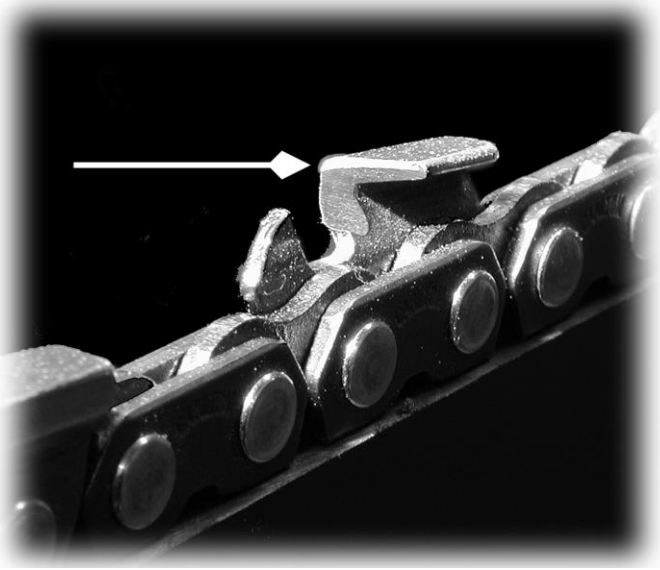


This is one example of what your cutters can look like. Rocks, banding or extremely hard knots can cause this damage.

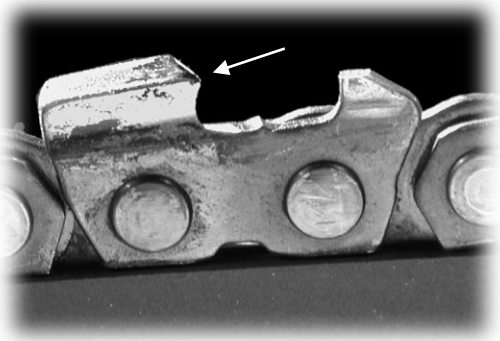
Normal wear



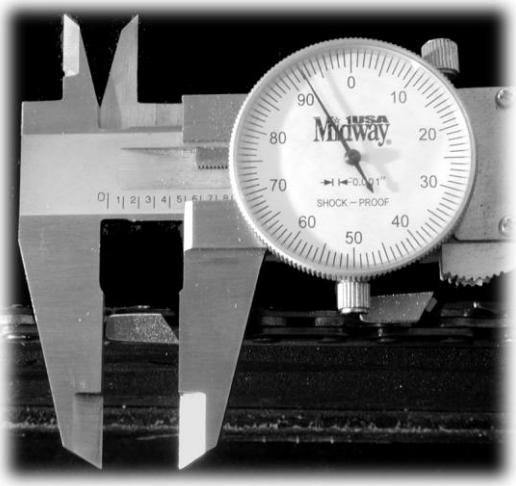
This image shows a dull “working corner”. Light reflecting off the flat edge.
The remaining cutter can be sharp, but this saw chain will not cut.



This cutter shows a top plate that is completely dull.
The flat reflective edge must be entirely gone for the cutter to be sharp.



This cutter has been burned. The previous sharpening was too aggressive.
This will require more than one grinding around this chain.
(Depth gauge in front of the cutter has been taken down.)



5. Going around the entire loop of saw chain, use the calipers supplied to randomly measure the top plate of 6 RH & 6 LH cutters. Mark the shortest cutter with a grease pen. If any of the cutters are damaged or burned, locate the worst one, mark with grease pen and note #7 on following page.

6. Setting the stops for sharpening.

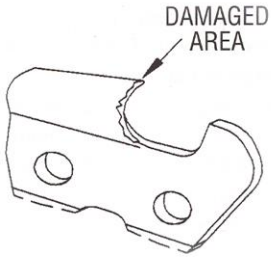
a. b. c.

a. With the motor off, find the cutter you marked with the grease pen. Lower the grinding wheel into the gullet of the saw chain. Screw the stop behind the cutter tooth in or out to allow a "kiss" grind between the cutter tooth and the grinding wheel.

(A minimum of interference pressure should suffice.)

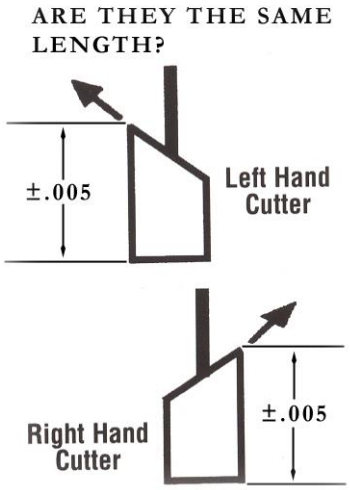
b. Set the depth of grind using the knob shown in "b." above.

c. The wheel should not exceed depth further than shown in "c." above. The leading edge of the cutter meets the wheel's radius edge and it's flat face.



7. If the cutter(s) is damaged, you may have to "kiss" grind 2 or 3 times around all the cutters on the same side to get past the damaged area. Do not try to grind a large amount off at one time. The excess heat will anneal the cutter(s) and it will not hold a sharp edge.

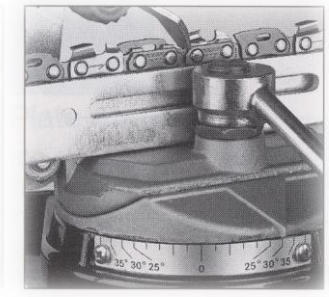
ALL CUTTERS MUST BE SHARPENED TO WITHIN ±.005 OF THE MEASUREMENT YOU JUST WROTE DOWN.



If cutters are a different length, they will pull one direction or the other.
Cutter teeth must be in balance.

Do not bear down on the saw chain with grinding wheels. Use a *light, feather touch* motion when grinding to achieve a better edge.

8. Sharpen the balance of the cutters on the same side. Measure a few cutters along the way to make sure you are keeping the length the same.

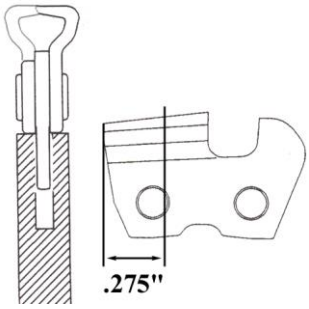


9. Rotate the vise to the same 27º & 25º to sharpen the other side.
(See #2 on page 6.)

10. Starting the opposite side, sharpen one tooth only. Measure it and make sure it is the same length as the cutter teeth you just sharpened.

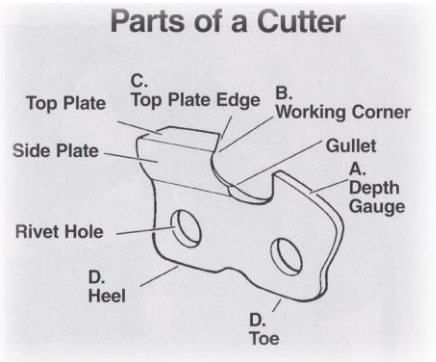
11. Sharpen the balance of the cutters on this opposite side. Check periodically to make sure they are the same length.

KERF WIDTH NOTE:



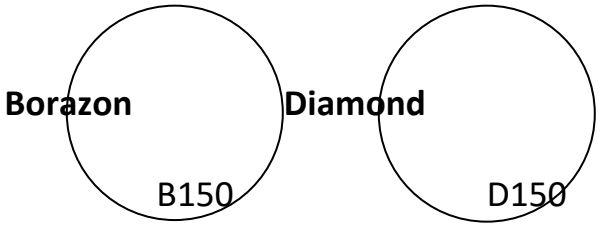
Do not sharpen the cutter teeth past the rivet line shown above. This will ensure the cutter teeth reach past the thickness of the saw bar. When the cutters reach approximately .275 in length, discard the chain.
This rule does not apply to carbide saw chain.

DO NOT TAKE DOWN THE DEPTH GAUGES.



You should be able to sharpen a loop of chain in 30 – 45 minutes.

If the saw chain is not going back on the saw, oil it for storage to keep it from rusting.



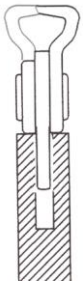
Borazon & diamond wheel cleaning:

Soft chain, burned chain, pitch and general debris can combine to clog up the wheel. Use an industrial strength cleaner such as basic carburetor cleaner. Simply spray cleaner on the wheel, then scrub with a wire brush.

- *Borazon wheels are for carbon and chromax saw chains.*
- *Diamond wheels are for carbide.*
- *DO NOT CROSS-USE WHEELS.*
- *DO NOT UNDER ANY CIRCUMSTANCES USE ANY CLEANING STICK OR THE GRINDER DRESSING BRICK ON WHEELS.*

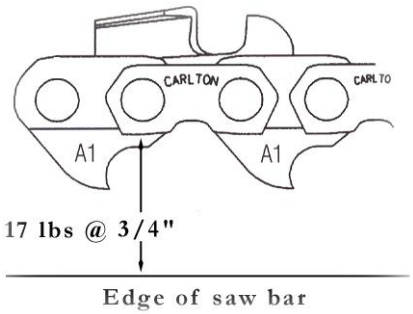
Saw bar maintenance:

What you're starting with…



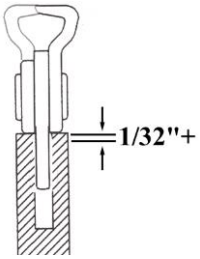
Tight saw bar rails.

Become familiar with the relationship between the saw bar and saw chain. When both are new, the rails of the saw bar are flat & square and they hold the chain's drive link tightly.

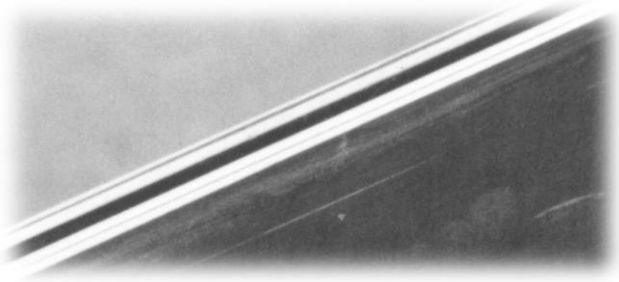


When installing a saw chain around the saw bar, saw chain tension should be set at 17 lbs. when pulled ¾" from saw bar as shown above. (22 lbs for paper roll saws.) See example on next page. The saw chain will be held tighter and wear on the saw bar will be optimized.

Use the take-up assembly at the end of the saw bar to tighten the saw chain. Using the tension scale shown, pull the saw chain away from the center of the saw bar to the distance and poundage shown on the previous page.

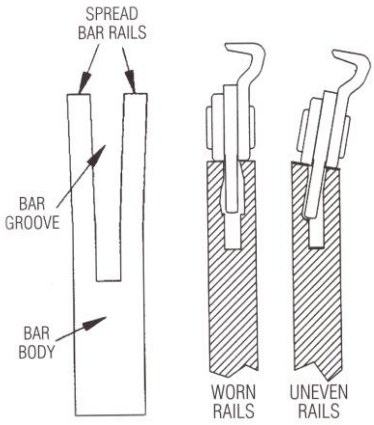


If both sides of the saw bar are worn down to 1/32”+, send the bar back to the factory for reconditioning.

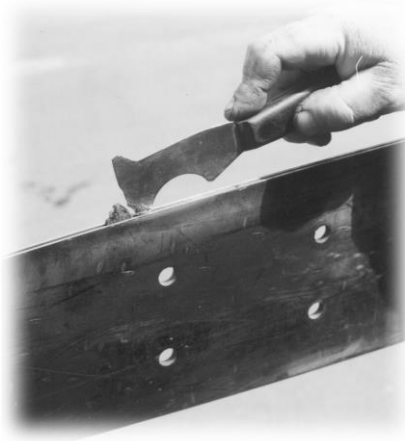


When the chain is sharpened correctly and not used when dull, it will wear into the rails of the saw bar. When this occurs the bar should be returned to Pacific Trail for reconditioning.

Saw bar damage caused by incorrect sharpening or cutting with a dull saw chain…



Sharpened incorrectly and/or cutting too fast during thin end-trims or when dull, the saw chain can roll over causing bar rails to spread or interior rail damage. Cutting tolerance is lost and/or the saw can cut with a ripple.



Each time the saw chain is changed, clean the saw bar groove as shown. Be sure to check the oil hole to the saw bar and clean as necessary.

Lubrication is very important to the life of these wear items.

Saw chain & saw bar trouble shooting:

Again, remember to always keep available, a new never been sharpened loop of saw chain. This will act as your "control" chain.

"Saw will not hold a square cut."

a. Measure all four corners of the material you just cut.
(Note the location of end-trims or internal cuts.)

b. Take the saw chain off and install a new, never been sharpened control saw chain.

c. Make a new pair of cuts in the same location as the previous pair and at the same speed. Compare with the four measurements taken in "a." above.

d. If the saw cuts correctly, improve sharpening technique.

e. If the saw is still cutting out of square, install a new or reconditioned saw bar. Keep the never been sharpened control saw chain on this saw bar.

f. Make a new pair of cuts as before. Compare measurements as before.

g. If none of the above helps, call Pacific Trail 1-888-910-SAWS (7297)

"The saw is giving me a bowed cut."

a. Follow each step above.

"The saw just will not cut, period."

a. Be sure your saw chain has not been installed backwards.

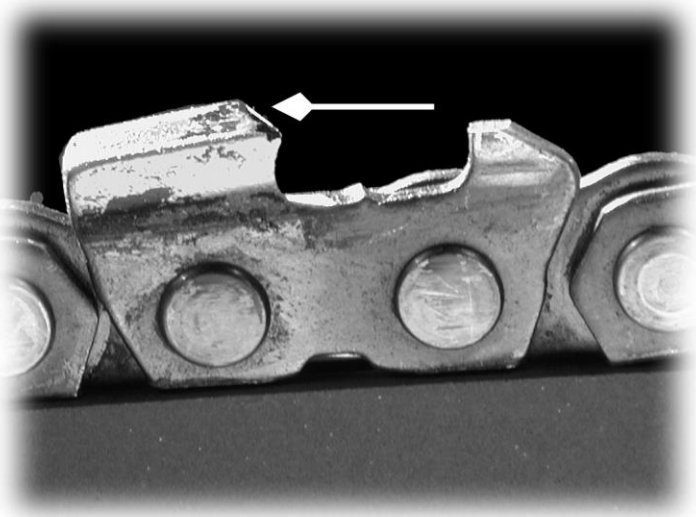
b. Install new control saw chain.

c. If the saw cuts OK, your saw chain is likely dull. See images below.

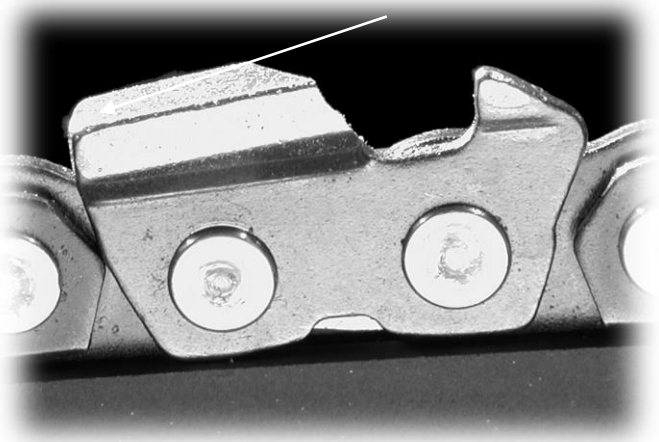
d. If the saw still does not cut, check to see if kerf is collapsing around the saw bar and saw chain. If so, the dunnage (4 x 4's) supporting the units are not likely the exact same height.

e. If none of the above helps, call Pacific Trail. 1-888-910-SAWS (7297)

Inconsistent dunnage height can cause a kerf collapse around the saw bar and saw chain. Collapse is also common when kiln stickers and uneven cants are present. Cutting tolerance can be affected.

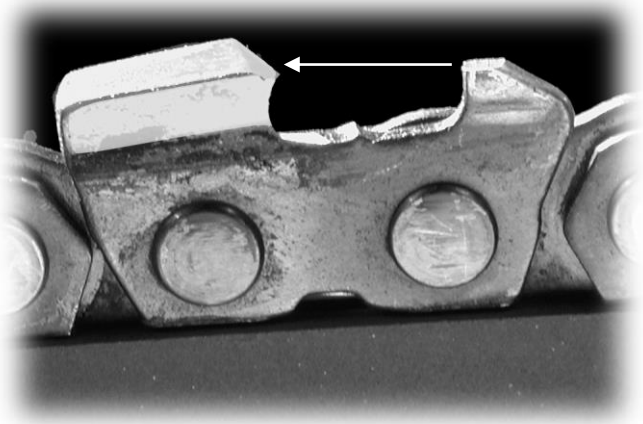


Don’t burn your cutters by taking off too much with any one grind. It may take 2 – 3 passes around the entire saw chain.

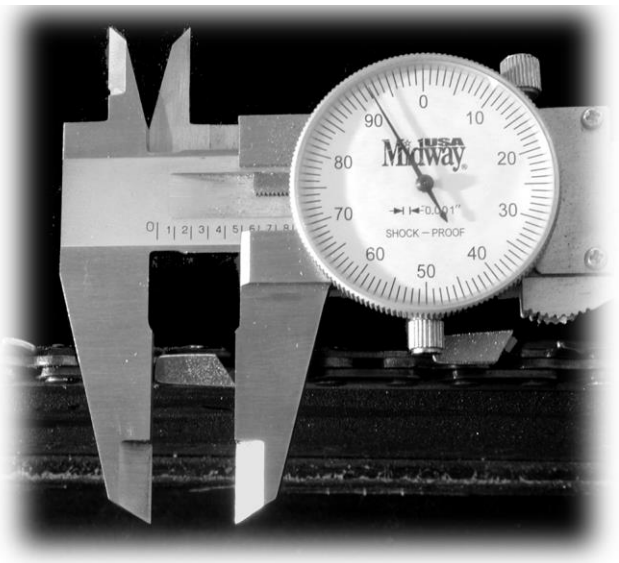


A back slope grind will not cut. There is no leading edge or “working corner”. Check depth of grind on page 9 - 6c.

Too much hook. It will cut aggressively at first but will dull quickly.
This tooth is ground too deep. Check depth of grind on page 9, 6c.



Depth gauges. Be sure to keep the depth gauges at .025 in height.
See pages 14 – 16.



Cutter teeth length. Keep RH & LH cutters within .005 in length.
Discard saw chain when cutter teeth reach .275 in overall length.

What a sharpened cutter should look like. A sharp working corner.
A sharp leading edge. No back slope. No hook. Depth gauge at .025.