The Handbook for Your Guide Bar & Chain

Care Instructions and Tips

LOGOSOL

OUR BEST TIPS!

With this handbook, we at LOGOSOL want to convey important advice on cutting tools, which you will not find anywhere else. Chains, guide bars and sprockets, i.e. the cutting tools of the chainsaw, have to work well togehter in order to get a good sawing result.

This handbook gives you answers to the majority of questions that LOGOSOL has received over the years. Even if you have experience of chainsaws, we warmly recommend you to study the whole handbook. A lot of the information is specifically about using chainsaws on sawmills.

In this handbook you can read about how to:

- handle new equipment
- sharpen in time.
- take care of the chain.
- choose the right sawmill chain oil
- maintain the guide bar.
- know when to replace the sprocket.
- sharpen the chain.
- detect faults.

I hope that these tips and accumulated experience will be useful for you.

Good luck!

MATTIAS BYSTRÖM
Vice President LOGOSOL

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TIME TO CHANGE?

Time to change to machine sharpening:

- When you sharpen your ripping chains manually and the chain often gets dull or you often get ridged patterns on the timber.

Time to change chain:

- When the links are severely worn on their undersides.
- When only 3 mm remains of the tooth.

Time to change guide bar:

- When the chain touches the bottom of the chain groove and the saw does not cut straight.

Time to change sprocket:

- When you acquire four new chains.
- When a new chain breaks.
- When you change to a new type of chain.

Contact LOGOSOL to be sure of getting the correct cutting equipment for your chainsaw.

SHARPEN IN TIME

If you keep your cutting tools in good condition, you will get the right dimensions on your timber, chains and guide bars will last longer, and you will saw faster. When rip sawing with a sawmill, the equipment is exposed to extreme stress. Both the motor output and the feed pressure are several times higher than when cross cutting timber, and the saw is run for considarably longer intervals. This makes special demands on you as a sawyer. When sawing hard, dry or largedimension timber, it is especially important that you are attentive and that your cutting tools are in good condition.

If you suspect that something is wrong, you should immediately stop sawing. Immediately interrupt sawing if you notice that:

- you have to increase the feed pressure.
- the sawdust is more fine-grained than usual.
- the guide bar gets unusually hot.
- you get poor surface finish.
- the saw does not cut straight.

Usually, operational disturbances are due to a dull chain that needs to be sharpened, but they can also be due to other problems that you should attend to. These will be presented later on in this handbook.

HANDLE NEW EQUIPMENT

New guide bars and chains should be greased before they are used. A good method is to spray adhesive oil **(ref. no. 9999-000-5100)** in the chain groove. Also spray on the chain when it is mounted on the guide bar. This way the chain will be lubricated from the moment it starts rotating. Do the same every time you change to a new chain on a used guide bar, just to be on the safe side.

Let the guide bar and chain run for 15 seconds and retighten the chain before you make the first cut. Keep an extra eye on the chain tension when making the first saw cuts. A new chain is stretched out to some extent, and it may need to be retightened already after the first cut.

LOGOSOL's line of spray oils. See prices on www.logosol.com

MAINTENANCE OF SAW CHAINS

It is quite common that the saw chain has to be sharpened after 3-4 logs if normal spruce or pine timber is sawn, but this can, of course, vary substantially. Mainly, it is the cuts into bark that wear out the sharpness of the saw teeth. Trees that have grown next to a road, or are dirty of some other reason, cause severe wear. Different wood kinds can be more or less hard to cut, and dry timber always causes more wear and tear than fresh. If the timber is perfectly clean, if it is felled on snow, or if the logs are debarked you can saw a longer time before the chain needs to be sharpened.

There is no rule for how long you can saw; this is something you have to assess while operating the equipment.

When it comes to the chain, the most important points are:

- Right and left teeth should be filed down equally. An unevenly filed chain can steer wrong and increase the wear and tear on the guide bar.
- The depth gauges should be kept at the right level.
- The chain must never get dull. Change to a newly sharpened chain as soon as you see the first signs of declining sharpness.

A little sharpening is enough

If a ripping chain is to work it must be correctly sharpened. The cutting edge of the tooth cuts the wood fibres and it has to be razor sharp. A rip saw chain is very rarely damaged the way a cross-cutting chain is. Normally, it only gets dull, which means that there is very little material that needs to be ground off to make the edge regain maximum sharpness.

Sharpening with an electric chain grinder (recommended)

When using a chain grinder, it is important that you take off as little material as possible. This way you avoid heating the chain, and it gets a long life. If the chain is damaged, after cutting into a nail, for instance, it can be good if you perform the sharpening in several steps. **LOGOSOL recommends a top plate angle at 0-10 degrees and a side plate angle at approx. 60 degrees.**

Worth noting:
Brand new rip saw chains that have a small side plate angle are 'aggressive'. You can expect that it will get dull relatively quickly, and that there is risk of wave patterns. After the first sharpening, the surface finish will be even finer than with a completely new saw chain.

Sharpening with a round file

It is possible to sharpen a rip saw chain by hand and attain good results. But it requires good know-how and a lot of practice. It is especially hard to get the correct side plate angle on the cutting tooth. The same is true when it comes to sharpening with rotating sharpening stones, since the side plate angle often gets too 'aggressive' for rip sawing. In that case, the chain quickly becomes dull and there is risk of getting wave patterns on the timber. Even people who have long experience of filing by hand, almost always attain a better and more uniform result when they change to machine sharpening. When sharpening Stihl Picco chains, we recommend a 4.8 mm round file.

File holder

When you are using a file holder with double files on a rip saw chain the chain often gets filed 'aggressive'. In this case the depth gauges become too low and the side plate angles of the teeth become too sharp, which means that the chain will take too much wood. This increases the risk of poor surface finish and wave patterns.

Manuel filing with a round file can still be a good method, as long as you are light-handed and do not press the file holder too hard, making the file dig into the tooth. You will attain a better result if you cut fresh logs and do not make too wide cuts.

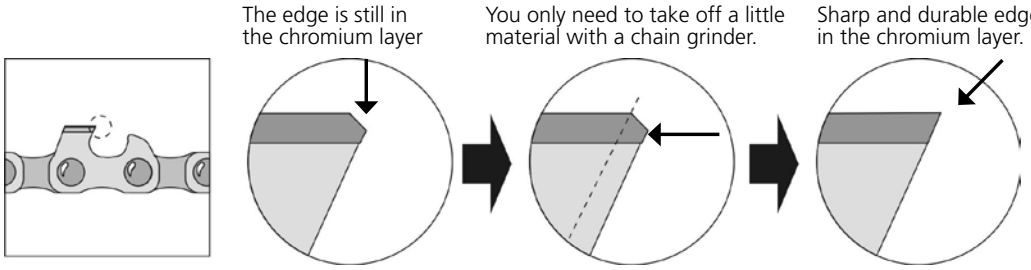
Filing vice

A necessary tool if you want to file your chains by hand. The saw chain is firmly secured, which facilitates filing manually.

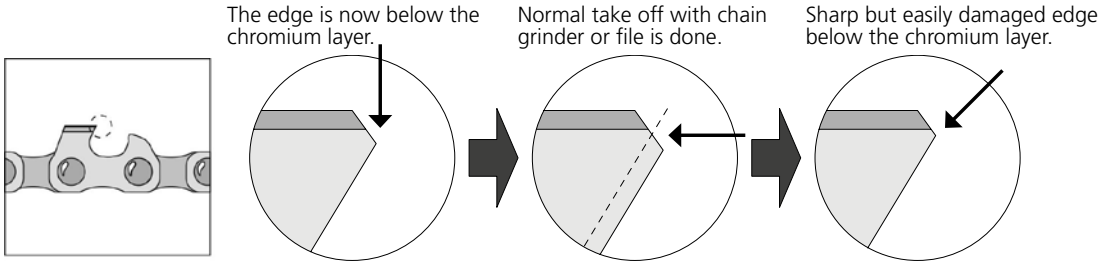
Keep the edge within the chromium layer!

The cutter of a chainsaw is covered with a very thin chromium layer. This gives a sharp and durable edge. As long as the edge is in the chromium layer, your chain will have perfect sharpness. If you do not immediately stop sawing as soon as you see indications of the chain loosing its sharpness, there is a clear risk that the chain becomes overheated

If you sharpen directly when the chain loses its sharpness



If you saw too long with a dull chain



the next time you sharpen the chain. The chain may get sharp, but because the new edge is not in the chromium layer it will very quickly become dull and, in the worst case, overheat again. To repair the damage, you have to file off a lot of the cutter.

If you always sharpen the chain before it becomes dull, the wear and tear on the guide bar and chain will be minimal. The grinding disc only needs to touch the tooth to make it sharp again. This means that the chain will last longer if you frequently and very carefully sharpen it.

The depth gauges

Due to the slight slope on the top side of the tooth, the edge will come in a lower position every time you sharpen the chain. The depth gauges, which decide how much wood the cutter will take away, should therefore be filed down at the same pace as the cutters becomes lower. If you do not do this, the life of the guide bar will be short, since you have to increase the feed pressure to make the chain cut. If, on the other hand, the depth gauges are filed down too much, it can lead to a poor sawing result or chain break.

Thus, it is important that the depth gauges are kept at the right level; 0.6–0.7 mm (0.024–0.027") below the edge of the cutter is the ideal. You can file the depth gauges with a grinding machine, but a depth gauge setter together with a depth gauge file also works well and gives good results.

Since you are always aiming for minimal take off when sharpening rip saw chains, it is sufficient if you check the depth gauges, using a depth gauge setter e.g., and file them when it is necessary. Consequently, you do not have to file the depth gauges every time you sharpen the teeth. **A rule of thumb is to file the depth gauges every time you have filed off 2 mm of the teeth.**

Chain tension

Ensure that the chain is correctly tensioned. A chain that is too tight can damage the bar tip sprocket, and a chain that is too slack causes wear and tear, which will result in a dimple just behind the bar tip. New chains are streched out and have to be tightened regularly after the first cuts. The chain should be tightened such that you can pull out a drive link from the groove of the bar using your thumb and your forefinger. When you release it, it should snap back into place again.

Storing the saw chains

Vegetable chain oil solidifies after a time. This means that used chains can become stiff. To be able to sharpen the chain, it is absolutely necessary that the chains are flexible and cleaned from rests of solidified chain oil. Spray used chains with universal oil if they are to be stored. Chains that have become stiff can be put in a mixture of hot water and dishwashing liquid and be cleaned with a dishbrush to become flexible again.

MAINTENANCE OF GUIDE BARS

Guide bars can be manufactured in two ways. Laminated guide bars are made of three metal plates that are welded together. Solid guide bars, where the groove is milled out from one piece of metal, are firmer and usually more expensive.

It is easy to believe that the guide bar has a manufacturing defect when it becomes worn out quickly. In reality, it is in most cases other factors that decide its lifespan and performance.

File the bar rails

Make sure that the bar rails are level and plane every time you change the saw chain. If placed on a level surface, the guide bar should be able to stand straight on its bar rails. With the LOGOSOL guide bar grinder **(ref. no. 7804-000-0005)** håller du enkelt svärdet i toppskick. This machine is a belt sander with a 90 degrees stop, which makes it easy to grind the bar rails.

Level and bar rails. *On a level surface, the bar should be able to stand straight on its bar rails.*

Unevenly worn bar rails. *When the bar rails are unevenly worn, there is a great risk that the chain will not cut staright.*

Worn out guide bar. *When the bar rails are worn so much that the drive links touch the bottom of the chain groove, the guide bar is worn out. Then, the guide bar and the chain will not cut straight and you will see that the lower tip of the drive link is slightly worn.*

Water cooling spares the bar

Even though the lubrication works as it is supposed to, and the feeding pressure is not too high, the guide bar can be overheated when you are sawing dry or hard wood.

If the temperature of the cutting tools is too high, the properties of the oil will impair and the chain will become dull quicker. Water cooling gives longer life to the bar and the chain.

Keep things clean

Keep the bar attachment of the chainsaw, its oil channel, and the attachment surface of the guide bar clean from sawdust and paint flakes, which can stop the oil flow. Make sure that the oil hole in the bar is completely open; this should also be done on new guide bars.

Do not overtighten

If the guide bar plate do not fit tight, the reason can be that the guide bar bolts have been overtightened. In this case, the cover plate can become warped, and oil will leak out on the bar instead of going down the hole for chain lubrication. Occasionally check that the cover plate is level.

Warning of high feed pressure

If you are sawing with a dull chain, or if the depth gauges are too high, the feed pressure usually becomes too high. Then, the strain on the oil film between the guide bar and the chain can become so high that the oil film breaks. In this situation the chain will work as a file against the bar rails, and the guide bar will wear out in a very short time. One single cut can cause visible damage. When you are edging boards, the bar is exposed to extreme stress. The entire feed pressure will be on a small part of the bar. Even edging a few boards at the highest speed can cause a dimple in the bar. To avoid this, you should never saw faster than 8m/min, i.e. 15 seconds for the distance between the log supports, which is 2 m.

Check the lateral straightness

The guide bar has to be directed exactly straight in the sawing direction. Even small deviations of some tenths of a millimetre will make the bar wear lopsidedly and quickly. A lopsided bar will also give a surface finish below par and can cut askew. (See the section Troubleshooting.)

Check: Clean the bar attachment and the guide bar. If the paint has begun flaking off, it should be completely removed from the contact surfaces. Fit the bar without the chain. Using a clamp, fit an approx. 1 m (40”) long straight rod at a 90 degrees angle, straight across the guide bar.

Measure the distance between the top edge of the guide rail, where the plastic strip is, and each end of the rod. The rod must not slope downwards or upwards in the sawing direction. See the manual’s section on adjustments for necessary action.

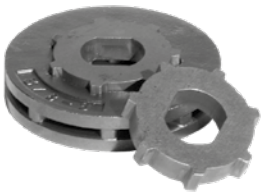
CHANGE THE CHAIN SPROCKET EVERY FOURTH CHAIN

If the chain breaks, it can be the cause of a chain and a sprocket that are not matched. For best results, you should alternate four chains on one sprocket. When the chains are worn out you replace the entire set, including the sprocket. A completely new chain on a worn-down sprocket can, if you are unlucky, break almost immediately.

Usually it is recommended that you change the sprocket every two chains, but by alternating between four chains the sprocket will last until these chains are worn out.

Make sure that you have the right chain sprocket. A PMX chain fits on a standard 3/8 sprocket, but you cannot use a standard 3/8" chain on a Picco sprocket. If you do that the drive links of the chain will get deformed, which leads to heat building up and, ultimately, the chain will get wedged between the bar rails.

We recommend using a spur sprocket with seven cogs for both electric and petrol chainsaws; it provides the best results, especially when paired with the 63PMX splitting chain. In rare cases where a spur sprocket is not an option, we recommend a rim sprocket with eight cogs.



Rim sprocket with adaptor for electric chainsaws.

Spur sprocket for petrol-driven chainsaws.

To upgrade your electric saw you need:
Rim sprocket with adaptor
(Ref no: 0000-642-1250)

USE SAWMILL CHAIN OIL

A guide bar is a slide bearing where the chain oil forms a coating as a barrier between the chain and the bar. As long as the oil film is intact the wear is minimal. If the film breaks due to too high feed pressure, or poor oil quality or quantity, steel will run on steel and the guide bar will be worn out very quickly.

The stickier the oil the better

A viscous, sticky chain oil will follow the chain round the bar tip and lubricate along the entire bar. The chain oils available on the market vary quite a lot both when it comes to price and quality. The best vegetable oils have just as good lubrication qualities as miniral oils. Often, the cause of severe wear and tear is that you have used an oil with a scanty adding of "viscous agent". You can get an idea about how suitable a chain oil is for a sawmill if you take an oil drop between your thumb and forefinger and then part the fingers. If it is a good oil, it will form many, long, fine threads between your thumb and forefinger. LOGOSOL has developed a sawmill chain oil that is stickier and more viscous than all other chain oils we know of.

LOGOSOL's own chain oil with extra good adhesion. Perfect for sawmill sawing.
Ref. no. 0718-000-1010 and 0718-000-1001

If the saw is to be stored for a longer period of time, you first have to run some mineral oil through the pump. The vegetable oil can harden after a couple of months, which usually means that the oil pump has to be replaced.

DIFFERENT SHARPENING OPTIONS

The easy way to a perfect result

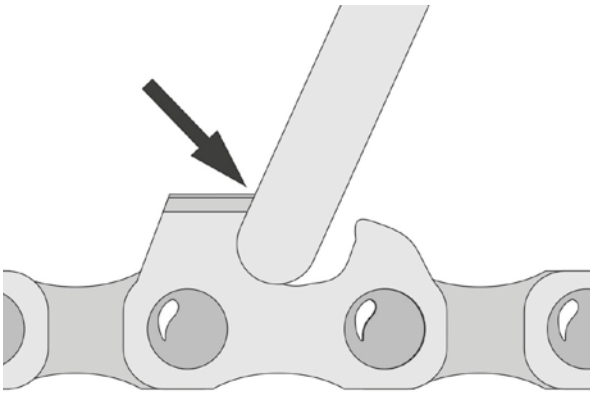
It is easy to keep the cutting equipment in good condition. LOGOSOL has the sharpening machines that give you the required sharpness, no matter if you are sawing with a chain or a band blade. Grinding discs are included with all our sharpening machines. Supplement with a diamond grinding disc as welll, for an even better result.

LOGOSOL Chain Grinder Pro

A very good manually operated chain grinder. The large grinding disc rotates at low speed, which means that you can grind off enough material without overheating the chain. The rotational direction of the grinding disc can be switched, which is important when you want to grind off a lot of material. The side-plate angle is adjustable. Sharpens chains for petrol-driven and electric chainsaws. Quick sharpening of all types of chains. 230 V, 180 W, 2800 rpm. **Ref. no. 9999-000-1565**

LOGOSOL Automatic Chain Grinder

A professional machine that gives you perfect saw chains. The teeth become razor sharp and symmetrical in a way that is hard to accomplish even with a really good manually operated electric grinder. The same is true when it comes to the depth gauges, which become identical around the whole chain. Setting up the machine is easy. Basically, it is set the same way as a manually operated grinder. 12V. Comes with cables and clamps for connecting it to a battery or a battery charger. **Ref. no. 9999-000-1515**



It is important that the edge is sharpened with a tool surface that is free from grindings.

Grinding discs of stone

For all of LOGOSOL's electric chain grinders, there are grinding discs of different thickness. You can always use the thinnest grinding disc, which is 3–4 mm (1/8"–3/16"), for all types of chains. When the depth gauges are to be ground, you change to a thicker disc that is 5-8 mm (1/4"–3/8"), and flat on its outer edge.

When sharpening with a stone disc, grindings always stick to the disc. If the disc is not rubbed off, it will stop working and will cause overheating of the cutting teeth. **Sharpening with a grinding disc that is not cleared from old material is usually the reason why you get a poor sharpening result.**

Use the shaper stone between each or every second chain you sharpen, to rub off a few tenths of a millimeter from the outer edge of the grinding disc. **Also, remember to lower the grinding disc after the rubbing.**

Shaper stone

A must if you want to get a good result with an electric chain grinder. You have to rub off some tenths of a millimetre from the grinding disc in order to reveal new abrasive material that can sharpen the tooth edge. Use the shaper stone between each or every second chain you sharpen. **Ref. no. 9999-000-0513**

Diamond grinding discs

With LOGOSOL's diamond grinding discs you can leave the Stone Age. Machined steel discs coated with abrasive materials that do not have to be rubbed off, but keep their function during their whole life. The weight of the steel disc gives a gyro effect that stabilizes the grinding operation.

The diamond grinding disc is especially suitable for sharpening ripping chains, since they only need to be ground off a little. If you avoid using the diamond grinding disc for heavy sharpening of e.g. cross-cutting chains that have cut in stone, the life of the diamond grinding disc will be very long.

The grindings do not stick to the diamond grinding disc, but it may need to be cleaned from both resin and chain oil.
Ref. no. 9999-000-0508 och 9999-000-0509

Depth gauge setter

The depth gauges have to be adjusted 2-3 times during the life of a chain. Manual filing with a depth gauge setter is a relatively quick operation and gives good results. If you machine-grind the depth gauges, the manual equipment can be used for setting the grinding machine. To get the correct depth, you can file one depth gauge by hand and then set the the machine to that depth gauge.
Ref. no. 9999-000-0432

Depth gauge file

A small, fine file of high quality. Without handle.
Ref. no. 9999-000-0481

All sharpening machines and equipment that LOGOSOL sells can of course also sharpen standard 3/8" and 0.325 cross-cutting chains that are used on standard chainsaws. For prices and more information, visit www.logosol.com

Watch our appreciated video on chain sharpening at LOGOSOL.COM!

SCAN THE QR CODE TO WATCH VIDEO ON CHAIN SHARPENING!

Get a sharp result with a chain grinder!
"In our new video on chain sharpening, I recommend everyone that owns a sawmill to sharpen their chains with a good chain grinder."

/ Bengt-Olov Byström, Founder of LOGOSOL

TROUBLESHOOTING

Ridged patterns (like a washboard) on the timber:

Ridged patterns on the sawn surface are due to wave motions in the chain, and occur more often when sawing oversized or hard timber. This is a result of a chain that is too aggressive:

1. Filing with a round file makes the chain too aggressive.
2. Depth gauges that are too low will make the chain aggressive.
3. Even a new chain is sharpened relatively aggressively.
4. If the guide bar is worn in the chain groove, it can also be a cause of the problem.
5. If the guide bar is oblique to the sawing direction it can also add to the problem.

If you sharpen with LOGOSOL's automatic chain grinder **(ref. no. 9999-000-1515)** or another electric sharpening machine with grinding disc, you will most probably get a very fine sawn surface. Even new chains may have to be sharpened if ridged patterns occur. A solid guide bar, with milled groove for the chain, usually gives a better sawing result thatn a laminated guide bar.

The saw does not cut straight:

- The guide bar is worn out and the chain touches the bottom of the groove.
- The right and left teeth of the chain are not filed down equally.
- The bar rails are not at a level.
- The guide bar is not fitted straight in the bar attachment.

If the guide bar springs back when it comes out of the end of the log, or if it does not follow the sawn surface when you reverse the saw, it does not cut straight. Sometimes it can be difficult to determine if it is movements in the timber or if it is the cutting equipment that causes the problem. If the problem occurs when you are sawing a thin board from a big cant, you can suspect that the cutting equipment is the cause.

The sawdust gets fine-grained and the feed pressure has to be increased:

- The chain is dull.
- The depth gauges are too high.

The guide bar becomes hot:

- The chain is dull.
- The depth gauges are too high.
- Too high feed pressure.
- The chain is too tight.
- Insufficient oil supply or oil quality.
- Hard-to-saw timber.

Chain break:

- In a drive link – the sprocket is worn out.
- In a cutting link – the chain is worn out due to a deficient oil film.

Small splinters break off the bar rails:
This will not affect the sawing results or the life of the bar, but is a sign that the guide bar is properly hardened by heating.

Both bar rails are worn down unusually quickly:

- Too high feed pressure, e.g. due to a faulty saw chain.
- Insufficient oil supply or oil quality.
- Too high temperature on the cutting equipment.
- The bar cover or the bar plate is not completely level.

One bar rail is worn down quicker than the other:

It is normal that the lower bar rail is worn slightly quicker due to the round shape of the log.

- The bar is not fitted straight in the bar attachment.
- The right and left teeth of the chain are not filed down equally.

A dimple forms in the bar rails at the bar tip sprocket:

- The chain is too slack.

A dimple forms in the bar rails at the bar attachment:

- The feed pressure is too high when you are edging boards.

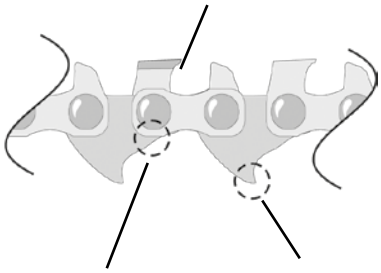
TROUBLESHOOTING

The chain gets wedged between the bar rails and becomes hot:

- A worn out sprocket deforms the drive links of the chain. The same thing happens if you e.g. use a 3/8" chain on a Picco sprocket.

The oil pump drive is worn out quickly:

- The oil pump drive is overtightened and has been pressed out to a too large diameter.
- If a new oil pump drive breaks at once, the saw has probably been standing too long filled with vegetable oil that has hardened in the oil pump. In this case the pump has to be replaced. Always make sure that the oil pump has not jammed up before replacing the oil pump drive.
- Lubricate the oil pump drive regularly with silicone spray.
  Ref. no. 9999-000-5110



If there is wear here, you have too high feed pressure or a poor chain oil.

If there is wear here, your guide bar is worn out.

If there is wear here, you have a slack chain.

If there is wear here, you have too high sawing speed when edging boards.

Severe wear on both the bar rails means that you have too high feed pressure or insufficient chain oil quality/supply .

Unevenly worn bar rails can mean that the bar is not fitted straight in the bar attachment. it is normal that the lower bar rail is worn slightly quicker due to the round shape of the log.

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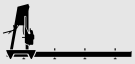 Sawmills

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