The Handbook for Your Cutting Equipment

A Booklet with Care Instructions

New Equipment

Before using new guide bars and chains, they should be greased. Spray adhesive oil (ref. no. 9999-000-5100) in the chain groove. Also spray onto the chain when it is mounted on the guide bar. This way the chain will be lubricated from the moment it starts rotating. Lubricate the groove 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 30 seconds, then retighten the chain before you (very carefully) take your first cut. After this you can saw with normal feeding pressure, but keep an extra eye on the chain tension when sawing the first logs. A new chain is stretched out to some extent, and initially it may need to be tensioned after every cut taken.

Logosol's assortment of spray oils

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Pay Attention!

Interrupt immediately

If you keep the cutting equipment in good condition you will get the correct dimensions on the 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 feeding pressure are several times higher than when cross cutting timber, and the saw is run for considerably longer intervals. This makes special demands on you as a master sawyer. When sawing hard, dry or thick wood it is especially important that you are attentive, and that your cutting equipment is in good condition.

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

- you have to increase the feeding pressure.
- the sawdust is more fine-grained than usual.
- the cutting equipment gets hot.
- the sawn surface is substandard.
- 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 booklet.

The Chain [sharpen in time]

It is quite common that the saw chain needs to be sharpened after 3-4 logs if ordinary spruce or pine 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 due to some other reason, cause severe wear. Different wood kinds can be more or less hard to saw, and dry wood always causes more wear and tear than fresh wood. If the timber is perfectly clean, if it is felled on snow, or if the logs are barked, you can saw for a longer time before the chain needs to be sharpened.

There are no rules for how long you can run the saw; this is something you as a master sawyer 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 teeth should be sharpened at the correct angles for the purpose, the depth gauges should be kept at the right level and, above all, the chain must never get dull.

Sharpen your PMX chain comfortably

Sharpening with a chain grinder: Mechanical sharpening of the teeth and the depth gauges is a quicker and easier method, and it gives a finer sawn surface. You get the best result if you sharpen the chains with Logosol's sharpening robot (ref. no: 9999-000-1515). The cheapest chain grinders with small grinding discs are a bit more difficult to use, as they rotate somewhat too fast. Due to this, they can overheat the cutting edge of the tooth. If you regularly clean the disc with the abrasive shaper stone (ref. no. 9999-000-0513) and grind carefully, these grinders usually works quite well. The larger chain grinders that have grinding discs with a diameter over 140 mm, are usually significantly better in all respects. Generally,

they run at a lower speed and are more sturdy, which makes it easier to get a good result. Correct sharpening of the tooth: Top plate angle 10°; side plate angle 45-60°. If hard or large-sized timber is to be sawn, it can even be necessary to resharpen new chains according to above.

Round Files, Filing Vice and Pferd File Holder

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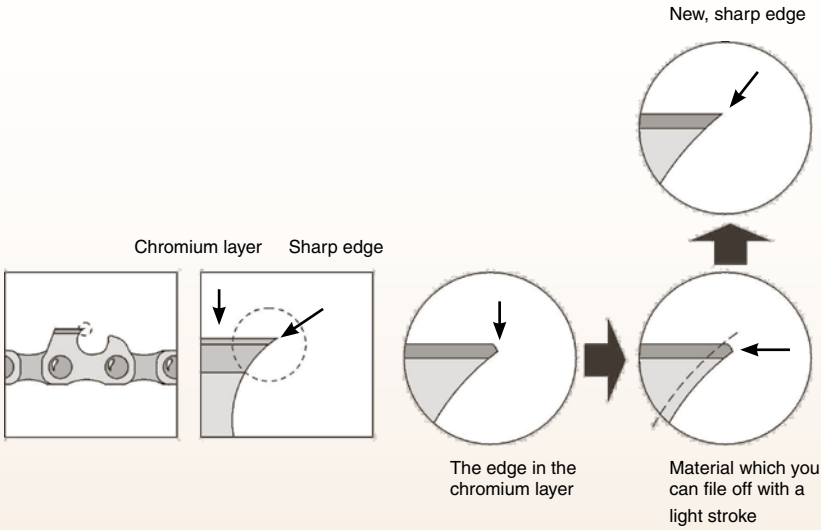
Sharpening manually: If you cut fresh logs or do not take too wide saw cuts, you can sharpen the chain manually using a round file. When sawing large-diameter logs or hardwood, the risk increases of getting a sawn surface that is below par.

A manually sharpened saw chain is in some cases preferable if you are using a saw with low motor power. This is due to the fact that the manually sharpened chain does not require as much feeding pressure.

It is much easier to sharpen the chain if you have a proper working place. Best is to build a table next to the sawmill where you can carry out sharpening and other maintenance of the chainsaw. Fasten the guide bar with a vice, for instance. If you have an electric saw you need a filing vice in order to keep the chain in position when sharpening it manually.

Sharpening a PMX chain is easy. Use the Pherd file holder with double files. Hold the file straight over the guide bar (90° to the flat side of the bar). File the teeth from inside and out. First sharpen the teeth of one side of the chain, and then the teeth of the other side. Do not press the file so hard that it bends and dives.



Keep the edge within the chromium layer!

The cutter on a chainsaw is covered with a very thin chromium layer. This gives a very 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 that the chain has lost sharpness, there is a risk that the chromium layer will be so damaged that you cannot reach the layer the next time you sharpen the chain. The chain may feel sharp, but because the new edge is not in the chromium layer it will very quickly become dull again. To repair the damage, you have to remove a lot of the cutter with the file.

If you always file before the chain becomes dull, the wear and tear on the guide bar and chain will be minimal. Only one or two light strokes with the file, and the cutter is sharp again. This means that the chain will last longer if you frequently sharpen it.

The depth gauges

Due to the slight inclination of the upper side on the saw tooth, the edge will be in a lower position every time you sharpen the chain. The depth gauges, which determine how much wood the cutter will take away, should therefore be filed down at the same pace as the cutters are.

If you do not file the depth gauges, the guide bar will be damaged by the feeding pressure which then has to be increased. If the depth gauges are filed down too much, it can lead to kickbacks, chain breaks, and a poor sawing result.

Thus, it is important that the depth gauges are kept at the right level; the optimum level is 0.6-0.7 mm (0.024-0.027”) below the edge of the cutting tooth. If you use a Pferd file holder (9999-000-0410) with a round file for the saw teeth and a flat file for the depth gauges, the depth gauges will actually get a bit too deep (0.8 mm or 7/8”), but at least all the teeth will be filed the same way. In some cases, when hard or oversized timber is sawn, this can give a bad sawn surface, as the teeth become too aggressive

Chain tension

Make sure that your chain is correctly tensioned. A chain that is too tight can damage the bar tip sprocket, and a chain that is too slack causes severe wear and tear, which will result in a dimple just behind the bar tip. A new chain is stretched out and has to be tensioned regularly the first time you use it. The chain should be tensioned so you can pull out the whole chain from the bar’s groove with your thumb and forefinger. When you release it, it should snap back into place.

Chain Oil [the stickier the better]

High feeding pressure calls for a 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 feeding pressure, poor oil quality or quantity, steel will run on steel and the guide bar will be worn out very quickly. Also the underside of the saw chain will wear, which can result in a chain break.

The stickier 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 mineral 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 the suitability of a chain oil 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 which is stickier and more viscous than all other chain oils we know of.

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

Keep things clean

Keep the bar attachment, its oil channel and the bar's attachment surface 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.

Sawdust and flakes can also cause oil leakage, which leads to poor lubrication as the bar plate of the electric saw / the chain cover of the petrol chainsaw cannot fit tight against the bar. Many master sawyers scrape the attachment surface of the bar completely clean of paint to eliminate any problems with paint flakes.

Check the oil channel

Another reason why the bar plate does not fit tight, is that the bar bolts are too tight. In that case, the cover plate can become warped, and the oil will leak out on the bar instead of going down in the hole for chain lubrication. Make sure that the cover plate is level and that the channel in the bar plate is not damaged.

Beware of too high feeding pressure

If you are sawing with a dull chain, or if the depth gauges of the chain are too high, the strain on the oil film can be so high that it breaks. In this situation the chain works as a file against the bar rails, and the guide bar will wear out very quickly. One single cut can cause visible damage. When you are edging boards the bar is exposed to extreme stress. The entire feeding 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 rails. Do not saw any faster than you do when sawing a 6" block.

The Guide Bar [also needs to be tended!]

It is easy to believe that it is a deficient bar that is to be blamed when something goes wrong. Actually, in most cases it is the factors around the bar which decide its performance and lifespan.

File the bar rails

Make sure that the bar rails are level and plane every time you change saw chain. A UKF edge file is a special tool for filing the bar rails, but you can also use an ordinary flat file or a band or disc grinder with angle support. If placed on a level surface, the bar should be able to stand straight on the bar rails.

UKF Edge File

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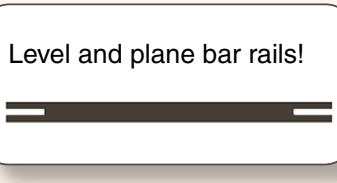


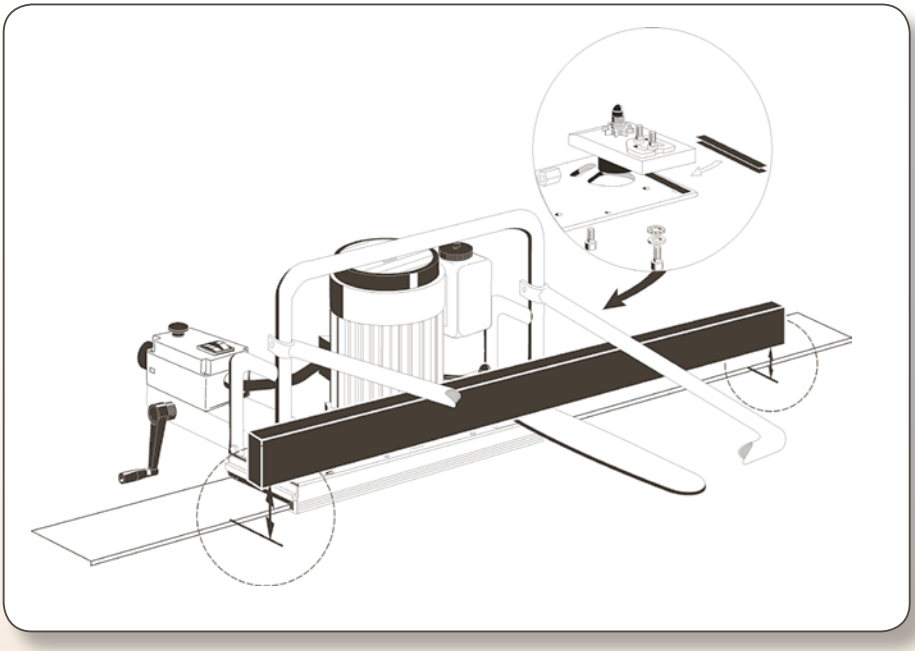
The bar is worn out when the bar rails are filed down so much that the drive links touch the bottom of the chain groove. The bar will then pull askew, and you will see that the lower tip of the drive link is slightly worn.

The groove width

The groove width, i.e. the distance between the bar rails, should be 1.40-1.45 mm (0.055-0.057”) when the chain is 1.3 mm (0.05”) – PMX-chain. If the distance is more than that, there is a risk that the bar will wear out quicker, and you can get poorer results on the cut surface.

Water cooling spares the bar

Even though the lubrication works as it is supposed to, and the feeding pressure is not too high, the bar can get overheated when you are sawing dry or hard wood. The oil's properties will become impaired and the chain will get dull quicker if the temperature on the cutting equipment is too high. For the electric saw units there is an automatic water cooling system available as an accessory (ref. no: 6605-000-0100). If you have a petrol chainsaw, consult Logosol about what equipment you should have to cool the bar.



Check the sawing direction

The cut must be horizontal and parallel to the guide rail. To achieve this the bar has to be laterally straight in its attachment. Even small deviations of 0.1 mm will make the bar wear quickly and lopsidedly. A lopsided bar gives a cut surface below par, and in worst case it causes wave patterns on the boards (see 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. Attach a ca 1 m (3.28ft) long, straight rod with a clamp. Let it be at a 90° angle to the guide bar, lying straight across it.

Measure the distance between the upper side of the guide rail, where the plastic strip is, and each end of the rod. If the difference is more than 1mm (1 mm difference at the ends of the rod is the same as 0.1 mm on the bar), you should make following procedures.

Electric saw: Place thin strips of metal sheeting (e.g. 1-3 layers of strips from an aluminium soda can) under the bar attachment. Tension the belt fairly tight, screw the bar attachment tight, and loosen the belt tensioning screw half a turn.

Petrol chainsaw: Place M6 washers between the carriage's bottom plate and the aluminium slide profiles until the rod is parallel to the guide rail. Normally you need to make this adjustment when other saw brands than Stihl is used.

Check the measurements: The rod may not slope downwards against the sawing direction. In that case it is better if the bar is adjusted ca 0.1 mm upwards.

The Sprocket [change it every fourth chain]

If a drive link breaks, the reason can be that the chain and sprocket 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 break during the first few minutes. It is not good to drive a normal 3/8” chain and a PMX-chain on the same sprocket.

Normally we recommend that you replace the sprocket after two chains, but by alternating between four chains the sprocket will last until these chains are worn out.

Check that you have the correct chain sprocket. A PMX chain fits on a normal 3/8 sprocket, but you cannot use a 1.6 mm 3/8 chain on a Picco sprocket. If you do that, the chain’s drive links will get deformed, which leads to heat building up, and finally the chain will get wedged between the bar rails.

Spur Sprocket and Rim Sprocket

Now, it is possible to use rim sprockets on Logosol’s electric saw units. A rim sprocket makes the chain run smoother. Under the sprocket, you fit an adaptor, which consists of two splined washers. If you have a saw that was bought before spring 2008, and want to upgrade the bar attachment so that you can use a rim sprocket, you should also replace the upper bar plate and the cover plate.

To upgrade your electric saw you will need:

Rim sprocket with adaptor	0000-642-1250
Cover plate 5 mm	9999-000-6024
Upper bar plate	9999-000-6023

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or www.logosol.co.uk

Troubleshooting

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 rail is properly tempered.

Both bar rails are worn down exceptionally quickly: Too high feeding pressure. / Insufficient oil supply or oil quality. / Too high temperature on the cutting equipment.

One bar rail is worn down quicker than the other: The bar is not fitted straight in the bar attachment. / The chain's right and left teeth are not filed down equally.

The guide bar becomes hot: Dull chain. / Too high feeding pressure. / The chain is too tight. / Insufficient oil supply or oil quality. / Hard-to-saw wood / wrong sprocket.

Ridged patterns (like a washboard) on the wood: This is due to wave motions in the chain. This is the result of a chain that is too aggressive, which it usually gets when it is sharpened with a round file. If you sharpen it with Logosol's sharpening robot or another electric grinder the problem will disappear, provided that the rest of the equipment is in good condition. A guide bar that is not fitted straight in the bar attachment, or a chain groove that has become too wide, are other possible causes.

Chain break: In a drive link - the sprocket is worn out. / In a cutting link - the chain is worn out on the underside due to a deficient oil film.

A dimple forms in the bar rails at the bar tip sprocket: Too slack chain

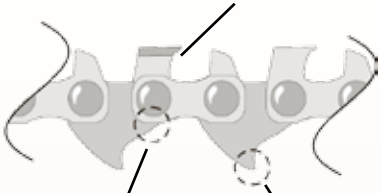
A dimple forms in the bar rails at the bar attachment: Too high feeding pressure when edging planks and boards.

You get fine-grained sawdust, and the feeding pressure has to be increased: The chain is dull. / The depth gauges are too high.

The saw cuts slightly askew: The chain's right and left teeth are not filed down equally. / The bar rails are not equally high. / The bar is not fitted straight in the bar attachment.
If the 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. It can, however, be difficult to determine if it is movements in the wood or if it is the cutting equipment that causes the malfuncion. If you use Logosol's Cross Support or the Versatile Log Fence, you can exclude sagging, and you will easily notice if there are any tensions in the wood.

The chain gets wedged between the bar rails and it becomes hot: Wrong sprocket. Probably a 1.6 chain is used on a Picco sprocket.

The plastic oil pump drive is worn out quickly: The pump is placed too low over the oil pump drive. Replace the bar plate and the cover plate or adjust the cover plate. / Lubricate the oil pump drive with silicone spray (9999-000-5110).

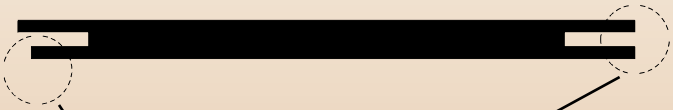


If there is wear here, you have too high feeding pressure, or a poor chain oil.

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 speed when edging boards.



Unevenly worn bar rails means that the bar is not fitted straight in the bar attachment.

If there is severe wear and tear on both the bar rails, you have too high feeding pressure or a poor chain oil.

Logosol Big Mill System

Time to change?

Time to change chain: When the links are severely worn on the underside. / When the teeth are damaged so that they cause scratches on the wood. / 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 cuts very askew.

Time to change sprocket: If a new chain breaks. / When you replace your four chains with new ones. / When you change to a new chain type.

Time to change oil: When there is inexplicable wear and tear on the bar. / Before the saw is to be stored for a longer period, you have to run some mineral oil through the pump.

Contact Logosol in order to be sure of getting the correct equipment for your chainsaw.

I hope that you will find these tips and gathered experiences useful.

I wish you all the best with your wood processing!

Mattias Byström

For contact information visit:

www.logosol.info

www.logosol.com

www.logosol.co.uk

www.logosol.com.au

www.logosolcanada.com

Logosols Sharpening Alternatives

Sharpening manually: Filing with a Pferd file holder is OK when you are going to saw fresh conifer wood or other sorts of softwood of dimensions that are not so large. For normal Scandinavian wood this method often goes well, but you cannot be sure of always getting a fine sawn surface.

The electric Nick Grinder: A cheap alternative that works well, but not completely perfectly. The grinding disc rotates a bit too fast, which means that you have to be careful when you are sharpening the teeth so that the the temperature is kept down at the tooth edges. The side plate angle is fixed at 60 degrees, which is almost too much, but it gives a good sawn surface. 220V.

The electric Maxx Grinder: A really good manually operated electric grinder. It is strongly built, the large grinding disc rotates at the correct speed, and it gives all necessary adjusting possibilities. 220V.

Logosol Sharpening Robot L1: Absolutely outstanding. A professional machine which gives you perfect saw chains. The teeth become razor sharp and symetrical in a way that is hard to accomplish even when using a 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.

Grindomatic: The same as the Sharpening Robot L1, but this machine sharpens both the sides of the chain in one single operation. It can also sharpen .404 chains, which are frequently used on harvesters and larger fire wood processors.

Swedish wood processing products

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Shaper Stone: A must if you want to get a good result with an electric grinder. You have to rub off about a tenth of a millimetre from the outer edge of the grinding disc in order to reveal new abrasive material that can sharpen the tooth edge. Use the stone between each or every second chain you sharpen.

Depth Gauge Setter: Even though you have an electric grinder that grinds the depth gauges, it can be good to use the setter as a check. One method to get the correct depth, is to file one tooth manually and then set the machine against that tooth.

Depth Gauge File: A small, fine file of high quality. It has no handle.

Grinding Discs: For the electric grinders there are grinding discs of different thicknesses. You can always use the thinnest grinding disc, which is 3-4 mm, for all types of chains. When the depth gauges are to be grinded, however, you should change to a thicker disc that is 5-8 mm and flat on the outer side.

All the above alternatives can also be used for sharpening normal 3/8” and 0.325 cross-cutting chains that are used on ordinary chainsaws.

For prices and information, visit www.logosol.com, www.logosol.co.uk, www.logosol.com.au or www.logosolcanada.com.

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