

# **The Handbook for Your Cutting Tools**

Care Instructions and Tips

## **OUR BEST TIPS!**

With this handbook, we at LOGOSOL want to convey important advice on cutting tools, which you will not find anywhere else. Chain, guide bar and sprockets, i.e. the cutting tools of the chainsaw, have to work well together 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 YOU:**

- 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!

A handwritten signature in black ink, reading 'Mattias Byström'.

Mattias Byström  
Product Manager and Deputy CEO  
LOGOSOL

## HANDLE NEW EQUIPMENT

New guide bars and chains should be greased before they are used. A good method is to spray adhesive oil (art.nr. 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.

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 15 seconds and retighten the chain before you very carefully take the 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 line of spray oils. See prices on [www.logosol.co.uk](http://www.logosol.co.uk)*

## 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 considerably longer intervals. This makes special demands on you as a master sawyer. When sawing hard, dry or large-dimension 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 booklet.

Pay attention to how fast you cut with a completely new chain. A correctly sharpened chain should cut nearly at the same speed.



## TAKE CARE OF THE CHAIN

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 barked you can saw a longer time before the chain needs to be sharpened.

There is no rule 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 filed 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. 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

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 10 degrees and a side plate angle at 60 degrees. A smaller top plate angle (e.g. 5 degrees) can give a somewhat finer surface finish, a more 'aggressive' side plate angle (e.g. 65 degrees) makes the chain cut slightly faster, but the chain gets dull more quickly and there is risk of wave patterns on the timber. Brand new rip saw chains that have a small side plate angle are 'aggressive'. You can expect that it will get dull quickly, and that there is risk of wave patterns. After the first sharpening, the surface finish will be even finer than with a 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.

## PFERD FILE HOLDER

When you are using the Pferd 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 sawing fresh logs and do not take too wide cuts. The chain saws quickly and with low feed pressure, which can be preferable if you have a chainsaw with low motor power.

**Procede as follows:** Hold the file straight over the guide bar (90 degrees to the flat side of the bar). File the teeth from inside and out. First sharpen the teeth



*LOGOSOL's sharpening robot always gives you perfectly sharpened chains. While the robot works you can continue sawing!*

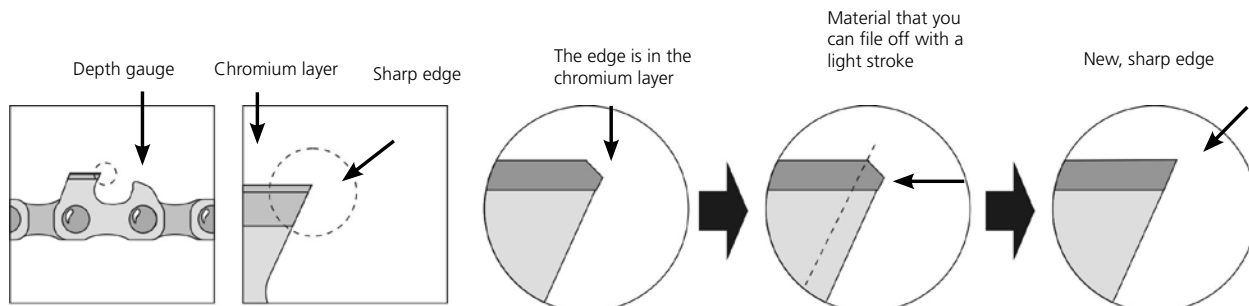


*Round files, filing vice and Pferd file holder.*

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. LOGOSOL recommends that you use a 4.8 mm round file for a PMX chain.

## 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 losing its sharpness, there is a clear risk that the chain becomes overheated and the chromium layer gets damaged. This means that you cannot reach undamaged chromium layer 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 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 upper side of the tooth, the edge will come 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 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 the depth gauges are filed down too much, it can lead to chain break and a poor sawing result.

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 the 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, 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 1 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 severe wear and tear, which will result in a dimple just behind the bar tip. New chains are stretched out and have to be tightened regularly the first minutes in operation. The chain should be tightened so that you can pull out the whole chain from the groove of the bar with 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.

## THE GUIDE BAR ALSO NEEDS TO BE TENDED

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. With the LOGOSOL guide bar grinder (item no: 7804-000-0005) you can easily keep the bar in top condition. The machine is a belt sander with a 90 degrees stop, which makes it easy to grind the bar rails.

If placed on a level surface, the guide bar should be able to stand straight on the bar rails. 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.

### GROOVE WIDTH

The groove width, i.e. the distance between the bar rails, should be 1.40-1.45 mm (1/16") when the chain is 1.3 mm (3/64"), PMX chain. If the distance is more than that, there is a risk that the guide bar will wear out quicker, and you can also get poorer results on the sawn surface, especially in combination with an aggressive saw chain.

### 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. For the electric saw units there is an automatic water cooling system available as an accessory (item no: 6605-000-0100).



*Level and plane bar rails!*



*The UKF edge file is a hand tool for filing the bar rails.*



*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.

Sawdust and flakes can also cause oil leakage and, with that, poor lubrication, as the bar plate of the electric saw / the chain cover of the petrol chainsaw cannot fit tight against the guide bar.

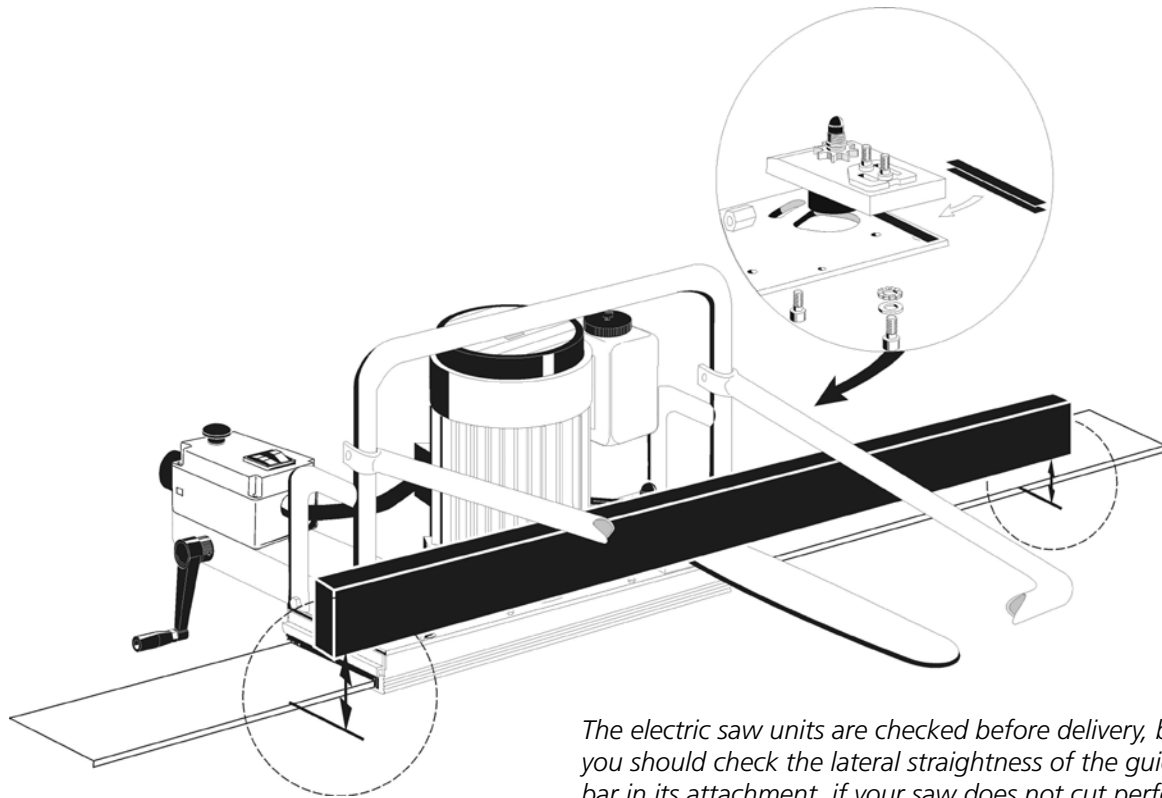
## CHECK THE OIL CHANNEL

Another reason why the guide bar plate does not fit tight, is that the bar bolts are tightened too much. 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. Make sure that the cover plate is level and the channel in the bar plate is not damaged.

## WARNING OF HIGH FEED PRESSURE

If you are sawing with a dull chain, or if the depth gauges are too high, 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.





*The electric saw units are checked before delivery, but you should check the lateral straightness of the guide bar in its attachment, if your saw does not cut perfectly.*

## CHECK THE LATERAL STRAIGHTNESS

The guide bar has to be directed exactly straight in the sawing direction. To achieve this the bar must be laterally straight in its attachment. 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 Troubleshooting on page 13.)

**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. If the rod is not parallel to the guide rail, you should make following procedures.

**Electric saw unit:** Loosen the guide bar attachment. Place thin metalstrips (e.g. 1-3 layers of strips cut from a soda can) under the bar attachment to adjust the angle. Tighten the belt fairly hard, and then loosen

the belt tensioning screw half a turn (this removes the tension on the bottom plate of the saw carriage).

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

**Check the measurements:** The rod should not slope downwards toward the sawing direction. In that case, it is better if the bar is adjusted some tenths of a millimetre upwards.

## 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. It is also inadvisable to drive both a standard 3/8" chain and a PMX chain with the same sprocket.

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 that you use rim sprockets on LOGOSOL's saw units E4000/E5000/E8000. The rim



*Rim sprocket with adaptor for electric saw units.*

*Spur sprocket for petrol chainsaws.*

sprocket makes the chain run smoother. An adaptor is used on the driveshaft to make the sprocket fit and to allow small movements in height. LOGOSOL E8 Speed Saw has a special sprocket with 24 cogs, which wear very little. **To upgrade your electric saw you need: Rim sprocket with adaptor, item 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. Also the underside of the saw chain will wear, which can result in a chain break.

### 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 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 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. View prices on [www.logosol.co.uk](http://www.logosol.co.uk)*

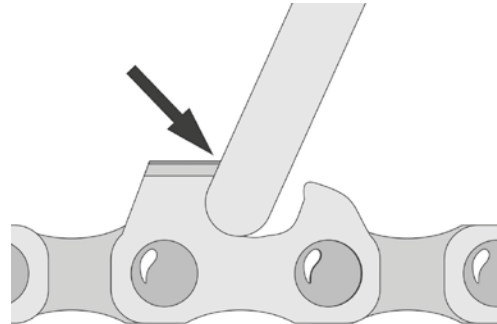
If the saw is to be stored for a longer period of time, you first have to run some mineral oil through the pump. The vegetable oil can harden after a couple of months, which usually means that the oil pump has to be replaced.

## DIFFERENT SHARPENING ALTERNATIVES

### CHAIN GRINDER, SMALL 220 V

An affordable, fully functional sharpening machine. The grinding disc rotates at high speed, which means that only careful sharpening works well, which is the case when it comes to normal sharpening of ripping chains. The side-plate angle is fixed at 60 degrees. This gives a fine sawn surface even when cutting hardwood. It may well be equipped with diamond grinding disc.

Item no: 9999-000-1520



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

### CHAIN GRINDER, LARGE 220 V

A very good manually operated chain grinder. The large grinding disc rotates at low speed, which means that you can grind off a lot of 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.

Item no: 9999-000-1525



### GRINDING DISCS OF STONE

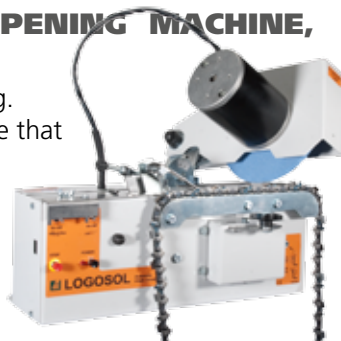
For all of LOGOSOL's electric chain grinders, there are grinding discs of different thickness. You can always use the thinnest grinding disc, which is 3–4 mm (1/8"–3/16"), for all types of chains. When the depth gauges are to be ground, you change to a thicker disc that is 5–8 mm (1/4"–3/8"), and flat 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 tooth. Sharpening with a grinding disc that is not cleared from old material is usually the reason why you get a poor sharpening result.

### LOGOSOL SHARPENING MACHINE, AUTOMATIC

Absolutely outstanding. 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.

Item no: 9999-000-1515



### 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.

Item 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 chains for rip sawing, 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.



*Diamond grinding disc.  
View price on  
[www.logosol.co.uk](http://www.logosol.co.uk)*

## LOGOSOL COMBI GRINDER

A powerful robot grinder that sharpens both saw chains and bandsaw blades. Logosol Combi Grinder automatically sharpens all types of saw chains and the majority of bandsaw blades. The mechanism is run by compressed air. The design is both sturdy and user-friendly, and the result is a more accurate and even tool grinding.



*The automatic sharpening machine Combi Grinder has its natural place in all businesses that offer sharpening of, for example, harvester chains.*

## DEPTH GAUGE SETTER

The depth gauges have to be adjusted 3-4 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 machine to that depth gauge.

Item no: 9999-000-0432



## DEPTH GAUGE FILE

A small, fine file of high quality. Without handle.

Item no: 9999-000-0481

*Depth gauge file and depth gauge setter. View prices on [www.logosol.co.uk](http://www.logosol.co.uk)*

**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.co.uk](http://www.logosol.co.uk)**



## 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 deep 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 Sharpening Robot (item 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.

### THE SAW CUTS ASKEW:

- 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. If you use the Cross supports (item no. 4500-070-2050) or the versatile log fence, you can exclude sagging, and tensions in the timber will easily be detected.



Cross supports.  
View price on  
[www.logosol.co.uk](http://www.logosol.co.uk)

### THE SAWDUST GETS FINE-GRAINED AND THE FEEDING 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 feeding pressure.
- The chain is too tight.
- Insufficient oil supply or oil quality.
- Hard-to-saw timber.
- Wrong sprocket.

### 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 feeding 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:

Too slack chain.

### A DIMPLE FORMS IN THE BAR RAILS AT THE BAR ATTACHMENT:

Too high feeding pressure when edging planks and boards.

### THE CHAIN GETS WEDGED BETWEEN

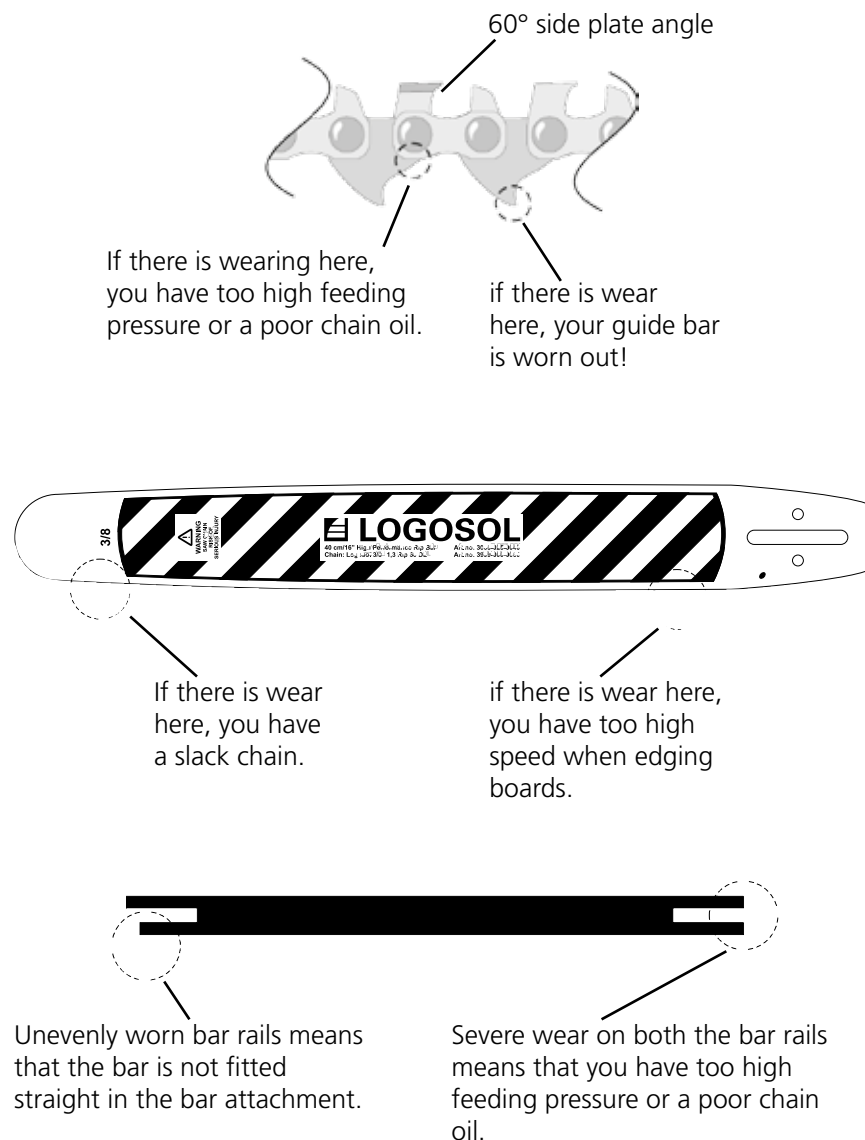
## TROUBLESHOOTING

### 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 tightened too hard 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 with silicone spray (item no. 9999-000-5110).



## 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 cuts very obliquely.

### 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.

### CONTACT US:

- Phone: 01361 840 389
- Email: [enquiries@logosol.co.uk](mailto:enquiries@logosol.co.uk)
- Web store: [www.logosol.co.uk](http://www.logosol.co.uk)
- Mailing address: LOGOSOL UK  
Clearfields Farm  
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