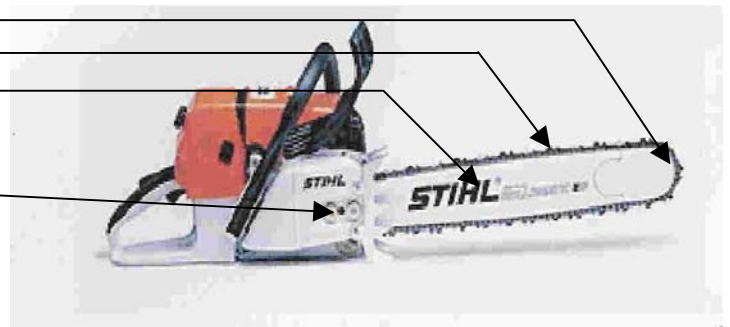


## Maintenance of the cutting components of chainsaws and its impact on their useful life

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### A few tips on the maintenance and useful life of the cutting components of chainsaws

- Guide bar tip or sprocket tip
- Chain
- Guide bar
- Oil pump
- Drive sprocket
- Clutch drum
- Clutch



#### 1- Sharpening

Chain sharpening must be performed according to the type of wood to be cut (hard or soft) and, more rarely, according to the lie of the wood fibres (longitudinal). Setting the cutting angle and the depth gauges will ensure rapid, regular and safe cutting.

The production of fine sawdust and the need to force on the saw during cutting are signs that the chain needs sharpening. The files used must be of very good quality and decrease in size according to the wear of the cutters.

Poor sharpening causes overheating and wear of the guide bar, stretching of the chain (premature breakage), premature wear of the shock absorbers and is tiring for the operator, with smaller output, decreased security and poor cut quality.

**Sharpening frequency:** average once per hour of use

#### 2- Chains

Choosing a chain type is not easy as there are numerous makes. However, although their lifetime depends on the steel used, maintenance is of prime importance.

After purchasing a new chain, soaking it in oil overnight will lengthen its useful life considerably.

When fitting a new chain, check the condition of the guide bar as a bar in poor condition can cause wear to the chain in just a few days (see point 4).

Regular sharpening at the right time reduces heating and lengthens the life of the chain.

A chain with square or semi-square teeth (delicate) should be preferred for more effective felling of standing trees and less sensitive rounded cutter teeth used for cutting in work areas or on river banks (earth, sand, etc.).

Make frequent checks of chain tensioning. A chain that is too loose is a cause of accidents and wear to the tip of the guide bar (chain jump, breakage, etc.).

**Lifetime** : 1 to 3 weeks depending on the type of wood cut (hard, soft, dry, green, etc.) and the distance from the forest to wetlands (rivers or peat bogs where tree trunks are covered with moss and abrasive silty deposit).

### 3- Guide bar tip or sprocket-nose

Several types are available. The choice depends on the work to be done.

- Stellite tip bar: these are inexpensive but the tip is strengthened with an alloy that is more resistant to the heating that results in premature chain wear. They are good for cutting dirty timber (in depots) as they are very tough.
- Sprocket-nose bar: this is a better design as the sprocket at the nose of the guide bar prevents heating. A jammed or worn sprocket requires the replacement of the entire bar.
- Guide bar with an interchangeable tip: this is the best of all in terms of longevity as the tip can be changed during the lifetime of the bar or in case of damage. It is designed to double guide bar lifetime.

**Maintenance.** When purchasing, check that there is a lubricating hole (not all guide bars have one). Soak in oil once a week if there is no lubricator. Use a smooth-cut file to remove any burrs. Bars with a lubricator should be lubricated daily.

**Lifetime:** average one month or much less (a week, a day...) if jammed, subjected to impacts or in case of intensive cutting with the tip.

### 4- Guide bar

This must be suited to the model of chainsaw (tension adjuster, lubrication, attachment, motor power, respect of the balance of the machine). The length varies according to use (small timber, large timber, pruning, etc.).

Turn over and inspect the bar once a day to check for the presence of burr that prevents it from entering wood.

Burrs must be filed down when the chain is changed. The lips of the guide trough should be maintained at the same level.

Lubrication holes must be cleaned regularly to prevent the heating and deformation of the chain (it stretches and becomes slack).

Any pinching or strain during felling should be monitored as the chain will wear quickly and other mechanical parts may be damaged (clutch, drive sprocket).

### 5- Oil pump

Regularly check that the flow of oil is sufficient to lubricate the chain.

For this, clean it or increase the discharge by adjusting the fuel:oil balance (as a rule, a fill of oil lasts the same time as a fill of fuel tank).

## **6- Drive sprocket**

This drives the chain and is therefore subject to the greatest stresses. Poor sharpening or lubrication or jamming cause wear or premature failure.

This can be fixed to the clutch drum for cutting large timber (stronger) but is generally mobile and follows the movement of the chain. The latter type is inexpensive and the most commonly used (only the sprocket has to be changed).

A sprocket in poor condition causes faster chain wear.

Sprocket diameter (number of teeth) can be increased for softwood; this increases the chain speed and less oil is used (a very special case).

**Lifetime:** change the sprocket twice during the lifetime of the guide bar.

## **7- Clutch drum**

This is the link between the motor and the drive sprocket and transmits the motor power to the cutting chain via the clutch (the clutch is inside the drum). It also stops chain immediately as the chain brake is on its outer edge.

Its lifetime depends on chain sharpening and lubrication and adjustment of the safety brake. Sharpening for softwood is too aggressive when used on hardwood and the clutch drum may overheat and break. With a low oil flow or if the housing is fouled, the chain will brake the clutch and slippage will overheat the drum and cause premature wear.

## **8- Clutch**

Clutch lifetime depends on the maintenance of the other cutting components: chain, guide bar, guide bar nose, guide oil holes and oiler.

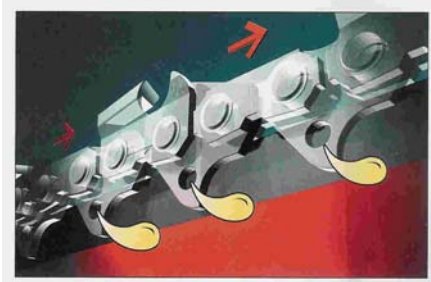
The clutch cannot stand long stress (slippage). It is therefore essential to maintain all the components mentioned above.

## Recapitulatory table of general maintenance

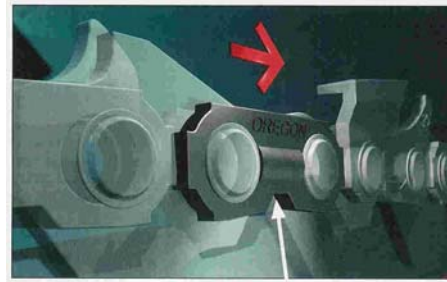
	Lifetime	Maintenance schedule	Type of maintenance
Chainsaw	1 year	Once a week	Complete cleaning with compressed air or petrol.
Guide bar	2 to 3 months	Twice a week	File any burr. Grind when each new chain is fitted. Clean the chain guide trough and clear oil holes
Guide bar nose	1 to 1.5 months	Once a day	Lubricate daily and whenever dismantled
Sprocket	0.5 to 0.7 month	Once a week	Check play and lubricate the bearing (if there is an oiler)
Clutch	6 months	Once a week	Ensure that the needle bearings are well lubricated
Chain	1 to 3 weeks	Once an hour or as necessary	Soak new chains in oil overnight before fitting. Regular sharpening appropriate for the timber to be cut.

## Some ongoing technical progress in chains and guide bars

### Chains with links enhancing the spreading of chain oil



Holes in the tangs carrying oil further along the guide bar (better lubrication resulting in longer chain life).

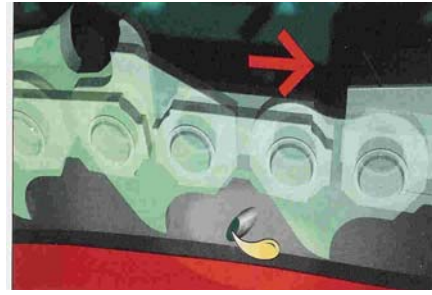


Micro-oiler enabling long lubrication of chain links (less wear).

### Guide bars are improving

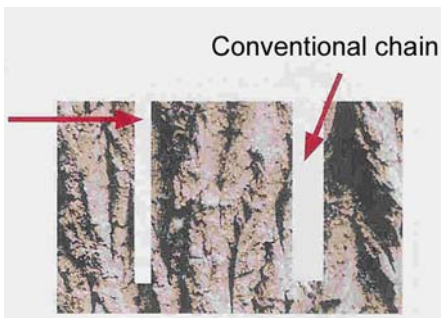


Oil retained at entry to the guide bar and protection against wood chips (better lubrication, smaller consumption)



Increased velocity of oil arriving at the guide bar by reducing the entry hole (few stoppages to clean the orifice)

### A trend towards narrower bars



Advantages: lighter, less bar and chain wear, less vibration (white finger disease), increased motor power and useful life.