

03 MAINTENANCE OF A CHAINSAW

City & Guilds
NPTC



Husqvarna[®]

Use of this worksheet

This worksheet is part of a series of interactive worksheets that has been produced in association with Husqvarna and Oregon to support the delivery of training for the City & Guilds (NPTC) suite of chainsaw qualifications.

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Content

This worksheet covers the following outcomes:

Be able to work safely

Be able to carry out maintenance of a chainsaw and cutting system

Be able to carry out operational chainsaw checks

Know relevant health and safety legislation and industry good practice

Know how to carry out maintenance of chainsaw and cutting system

Why it is important to maintain a chainsaw to manufacturer's recommendations

There are a number of reasons for maintaining a chainsaw to the standard defined by the manufacturer; these include:

- it is a legislative requirement
- if properly carried out it keeps the saw in a safe condition to use
- it reduce the down time (the amount of time that a chainsaw is not in use because it requires repair).

Maintenance is generally considered in the following ways:

- routine maintenance
- periodic maintenance
- end of year maintenance.

Discuss this with your trainer and suggest what activities may be carried out under each type of maintenance. Complete the table below.

Type of maintenance	Some activities that might be carried out
Routine	
Periodic	
End of year	

The functions of the safety features on a chainsaw

There are a number of key safety features built into a chainsaw which are essential for keeping operators and those around them safe. **After discussion with your trainer, name each of the safety features listed, and explain the function of each one in the spaces provided.**

Safety feature	Name and function
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>

Safety feature	Name and function
	<p>Name: Chain with low kick back characteristics</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>
	<p>Name:</p> <p>Function:</p>

Safety feature	Name and function
	<p>Name:</p> <p>Function:</p>

Steps to be taken when a chainsaw is not repairable, faulty or non-operational

There are some important steps that must be taken when a chainsaw is not repairable, faulty or non-operational. **Complete the following sentences:**

If a chainsaw is not repairable it should be _____

If a chainsaw is faulty and it is not within the capabilities of the operator to remedy this, he/she should

If the chainsaw is non-operational and it is within the capabilities of the operator, he/she should

The function and maintenance requirements of individual components

A chainsaw needs to be serviced regularly to ensure that all the features on the saw operate correctly and that the saw works efficiently. Basic servicing can be carried out by the operator in accordance with the guidance provided in the manufacturer's handbook. It is particularly important to check the safety features when carrying out maintenance.

Picture	Function	Maintenance
	<p>Sparkplug:</p>	
	<p>Air filter:</p>	
	<p>Chainbrake:</p>	
	<p>Cooling system:</p>	
	<p>Exhaust system:</p>	

Picture	Function	Maintenance
	Clutch/drive system:	
	Sprocket:	
	Starter mechanism:	
	Greasing/lubrication:	
	Guide bar:	

Picture	Function	Maintenance
	Chain:	
	Fuel/oil filters:	

Different chain types and their application

There are two main types of 'cutter'; these are:

- **Chisel**
- **Semi Chisel**

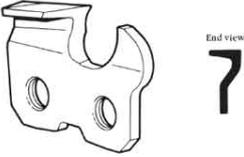
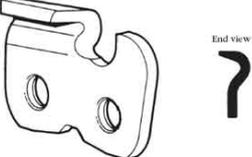
For general use (in forestry, tree surgery and firewood cutting), the type used will depend on the timber type, the experience of the operator and to some extent personal preference.

A full **Chisel** chain has a square cornered tooth, splitting wood fibres easily in the cut for fast, efficient cutting in clean softwood.

A **Semi-Chisel** chain has a rounded working corner, formed by a radius between the top and side plates. While slower than full chisel in softwood, it retains an acceptable cutting sharpness longer, making it the preferred choice for dirtier wood, hard or dry wood, frozen wood or stump work, all of which would rapidly degrade a full chisel chain.

There is a third variant, the "**Chamfer Chisel**" by Oregon. This is similar to the semi-chisel design but has a small 45-degree chamfer between the plates rather than a radius. Performance is similar to good semi-chisel.

Identify the types in the table overleaf and state when each could be used.

Picture	Type and when it could be used
	
	
	

How to obtain the correct filing information for a chain, and why it is necessary

It is important to select the correct file size and to identify the filing angles for the chain before attempting to sharpen it. The chain must be sharpened according to the manufacturer's recommendations. A properly sharpened chain enhances the performance of the chainsaw.

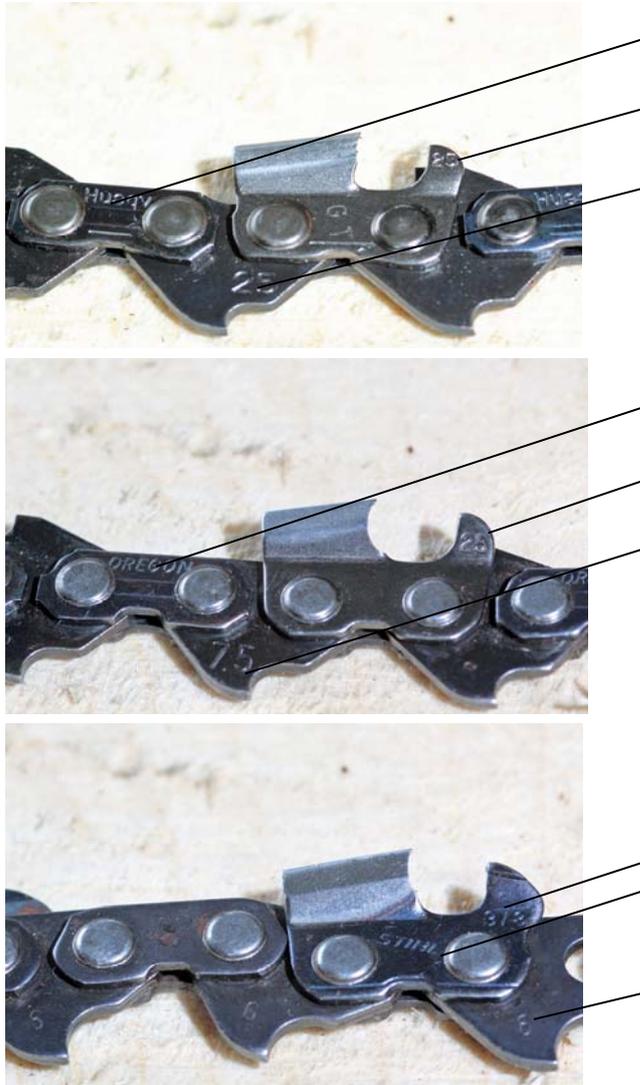
Information can be found:

- on the chain itself
- in information provided by manufacturers
- on chain charts
- on the box that the chain was supplied in (if appropriate)

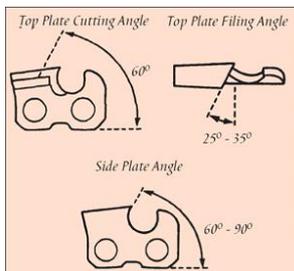
Example of a chain chart

CHAIN TYPE		PITCH (INCHES)	FILE (MM/INCHES)	CUTTING TOOTH SHAPE	
HUSQVARNA	OREGON			7	
H30 "Pixel"	95VP	.325"	4.8 / 3/16"	7	Semi-Chisel
H25	21BP	.325"	4.8 / 3/16"	7	Semi-Chisel
H42	73LP	3 / 8"	5.5 / 7/32"	7	Chisel
H36	91VG	3 / 8"	4.0 / 5/32"	7	Chamfer Chisel
H37	91PX	3 / 8"	4.0 / 5/32"	7	Chamfer Chisel
H64	27	.404"	5.5 / 7/32"	7	Micro Chisel

In order to be able to use a chain chart effectively, information must be correctly interpreted from the chain. **Label each chain, indicating the meaning of the information stamped into the chain.**



Filing angles

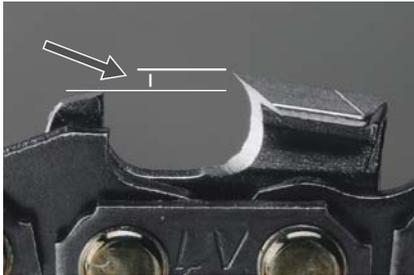


If you use a filing gauge you do not need to think about the different angles to ensure a good result, providing that you follow the instructions properly.

It is important that each cutter is the same length after filing, as this prevents:

- **increased vibration**
- **inaccurate cutting; and**
- **increased risk of kickback.**

Depth gauge setting



It is important to have the correct depth gauge setting as it:

- **reduces the risk of kick back**
- **reduces chain vibration; and**
- **ensures that the chainsaw achieves optimum cutting speed.**

It is recommended that the depth gauges are filed after the cutting teeth have been filed 3 – 5 times during normal wear.

Maintaining the cutting system in accordance with the operator's handbook, using appropriate tools

State the reasons for wearing the items of PPE in the picture.

PPE	Reason for wearing
	<p>Boots:</p> <p>Gloves:</p> <p>Eye Protection:</p>

For the chainsaw to operate at peak efficiency it is essential that the cutting system is properly maintained. The cutting system consists of:

- the bar
- the chain.

The two tables on the following pages summarise routine maintenance of the bar and chain; however all maintenance activities should be performed in accordance with the manufacturer’s recommendations.

The following Oregon publications are excellent sources of information:

**The Chain Troubleshooting Guide
The Saw Bar Troubleshooting Guide; and
The Rim and Spur Sprocket Troubleshooting Guide.**

Bar	Maintenance includes:
  	<p>identification of uneven and damaged rails</p> <p>checking the straightness of the bar</p> <p>checking the bar groove depth</p> <p>identification of any blueing, cracking or burring</p> <p>removal of burs</p> <p>clearing the bar groove and oil holes</p> <p>inspecting the sprocket nose for security and condition</p> <p>greasing the bar nose sprocket</p> <p>turning the bar following maintenance to reduce wear</p>

Chain

Maintenance includes:



checking the cutters for damage, selecting the first one to sharpen

securing the bar/chain in a vice on a bench or timber vice on site

selecting and using the correct file with a handle fitted

correct maintenance of the top and side plate angles throughout

ensuring a consistent cutter length is maintained

removing burrs (when appropriate)

maintaining the height and profile of the depth gauges – ***as per the example to the left.***

Problems that may be encountered when a chain and guide bar are worn, damaged or poorly maintained

There are a number of problems that may be encountered by the operator when a chain and guide bar are worn, damaged or poorly maintained. **After discussion with your trainer describe the problems that may be encountered.**

Problems that may be encountered with a worn chain



1.

2.

3.

4.

Problems that may be encountered with a worn guide bar



1.

2.

3.

4.

Disposal of waste from chainsaw maintenance

activities

After carrying out maintenance the area should be left in a clean and tidy state with the tools and equipment put away. All waste produced from maintenance activities should be disposed of in line with legislative requirements, good practice and as required on the site.

Enter the required information in the table below.

 <p>The image shows a green recycling symbol (three arrows forming a triangle) to the right of the words 'REUSE', 'REDUCE', and 'RECYCLE' stacked vertically in a bold, green, sans-serif font.</p>	<p>State what is considered to be good practice for waste disposal.</p> <p>How should waste oil be disposed of?</p>
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Appropriate Personal Protective Equipment (PPE)

required when test starting a chainsaw

These are no different from when you are operating a chainsaw!

The requirements for PPE are outlined in AFAG 308. You should remember that PPE is the last line of defence and no PPE can guarantee total protection. This is especially true in respect of cuts from chainsaws.

All items of PPE should comply with legislative requirements, be of a specific standard (either European or British) and carry the CE Chainsaw logo.

CE



<p>Draw the CE Chainsaw Logo</p>

Complete the following table which contains details of PPE. You need to state why each item is required.

Item of PPE	Reasons for use
 <p>Safety helmet complying with BS EN 397 Eye protection complying with BS EN 1731 Hearing protection complying with BS EN 352-1</p>	
 <p>Gloves complying with BS EN 381-7</p>	

Item of PPE	Reasons for use
 <p data-bbox="236 645 715 712">Leg protection complying with BS EN 381-5</p>	<p data-bbox="770 376 975 416">Type A or C?</p>
 <p data-bbox="236 1048 671 1122">Protective high visibility jacket complying with BS EN 381-5</p>	
	

Safe starting of the chainsaw

There is only one way to start a chainsaw – that is, safely; but there **two** methods.

Cold starting procedure



Warm starting procedure



After starting the saw, there are a number of post starting checks which should be carried out; these include **(enter the missing words)**:

1. Ensuring that the chain _____ when the engine revs return to idle and that there is no “chain creep”.
2. Ensuring that the chain brake _____ according to the manufacturer’s specification.



3. Ensuring that the stop _____ and throttle interlock are working correctly.



4. Ensuring that _____ to the guide bar and chain is working properly.



Notes

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