

# Chainsaws at work



Health and Safety  
Executive

## Chainsaws at work



## Introduction

This leaflet gives advice on using portable, hand-held, petrol-engine chainsaws at work. It is aimed at employers, the self-employed and those who control the use of work equipment and includes basic information on safe working practices which operators should follow.

It will help you comply with your duties under health and safety law, but is not intended as a substitute for proper instruction and training (including training of managers and supervisors to identify whether good practice is being followed).

When you assess the risks from working with chainsaws, it can be very valuable to talk to your employees about how they do their work. Use trade union or other employee safety representatives to help you.

Employers should remember they may be responsible for the health and safety of someone who is self-employed for tax and National Insurance purposes but who works under their control and direction.

## Fitness to operate a chainsaw

To use a chainsaw safely, the operator needs to be reasonably fit, both physically and mentally. People with disabilities need not necessarily be excluded from work with chainsaws, however, medical advice may restrict the tasks they can do and require increased supervision. Although it is not a legal requirement, it is recommended that employers undertake pre-employment screening when selecting chainsaw operators. Seek further medical advice if prospective operators have any condition affecting:

- mobility (eg arthritis, stroke);
- alertness (eg diabetes or alcohol/drug dependency);
- physical strength (eg heart conditions);
- vision (which cannot be corrected by glasses or contact lenses);
- manual dexterity/grip strength (eg vibration white finger);
- balance (eg vertigo or giddiness).

Operators should inform their employers when they are taking prescribed medication. Check with the operator's medical practitioner if the medication can affect a person's ability to operate a chainsaw safely.

## Chainsaws and young people

Chainsaws should not be operated by anyone under minimum school leaving age (MSLA), which is on, or near the age of 16 years, depending on when the last day of the school year falls. Employers of young people (ie above MSLA but under 18 years old) will need to ensure:

- they have the physical capacity to operate the chainsaw safely;
- particular account is taken of their inexperience, immaturity and lack of awareness of relevant risks;
- they are supervised by a person competent in the use of a chainsaw for the work being done by the trainee and who, where appropriate, holds the relevant competence certificate or award.

## Health risks

Chainsaws expose operators to high levels of noise and hand-arm vibration which can lead to hearing loss and conditions such as vibration white finger. These risks can be controlled by good management practice including:

- purchasing policies for low-noise/low-vibration chainsaws (eg with anti-vibration mounts and heated handles);
- providing suitable hearing protection;
- proper maintenance schedules for chainsaws and protective equipment;
- giving information and training to operators on the health risks associated with chainsaws and use of personal protective equipment (PPE) etc.

Encourage existing chainsaw operators to report any signs or symptoms which may affect their ability to use a chainsaw safely or may indicate adverse health effects from noise and/or vibration. Employers are required to carry out health surveillance of their employees where noise or hand-arm vibration exposure cannot be reduced to safe levels. See 'Further reading' for more information.<sup>1,2,3,4,5</sup>

## Training and competence

### *All chainsaw use*

Chainsaws are potentially dangerous machines which can cause major injury if used by untrained people. Anyone who uses a chainsaw at work should have received adequate training and be competent in using a chainsaw for that type of work. The training should include:

- dangers arising from the chainsaw itself;
- dangers arising from the task for which the chainsaw is to be used; and
- the precautions to control these dangers, including relevant legal requirements.

### *Use of chainsaws in tree work*

The Approved Code of Practice supporting regulation 9 of the Provision and Use of Work Equipment Regulations 1998 (PUWER 98)<sup>6</sup> sets a minimum standard for competence of people using chainsaws in tree work:

‘All workers who use a chainsaw should be competent to do so. Before using a chainsaw to carry out work on or in a tree, a worker should have received appropriate training **and obtained a relevant certificate of competence or national competence award**, unless they are undergoing such training and are adequately supervised. However, in the agricultural sector, this requirement only applies to first-time users of a chainsaw.’

This means everyone working with chainsaws on or in trees should hold such a certificate or award **unless**:

- it is being done as part of agricultural operations (eg hedging, clearing fallen branches, pruning trees to maintain clearance for machines); **and**
- the work is being done by the occupier or their employees; **and**
- they have used a chainsaw before 5 December 1998.

**In any case, operators using chainsaws for any task in agriculture or any other industry must be competent under PUWER 98.**

See AFAG leaflet 805 for guidance on the level of training and certification appropriate for tree work.<sup>7</sup>

### *Training provision*

Training should be carried out by specialist instructors at organised training courses. Advice on suitable training courses (and competence assessment where appropriate) is available from your industry Sector Skills Council and sources listed under ‘Further advice’.

Where training is being consolidated through workplace-based experience, the trainee should be supervised by a person competent in the use of a chainsaw for the work being done by the trainee and who holds the relevant competence certificate or award.

It is recommended that all chainsaw operators have regular refresher/update training to ensure they work to industry best practice and maintain their levels of competence. The suggested intervals for such training are:

- occasional users – every two to three years;
- full-time users – every five years.

### *Supervision of trainees at training courses and training at work*

Instructors need to organise training to maintain a suitable ratio of trainees to instructors. Factors to be considered include:

- the level of experience of trainees;
- the content of the training;
- the location/terrain where the training is being carried out.

See Table 1 for a general guide to the ratio of trainees to instructors.

Where trainees are deemed to be safe and competent but need to consolidate their competence through workplace-based experience before undergoing external assessment, a suitable record of training must be kept. During this consolidation period, the trainee still needs to be supervised (see Table 1).

	Organised training course	Supervision of consolidation of training at work
Overall ratio	1:4	1:2
During initial practical operation	1:1	1:1
Once trainee can work safely	Degree of supervision may be reduced for individual trainees, to a maximum of 1:4, so long as the instructor continues to supervise on a full-time basis	May return to 1:2 once trainee(s) have reached a satisfactory level of competence. The supervisor may then also carry out work in the vicinity

**Table 1** Recommendations for the ratio of trainees to instructors

## Selecting a chainsaw

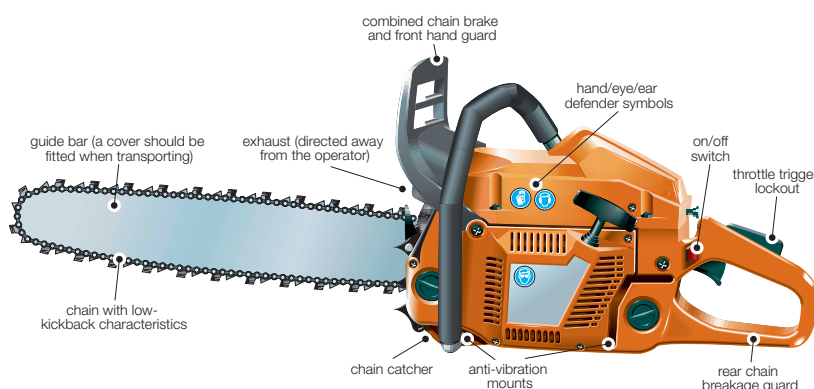
There are two basic designs of chainsaw – ‘rear-handled’ and ‘top-handled’<sup>8,9</sup>

### Rear-handled chainsaws

These have the rear handle projecting from the back of the saw. They are designed to always be gripped with both hands, with the right hand on the rear handle. Select chainsaws which will be suitable for the intended work. It may be necessary to have a range of saws with different guide bar lengths available. As a general rule, choose a chainsaw with the shortest guide bar suitable for the work. Training in how to use chainsaws will identify the type and size of saw most suited to a range of operations.

### Top-handled chainsaws

These saws have the rear handle over the top of the engine. **They are only suitable for use off the ground by trained competent arborists.** They are not designed for use on the ground or as a substitute for small, rear-handled chainsaws.



## Maintaining a chainsaw

Proper maintenance is essential for safe use and protection against ill health from excessive noise and vibration. The saw must be maintained in its manufactured condition with all the safety devices in efficient working order and all guards in place. It should be regularly serviced by someone who is competent to do the job.

Operators need to be trained in the correct chain-sharpening techniques and chain and guide bar maintenance to keep the saw in safe working condition. Operators should report any damage or excessive wear from daily checks on the following:

- on/off switch;
- chain brake;
- chain catcher;
- silencer;
- guide bar, drive sprocket and chain links;
- side plate, front and rear hand guards;
- anti-vibration mounts;
- starting cord for correct tension.

## Personal protective equipment

Suitable personal protective equipment (PPE) should always be worn, no matter how small the job. European standards for chainsaw PPE are published as part of EN 381 *Protective clothing for users of hand-held chainsaws*.

Protective clothing complying with this standard should provide a consistent level of resistance to chainsaw cut-through. Other clothing worn with the PPE should be close fitting and non-snagging.

**NB No protective equipment can ensure 100% protection against cutting by a hand-held chainsaw.**

**Safety helmet** – to EN 397. (Arborists working from a rope and harness may use a suitably adapted rock-climbing helmet.)

**Hearing protection** – to EN 352-1.

**Eye protection** – mesh visors to EN 1731 or safety glasses to EN 166.

**Upper body protection\*** – chainsaw jackets to BS EN 381-11.

**Gloves** – to EN 381-7. The use of appropriate gloves is recommended under most circumstances. The type of glove will depend on a risk assessment of the task and the machine. Consider the need for protection from cuts from the chainsaw, thorny material and cold/wet conditions.

**Leg protection** – to EN 381-5. (All-round protection is recommended for arborists working in trees and occasional users such as those working in agriculture.)

**Chainsaw boots** – to BS EN ISO 20345:2004 and bearing a shield depicting a chainsaw to show compliance with EN 381-3. (For occasional users working in even ground where there is little risk of tripping or snagging on undergrowth or brash, protective gaiters conforming to EN 381-9 worn in combination with steel-toe-capped safety boots.)

\* Chainsaw jackets can provide additional protection where operators are at increased risk (eg trainees, unavoidable use of a chainsaw above chest height). However, this needs to be weighed against increased heat stress generated by physical exertion (eg working from a rope and harness).

## **Lone working**

Avoid working alone with a chainsaw. Where this is not possible, establish procedures to raise the alarm if something goes wrong. These may include:

- regular contact with others using either a radio or telephone;
- someone regularly visiting the worksite;
- carrying a whistle to raise the alarm;
- an automatic signalling device which sends a signal at a preset time unless prevented from doing so;
- checks to ensure operators return to base or home at an agreed time.

For more information on lone working see 'Further reading'.<sup>10</sup>

## **First aid**

Anyone working with chainsaws needs to understand how to control major bleeding and to deal with crush injuries, so it is recommended that operators hold an emergency first-aid certificate. In remote sites, people who have been injured may also be at risk of hypothermia. Make sure operators always carry a personal first-aid kit (incorporating a large wound dressing) with them and have reasonable access to a more comprehensive kit.<sup>11</sup>

## **Working with chainsaws**

### ***Fuelling and lubrication***

Make sure petrol containers are in good condition and clearly labelled, with securely fitting caps. Use containers which are specially designed for chainsaw fuelling and lubrication. Fit an auto-filler spout to the outlet of a petrol container to reduce the risk of spillage from over-filling. Operators should:

- avoid getting dirt in the fuel system (this may cause the chainsaw to be unreliable);
- securely replace all filler caps immediately after fuelling/oiling;
- wipe up any spilt petrol/oil;
- during starting and use, keep fuel containers well away from fires and other sources of ignition, including the saw itself (at least 4 m is recommended).

Do not allow operators to use discarded engine oil as a chain lubricant – it is a very poor lubricant and may cause cancer if it is in regular contact with an operator's skin.

### ***Starting the chainsaw and pre-use checks***

When preparing to use a chainsaw, operators should check:

- all nuts, screws etc are tight;
- the saw chain is correctly tensioned;
- the throttle cannot be squeezed unless the throttle lock-out is pressed; and
- they are wearing the correct PPE.

When starting the saw, operators should maintain a safe working distance from other people and ensure the saw chain is clear of obstructions.

When starting a chainsaw with a cold engine, operators should:

- place the saw on level ground;
- secure the saw firmly, eg put a foot on the rear-handle base plate and a hand on the front handle;
- set the controls as recommended by the manufacturer;
- pull the starter cord firmly.

Once the saw has started, operators should rev the throttle to warm up the engine and check:

- the saw chain stops moving when the engine revs return to idle;
- the chain brake is effective when applied at maximum revs or according to the manufacturer's specification;
- the engine continues to run when the saw is turned through 90° in any direction;
- the stop switch works correctly;
- lubrication to the guide bar and chain is working properly.

These checks should be repeated at regular intervals throughout the day.

When starting a chainsaw with a hot engine, operators may use the same method as above. Alternatively, they can grip the rear handle firmly between the knees and the front handle with their left hand, pulling the starter with their right hand.

Once the saw is running, operators should apply the chain brake before moving off with the saw. Most modern chainsaws will allow hot starting with the chain brake applied.

### ***Kickback***

Kickback is the sudden uncontrolled upward and backward movement of the chain and guide bar towards the operator. This can happen when the saw chain at the nose of the guide bar hits an object. Kickback is responsible for a significant proportion of chainsaw accidents, many of which are to the face and parts of the upper body where it is difficult to provide protection. A properly maintained chain brake and use of low-kickback chains (safety chains) reduces the effect, but cannot entirely prevent it. Make sure operators use the saw in a way which avoids kickback by:

- not allowing the nose of the guide bar to accidentally come into contact with any obstruction, eg branches, logs, stumps;
- not over-reaching;
- keeping the saw below chest height;
- keeping the thumb of the left hand around the back of the front handle;
- using the appropriate chain speed for the material being cut.

### ***Using the chainsaw***

Whatever the job, check the worksite thoroughly to identify any potential hazards. This is particularly important when carrying out felling or demolition work. Wherever possible maintain a clear working area on the site. For any work with a chainsaw ensure:

- the risks from the work have been assessed and controlled;
- the operator is competent to do the job;
- the operator wears the appropriate PPE;
- the operator either stops the engine or applies the chain brake when not cutting with the saw.

Don't forget to include the risks from manual handling in your assessment.<sup>12</sup> Operators can suffer serious back injuries from handling timber incorrectly. Training in good manual handling techniques and using handling aids/tools should reduce the risk of these injuries.

## Tree felling using chainsaws

Before felling starts on the worksite:

- contact the owners of any overhead power lines within a distance equal to twice the height of any tree to be felled to discuss whether the lines need to be lowered or made dead;
- do not start work until agreement has been reached on the precautions to be taken;
- check whether there are underground services such as power cables or gas pipes which could be damaged when the tree strikes the ground;
- if there are roads or public rights of way within a distance equal to twice the height of the tree to be felled, ensure that road users and members of the public do not enter the danger zone. You may need to arrange warning notices, diversions or traffic control.

When felling a tree:

- check if it is affected by rot;
- assess what could affect the direction of fall, such as wind conditions and whether the tree is leaning, has uneven growth or branches which could foul other trees;
- be especially careful to check for broken crowns and branches which might fall during the operation;
- check both the tree to be felled and those nearby;
- operators may need to use aid tools such as alloy or plastic wedges, a breaking bar, a cant hook, a winch, or high-lift wedges and a sledgehammer;
- make sure operators have the right equipment available and the skills to use it correctly.

If a tree is likely to become hung-up on another during felling, operators will need to have the knowledge and the equipment to bring the hung-up tree down safely. Dealing with leaning trees or wind-blown trees also requires special skills.

Safe working practices for felling are given in HSE's AFAG leaflets 300 series (see 'Further reading').

## Working with chainsaws off the ground

Chainsaws should not be used off the ground unless the operator has been adequately trained in safe working techniques. Work off the ground involving the lifting and lowering of people or loads, including work-positioning techniques, will be subject to the requirements of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) (see 'Further reading').<sup>13,14</sup>

### Mobile elevating work platforms

Always use a purpose-built platform. Ensure operators have received adequate training in the safe operation of the platform and safe use of a chainsaw from a work platform.



### Work from ladders

Avoid using a chainsaw from a ladder. Chainsaws require both hands to be operated safely: work on a ladder requires one hand to hold the ladder to maintain a steady working position. Work from a ladder should only be done by an arborist trained in and equipped for tree climbing. When operating from a ladder, the climber must establish an independent anchor to the tree using a rope and harness and obtain a stable and secure work position.

### Ropes and harnesses

Using a chainsaw from a rope and harness requires special skills. This should only be done by people who have obtained the relevant competence certificate for arboricultural work.

## Further reading

### HSE publications

- 1 *Health surveillance at work* HSG61 (Second edition) HSE Books 1999 ISBN 0 7176 1705 X
- 2 *Control the risks from hand-arm vibration: Advice for employers on the Control of Vibration at Work Regulations 2005* Leaflet INDG175(rev2) HSE Books 2005 (single copy free or priced packs of 10 ISBN 0 7176 6117 2)
- 3 *Hand-arm vibration: Advice for employees* Pocket card INDG296(rev1) HSE Books 2005 (single copy free or priced packs of 25 ISBN 0 7176 6118 0)
- 4 *Noise at work: Guidance for employers on the Control of Noise at Work Regulations 2005* Leaflet INDG362(rev1) HSE Books 2005 (single copy free or priced packs of 10 ISBN 0 7176 6165 2)
- 5 *Protect your hearing or lose it!* Pocket card INDG363(rev1) HSE Books 2005 (single copy free or priced packs of 25 ISBN 0 7176 6166 0)
- 6 *Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22* (Second edition) HSE Books 1998 ISBN 0 7176 1626 6
- 7 *Training and certification* Leaflet AFAG805 HSE Books 2003 (single copy free or priced packs of 15 ISBN 0 7176 2668 7)
- 8 *Using petrol-driven chainsaws* Leaflet AFAG301 HSE Books 2003 (single copy free or priced packs of 15 ISBN 0 7176 2636 9)
- 9 *Safe working methods with top-handled chainsaws* CRR402 HSE Books 2001 ISBN 0 7176 2249 5 (also available to view at [www.hse.gov.uk/research](http://www.hse.gov.uk/research))
- 10 *Working alone in safety: Controlling the risks of solitary work* Leaflet INDG73(rev) HSE Books 1998 (single copy free or priced packs of 15 ISBN 0 7176 1507 3)
- 11 *Basic advice on first aid at work* Leaflet INDG347 HSE Books 2002 (single copy free or priced packs of 20 ISBN 0 7176 2261 4)

12 *Getting to grips with manual handling: A short guide* Leaflet INDG143(rev2)  
HSE Books 2004 (single copy free or priced packs of 15 ISBN 0 7176 2828 0)

13 *LOLER: How the regulations apply to forestry* Agriculture Information Sheet  
AIS29 HSE Books 1998

14 *LOLER: How the regulations apply to arboriculture* Agriculture Information  
Sheet AIS30(rev1) HSE Books 2006

15 *Farm and estate forestry operations* Agricultural Safety Leaflet AS15(rev)  
HSE Books 1996

### **AFAG leaflets**

HSE's Arboriculture and Forestry Advisory Group (AFAG) has produced a comprehensive set of leaflets on safe working practices for forestry and arboricultural operations.

Single free copies of the leaflets are available by mail order from HSE Books (see 'Further information' for details). They are also available in priced packs of 15 or can be printed direct from HSE's website at [www.hse.gov.uk/pubns/forindex.htm](http://www.hse.gov.uk/pubns/forindex.htm).

### **Other publications**

*A guide to good climbing practice* available from the Arboricultural Association,  
Ampfield House Ampfield, Romsey, Hampshire SO51 9PA Tel: 01794 368717

### **Further advice**

Further general advice is available from the following Trade Associations:

Arboricultural Association, Ampfield House, Ampfield, Romsey, Hampshire  
SO51 9PA Tel: 01794 368717;

Forestry Contracting Association Ltd, 1B Market Place, Pickering, North Yorkshire  
YO18 7AA Tel: 08700 421110.

### **Training**

Specific advice on training is available from colleges and from:

Lantra Awards, Stoneleigh Park, Kenilworth, Warwickshire CV8 2LG  
Tel: 02476 419703 Fax: 02476 411655.

### **Competence assessment**

Information on competence assessment can be obtained from:

Lantra Awards (see above);

NPTC, Stoneleigh Park, Kenilworth, Warwickshire CV8 2LG  
Tel: 02476 857300 Fax: 02476 696128.

## Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995 Website: [www.hsebooks.co.uk](http://www.hsebooks.co.uk) (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: [www.hse.gov.uk](http://www.hse.gov.uk).)

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<p>This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.</p>
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