



## Safe use of manually operated cross-cut saws

### Woodworking Sheet No 36

#### Introduction

This information sheet is one of a series produced by HSE's Woodworking National Interest Group in consultation with the woodworking industry. Its purpose is to provide practical guidance for users, manufacturers and suppliers of manually operated cross-cut saws on methods of safeguarding and safe working practices.

Key legal requirements covering the supply and use of these machines are contained in the Supply of Machinery (Safety) Regulations 1992,<sup>1</sup> section 6 of the Health and Safety at Work etc Act 1974 (the HSW Act); the Management of Health and Safety at Work Regulations 1999<sup>2</sup> and the Provision and use of Work Equipment Regulations 1998 (PUWER 98).<sup>3</sup>

#### Scope

For the purpose of this information sheet, a manually operated cross-cut saw is one where the saw blade is moved to and through the workpiece using human effort. Horizontal-stroking and down-stroking machines are dealt with specifically. However, some information may also be applicable to other types of machines.

Power-operated cross-cut saws are dealt with in WIS35.<sup>4</sup>

#### The accident record

HSE inspectors investigated 276 serious accidents at manually operated cross-cut saws, over a ten-year period, but these are likely to account for only a proportion of the total number of accidents which occurred on these machines. The guidance in this information sheet is based on an analysis of the reported causes of the investigated accidents and measures which could have been taken to prevent them.

Investigating inspectors concluded in the majority of cases that the absence of physical safeguards or poor adjustment of them led to many of the accidents. The failure to follow safe working practices, sometimes because of a lack of training, was another significant factor, eg 'brushed aside chips and dust during rundown'; 'held guard up to see cutting line'. Other accidents occurred when operating in the ripping mode.

#### What can be done to stop these accidents?

The physical safeguards required for safe operation of each design of manually operated cross-cut saw differ

slightly from one another. However, the basic aim of enclosing the saw blade as much as possible for as long as possible is common to the safeguarding of them all. As with all manually operated woodworking machines, the importance of proper training and the use of safe working practices cannot be overstated.

The following paragraphs should help you to decide what safeguarding is appropriate in most cases.

#### Safeguarding the machines

If you buy a new machine, the manufacturer should have ensured that it is properly safeguarded, in accordance with the relevant essential health and safety requirements (EHSRs) of the Supply of Machinery (Safety) Regulations 1992. This means it should be safe to use, as it is sold. If you buy a second-hand machine the supplier has a responsibility to ensure it is safe to use under section 6 of the HSW Act. When making a purchase you may wish to use this information sheet to check the machine meets an appropriate level of safety.

#### Horizontal-stroking machines

Three designs of horizontal-stroking machine (radial arm, travelling head and pendulum) are dealt with in this information sheet (see Figures 1, 2 and 3). The safeguarding required for each is similar.

All machines should be fitted with a fixed (hood) guard to enclose the non-cutting part of the saw blade. This guard should extend at least as far down as the saw spindle. A dust extraction outlet is often incorporated into this guard.

There should be no access to the saw blade of any design when in the rest position. This can be achieved, for example, by providing a saw housing into which the cutting part of the saw blade retreats when not in use. Alternatively, self-closing side guards which cover at least the outside edge of the exposed saw teeth and which rise and open on contact with the workpiece may be provided. It is important to realise these guards do not provide protection against contact with the saw blade from the front of the machine.

Some machines may be fitted with manually adjusted side guards. These alone are unlikely to provide sufficient protection when in the rest position, since they may not adjust below fence height. Side guards may not always be practicable when carrying out mitred cutting with a canted saw blade.

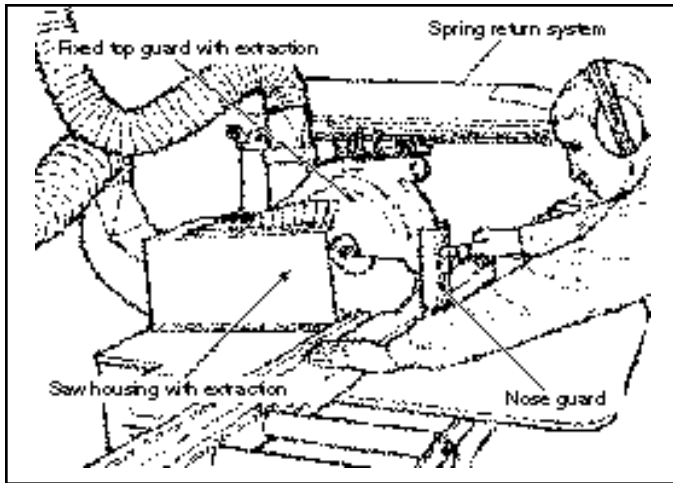


Figure 1 Typical radial-arm machine

Of particular importance is the provision of an adjustable nose guard designed to prevent contact with the front edge of the saw blade during the cutting stroke and when in the rest position. The saw blade stroke should be set so the nose guard does not extend beyond the front edge of the work table. Best practice is for the nose guard to be adjustable down to within 12 mm of table level. The gap in the fence should be wide enough to allow the passage of the nose guard.

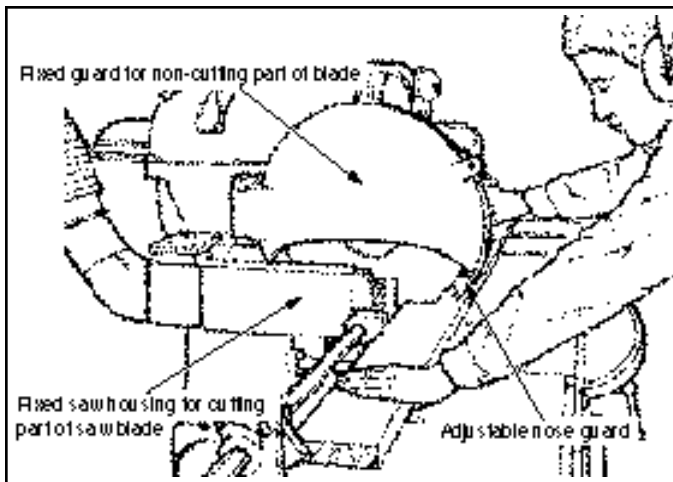


Figure 2 Typical travelling-head machine

Accidents have occurred during the rundown period of saw blades. Machines should be fitted with either:

- some form of return device, so that the saw unit returns to its safe rest position when the saw unit is released (eg spring-assisted return wire or counterbalancing); or
- an automatic brake which stops the rotation of the saw spindle in 10 seconds or less.

Where a return device is used, the risk of 'bounceback' of the saw unit towards the operator should be considered. Some form of impact absorption material may be required to prevent this. Fitting a return device is best practice, even where the machine has a manual brake.

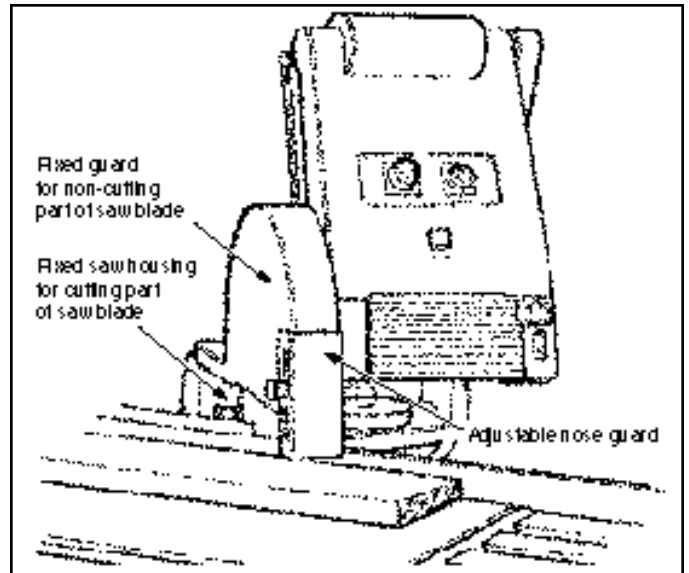


Figure 3 Typical pendulum machine

### Down-stroking machines

Often termed 'snipper saws' or 'mitre saws', these machines are pulled forwards and downwards through an arc during their cutting stroke. Some machines may combine a horizontal stroke. Where this is the case, the horizontal movement should only be possible when the saw blade is lowered to the maximum depth of cut.

The non-cutting part of the saw blade should have a fixed guard which will normally extend to at least the saw spindle. In the rest position, access to the cutting part of the saw blade should be prevented by self-closing guards.

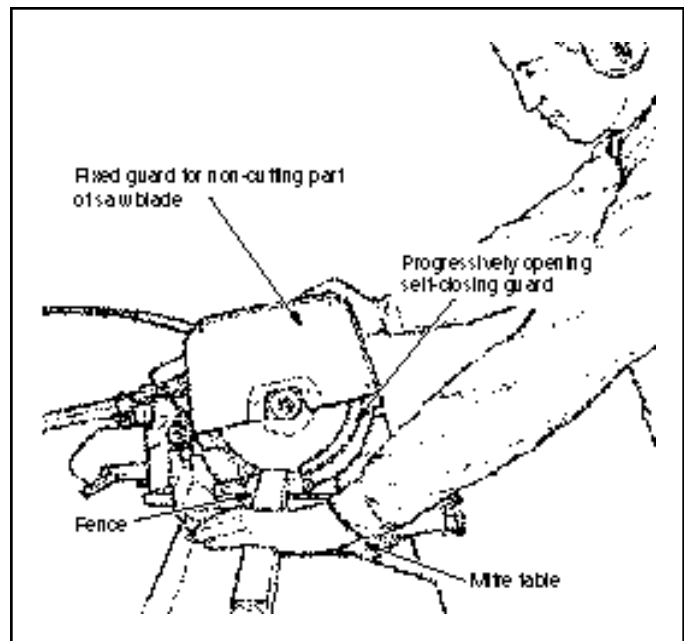


Figure 4 Down-stroking machine with progressively opening guard

Two designs of self-closing guard are available. The first should open progressively as the saw unit is lowered through its cutting stroke (see Figure 4). The second should open when it makes contact with the workpiece and should rest on the workpiece during cutting.

It is good practice for both types of guard to be locked in the fully closed position and for there to be a guard release control on the operator's handle. This arrangement should be standard for all new machines.

**Fence and workpiece support**

A fence which is high enough to support the timber should be provided at either side of the cutting line. When carrying out straight cutting on a machine which is able to pivot and/or cant for angled cutting, the gap in the fence to allow for the passage of the saw blade can be reduced using renewable fence inserts.

Adequate workpiece support is essential for all operations carried out using manual cross-cut saws. Large workpieces should be supported using extension tables or roller supports at either side of the saw unit.

**Specific operations**

**Ripping**

Some radial arm machines have the facility to turn the saw unit through 90° to allow ripping to take place. Accident experience has shown that, even when set up correctly, the operation of ripping using a cross-cut saw is less safe than using a circular saw bench. As the saw blade is set above the timber there is an increased risk of kickback of the workpiece which has led to numerous serious injuries.

Where a circular saw bench is available this should always be used in preference to a cross-cut saw for any ripping operation because it is more suitable for the purpose (see regulation 4 of PUWER 98).

If a circular saw bench is unavailable and ripping has to be carried out on a cross-cut saw, it is extremely important that the machine is correctly safeguarded (see Figure 5). The saw unit should be locked in the ripping position and a suitably positioned rip fence should be used. The direction of rotation of the saw blade should be opposed to the direction of feed.

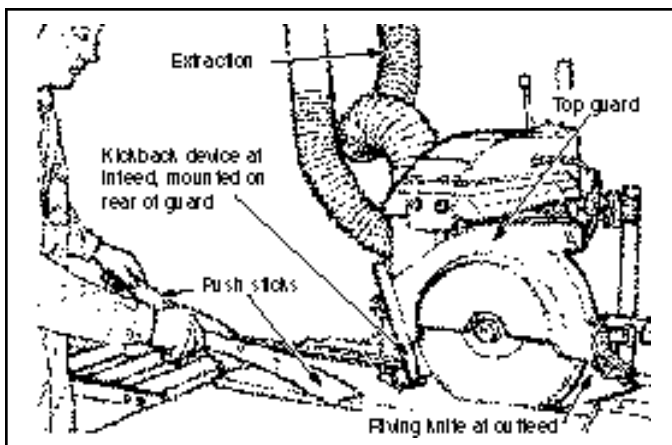


Figure 5 Radial arm cross-cut saw set up for ripping

A guard-mounted anti-kickback device, the height of which is adjusted to suit the depth of material being cut, should be fitted at the saw blade infeed. The outfeed of the saw blade should be fitted with a suitable riving knife. Both the anti-kickback device and the riving knife should be available from the machine manufacturer or supplier. The saw blade used should be suitable for ripping operations (cross-cutting saw blades are generally unsuitable for ripping).

Suitable push-sticks should be provided for all ripping operations.

**Trenching**

When using a trenching tool it is important to secure the workpiece in place firmly. The slow peripheral speed of the trenching tool increases the risk of workpiece kickback. A bed-mounted jig (see Figure 6) can increase safety during this operation.

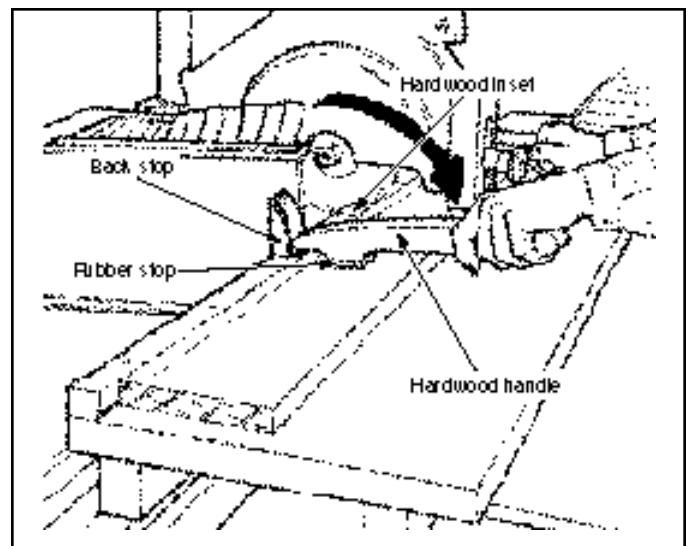


Figure 6 Trenching jig

**Pointing stakes**

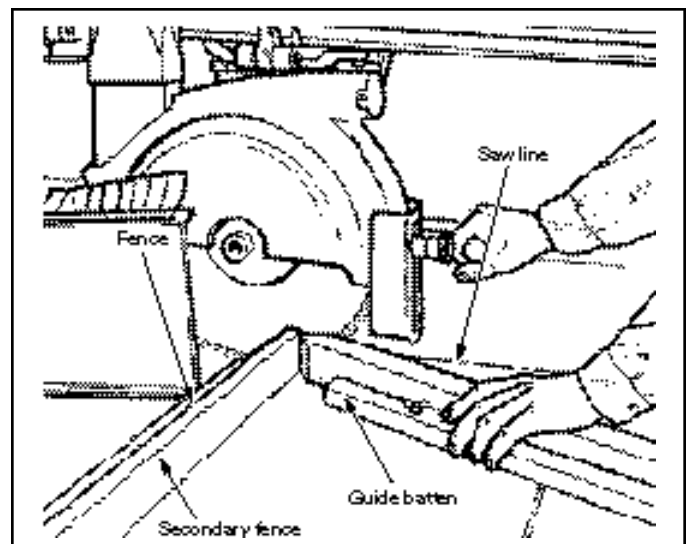


Figure 7 Pointing (peg and paling) jig

Manual cross-cut saws should only be used for this purpose if an appropriate jig (see Figure 7) and sufficient workpiece support is provided.

### Safe working practices

It is good practice to mark a 'no-hands' area on the work table (eg marked with yellow hatching) which could, for example, be set at 300 mm either side of the saw line. Operators should be trained not to hold the timber within this area during cutting. Where small workpieces or narrow sections are being cut, the use of a workpiece holder or jig may be appropriate.

Accidents have occurred when operators have crossed their arms during cutting. For example, they have mistakenly pulled a workpiece along the fence, from right to left, using the left hand instead of correctly pushing it along with the right. The practice of reaching across the sawline should be avoided as far as is practicable. Left-handed operators may require specific training.

The removal of offcuts and chips should only occur when the saw blade is in a safe rest position and/or the saw spindle has stopped rotating. It is good practice to use a stick, rather than hands, to remove offcuts. Accessible rotating saw blades should never be left unattended.

If the machine is fitted with a manual brake this should always be operated before leaving the machine.

Some timber will be naturally bowed. It is important when cutting such timber to place the bow against the bed so the timber is less likely to bind on the saw blade and create a risk of kickback.

### Machine maintenance and adjustment

The slides, runways, pivots and bearings of these machines often become dusty which impedes free running. Routine maintenance, cleaning and lubrication is required to ensure the saw and its safeguards operate properly.

Machines should be sited so controls and adjustments are easily accessible.

### Training and instruction

As is the case with all woodworking machines, it is vital that operators are properly trained to safely carry out the work they are expected to do. Only operators who have been authorised - ideally in writing - as properly trained and competent, should be allowed to operate machines. Adequate instruction and supervision are also important.

### References and further reading

- 1 *Product standards - Machinery - A guide to the UK Regulations* (May 1995) DTI URN 95/650. Copies available from the DTI's Business in Europe Hotline on 0870 150 2500
- 2 *Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice L21* HSE Books 2000 ISBN 0 7176 2488 9
- 3 *Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22* HSE Books 1998 ISBN 0 7176 1626 6
- 4 *Safe use of power-operated cross-cut saws WIS35* HSE Books 1998
- 5 *Safe use of woodworking machinery. Provision and Use of Work Equipment Regulations 1998 as applied to woodworking machinery. Approved Code of Practice and Guidance L114* HSE Books 1998 ISBN 0 7176 1630 4

The future availability and accuracy of the references listed in this publication cannot be guaranteed.

### 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.)

For information about health and safety ring HSE's InfoLine Tel: 08701 545500, Fax: 02920 859260, e-mail: [hseinformationservices@natbrit.com](mailto:hseinformationservices@natbrit.com) or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG. You can also visit HSE's website: [www.hse.gov.uk](http://www.hse.gov.uk)

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

This publication may be freely reproduced, except for advertising, endorsement or commercial purposes. First published 11/98. Please acknowledge the source as HSE.