

Safe use of hand-fed planing machines

HSE information sheet

Woodworking Information Sheet No 17

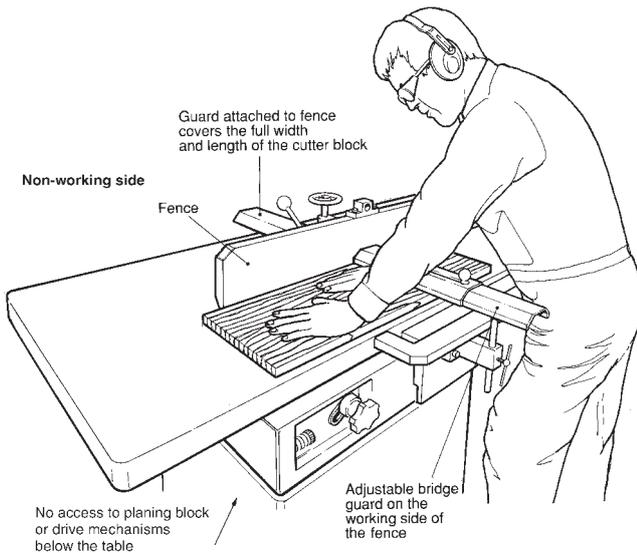


Figure 1 Basic safeguarding requirements

Introduction

This information sheet is one of a series produced by HSE's Manufacturing Sector. Its purpose is to give guidance on safe methods of work for the most common jobs on hand-fed surface planers. The main legal requirements covering the use of these machines are in the Provision and Use of Work Equipment Regulations 1998 (PUWER 98) and the supporting Approved Code of Practice (ACOP) *Safe use of woodworking machinery*.^{1,2}

It is vital that machine operators are properly trained to carry out the work they are expected to do.² 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.

When purchasing a new surface-planing machine, it should be supplied with a declaration of conformity and have a CE mark.³ As a minimum, it should be designed and constructed to meet BS EN 859 (under review).⁴ New tooling should meet BS EN 847-1.⁵

Accident history

In an HSE survey of 1000 woodworking machinery accidents, 20% occurred on hand-fed surface-planing machines. Of these, 80% occurred during edging or flattening, rather than the specialised operations such as rebating, moulding or chamfering which accounted for some 10% of the total. Although a bridge guard was provided in most cases, accidents were mainly caused by the failure to adjust the guard properly.

A two-knife cutter block makes approximately 10 000 cuts per minute and if a machinist's fingers are in contact for only a tenth of a second, 16 slices will be removed.

Safeguarding of hand-fed planing machines

Before considering any particular operation in detail, look first at the basic guarding requirements (see Figure 1).

The bridge guard should be:

- strong and rigid (to support heavy timbers) and made from a material such as wood or aluminium, so that in the event of contact with the cutter block, neither the guard nor the cutter block will disintegrate;
- constructed so that it is not easily deflected, which would expose the cutter block;
- long enough to cover the table gap with the fence at maximum adjustment. For large machines telescopic guards are available;
- wide enough (at least equal to the cutter block diameter); and
- easily adjustable horizontally and vertically without the use of a tool.

To reduce the risk of contact with the cutter block during run down, machines should be fitted with a braking device that brings the block to rest within 10 seconds. All unbraked machines should now have been fitted with a brake, unless the run-down time is less than 10 seconds.^{2,6}

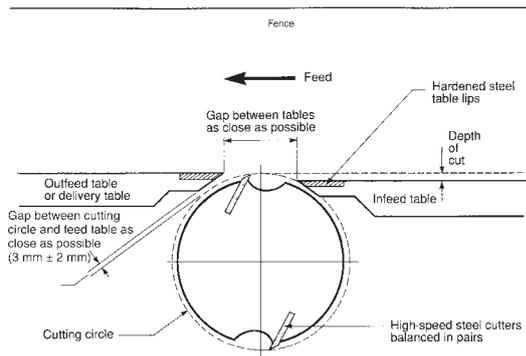
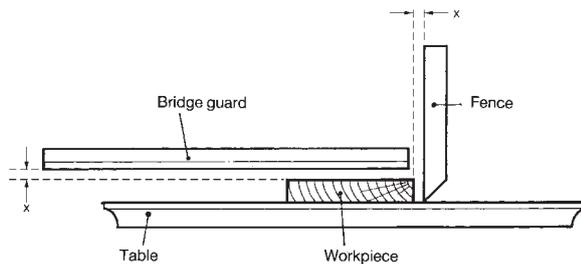
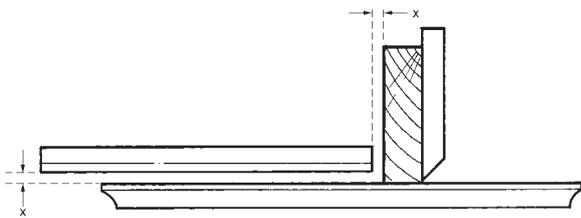


Figure 2 Table height and gap



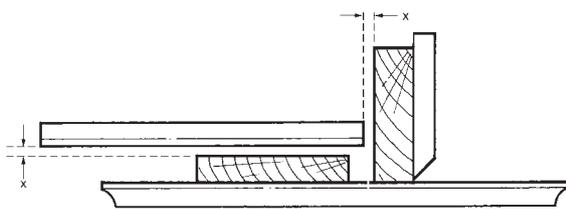
Note: Bridge guard to be adjusted as close to the workpiece and fence as possible (x).

Figure 3 Adjustment of the bridge guard – Flattening



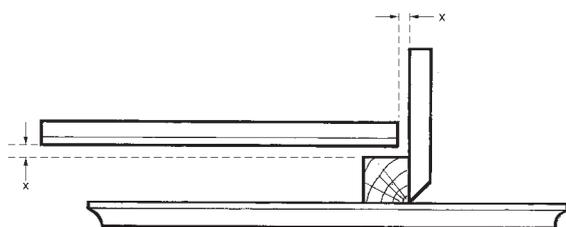
Note: Bridge guard to be adjusted as close to the workpiece and table as possible (x).

Figure 4 Edging



Note: Bridge guard to be adjusted as close to the workpiece as possible (x).

Figure 5 Flattening and edging rectangular stock



Note: Bridge guard to be adjusted as close to the workpiece and fence as possible (x).

Figure 6 Flattening and edging small square stock

Tooling and table setting

Setting the tables and the cutter blocks is crucial not only to the quality of the work, but also to the safety of the operation to be carried out.

Only cylindrical (or 'round form') cutter blocks should be used on hand-fed planing machines. Keep knife projections to a minimum – on new machines (ie post-1995) the maximum cutter projection should be 1.1 mm (see BS EN 847-1).⁵

Follow the tooling manufacturer's recommendations for balancing the cutter block assembly, minimum clamping length of knives and torque (for screw fixings). The knives should be sharpened at regular intervals to reduce the risk of snatching and kick-back, and resulting injury.

The clearance distance between the cutting circle and the lips of the infeed and outfeed tables should be as small as practicable, generally 3 mm ± 2 mm (see Figure 2). The out-feed table height should never be below the cutting circle diameter.

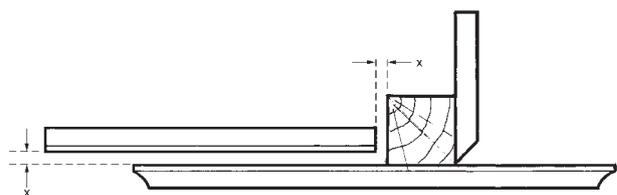
All guards should be in position before trial cuts are made.

Using the hand-fed planing machine

Failure to adjust the bridge guard to give the optimum degree of protection has been the cause of many serious injuries (see Figures 3-7).

It is important to position your hands correctly on the workpiece when machining. When flattening, the workpiece should be fed by pressure with the right hand, the left hand holding it down initially on the in-feed table. As soon as there is enough timber on the out-feed table, the left hand can pass safely over the bridge guard to apply pressure on the out-feed table and will be followed by the right hand to complete the feeding operation. It is not necessary to exert feeding pressure directly over the cutter block.

When edging, your hands should not pass over the cutter while they are in contact with the timber. Their main function is to exert horizontal pressure on the workpiece to maintain it square to the fence.



Note: Bridge guard to be adjusted as close to the workpiece and table as possible (x).

Figure 7 Flattening and edging large square stock

Safety devices

Use a push block when planing short pieces. It should have well-designed handles to give the machinist a firm grip (see Figure 8). This will reduce the risk of a short workpiece dipping as it passes the lip of the in-feed table, which results in abrupt contact with the cutters and can cause kick-back of the workpiece.

Rebating and bevelling

PUWER 98 requires that the most suitable (ie lowest risk) machine available is selected for every machining operation. For example, cutting a rebate on a properly guarded vertical spindle moulding machine is lower risk than a surface-planing machine.²

Stopped work should never be done on a hand-fed planing machine – eg only use the machine for jobs involving the full length of the workpiece.

New (CE-marked) planing machines should be designed so that it is not possible to carry out rebating using the end of the cutter block.⁴ On old (eg pre-1995) machines, rebating using the end of the block can be done provided a more suitable machine is not available and that:

- the workpiece is properly supported (see Figure 9);
- a tunnel guard is formed, eg by means of Shaw guards, which prevents the operator's hands from reaching the cutter block;
- the table gap is guarded on both sides of the fence;
- correctly ground cutters are used to reduce the risk of workpiece kick-back.

Note: The extended pads on the Shaw guards (Figure 9) effectively prevent access to the cutter block even when there is no workpiece.

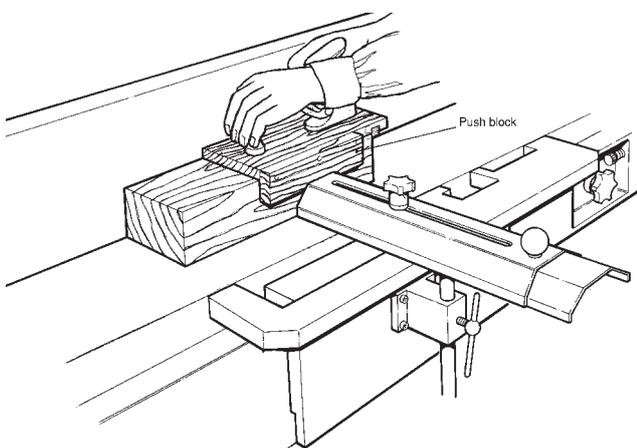


Figure 8 Push blocks for use with short pieces of timber

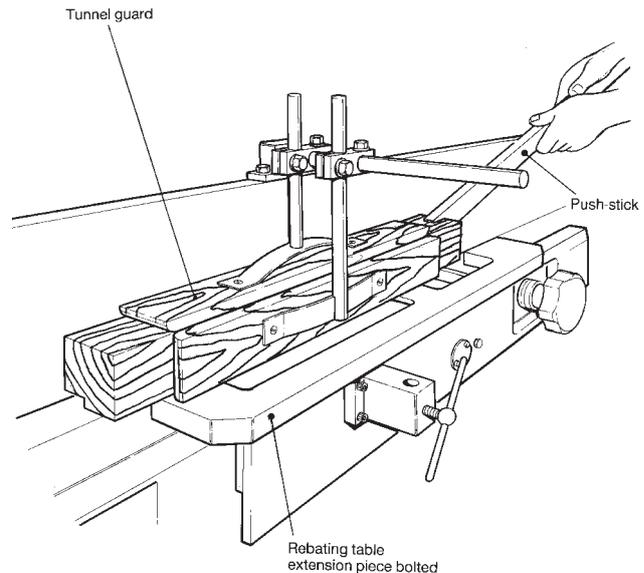


Figure 9 Rebating using a rebating table, Shaw guards and push stick

Angled cuts (ie bevels) need adequate workpiece support. As for rebating, Shaw guards can be used to make a tunnel guard through which the work can be fed (see Figure 10).

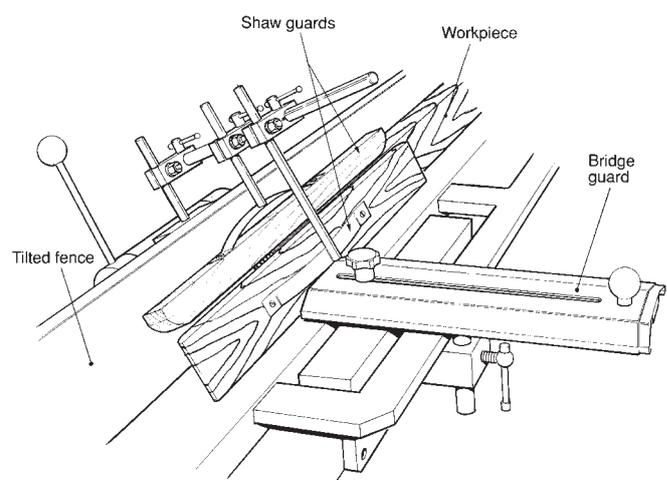


Figure 10 Bevelling using a tilted fence and Shaw guards

Power feed

Consider using a demountable power-feed device, as on other hand-fed machines, as it removes the need for the operator to approach too close to the cutter block. A power-feed device can also overcome the risk of kick-back. However, using power feed does not remove the need for guarding, particularly as the feed unit needs to be mounted on the out-feed table for surfacing.

Maintenance

Machines, particularly safety devices and guards, must be adequately maintained to ensure safety. Unless a bridge guard moves freely (both vertically and horizontally) it is unlikely to be kept adjusted.

- Lubricate machines regularly.
- Make sure any damage is reported and replace parts as required.
- Change the pads on Shaw guards regularly to suit the size of the workpiece. The fixing screws need to be in good condition; keep spares available and have the right tools to hand.
- Inspect and replace the handles on push blocks regularly – they should be secure.

References and further reading

1 *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

2 *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

3 *Buying new machinery. A short guide to the law and some information on what to do for anyone buying new machinery for use at work* INDG271
HSE Books 1998

4 BS EN 859: 1998 *Safety of woodworking machines. Handfed surface planing machines* (under review)

5 BS EN 847-1: 2005 *Tools for woodworking. Safety requirements. Milling tools, circular saw blades*

6 PUWER 98: *Retrofitting of braking to woodworking machines* WIS38 HSE Books 1998

7 *Safe use of vertical spindle moulding machines* WIS18(rev1) HSE Books 2001

8 Pack of 6 woodworking posters HSE Books 1999
ISBN 0 7176 2433 1

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