Hand-fed surface planing machines

Safe working practices

HSE information sheet

Woodworking Information Sheet No 17 (Revision 2)

Introduction

This information sheet is aimed at employers and others who have control of how surface planing machines are used. Machine operators will also find this information of use.

Accident history

Surface planing machines are a common cause of accidents. Many of these occur during edging or flatting, rather than the specialised operations such as rebating, moulding or chamfering. Analysis of woodworking accidents has found that the two most common causes were missing or inadequate guarding and lack of training. It is therefore important that you train operators to correctly set the guards and use safety devices such as push blocks where necessary.

Training issues

No one should be allowed to work on a surface planing machine unless they have demonstrated competence. It is advisable that competent operators are authorised in writing by a responsible person (director, senior manager etc). This will then form part of the training records. Anyone who supervises the use of any work equipment should have access to information and where appropriate, written instructions.[1]

Legal requirements

Legal requirements covering the use of these machines are contained in *Safe use of woodworking machinery: Provision and Use of Work Equipment Regulations 1998 (as applied to woodworking machinery). Approved Code of Practice and guidance*.[1] This document gives practical advice on the safe use of woodworking machinery and covers the provision of information and training as well as aspects of guarding and maintenance (see also Further reading).

When buying a new surface planer, it should be supplied with a declaration of conformity and have a CE mark. Designers and manufacturers must conform to the essential safety requirements of the Machinery Directive and associated European Free Trade Association (EFTA) regulations. One way of achieving this is by designing and constructing the machine to meet BS EN 859.[2] Cutter blocks should meet BS EN 847 Part 1.[3] However, there are many older machines still in use and the guarding requirements for these machines will also be covered.

Safeguarding of hand-fed planing machines

To prevent access to the cutter block there should be guards in front of and behind the fence. The fixed guard behind the fence is attached either to the fence or to the fence support and is designed to move with the fence as it is adjusted. A bridge guard is used to prevent access at the front of the fence. Both guards must be capable of covering the full length and diameter of the cutter block.

In general, all bridge guards should be:

- strong, shock- and compression-resistant and made from a material such as plywood or light alloy, so that in the event of contact with the cutter block, neither the guard nor the cutter block will disintegrate;
- easily adjustable without the aid of a tool but not easily deflected, which would expose the cutter block;
- capable of being adjusted to make the gap between the fence and the guard as small as possible, see Figure 3;
- capable of being adjusted to make the gap between the bridge guard and the workpiece upper surface (or table) as small as possible, see Figures 3 and 4.

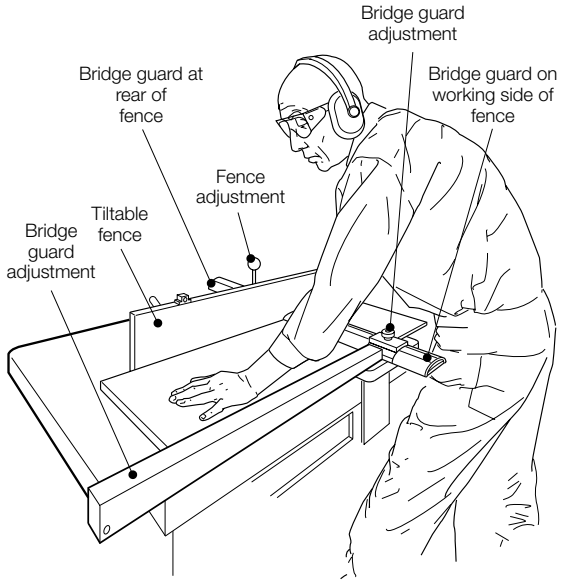


Figure 1 Basic safeguarding requirements

Details of the bridge guard specifications for newer machines are shown in Figure 1. These include the requirements for it to be:

- flat or convex in shape with a smooth upper surface without projecting parts;
- possible to lock in any horizontal position;
- adjustable in height up to a maximum of 75 mm above the outfeed table;
- not possible to remove it from the machine unless a tool is used;
- capable of being adjusted manually or automatically so as to make the gap between the fence and the guard at most 6 mm, regardless of the position of the fence and tables;
- capable of being adjusted manually or automatically so as to make the gap between the bridge guard edge and the workpiece upper surface a maximum of 2 mm at infeed table side and 4 mm at the outfeed table side.

See BS EN 859 for further details.

There are many old-style 'telescopic' bridge guards still in use on older machines, as detailed in Figures 8 and 10. This is acceptable provided that they meet the necessary legal requirements.[1] The main difference between these and the new style is that being in two pieces they do not have a smooth upper surface.

Braking

To reduce the risk of contact with the cutter block during run down, machines should be fitted with a braking device that brings the blade to rest within ten seconds. Unless already fitted with a manual or foot-operated brake, surface planers with a rundown time greater than ten seconds should have been fitted with a braking device by 5 December 2003.[1,4]

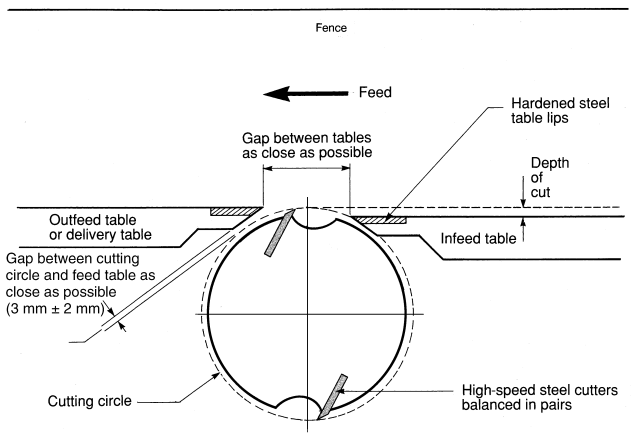


Figure 2a Table height and gap

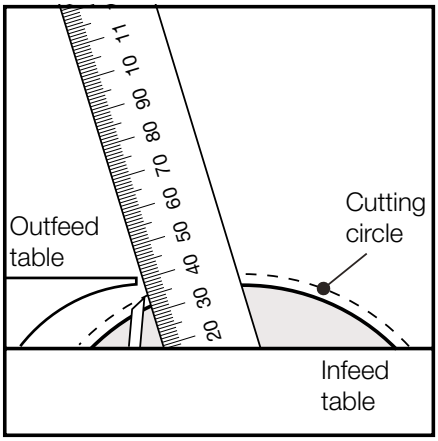
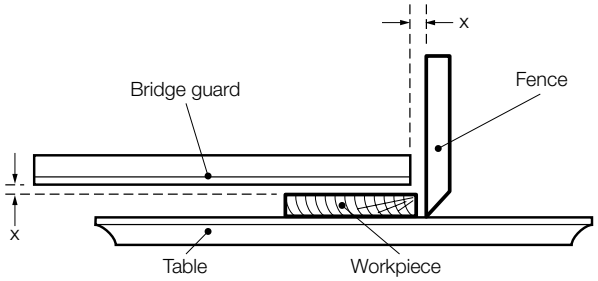
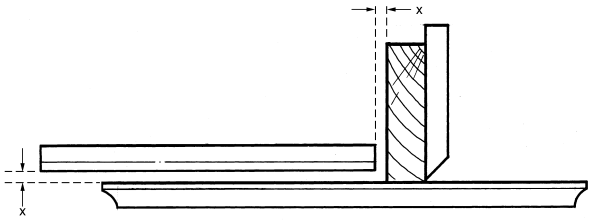


Figure 2b Measuring gap between table edge and cutters



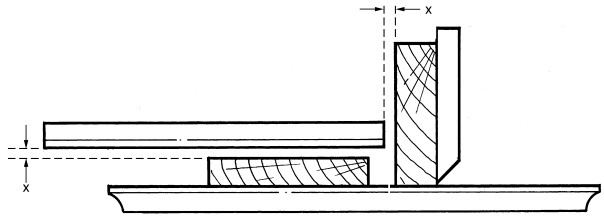
Note: Bridge guard to be adjusted as close to the workpiece and fence as possible (x)

Figure 3 Adjustment of the bridge guard – Flatting



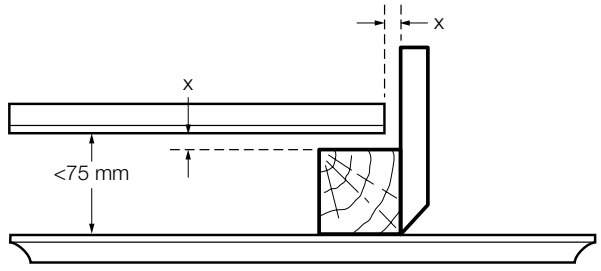
Note: Bridge guard to be adjusted as close to the workpiece and table as possible (x).

Figure 4 Edging



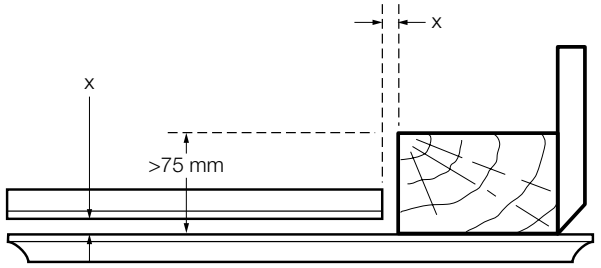
Note: Bridge guard to be adjusted as close to the workpiece as possible (x).

Figure 5 Flatting 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



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

Figure 7 Flattening large stock

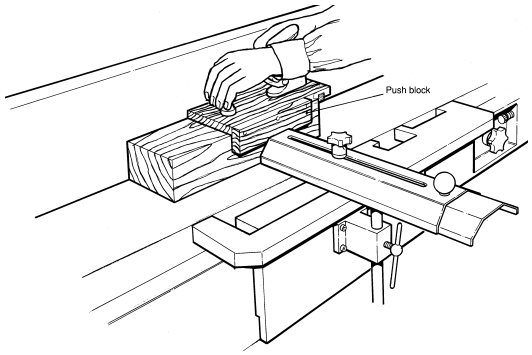


Figure 8 Push blocks for use with short pieces of timber

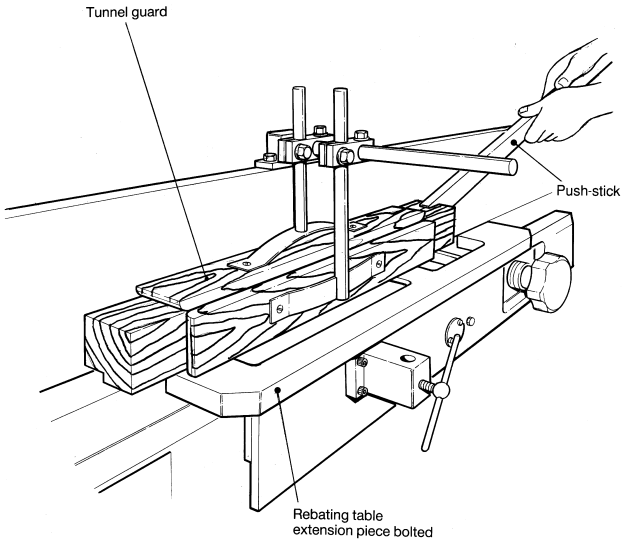


Figure 9 Rebating using a rebating table, Shaw guards and push stick

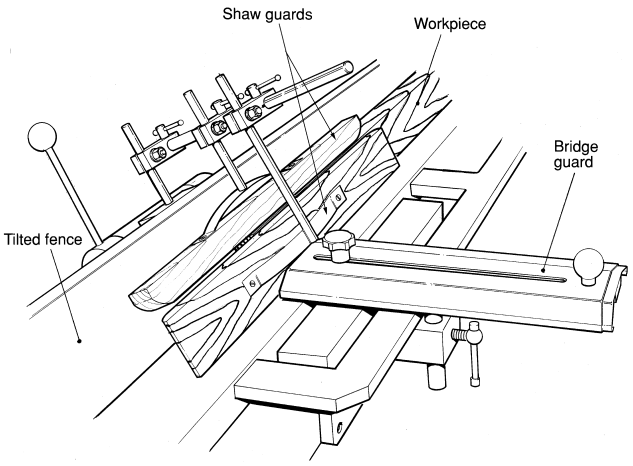


Figure 10 Bevelling using a tilted fence and Shaw guards

Tooling and table setting

Correctly setting the tables and the cutter block is crucial not only to the quality of the work, but also to the safety of the operation.

Only cylindrical (or 'round form') cutter blocks marked MAN should be used on hand-fed planing machines, see BS EN 847-1.

Follow the tooling manufacturer's recommendations for:

- balancing the cutter block assembly;
- the minimum clamping length of knives;
- the correct torque for screw fixings.

You should also sharpen knives at regular intervals to reduce the risk of injury from snatching or kickback.

The clearance distance between the cutting circle and the lips of the infeed and outfeed tables should be as small as practicable, BS 859[2] states that it must be 3 mm ± 2 mm, see Figure 2. The measurement should be made radially in line with the centre of the cutter block. This outfeed table height should never be below the cutting circle diameter.

Any slots on the table or table lips to reduce noise should not be more than 6 mm wide and have a minimum tooth thickness of 1.5 mm at the tip.

Once the cutter block and table have been set remember to correctly position the guards before any trial cuts are made.

Using the hand-fed planing machine

Failure to adjust the bridge guard and fence to give the optimum degree of protection has been the cause of many serious injuries. The correct positions of the bridge guard for various flattening and edging operations are shown in Figures 3 to 7. The fence should always be adjusted to the width of material being cut, therefore reducing the amount of exposed cutter.

When flatting, the bridge guard should be placed over the workpiece when it is less than 75 mm, see Figures 3 and 6. It is important to position your hands correctly on the workpiece when machining. When applying hand pressure keep your hands on top of the workpiece. If they are at the sides they will be closer to the cutters. When flatting, the workpiece should be fed by pressure with the right hand, the left hand holding it down initially on the infeed table. As soon as there is enough timber on the outfeed table, the left hand can pass safely over the bridge guard to apply pressure on the outfeed table, followed by the right hand to complete the feeding operation.

If the workpiece is greater than 75 mm, or when edging, then the bridge guard should be positioned at the side of the workpiece, as shown in Figures 4 and 7. However, it is not necessary to exert feeding pressure directly over the cutter block and your hands should not pass over the cutter block when it is in contact with the timber unless using a feeding device such as a push block. Your hand's main function is to exert horizontal pressure on the workpiece and maintain it square to the fence.

Safety devices

Provide a push block made from plastic, wood or plywood for use on all machines. You should also make provision for storing push blocks on the machine. It should have well designed handles to give the machinist a firm grip, see Figure 8.

You should also always use a push block when planing short pieces. This will reduce the risk of a short workpiece dipping as it passes the lip of the infeed table, which results in abrupt contact with the cutters and can cause the workpiece to kick back.

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.[1]

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.

Any CE-marked planing machines (manufactured after 1995) should be designed so that it is not possible to carry out rebating using the end of the cutter block.[2] 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 kickback.

Note: The extended pads on the Shaw guards (Figure 9)

effectively prevent access to the cutter block even when there is no workpiece.

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.

Power feed

Consider using a demountable power feed device, particularly for work pieces over 75 mm in thickness. As with other hand-fed machines, such as a vertical spindle moulder, 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 kickback. However, using power feed does not remove the need for guarding, particularly as the feed unit needs to be mounted on the outfeed table for surfacing.

Maintenance

Machines, particularly safety devices and guards, should be adequately maintained to ensure safety.[1] You should consider how your workers use machinery and have adequate maintenance arrangements in place to ensure it remains safe. 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

1 *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 (Second edition) HSE Books 2014
www.hse.gov.uk/pubns/books/l114.htm

2 BS EN 859:2007+A2:2012 *Safety of woodworking machines. Hand fed surface planing machines* British Standards Institution

3 BS EN 847-1:2013 *Tools for woodworking. Safety requirements. Milling tools, circular saw blades* British Standards Institution

4 *Retrofitting braking to woodworking machines* Woodworking Information Sheet WIS38(rev1) HSE 2014
www.hse.gov.uk/woodworking/wis38.htm

Further reading

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Fourth edition) HSE 2014
www.hse.gov.uk/pubns/books/l22.htm

More information on surface planers, including videos illustrating correct working practices, can be found on HSE's woodworking website:
www.hse.gov.uk/work-equipment-machinery/index.htm

Further information for suppliers, installers and users of new and second-hand machinery can be found on HSE's Work equipment and machinery webpages:
www.hse.gov.uk/work-equipment-machinery/index.htm

Further information

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http://www.hse.gov.uk/woodworking/wis.htm