

Power-fed mobile wood chippers:

Operator protection at infeed chutes

HSE information sheet

Agriculture Information Sheet No 38 (Revision 1)

Introduction

This information sheet provides guidance for those working in arboriculture and forestry. It outlines the protection needed for operators at the infeed chutes of power-fed mobile wood chippers.

In general terms, operators should be protected from contact with the infeed rollers by a combination of reach-distance guarding (created by the shape and dimensions of the infeed chute) and a correctly positioned protection device which, when activated, stops the infeed rollers.

The height of the lower edge of the infeed chute, in the working position, determines the size of the chute and how the protection device is arranged. This height should be measured with the machine on level ground and with the chute in its working position.

Reach-distance guarding

New machines supplied on or after 27 June 2005

Must comply with BS EN 13525:2005+A2:2009 *Forestry machinery. Wood chippers. Safety.*

Machines supplied on or before 26 June where the lower edge of the infeed chute is below 600 mm

If, in the correct level working position, the height of the lower edge of the infeed chute is less than 600 mm from the ground, make sure the following criteria are met (see Figure 1):

- The distance from any chute edge to the infeed rollers is at least 1200 mm.
- The height from the centre line of the protection device (located along the top edge of the infeed chute) to the lower edge of the chute is no greater than 1000 mm.
- From the infeed rollers, the floor of the chute slopes downwards to the bottom edge of the chute.

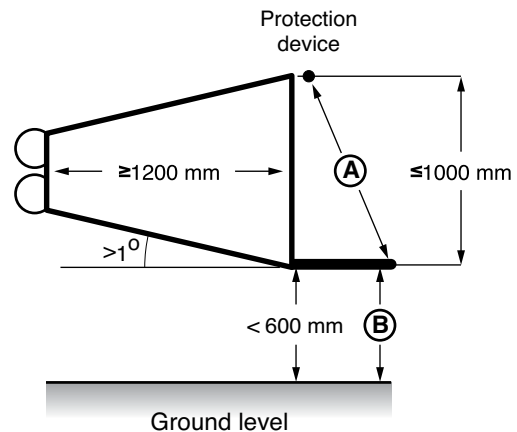


Figure 1 Dimensions for infeed chutes below 600 mm from ground level

If the chute has an additional extension attached to the lower edge, beyond the 1200 mm of the fully enclosed chute, make sure that the total distance from the centre line of the protection device at the top edge of the infeed chute, via the outermost edge of the extension to the ground (A+B), does not exceed 1600 mm.

For chutes of this design, make sure that the protection device is located at the **sides and upper edge** of the chute (see Figure 2).

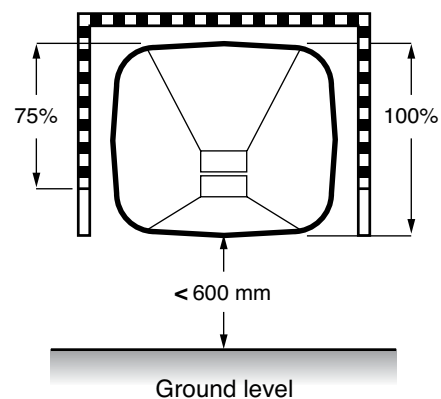


Figure 2 Position of protection devices on infeed chutes below 600 mm from ground level

Ensure that the protection device operates by:

- stopping the infeed action when pushed in the feeding direction;
- stopping or reversing the infeed action when pulled against the feeding direction.

New machines supplied between 1 November 2000 and 26 June 2005, where the lower edge of the infeed chute is 600 mm or higher

If, in the correct level working position, the height of the lower edge of the infeed chute is more than 1000 mm from the ground, then the minimum horizontal distance from any chute edge to the infeed rollers should conform with Table 2 of BS EN ISO 13857:2008 (see Figure 3).

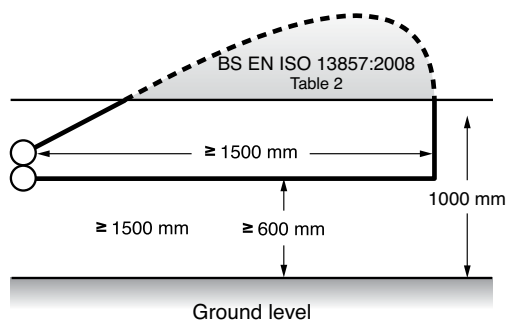


Figure 3 Dimensions for infeed chutes at 600 mm and above

If, in the correct level working position, the height of the lower edge of the infeed chute is between 600 mm and 1000 mm from the ground, the minimum horizontal distance from the infeed rollers to any part of the outer edges of the chute which are less than 1000 mm from the ground needs to be at least 1500 mm.

Where the outer edges extend above 1000 mm, Table 2 of BS EN ISO 13857:2008 also applies (see Figure 3).

For chutes of this design make sure that the protective device is located at the **sides and lower edge** of the chute (see Figure 4).

Ensure that the protection device operates by stopping the infeed action when pushed in the feeding direction.

Machines supplied before 31 October 2000, where the lower edge of the infeed chute is 600 mm or higher

If, in the correct level working position, the height of the lower edge of the infeed chute is 600 mm or more above the floor, make sure that the following criteria are met (see Figure 5):

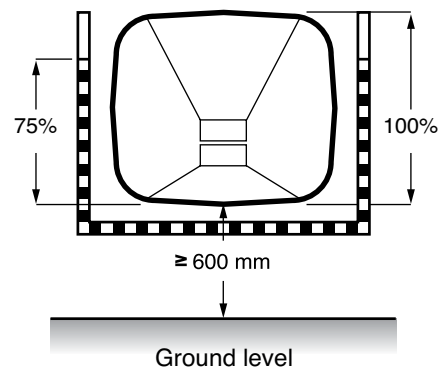


Figure 4 Position of protection devices on infeed chute at 600 mm and above

- The distance from the infeed rollers to the lower edge of the infeed chute should be at least 1200 mm.
- The distance from the infeed rollers to either side or the top of the infeed chute should be at least 850 mm. This distance may be slightly reduced at the top of the infeed chute if there are sloping side panels extending from the top edge to the outermost lower edge. See BS EN ISO 13857:2008 Tables 3 and 6.

For chutes of this design make sure that the protection device is located at the **sides and lower edge** of the chute (see Figure 5).

Make sure that the protection device operates by stopping the infeed action when pushed in the feeding direction.

Protection devices

Design, position and function

Protection devices can be either:

- a dedicated stopping device (with the controls for operating the infeed rollers elsewhere); or
- combined with the control system for the infeed rollers.

Make sure the design and position of protection devices allow the operator to stop the infeed of wood in the direction of feed by using parts of his/her body other than the hands (eg elbow, hip, torso etc). This will be possible if the protection device:

- can be pushed to the stop position without any interference by the edge of the chute;
- covers a minimum of 75% of each vertical projection at the sides of the chute and 100% of the horizontal projection at the top or bottom of the chute, as appropriate for the machine according to the height of the outermost lower edge, ie below or above 600 mm (see Figures 2, 4 and 5);

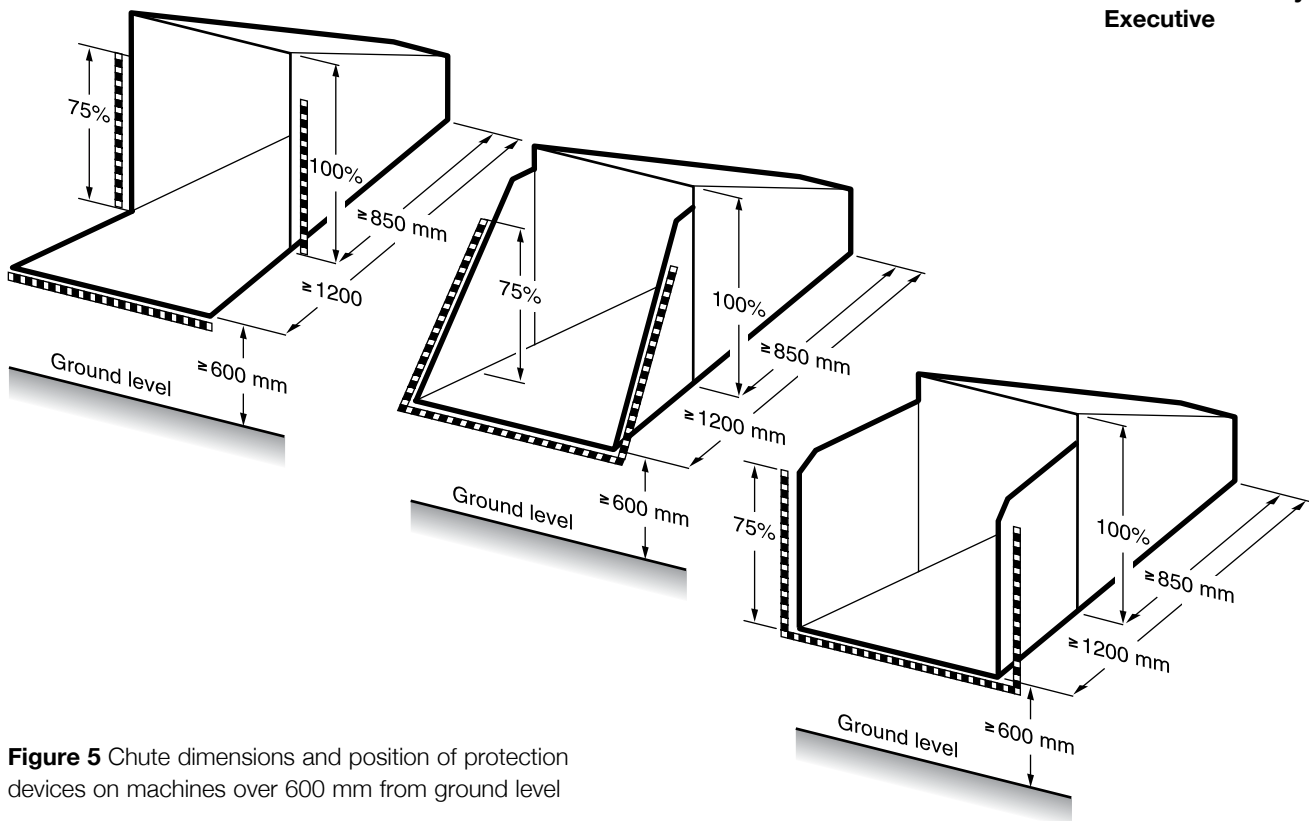


Figure 5 Chute dimensions and position of protection devices on machines over 600 mm from ground level

- does not require a force greater than 150 N on the horizontal part of the device(s) and 200 N on any point of the 75% projection as shown in Figures 2, 4 and 5 (this can be measured using a spring balance – 10 N equals approximately 1 kg of pulling force);
- where combined with the control system for the infeed rollers, has the stop position located between any other function and the chute edge.

- a detent at the stop position requiring force in more than one direction for its disengagement (eg lift and pull by the operator);
- configuring the control system for the infeed rollers so the stop condition is maintained until a separate reset control is activated by the operator.

Ensure that, on all sides of the chute, the result of actuating the device is identical.

Make sure protection devices:

- are robustly constructed and mounted so they remain operational in daily use (eg adequate points for lubrication and protection against dirt etc);
- are designed to reduce the collection of debris in areas which would impede the full movement of the device;
- cannot be easily defeated or disconnected.

Restarting after activation of the protection device to the stop position

The crucial function of the protection device is to stop the infeed rollers. Make sure that it is only possible for the operator to restart the rollers by using a secondary control provided for the purpose. Ways of achieving this include:

- a mechanical device, such as a latch, to hold the protective device in its stop position until released by the operator (make sure such a device cannot be easily defeated);

Training

Feeding the wood chipper safely

Operators must be adequately trained to use the machine safely.

To make sure that the wood is fed safely into the machine this training will need to include:

- positioning the machine so that the outermost lower edge of the infeed chute is the correct height above the ground to ensure the proper function of the protection device;
- instruction on the correct operation of the machine's controls and protection devices;
- an understanding of the safety features fitted to the machine, why they are needed and how they need to be checked;
- instruction on safe work practices to avoid and remove blockages, eg keeping the chipping knives sharp and correct setting of the infeed roller and chipping component speed;
- instruction on how to feed the chipper safely.

NB: There may be other aspects of the machine on which operators need to be trained. The above only relates to safe feeding.

Operating instructions for your machine will be given in the machine handbook. Make sure it is kept with the machine.

In general, when feeding a wood chipper:

- wear close-fitting clothing without any loose cuffs, straps or strings and suitable personal protective equipment to protect eyes and ears. Make sure any gloves have long, close-fitting cuffs that can be tucked into the sleeves;
- operate the chipper from a position where the protection device can be readily activated;
- feed branches butt first, releasing the wood when it is gripped by the rollers;
- always use a long branch as a push-stick to feed short material;
- never jam, disable or remove any safety device on the machine;
- never reach into the infeed chute without stopping the infeed rollers;
- never make any adjustment, or carry out maintenance, repairs or cleaning, with the power unit running or before all the machine components are at a complete standstill.

Further reading

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition) HSE Books 2008 ISBN 978 0 7176 6295 1
www.hse.gov.uk/pubns/books/l22.htm

BS EN 13525:2005+A2:2009 *Forestry machinery. Wood chippers. Safety* British Standards Institution

BS EN ISO 13857:2008 *Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs* British Standards Institution

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

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