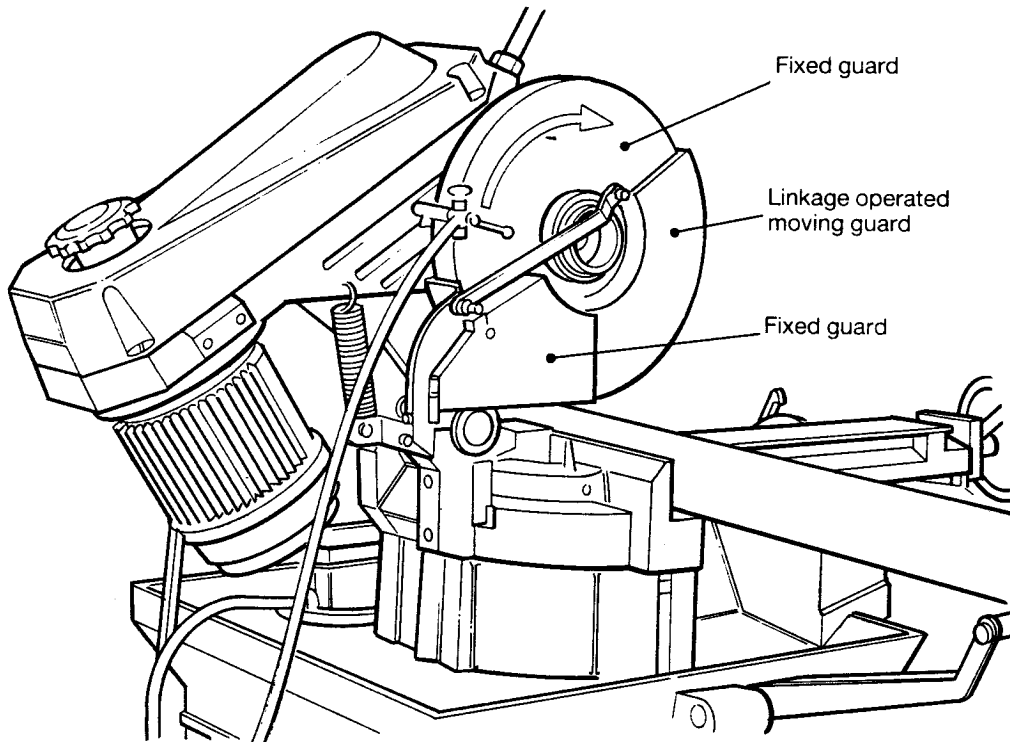




Safety at manually-fed pivoting-head metal-cutting circular saws

Engineering Sheet No 12 (rev)



Introduction

This guidance is for users of general-purpose pivot head saws where the saw is manually fed into the workpiece (see illustration). It is also intended to assist users in meeting the current legal requirements.¹ Some of the general principles described may, however, be applicable to other types of saw.

Hazards and risks

The main hazards for operators of these machines are from contact with the moving saw blade, exposure to high noise levels and contact with metalworking fluids. The chief risk of injury from the saw blade arises during feeding, adjusting or retrieval of workpieces. Further risks occur during swarf removal or cleaning, particularly when the machine is left running. Many of the accidents at these machines result in very serious injury to the hands and arms of operators, including amputations. The majority of accidents are associated with inadequate standards of guarding where clothing entanglement, poor systems of work and poor maintenance are contributory factors. The health risks associated with noise and metalworking fluids can be significant and should always be considered when using these machines.

Safeguards

These sawing machines may be effectively safeguarded

in several ways. The objective of any guard should be to prevent contact with the saw blade when the saw head is in the rest or raised position and to limit the amount of blade which is exposed when cutting. This may be achieved by using a suitable mechanically linked self-adjusting guard (see illustration). Saw blade guards which rely solely on gravity operation for their adjustment are not considered to be fully effective.

In circumstances where it is not possible to fit a mechanically linked guard (eg due to design constraints on the machine), existing guards (eg a fixed and gravity operated supplementary guard) should be provided but with the addition of a hold-to-run button or trigger switch on the operating handle (see BS 5304:1988, section 5.3² and BS EN 60204:1993³). The button or switch should be arranged so that, when the operating handle is released, power to the saw blade spindle is removed. Alternatively, where a saw is dedicated to a particular operation and requires minimal re-setting, for mitre cutting etc, fixed guarding attached to the machine table is a practicable option.

In fixed guards, the size of feed and take-off apertures should not allow finger access to the saw blade and should be in accordance with BS EN 294:1992.⁴ The use of tunnel guards is a useful method of restricting finger access to the saw blade at feed and take-off points.

All the guards should be of robust construction to withstand the stresses of the expected service conditions. The use of feed stops or length gauges is recommended, as these devices minimise the need for direct sight of the blade and workpiece when cutting. Where a view is required, transparent or mesh materials may be used in fixed guards. Problems associated with swarf build-up when using fixed guards can be overcome by using a removable swarf tray.

Noise

Noise levels in excess of 100 dB(A) can be generated during cutting operations particularly at high-speed saws cutting non-ferrous materials such as aluminium. Employers should ensure that the requirements of the Noise at Work Regulations are met.⁵ This includes assessing employees' exposure to noise properly. Steps should be taken to try to reduce noise at source, where this is reasonably practicable. Some practical methods of reducing noise include:

- (a) adequate clamping of workpieces;
- (b) the use of noise/vibration absorbing materials on the surface of feed tables;
- (c) the use of correctly selected and maintained saw blades;
- (d) the use of 'damped' saw blades (ask for manufacturer's advice);
- (e) enclosure or partial enclosure of the cutting head using suitable noise-absorbing materials.

Employees should be advised of any noise hazard and the subsequent risks of hearing damage. Where hearing protectors (ear muffs etc) are provided, employees should be trained to use them correctly.

Metalworking fluids/lubricants

The use of metalworking fluids in engineering processes, including sawing, can be associated with a number of health effects. Work with metalworking fluids is subject to the COSHH Regulations.⁶ Dermatitis (inflammation of the skin) can result from exposure to such fluids due to irritant or allergic effects or a combination of the two. This can be made worse by skin abrasions caused by swarf. Where oil mists or aerosols are present in the operator's breathing zone respiratory sensitisation or irritation may occur particularly if the fluid is contaminated with bacteria. Good precautionary measures as described in *Metalworking fluids - health precautions*⁷ should be adopted. Good practice not only reduces the risk of health problems but improves environmental conditions, helps maintain product quality and reduces costs, for example in tool wear. It should be possible to use waxes and similar lubricants safely using appropriate applicators.

Training and maintenance

Operators should receive careful and comprehensive instruction and training so that they are fully familiar with the machine, its controls, the safety devices and other associated hazards, eg lifting and carrying of workpieces etc. Regular inspection and maintenance of the safety devices and safety critical parts of the machine such as counterbalance springs and their fixing points, is essential. Detailed advice on this matter should be contained in the manufacturer's instruction manual. Cleaning should be carried out with the machine switched off and isolated.

References and further information

- 1 *Work equipment Provision and Use of Work Equipment Regulations 1992. Guidance on the Regulations* L22 HSE Books 1992 ISBN 0 7176 0414 4
- 2 BS 5304:1988 *Code of Practice for safety of machinery*
- 3 BS EN 60204:1993 *Safety of machinery - Electrical equipment of machines - Part 1: Specification for general requirements*
- 4 BS EN 294: 1992 *Safety distances to prevent danger zones being reached by the upper limbs*
- 5 *Noise at Work: the Noise at Work Regulations 1989 Noise Guide 1: legal duties of employers to prevent damage to hearing and Noise Guide 2: legal duties of designers, manufacturers, importers and suppliers to prevent damage to hearing* HSE Books 1989 ISBN 0 7176 0454 3
- 6 *General COSHH ACOP (Approved Code of Practice) and Carcinogens ACOP and Biological Agents ACOP (1996 edition): Control of Substances Hazardous to Health Regulations 1994* L5 HSE Books 1997 ISBN 0 7176 1308 9
- 7 *Metalworking fluids: health precautions* EH62 HSE Books 1992 ISBN 0 11 885667 7

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