Portable tools

Abrasive grinder

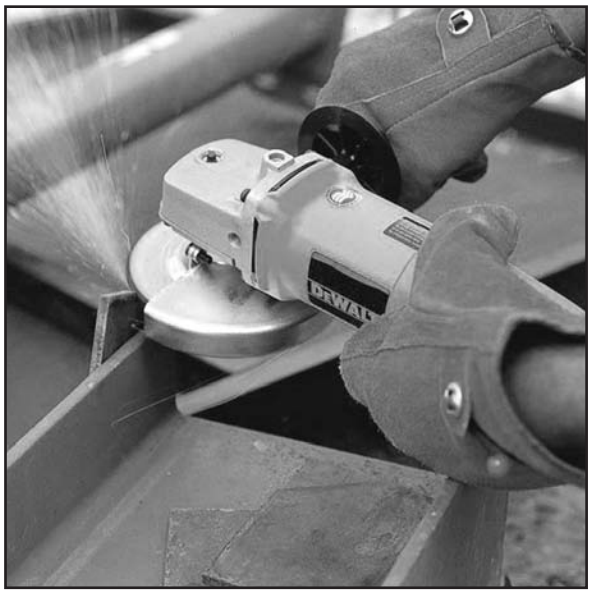
Belt sander

Circular saw

Jig saw

Portable abrasive grinder

One of the most common portable tools found in virtually any shop, the portable grinder is incredibly useful for grinding and finishing material of all shapes and sizes.



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Hazard

The hazards associated with portable grinders are similar to those of pedestal or bench grinders. First of all, serious abrasion or cuts can occur from contacting the rotating abrasive stone. There is also the potential for the abrasive stone to shatter, plus the dangers of exposure to the rotating wheel, flange, and spindle end from kickback. Finally, other concerns such as flying fragments and sparks are present during portable grinding operations.

Solution

These types of grinders normally come with the manufacturer's safety guard covering most of the wheel. Abrasive grinder exposure must not exceed a maximum angle of 180 degrees and the top half of the wheel must be enclosed at all times. The guard must be mounted so it maintains proper alignment with the wheel.

Vertical "right angle" grinders must have a 180-degree guard between the operator and wheel. The guard must be adjusted so that pieces of a broken wheel will be deflected away from the operator. The above picture depicts a properly guarded "right angle" grinder.

Cup wheel grinders must be guarded as described above or be provided with special "revolving cup guards," which mount behind the wheel and turn with it.

There are exceptions for guarding based on work practices and for other grinders (Oregon OSHA Division 2/Subdivision P 29 CFR 1910.243(c)(1)). Natural sandstone wheels and metal, wooden, cloth, or paper discs that have a layer of abrasive on the surface are not covered by Oregon OSHA's portable abrasive grinder rule.

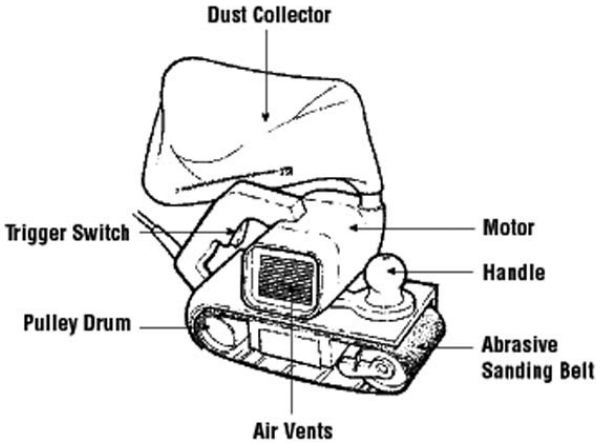
All abrasive wheels must be closely inspected and "ring-tested" before mounting to ensure that they are free from cracks or other defects. The spindle speed of the machine also must be checked before mounting the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Always follow the manufacturer's recommendations.

References

- **General Industry** — *Oregon OSHA Division 2/Subdivision P 29 CFR 1910.243(c)*
- **Construction** — *Oregon OSHA Division 3/Subdivision I 29 CFR 1926.303*
- **Agriculture** — *Oregon OSHA Division 4/Subdivision P OAR 437-004-2230(3)*
- ANSI/UL 45-1990 *Portable Electric Tools*
- ANSI B7.1 *Safety Code for the Use, Care, and Protection of Abrasive Wheels*
- ANSI B11.9 *Safety Requirements for Grinding Machines*

Portable belt sander

The portable belt sander is a general-purpose finishing tool. The belt is looped around two or more pulleys. The belt sander's linear motion makes it an excellent tool for sanding with the grain of the wood.



Hazard

Serious abrasion can occur from contacting the moving belt.

In-running nip points — created where the belt meets the pulley — can be present on the side of the tool. Nip points allow fingers, clothing, or hair to become caught in the tool.

Solution

Both hands should be used to operate the portable belt sander, one on the trigger switch and the other on the front handle.

Guard the unused runs of the sanding belt and all in-running nip points. This is normally accomplished by the tool's casing, enclosing the top portion of the belt and much of the side. The enclosure, or guard, on the sides must prevent the operator from contacting the nip points.

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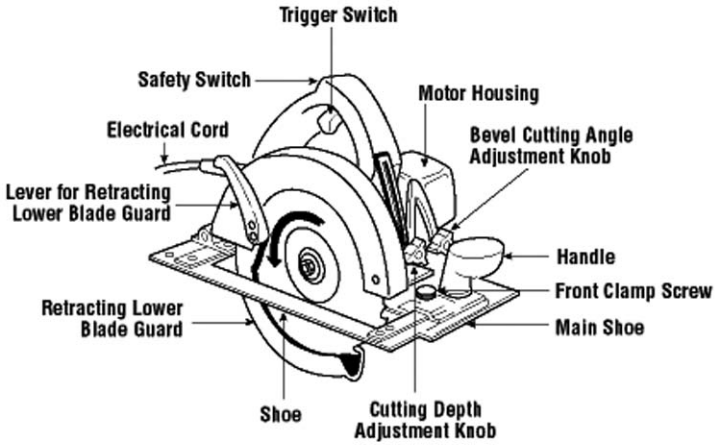
References

- **General Industry**
  Oregon OSHA Division 2/Subdivision P
  29 CFR 1910.243(a)(3)
- **Agriculture**
  Oregon OSHA Division 4/Subdivision P OAR 437-004-2230(1)(d)

Portable circular saw

The portable circular saw is probably the most commonly used power saw. Circular saws are very versatile and are used to crosscut, rip, and bevel cut.

The operator adjusts the saw to the proper cutting depth and pushes the tool through the wood.



Hazard

Severe cuts and amputations can occur if the operator contacts the saw blade. Many injuries occur when the lower portion of the blade is fully exposed during operation or when the operator places his or her hand under the base plate (shoe) of the saw.

Kickbacks can also present a significant hazard. They occur when the saw blade binds in the cut and the saw kicks back toward the operator. Binding most often occurs when the piece being cut off is not allowed to fall down, if cutting on an incline, or between two saw horses and either the weight of the saw or the forward motion causes the saw kerf (line of cut) to close.

Solution

All saws with a blade diameter greater than two inches must be equipped with guards above and below the base plate (shoe). The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard must enclose the teeth as much as possible and cover the unused portion of the blade when cutting.

When the tool is withdrawn from the work, the lower guard must automatically and instantly return to the covering position. Check that the retracting lower guard has returned to its starting position before laying the saw down. If the saw is set down with the guard open, it usually spins in a tight circle — sometimes cutting its own cord or possibly your toes!

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In addition, the lower guard must be equipped with a lug or lever, remote from the blade teeth, that will permit the operator to shift the guard safely for starting unusual cuts. Never hold or force the retracting lower guard in the open position — ***never pin the guard up!***

Kickbacks can be minimized by setting the proper blade depth so that the lowest tooth extends no more than 1⁄8-inch beyond the bottom of the material. This limits the area of the blade in the kerf and also exposes less of the blade if the saw does kick back.

It's also important to keep the saw kerf open, reducing the chance for the saw to bind. The board being cut should be positioned so that the weight of the cutoff keeps the saw kerf open as the cut is being made. If making a cut when both sides are supported (e.g., cutting between two sawhorses), lift the piece being cut off up and toward you as the cut progresses. Also, make sure you're not cutting uphill — even the slightest incline can cause the saw to bind. Furthermore, the saw must always move in a straight line. If the blade wanders from its straight path, the rear of the blade can bind against the side of the kerf. If the saw has to be turned off in the middle of a cut, make sure the blade has stopped spinning before taking your hand off the saw. Always keep your body out of the line of potential kickback.

Use two hands whenever possible, one on the trigger switch and the other on a front knob handle. Secure work being cut to avoid movement.

References

- **General Industry**
  Oregon OSHA Division 2/Subdivision P 29 CFR 1910.243(a)(1)(i)
  Oregon OSHA Division 2/Subdivision P OAR 437-002-0266(1)
- **Construction**
  Oregon OSHA Division 3/Subdivision I 29 CFR 1926.304(d)
- **Agriculture**
  Oregon OSHA Division 4/Subdivision O OAR 437-004-2230(1)(a)
- ANSI/UL 45-1990 *Portable Electric Tools*

Portable jigsaw

Handheld jigsaws are useful for cutting intricate curves and patterns in thin stock. They have thin blades that move rapidly up and down through the saw's guide plate. The blade is held in a chuck. The operator either holds the saw with one hand while the other hand is used to secure the stock, or the saw is held with both hands if the stock is already secured.

Hazard

Serious cuts can occur when the operator contacts the reciprocating blade. Much of the blade is exposed by design and contact can be made before or after the cut, or during the cut if the operator's hand is securing the material underneath the stock and in the path of the blade.

Solution

Ensure the portion of the blade above the guide plate is adequately guarded. This may require setting it to an appropriate height.

Be aware of the portion of the blade below the stock, especially if you are using one hand to secure the material.

Make turns slowly and use a narrow blade for sharp turns.

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