

36 HAND TOOLS

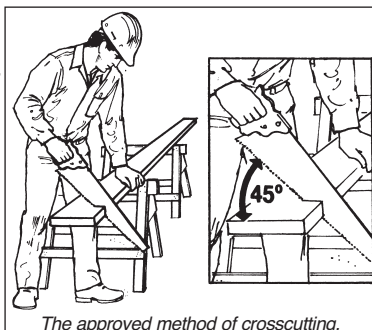
Injuries with hand tools are not often serious but they do involve lost time. Common causes include using the wrong tool, using the right tool improperly, haste, and lack of training or experience.

Hand Saws

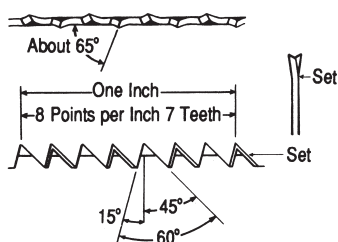
Select the right saw for the job.

A 9-point hand saw is not meant for crosscutting hardwood. It can jump up and severely cut the worker's hand or thumb.

For this kind of work, the right choice is an 11 point (+). When starting a cut, keep your thumb up high to guide the saw and avoid injury.



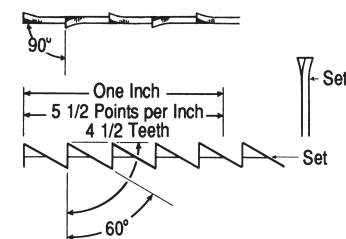
The side and tooth-edge views of a typical crosscut saw. This saw is used for cutting across the grain and has a different cutting action than that of the rip saw. The crosscut saw cuts on both the forward and backward strokes.



For cutting softwood, select a 9 point (-). The teeth will remove sawdust easily and keep the saw from binding and bucking.

Ripping requires a rip saw. Check the illustrations for the differences in teeth and action between rip and crosscut saws.

The side and tooth-edge views of a typical rip saw. This saw is used for cutting with the grain. Cutting is done only on the forward stroke.



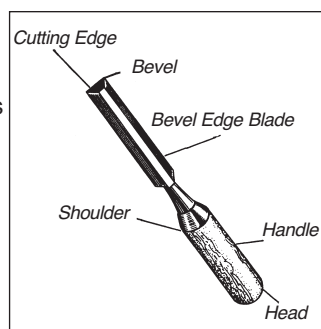
Wood Chisels

Most injuries with this tool can be prevented by keeping the hand that holds the work **behind**, not in front of, the chisel.

A dull or incorrectly sharpened chisel is difficult to control and tedious to work with.

Chisels not in use or stored in a toolbox should have protective caps.

Wood chisels are tempered to be very hard. The metal is brittle and will shatter easily against hard surfaces.



Never use a chisel for prying.

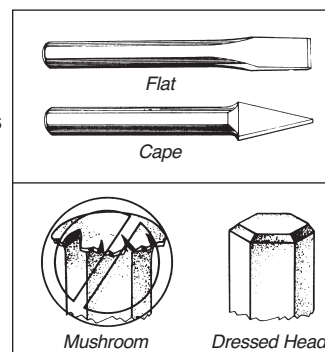
Repeatedly striking the chisel with the palm of your hand may lead to a musculoskeletal disorder.

With chisels and other struck tools, **always wear eye protection**. Gloves are recommended to help prevent cuts and bruises.

Cold Chisels

Cold chisels are used to cut or shape soft metals as well as concrete and brick.

In time, the struck end will mushroom. This should be ground off. Don't use chisels with mushroomed heads. Fragments can fly off and cause injury.

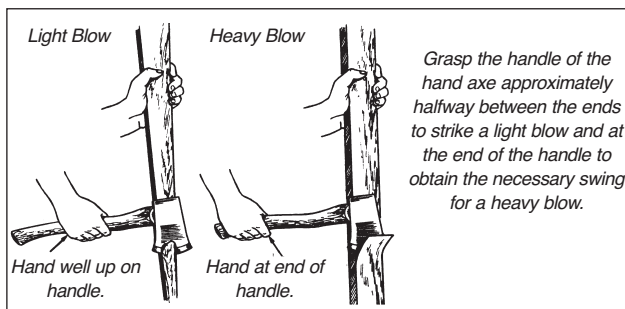
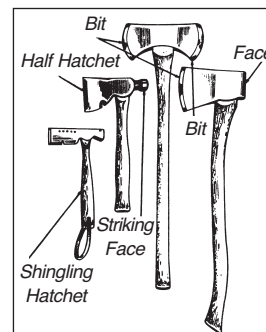


Axes and Hatchets

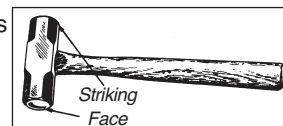
In construction, axes are mainly used for making stakes or wedges and splitting or shaping rough timbers.

Unless it has a striking face, don't use the hatchet as a hammer. The head or the wooden handle can crack and break.

Hatchets with striking faces are meant only for driving common nails, not for striking chisels, punches, drills, or other hardened metal tools.



Never use an axe or hatchet as a wedge or chisel and strike it with a hammer.



Most carpenters prefer a hatchet with a solid or tubular steel handle and a hammer head with a slot for pulling nails.

Sledgehammers

Sledgehammers are useful for drifting heavy timbers and installing and dismantling formwork. They can knock heavy panels into place and drive stakes in the ground for bracing.

Sledgehammers can also be used to drive thick tongue-and-groove planking tightly together. Use a block of scrap wood to prevent damage to the planks.

The main hazard is the weight of the head. Once the hammer is in motion it's almost impossible to stop the swing. Serious bruises and broken bones have been caused by sledgehammers off-target and out of control.

Missing the target with the head and hitting the handle instead can weaken the stem. Another swing can send the head flying.

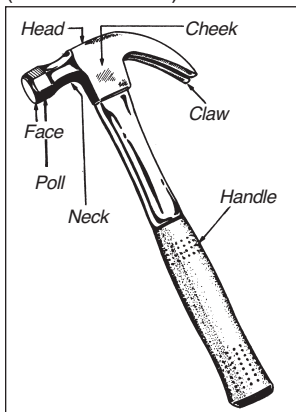
Always check the handle and head. Make sure the head is secure and tight. Replace damaged handles.

As with any striking or struck tool, always wear eye protection.

Swinging a sledgehammer is hard work. Avoid working to the point of fatigue. Make sure you have the strength to maintain aim and control.

Claw Hammers

These are available in many shapes, weights, and sizes for various purposes. Handles can be wooden or steel (solid or tubular). Metal handles are usually covered with shock-absorbing material.



Caution: Repeated use of a hammer may lead to musculoskeletal injury, strain, or carpal tunnel syndrome. Exercising to warm up, as well as to develop and maintain overall muscle condition, may help to reduce the risk of strain or injury.

Don't use nail hammers on concrete, steel chisels, hardened steel-cut nails, or masonry nails.

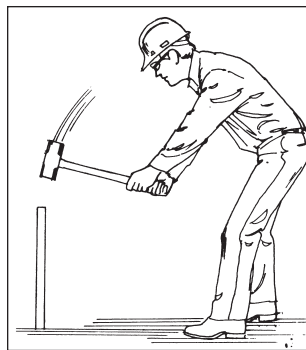
Discard any hammer with a dented, chipped, or mushroomed striking face or with claws broken, deformed, or nicked inside the nail slot.

Utility Knives

Utility knives cause more cuts than any other sharp-edged cutting tool in construction.

Use knives with retractable blades only.

Always cut away from your body, especially away from your free hand. When you're done with the knife, retract



Hammer On Target

the blade at once. A blade left exposed is dangerous, especially in a toolbox.

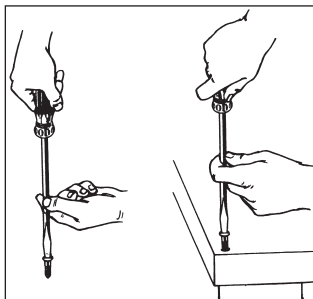
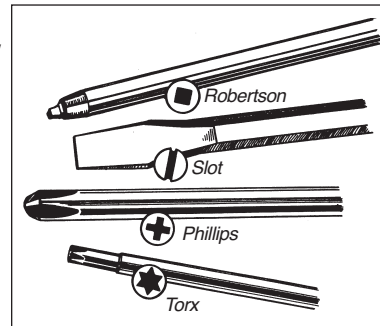
Screwdrivers

More than any other tool, the screwdriver is used for jobs it was never meant to do.

Screwdrivers are not intended for prying, scraping, chiselling, scoring, or punching holes.

The most common abuse of the screwdriver is using one that doesn't fit or match the fastener. (i.e., using a screwdriver too big or too small for the screw or not matched to the screw head).

The results are cuts and punctures from slipping screwdrivers, eye injuries from flying fragments of pried or struck screwdrivers, and damaged work.

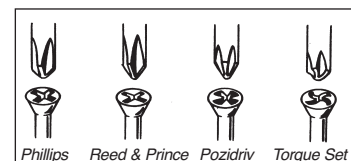


Always make a pilot hole before driving a screw.

Start with one or two "soft" turns, that is, with the fingers of your free hand on the screw. Engage one or two threads, make sure the screw is going in straight, then take your fingers away.

You can put your fingers on the shank to help guide and hold the screwdriver. But the main action is on the handle, which should be large enough to allow enough grip and torque to drive the screw. Power drivers present obvious advantages when screws must be frequently or repeatedly driven.

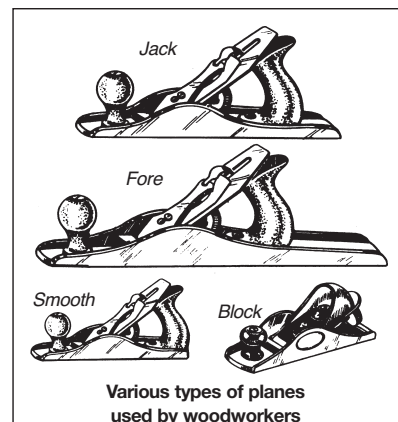
Note: All cross-point screws are not designed to be driven by a Phillips screwdriver. Phillips screws and drivers are only one type among several crosspoint systems. They are **not** interchangeable.



Hand Planes

Hazards include the risk of crush and scrape injuries when the hand holding the plane strikes the work or objects nearby. Cuts and sliver injuries are also common.

The hand plane requires some strength and elbow grease to use properly. The



Various types of planes used by woodworkers

hazards of overexertion and tendinitis can be aggravated by using a dull iron or too short a plane.

Use the plane suited to the job and keep the iron sharp.

For long surfaces like door edges, use a fore plane 18" long and 2 $\frac{3}{8}$ " wide or a jointer plane 24" long and 2 $\frac{5}{8}$ " wide.

For shorter surfaces, use a jack plane 15" long and 2 $\frac{3}{8}$ " wide or a smoothing plane 10" long and 2 $\frac{3}{8}$ " wide.

Remember that sharp tools

require less effort and reduce the risk of fatigue, overexertion, and shoulder and arm strain.

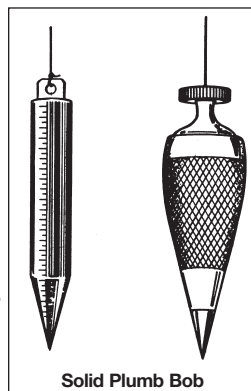
Work can also be easier with a door jack and supports on your work bench.

Plumb Bobs

The weight of a mercury-filled plumb bob will surprise you. Designed for use in windy conditions, the bob has considerable weight in proportion to its surface area.

The weight and point of the bob can make it dangerous. Ensure that all is clear below when you lower the bob.

Don't let it fall out of your pocket, apron, or tool bag. The same goes for the standard solid bob.

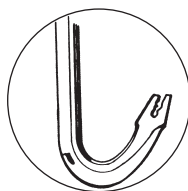


Solid Plumb Bob

Crow Bars

Any steel bar 25-150 cm long and sharpened at one end is often called a crow bar.

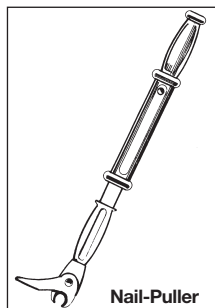
The tools include pry bars, pinch bars, and wrecking bars. Shorter ones usually have a curved claw for pulling nails and a sharp, angled end for prying.



Nail Pulling

Pulling out nails can be easier with a crow bar than a claw hammer.

In some cases, a nail-puller does the job best. Keep the hand holding the claw well away from the striking handle.



Nail-Puller

Lifting

Loads levered, lifted, or shifted by bars can land on fingers and toes.

- Make sure to clear the area and maintain control of the load.
- Have enough rollers and blocking ready.

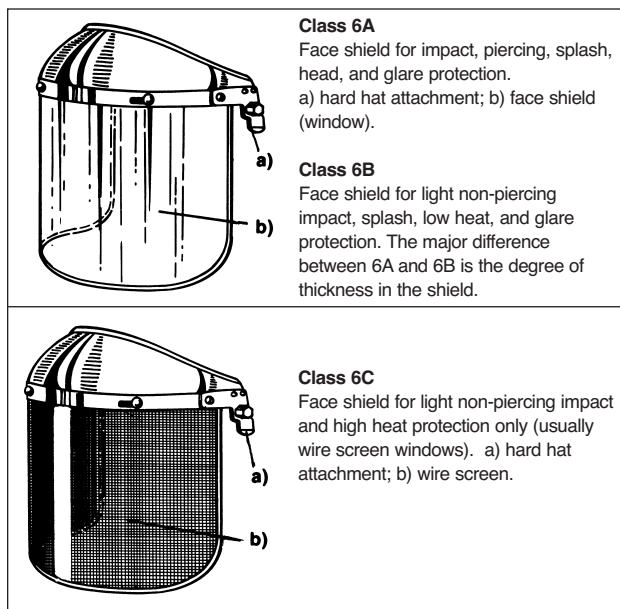
- Never—not even for a split second—put fingers or toes under the load.

General

Try to avoid prying, pulling, wedging, or lifting at sharp angles or overhead.

Wherever possible, keep the bar at right angles to the work.

Wear eye protection and, where necessary, face protection.



Class 6A

Face shield for impact, piercing, splash, head, and glare protection. a) hard hat attachment; b) face shield (window).

Class 6B

Face shield for light non-piercing impact, splash, low heat, and glare protection. The major difference between 6A and 6B is the degree of thickness in the shield.

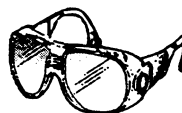
Class 6C

Face shield for light non-piercing impact and high heat protection only (usually wire screen windows). a) hard hat attachment; b) wire screen.

Examples of Class 1 - Spectacles



Class 1A
Spectacles with side protection



Class 1B
Spectacles with side and radiation protection