

1 HAND TOOLS

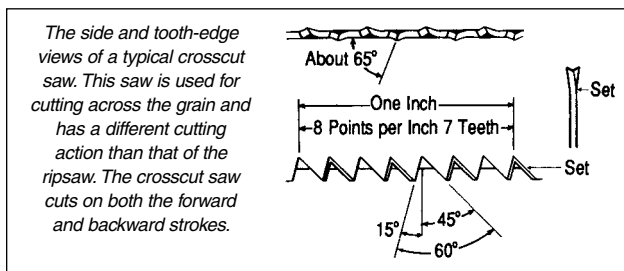
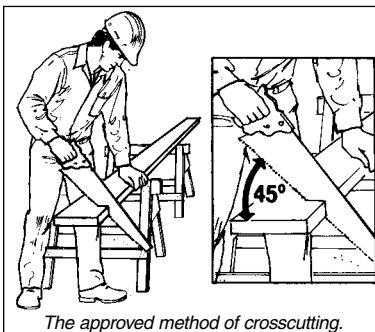
Injuries with hand tools are not often serious but they do involve lost time. Common causes include using the wrong tool, using the right tool improperly, haste, and lack of training or experience.

Hand Saws

Select the right saw for the job.

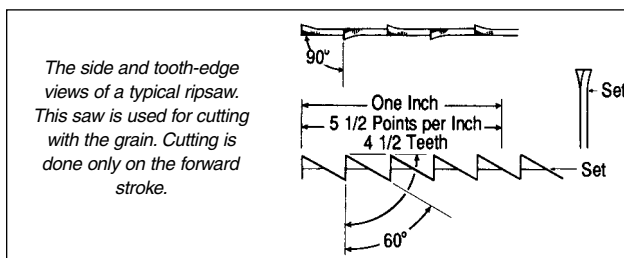
A 9 point is not meant for crosscutting hardwood. It can jump up and severely cut the worker's hand or thumb.

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.



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.



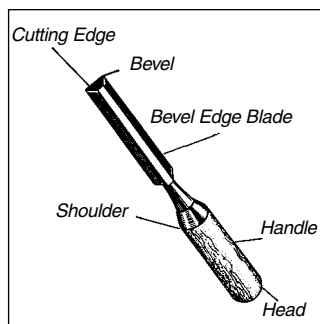
Wood Chisels

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.

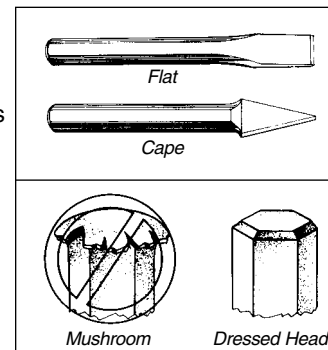
Repeatedly striking the chisel with the palm of your hand may lead to repetitive strain injury.

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.

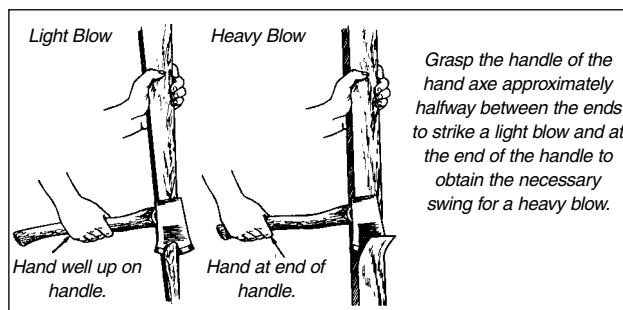
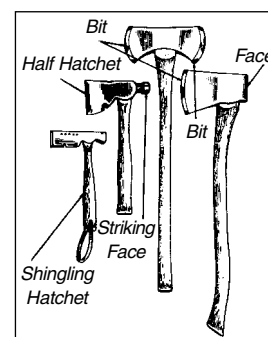


Axes and Hatchets

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

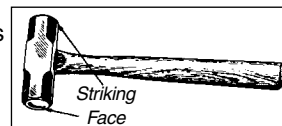
Unless it has a striking face, don't use the hatchet as a hammer. The head or the wooden handle can crack and break.

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.

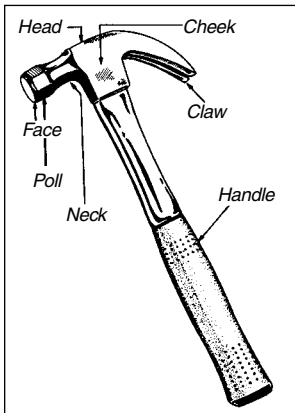
Always check handle and head. Make sure head is secure and tight. Replace damaged handles.

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 wood 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.

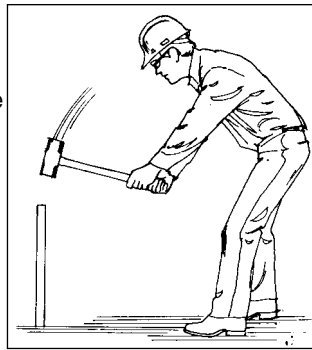
Discard any hammer with a dented, chipped, or mushroomed striking face or with claws broken, deformed, or nicked inside the nail slot.

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



Hammer On Target

Start with a good quality hammer of medium weight (16 ounces) with a grip suited to the size of your hand.

Rest your arm occasionally to avoid tendinitis. Avoid overexertion in pulling out nails. Use a crow bar or nail puller when necessary.

When nailing, start with one "soft" hit, that is, with fingers holding the nail. Then let go and drive the nail in the rest of the way.

Strike with the hammer face at right angles to the nailhead. Glancing blows can lead to flying nails. Clean the face on sandpaper to remove glue and gum.

Don't use nail hammers on

your free hand. When you're done with the knife, retract the blade at once. A blade left exposed is dangerous, particularly in a toolbox.

Screwdrivers

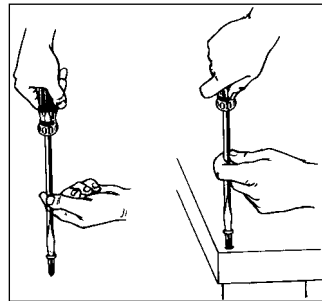
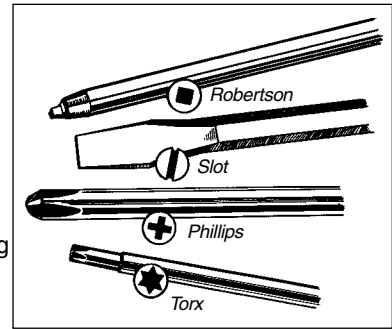
More than any other tool, the screwdriver is used for jobs it was never meant to do.

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.

That means 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.

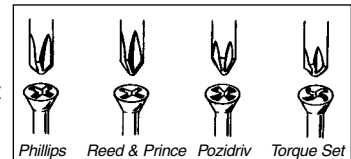


Always make a pilot hole before driving a screw.

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.

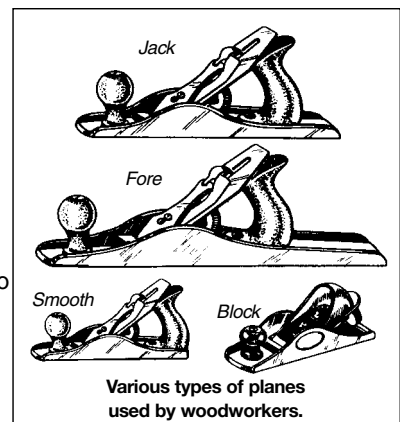
Note: All cross-point screws are not designed to be driven by a Phillips screwdriver. Phillips screws and drivers are only one type among several crosspoint systems. They are **not** interchangeable.



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



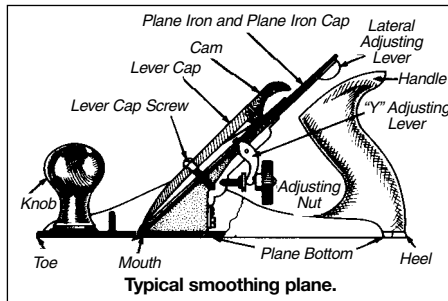
Various types of planes used by woodworkers.

grease to use properly. The 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 3/8" wide or a jointer plane 24" long and 2 5/8" wide.

For shorter surfaces, use a jack plane 15" long and 2 3/8" wide or a smoothing plane 10" long and 2 3/8" wide.



Remember that sharp tools require less effort and reduce the risk of fatigue, overexertion, and back strain.

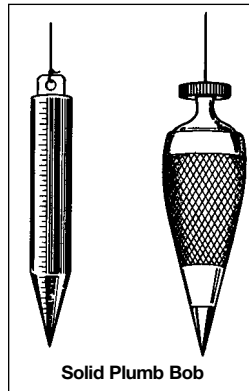
Work can also be easier with a door jack (page 182) and supports on your work bench.

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.

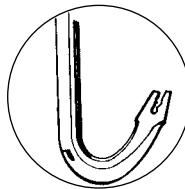
Don't let it fall out of your pocket, apron, or tool bag. The same goes for the standard solid bob.



Crow Bars

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

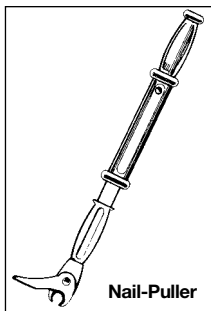
The tools include pry bars, pinch bars, and wrecking bars. Shorter ones usually have a curved claw for pulling nails and a sharp, angled end for prying.



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.



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.

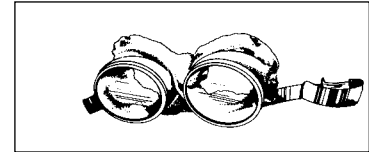
- Never – not even for a split second – put fingers or toes under the load.

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.



2 POWER TOOLS — DRILLS, PLANES, ROUTERS

Safety Basics

- Make sure that electric tools are properly grounded or double-insulated.
- Never remove or tamper with safety devices.
- Study the manufacturer's instructions before operating any new or unfamiliar electric tool.
- Regulations require that ground fault circuit interrupters (GFCIs) be used with any portable electric tool operated outdoors or in wet locations.
- Before making adjustments or changing attachments, always disconnect the tool from the power source.
- When operating electric tools, always wear eye protection.
- When operating tools in confined spaces or for prolonged periods, wear hearing protection.
- Make sure that the tool is held firmly and the material properly secured before turning on the tool.

Drills

Types

With suitable attachments, the drill can be used for disk sanding, sawing holes, driving screws, and grinding.

However, when such applications are repeatedly or continuously required, tools specifically designed for the work should be used.

Trim carpenters will generally select a 1/4 or 3/8 inch trigger-controlled variable speed drill (Figure 129). Simply by increasing pressure on the trigger, the operator can change drill speed from 0 to 2,000 rpm.

Carpenters working in heavy structural construction such as bridges, trusses, and waterfront piers will usually select the slower but more powerful one- or two-speed reversible 1/2 or 3/4 inch drill (Figure 130a).

Size of the drill is determined by the maximum opening of the chuck. For instance, a 3/8 inch drill will take only bits or attachments with a shank up to 3/8 inch wide.

