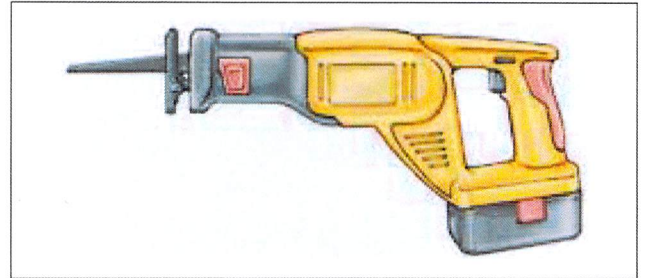


Power tools—saws

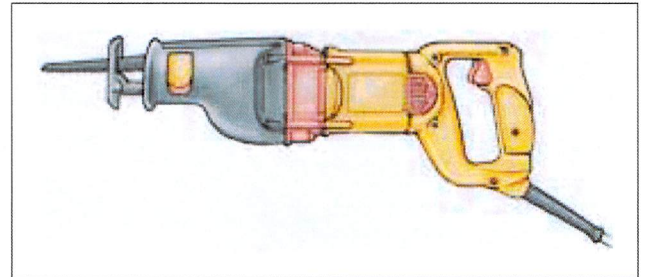
The following saws are commonly used in house construction: circular saw, quick cut saw (cut off), sabre saw (reciprocating), chain saw, chop saw, radial arm saw, and table saw.

Basic safety

- Wear the appropriate protective clothing at all times when operating a saw, especially eye protection.



Battery-operated reciprocating saw

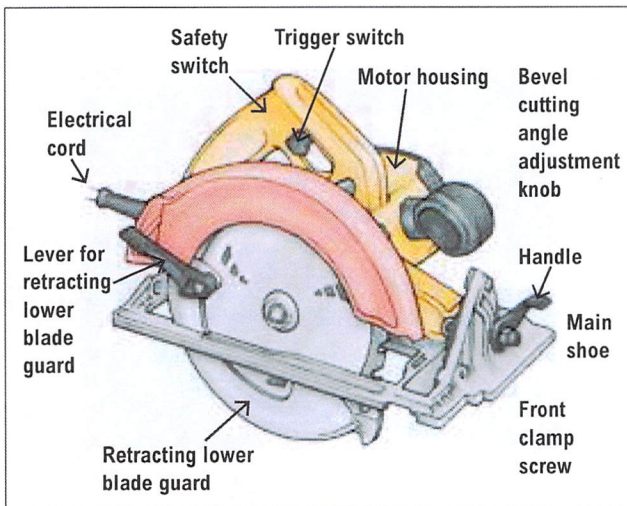


Electrically operated reciprocating saw

- When ventilation is poor, wear a suitable dust mask. Exposure to dust from materials such as particle board or medium density fibre (MDF) board may cause health problems.
- When using saws for long periods of time, especially in a confined space, wear hearing protection.
- Use a ground fault circuit interrupter for all electrically operated tools.
- Disconnect the power source on all tools before making any changes or adjustments.
- Never put hand tools down on a bench or on the floor while the blade is still moving.
- When using hand-held saws:
 - Keep hands away from the rotating blade; wet lumber, plywood, or wood with a twisting grain can cause binding and kick back of the blade.
 - Rest or clamp wood to a bench or sawhorse on a stable footing; make sure you have a firm grip on the wood being cut.
 - Always use the right blade for the material you are cutting; ensure that it is sharp and installed correctly.
- When using a sabre saw (reciprocating), caution should be exercised when cutting near electrical wiring, copper or plastic piping.

- Only persons trained in the operation, care, and maintenance of the quick cut saw should use it, because it is a powerful machine. When operating the saw, always have both hands holding the saw and be on a firm footing. Some of the hazards include, but are not limited to
 - High-speed blade rotation and exposure during operation
 - Exhaust fumes from combustion engine
 - Dust when dry cutting concrete or masonry
 - Showers of hot sparks when cutting sheet metal or solid steel
- Quick cut saws are generally gas-operated machines. When re-fueling, shut off the engine; ensure that this is carried out in a well-ventilated area, preferably outside. Any gas spills must be cleaned up immediately to ensure the vapors cannot come into contact with any form of ignition.

Portable circular saws

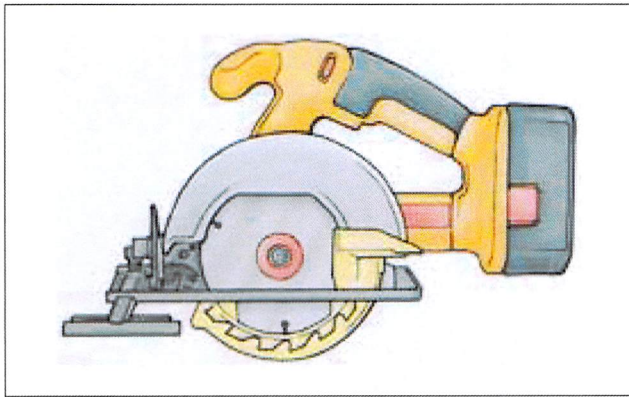


Electrically operated portable circular saw

Safe work procedures

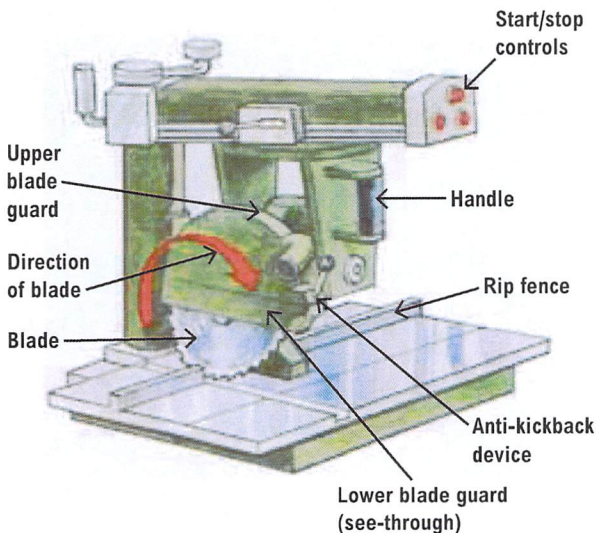
- Permit only trained and experienced workers to operate a saw.
- Wear proper eye and hearing protection, and when required, respiratory protection.
- Use sharp blades designed for your work and recommended by the tool manufacturer.
- Check the retractable lower blade guard before use, to make certain that it works correctly.
- Allow the saw to reach full power before cutting.
- Make sure the lower blade guard is fully returned before laying down the saw.
- Disconnect the power supply before adjusting or changing the blade.
- Keep all electrical cords clear of the cutting path.
- Use both hands to operate the saw.
- Keep the saw blade guards and motor clean and free of sawdust.
- Secure the work while cutting.
- Do not fix or hold the retractable lower blade guard in the open position.
- Do not place your hand under the shoe or guard of the saw while the saw is connected to the power supply.
- Do not overtighten the saw blade locking nut.
- Do not twist the saw while cutting to change direction or saw alignment unless the blade is designed for that purpose.
- Do not use a saw that vibrates or is defective.

- Do not force the saw during cutting.
- Do not cut materials without first checking for obstructions or foreign objects such as nails and screws in the cutting path of the saw.
- Do not carry portable circular saws with hands or fingers on the trigger switch.



Battery-operated portable circular saw

Radial arm saws

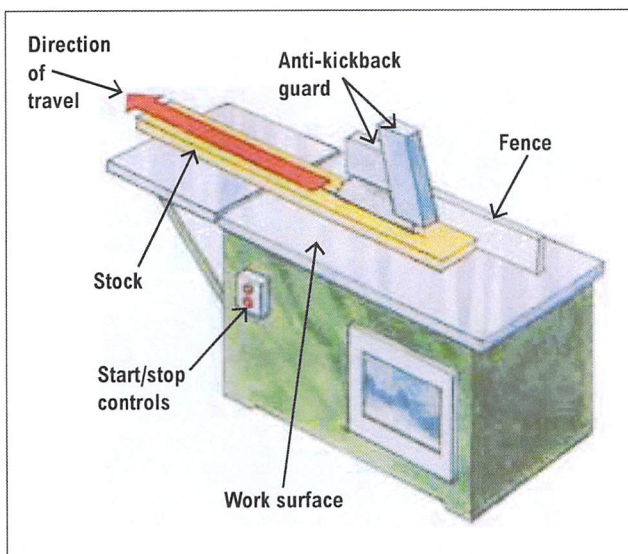


Safe work procedures

- Wear proper eye and hearing protection, and when required, respiratory protection.
- A radial arm saw cutting table must be of sufficient width so that no part of the saw blade overhangs the forward edge of the table. A stop may also be used to limit forward travel of the saw to prevent overhang.
- Saws must not be operated at speeds in excess of the manufacturer's recommendation.
- Only use accessories designed for the saw and recommended by the manufacturer.
- Make sure the blade guard is in place and properly adjusted.
- Stand on the handle side of the saw when cross cutting.
- Return the saw blade to behind the fence after each cut.
- Make sure the overall length of the saw table (both infeed and outfeed) is twice the length of the lumber being cut.
- Make sure during ripping that material is fed counter to the saw blade rotation.
- The motor head must be locked into position at the correct height and desired angle.
- Clamp stock to the table when making mitre, bevel, or compound mitre cuts. This overcomes the tendency of the stock to slide along the fence.
- Turn off the saw and unplug the electrical cord when making changes.

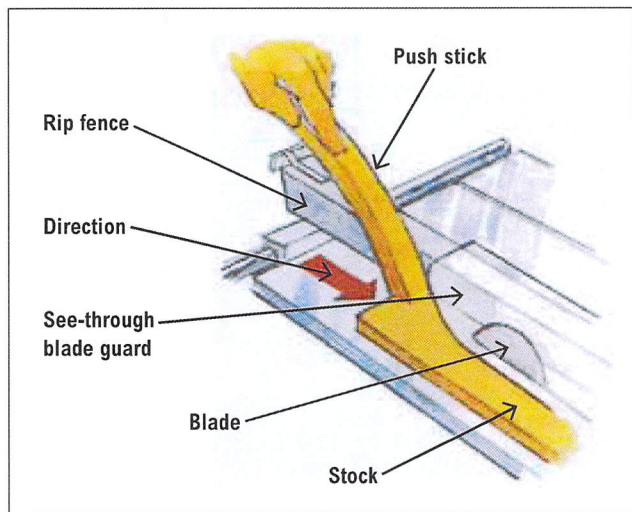
- When it is necessary to measure stock on the cutting table, the saw must be turned off until measuring is complete.
- Do not use radial arm saws for ripping unless spreader and anti-kickback devices are used.
- During operation, do not remove your hand from the operating handle, unless the cutting head is behind the fence.
- Do not remove stock from the cutting table until the saw blade has been returned to its position behind the fence.
- Do not cut “free-hand.” The material to be cut must lie solidly on the cutting table against the back guide.
- Do not use any circular saw blade having a crack exceeding $\frac{1}{10}$ of the saw diameter or any circular saw blade with cracks adjacent to the collar line.

Table saws

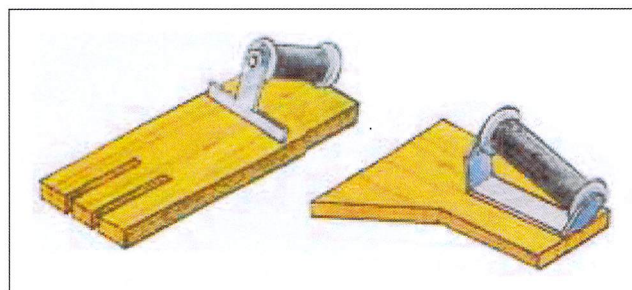
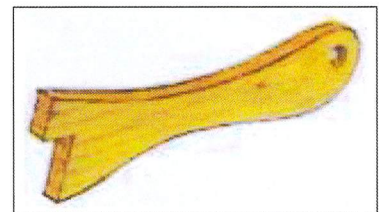


Safe work procedures

- Wear proper eye and hearing protection, and when required, respiratory protection.
- Refer to and follow the table saw manufacturer's instructions for reducing the risk of kickback.
- Permit only trained and experienced workers to operate the saw.
- Make sure the guard is in place and working correctly.
- Choose the proper saw blade for the type of work being done.
- Keep saw blades clean, sharp, and properly set so they will cut freely without being forced.
- Keep the work area clean. Operate the table saw in a non-congested, well-lighted area.
- Feed material into the saw blade counter to the direction of rotation.
- During cutting, keep hands out of the line of the saw cut.
- Use the saw blade guard with a spreader and anti-kickback fingers for ripping or cross cutting operations.
- Keep your body to the side of the saw blade out of the line of a possible kickback.
- Use a push stick when ripping narrow stock.



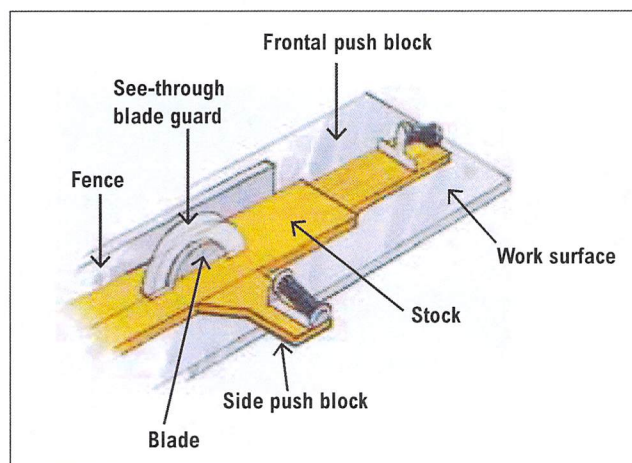
Simple push stick useful on table saw when distance between the blade and fence is narrow



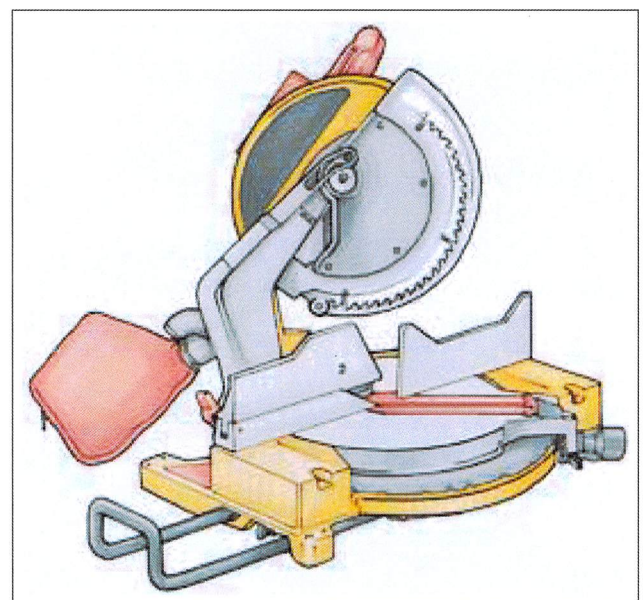
Frontal push block

Side push block

- When changing the saw blade:
 1. Stop the machine
 2. Disconnect the power supply
 3. Place the plug end of the cord on top of the saw table
 4. Replace the saw blade
- Do not perform free-hand sawing. The stock must be held firmly against the mitre gauge or rip fence to position and guide the cut.
- Do not reach around or over a moving saw blade.
- Do not leave the table saw unattended while the saw blade is in motion.



Use of two push blocks on single application

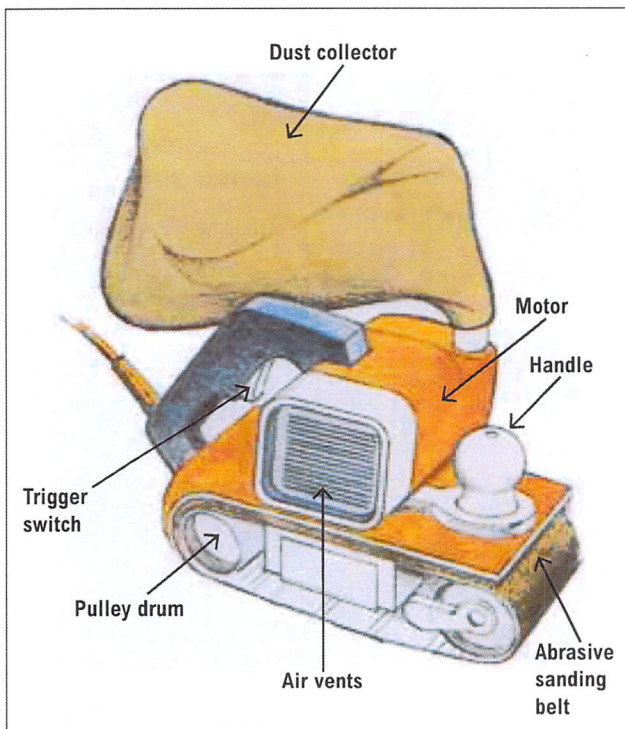


Electrically operated mitre saw

Other electrically operated tools

- When operating screw guns, extra care must be taken when changing drill bits to avoid contact with the power source. To avoid constant twisting of the wrist, set the right torque for the size of screw.
- When using large hammer drills to drill horizontally above the waistline or upward, special care is needed. The drill bits can jam, and the torque on the drill can cause severe twisting of the wrist.
- When using any type of drill or screw gun, safety glasses must be worn at all times; and in some cases, a full face shield may be required.

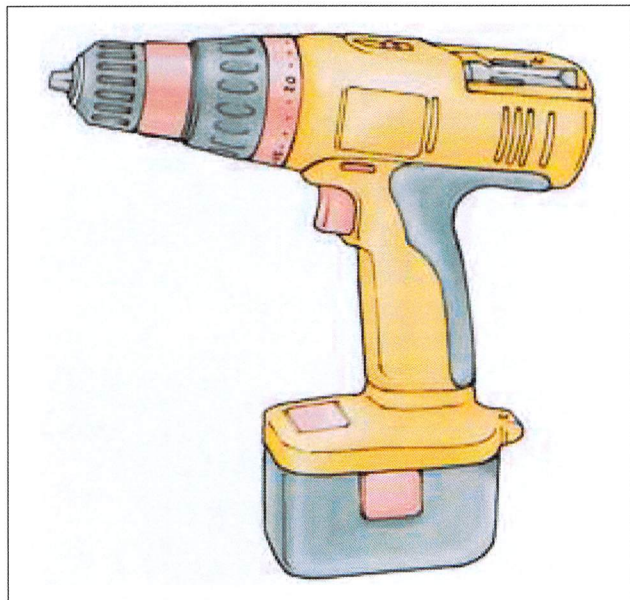
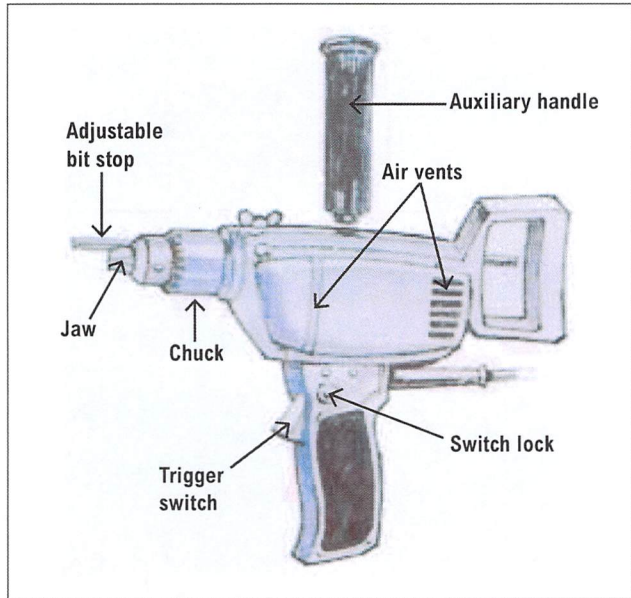
Powered hand belt sander



Safe work procedures

- Wear proper eye and hearing protection, and when required, respiratory protection.
- Disconnect the power supply before changing the sanding belt, making adjustments, or emptying the dust collector.
- Use sanding belts that are the same width as the pulley drum.
- Make sure the sanding belt is installed in the direction indicated on the belt and sander.
- Inspect sanding belts before using them. Replace worn or frayed belts.
- Keep hands away from the sanding belt. Use both hands to operate the sander, one on the trigger switch and the other on the front knob handle.
- Keep all cords clear of the sanding area during operation.
- Clean dust from the motor and vents at regular intervals.
- Do not exert excessive pressure upon the moving sander.
- Do not use a sander without an exhaust system or dust collector. Empty the collector when $\frac{1}{4}$ full.
- Do not work on unsecured material that can be thrown by belt motion. Secure the material or use a stop block.

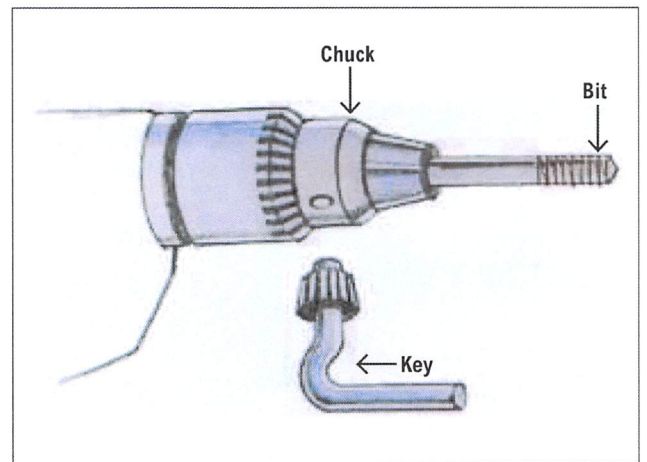
Powered hand drills



Battery operated power drill

Safe work procedures

- Wear proper eye and hearing protection.
- Keep drill vents clear to maintain adequate drill ventilation.
- Keep drill bits sharp at all times.
- Keep electrical cords clear of the drilling area.
- Secure the material being drilled to prevent movement.
- Slow the rate of feed before breaking through the surface.
- Drill a small pilot hole before drilling large holes.
- Disconnect the power supply before changing or adjusting the drill bit or other attachments.
- Remove the chuck key before connecting the drill to the power supply.



-
- Do not use a bent or damaged drill bit.
 - Do not exceed the manufacturer's recommended maximum drilling capacities.
 - Do not use high speed steel bits without cooling or lubrication.
 - Do not reach under or around material being drilled.
 - Do not overreach. Keep proper footing and balance at all times.
 - Do not drill with one hand while holding the material with the other.

Chain saws for construction

- Chain saws used for construction must be equipped with a chain brake and with anti-kickback chain.
- Whether a chain saw is electric- or gasoline-powered, operators must follow the manufacturer's recommended safe operating procedures.
- Never walk around with a saw in the operating mode. Switch off the power source.
- Do not attempt to cut anything other than wood with a chainsaw.
- When operating a chain saw, safety goggles and hearing protection must be worn at all times.
- Trousers or chaps, with ballistic nylon pads sewn in, will provide protection to the legs.

- Hold the saw securely with both hands with fingers and thumb around the handles. This grip helps prevent the hands being dislodged and provides control in the event of a kickback.

Safe work procedures

- Don't operate the saw when you are tired.
- Know where the bar tip is at all times.
- Don't allow the cut to bind (close) on the saw chain.
- Make sure the chain brake is functioning.

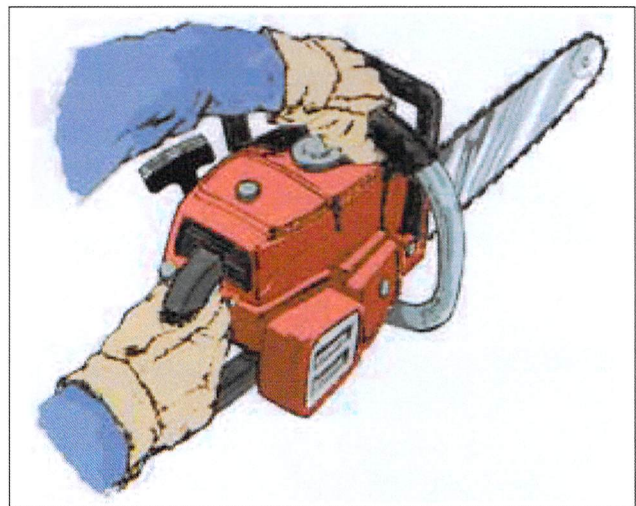
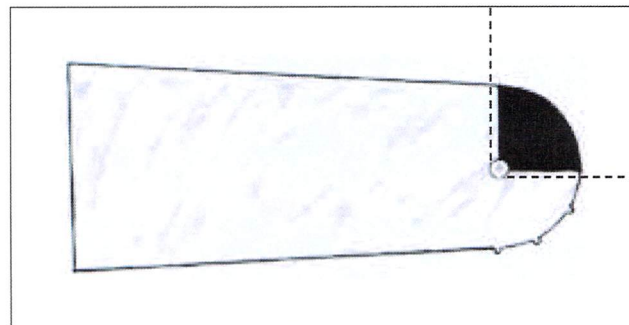


Diagram showing proper grip of a chain saw

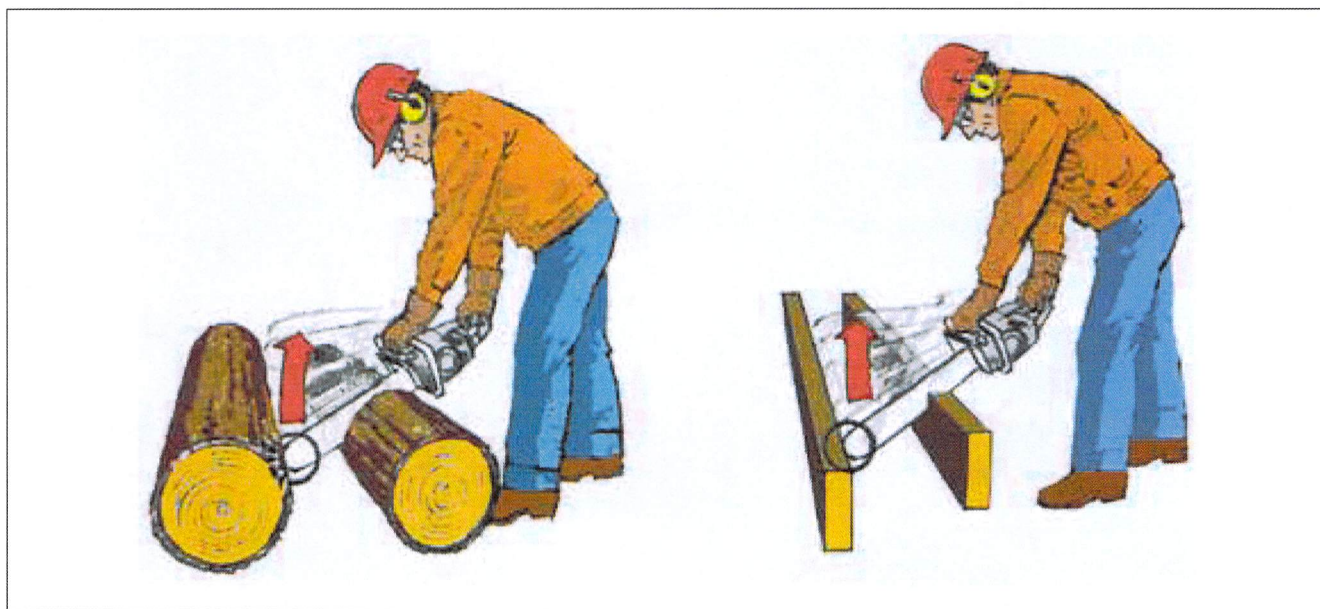
Kickback

The most common and usually most violent kickback occurs when contact is made in the “kickback” zone.

Contact in this zone makes the chain bunch up and try to climb out of the cutting track. This often happens when the saw tip makes contact with something beyond the cutting area, such as a tree branch, a log, or planks.



Make sure to avoid contact in the kickback zone (shown in black).



The above examples show how kickback can occur.

Construction site hazards

Many of the hazards in falling and bucking trees will also be encountered by workers cutting dressed lumber or timbers on a residential construction job site.

Safe work procedures

- Take extra care when making pocket cuts. Start the cut with the underside of the chain tip, then work the saw down and back to avoid contact with the kickback zone. Consider the use of a sabre (reciprocating) saw to make pocket cuts.

- Be particularly careful to avoid contact with nails, piping, or other objects. This is especially important when making a pocket cut through framing lumber such as a subfloor or when cutting used lumber such as shoring, lagging, or blocking timbers.

