

Chainsaw Safety & Operating Techniques

IMPORTANT NOTE AND DISCLAIMER: This is not meant as a training program or brochure. These are only tips to be kept in mind when operating a chainsaw. For complete training, please consult a professional, safety manual or safety DVD.



Chainsaws are one of the most dangerous tools to use. Common sense, combined with safe use of your chain saw, will make for a pleasurable and efficient experience.

Prepare Yourself

Always prepare yourself before operating a chainsaw. If you have never operated a chainsaw, you should obtain training from someone who is familiar with recommended safe operational procedures before attempting to work with a chainsaw.

NEVER operate your chainsaw unless you are in top physical and mental condition. If you are taking medications, under the influence of alcohol or otherwise in a condition where your physical and mental abilities are impaired, do not attempt to operate a chainsaw. Chainsaws are dangerous machines that can maim or kill the operator. Your chance of injury is significantly decreased if you are rested, alert and healthy.

Make sure you are properly dressed. Safety goggles, hearing protection, steel-toed shoes, hardhat, gloves, and close fitting clothing are all highly recommended when working with chain saws. To reduce the risk of cut injuries, wear pants or chaps that contain pads of cut retardant material.



The Power Tool

Always check that your chainsaw is in good condition before continuing work. Check in particular that the fuel system is tight (no leaks) and that the controls and safety devices are working properly. Do not continue operating the machine if it damaged. In case of doubt, have it checked by your servicing dealer.

Fueling

Chainsaw engines are 2-stroke and require a mixture of gas and oil to run properly. In most cases a ratio of 50:1 is required. Most manufacturers recommend 89-octane fuel. Be sure to refuel your chainsaw in well-ventilated areas, outdoors. Always shut off the engine and allow it to cool before refueling.

Correct Chain Tension

To ensure good cutting action and a long chain life, check chain tension frequently. If the chain is loose, it will come off; if too tight, the chain will bind and overheat. All chains stretch with use. Most of the stretching occurs within the first half hour of operation. If the chain becomes loose while cutting, shut off the engine and then tighten. Never try to adjust the chain while the engine is running.

Starting the Chainsaw

Be sure the guide bar and chain are clear of you and all other obstructions and objects, including the ground. To reduce the risk of injury from chain contact, the chain brake must be engaged when starting the saw. When the engine is started, the engine speed with the starting throttle lock engaged will be fast enough for the clutch to engage the sprocket and, if the chain brake is not activated, turn the chain.

1. With the choke lever down and the chain brake engaged, place the chainsaw on firm ground or other solid surface in an open area. Maintain good balance and footing. Grip the front handlebar of the saw firmly with your left hand and press down. For saws with a rear handle level with the ground, put the toe of your right foot into the rear handle and press down.
2. With your right hand pull out the starter grip slowly until you feel a definite resistance and then give it a brisk, strong pull.



When the engine fires:

3. Move the choke control to its original position (choke open).
4. Pull the starter rope again until the engine remains on. Operate the throttle to automatically disengage the “fast-idle” position.
5. Release chain brake.

During Operation

Always hold the unit firmly with both hands on the handles while you are working. Wrap your fingers and thumbs around the handles. Your right hand should grip the rear handle. This also applies to left-handers. With your hands in this position, you can best oppose and absorb the push, pull and kickback forces of your saw without losing control.

- To reduce the risk of cut injuries, keep hands and feet away from the cutting tool.
- Never touch a moving cutting tool with your hand or any other part of your body.
- To reduce the risk of injuries, never work on a ladder or any other insecure support.
- Never hold the machine above shoulder height.
- Never work in a tree unless you have received specific, professional training for such work, are properly secured, have both hands free for operating the chainsaw in a cramped environment and have taken proper precautions to avoid injury from falling limbs or branches.

Reactive Forces

Reactive forces may occur at any time the chain is rotating. Reactive forces can cause serious personal injury. The powerful force used to cut wood can be reversed and work against the operator. If the rotating chain is suddenly stopped by contact with any solid object such as a log or branch or is pinched, the reactive forces may occur instantly. These reactive forces may result in loss of control, which, in turn, may cause serious or fatal injury. The most common reactive forces are:

- Kickback
- Pushback
- Pull-in

Kickback

Kickback may occur when the moving saw chain near the upper quadrant of the bar nose contacts a solid object or is pinched. The reaction of the cutting force of the chain causes a rotational force on the chainsaw in the direction opposite to the chain movement. This may fling the bar up and back in a lightning fast reaction in an uncontrolled arc mainly in the plane of the bar. Under some cutting circumstances the bar moves towards the operator, who may suffer severe or fatal injury.

Kickback may occur, for example, when the chain near the upper quadrant of the bar nose contacts wood or is pinched during limbing or when it is incorrectly used to begin a plunge or boring cut.

The greater the force of the kickback reaction, the more difficult it becomes for the operator to control the saw. Many factors influence the occurrence and force of the kickback reaction. These include chain speed, the speed at which the bar and chain contact the object, the angle of contact, the condition of the chain and other factors.

The best protection from personal injury that may result from kickback is to avoid kickback situations:

1. Hold the chainsaw firmly with both hands and maintain a secure grip. Don't let go.
2. Be aware of the location of the guide bar nose at all times.
3. Never let the nose of the guide bar contact any object. Do not cut limbs with the nose of the guide bar. Be especially careful near wire fences and when cutting small, tough limbs, small size brush and saplings, which may easily catch the chain.
4. Don't overreach.
5. Don't cut above shoulder height.
6. Begin cutting and continue at full throttle.
7. Cut only one log at a time.
8. Use extreme caution when reentering a previous cut.
9. Do not attempt to plunge cut if you are not experienced with these cutting techniques.
10. Be alert for shifting of the log or other forces that may cause the cut to close and pinch the chain.

11. Maintain saw chain properly. Cut with a correctly sharpened, properly tensioned chain at all times.
12. Stand to the side of the cutting path of the chainsaw.

Pull-In

Pull-in occurs when the chain on the bottom of the bar is suddenly stopped when it is pinched, caught or encounters a foreign object in the wood. The reaction of the chain pulls the saw forward and may cause the operator to lose control.

Pull-in frequently occurs when the bumper spike of the saw is not held securely against the tree or limb and when the chain is not rotating at full speed before it contacts the wood.

To avoid pull-in:

1. Always start a cut with the chain rotating at full speed and the bumper spike in contact with the wood.
2. The risk of pull-in may also be reduced by using wedges to open the kerf or cut.

Pushback

Pushback occurs when the chain on the top of the bar is suddenly stopped when it is pinched, caught or encounters a foreign object in the wood. The reaction of the chain may drive the saw rapidly straight back toward the operator and may cause loss of saw control. Pushback frequently occurs when the top of the bar is used for cutting.

To avoid pushback:

1. Be alert for forces or situations that may cause material to pinch the top of the chain.
2. Do not cut more than one log at a time.
3. Do not twist the saw when withdrawing the bar from a plunge cut or underbuck cut because the chain can pinch.

Cutting Techniques

“Felling a tree” is cutting down a tree.

- Examine the tree to determine which way it leans and how it's weighted. This will have a lot to do with the direction of the fall.
- Examine the surrounding area and make sure it is free of people, power and utility lines and any other objects the tree might strike with the fall.
- Clear the area of people, vehicles, branches and debris.
- If an electric power line runs anywhere near the vicinity of the tree **DO NOT** attempt to work on the tree unless you are absolutely certain that it will not interfere with the electric line. If you must fell the tree and you suspect a problem, call your local utility to remove the tree. They have the expertise to do it safely.
- Gauge wind speed and direction. If windy or gusty conditions exist, postpone felling until conditions improve.

- Carefully observe the area for other trees. A cut tree that becomes entangled with a standing tree and does not properly fall creates a very dangerous hazard. Determine the direction of fall carefully as well as an escape route. **DO NOT** wait until the tree is falling to decide which way you should move to avoid being hit.
- **Plan ahead!** Always plan an escape route to a safe location from your work area. You should plan a path of retreat along a line of approximately 45 degrees from the direction of the falling tree (Figure 3). This is a very important consideration when felling trees. Select a place beforehand to set the chain saw. **NEVER** run with a chain saw in your hand, operating or not. If a dangerous condition occurs, turn off the chain saw and set it down. Chainsaws are replaceable. You are not.
- Plan a safe, unobstructed path of retreat before making felling cut. When tree begins to fall, remove safe, stop motor, set it on ground and retreat rapidly at 45-degree angle from line of fall.
- Plan your cuts carefully. Under most conditions, chain saws can cut smaller trees (up to a 6-inch diameter) with a single pass. Larger trees may require a series of cuts as described in the next section.

Felling Large Trees

Follow these guidelines when felling larger trees (7-inch diameters and up).

1. Start with a two-cut, 45-degree notch on the side of the tree specific to the direction of the fall.
2. Cut the bottom of the notch first, about one third of the way through the diameter. Make the second at a 45-degree angle that meets the depth of the first cut.
3. Make the felling cut from the opposite side of the tree, approximately 2 inches higher than the floor of the notch cut on the opposite side of the tree.
4. Do not cut all the way through. Leave a hinge of about 1/8 to 1/6 of the diameter where you are cutting. This keeps the tree kicking back and upward as it falls. The size of the hinge may vary depending on when the tree starts to fall.
5. When the tree starts to fall, shut off the chain saw, set it down safely (don't throw it), and leave the area along your planned escape route. **DO NOT** return to the site until the tree is down and no longer moving.
6. If the tree should roll, let it. One person cannot stop or control a moving tree.
7. Some trees are very well balanced and do not fall after making the felling cut. In this case use wedges to start the fall and influence its direction. Always use two wedges and a sledge with a face 1/3 larger than the face of the wedge.
8. Plastic wedges are safer than metal. They will not damage the saw teeth or chain. Always remove the chain saw when driving wedged into the cut. Strike the wedge carefully. Careless blows may result in popping the wedge from the cut. This may result in the tree falling backward, on you.
9. Never use an axe as the wedge or driver. Axe heads may shatter and flying pieces can cause injury.

Limbing the Tree

Follow these steps when limbing trees:

1. Before you begin limbing felled or fallen trees, make sure the fallen tree is stable and will not move as you work.
2. Examine the situation at every limb you intend to remove. Make sure the limb will not bind against the saw as you cut.

3. Whenever possible, cut limbs on the opposite side of the tree trunk from which you are working. Doing so keeps the tree trunk between you and the saw (Figure 5).
4. **NEVER** stand on the downhill side when removing limbs. Remember that tree trunks are circular and may roll as you remove limbs.
5. Be aware of limbs that may spring out from released tension during the cut. These limbs can cause injury.
6. Whenever possible, keep the tree limb or similar barrier between yourself and the saw blade.
7. Larger limbs may require more than one cut for safe removal from the tree trunk. Plan your cuts to eliminate the possibility of binding. Stored energy is a very real danger with chain saws and can cause a cut to pinch the blade and immobilize the saw. Use a wedge if you think binding may occur.
8. Always plan an escape route. Large limbs may roll after you remove them from the trunk.
9. When cutting large limbs and/or the tree trunk into convenient lengths (bucking), make sure to support the trunk along its entire length so it will not roll. Block or wedge the trunk in place, if needed.
10. Cut downward from the top of the trunk (overbuck) approximately 1/3 of the diameter and then roll the trunk over to make final cuts.
11. Use wedges to keep the cut open for logs too heavy to roll over. Always drive wedges with care to ensure they will not encounter the chain saw. Even though this should prevent pinching, always be alert to the situation.

Key Safety Tips

- Always avoid making cuts with the saw between your legs, always cut with the saw to the outside of your legs.
- Don't stand on a log and saw between your feet.
- Always stand to one side of the limb you are to cut, never straddle it.
- Always keep in mind where the chain will go if it breaks, never position yourself or other people in line with the chain.
- Keep the chain out of the dirt, debris will fly, the teeth will be dulled and the chain life shortened considerably.