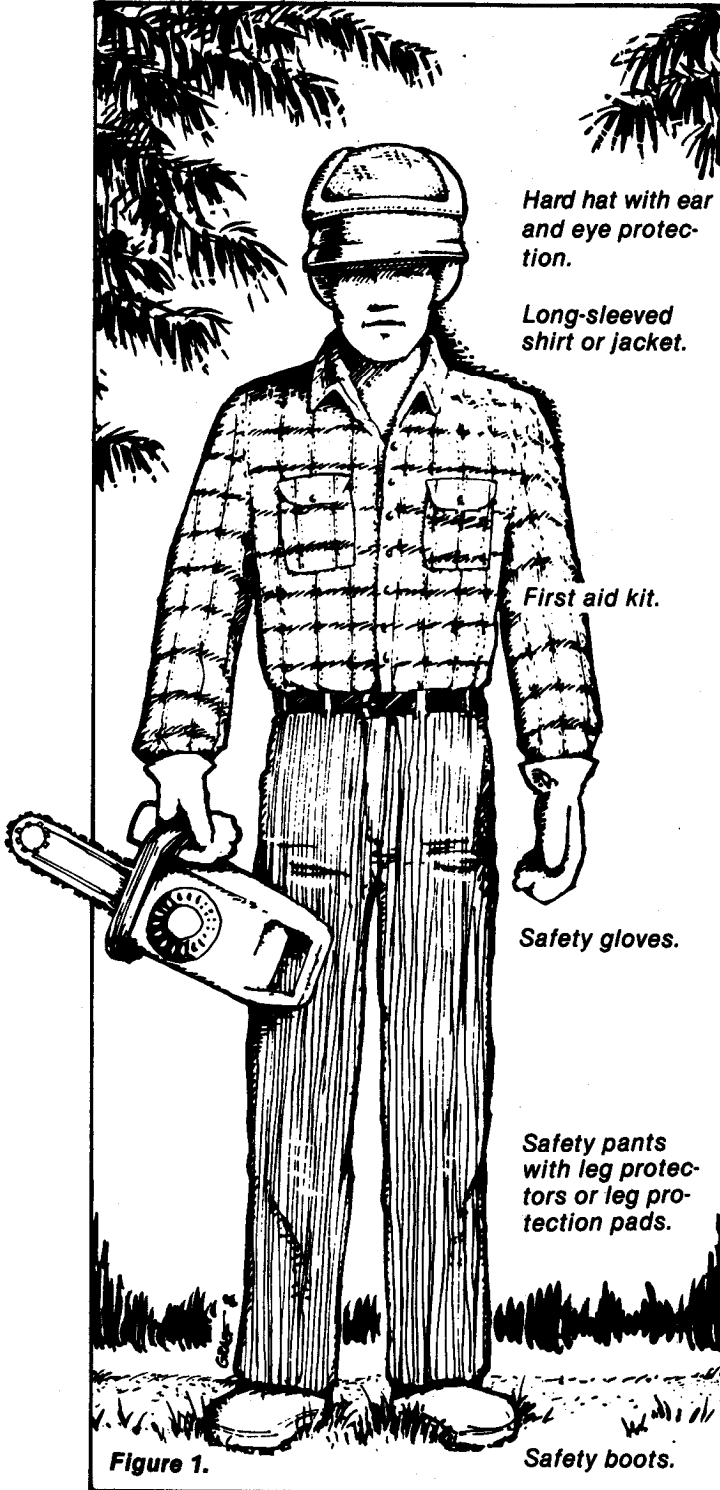




Safe Tree Harvesting

Tom Steele and Gordon Cunningham



The chain saw is a versatile and efficient tool, but many accidents result from its improper use. This publication covers the fundamentals of safe tree harvesting with a chain saw.

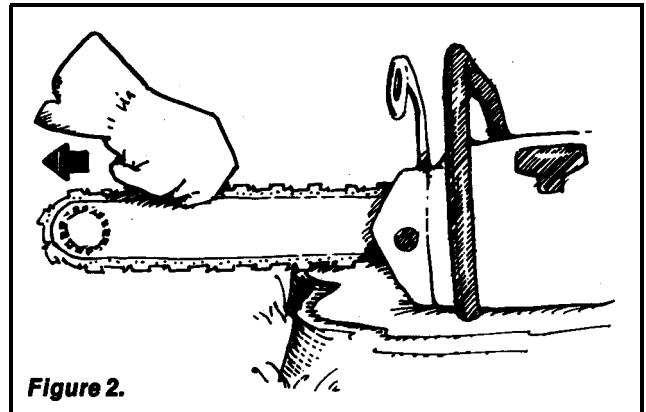
Getting Ready Safety Equipment

Personal safety equipment greatly reduces the risk of serious injury. A chain saw operator should wear (Figure 1): 1) A hard hat, 2) Ear protection, 3) Eye protection, 4) Safety gloves or mitts, 5) Safety pants, 6) Safety boots, 7) A first aid kit.

Adjusting chain tension

Before using a chain saw, ensure that it is in good working condition. A poorly maintained saw reduces cutting efficiency and significantly increases the risk of personal injury. The chain should be sharp and show no signs of breakage (such as cracked rivets, broken drive links, chipped cutters).

Correct chain tension is very important. A loose chain cuts poorly and may fall off the guide bar and injure the operator. A chain that is too tight results in increased wear of the chain, the guide bar, and the drive sprocket. To adjust the chain tension properly, place the chain saw on a flat surface and then tighten the chain until it can just be rotated around the guide bar without moving the saw body (Figure 2). To avoid cutting yourself, wear gloves and pull the chain towards the nose of the bar. It is good practice to check the chain tension periodically while working. Allow the saw to cool before you check and adjust the chain tension.



Cleaning the Air Filter

Always make sure that the air filter is clean. The small engine of a chain saw is sensitive to changes in air intake. A dirty air filter causes the saw to run as though the choke were open: more gas and less air. The air filter should be cleaned after about ten hours of use. It may be cleaned with soapy water and a soft brush—an old toothbrush is ideal (Figure 3). Do not use a gas-oil mixture to clean the air filter.

Mixing the Fuel

Chain saw fuel is a gas-oil mixture. Oil is added to the gas to lubricate the cylinder walls, the piston, the end bearings, and the crank shaft bearing. This prevents the saw from “seizing up.” Check your owner’s manual to determine the correct mix of gas and oil for your saw. Use a high quality oil designed specifically for two-stroke engines and mix it accurately—too much oil can result in low power, while too little oil may result in an expensive repair bill.

Filling the Tank

Always be careful when adding fuel to your saw don’t allow dirt and sawdust to fall into the fuel tank (Figure 4). Remember to fill the chain oil tank with each refueling. Filling both at the same time ensures that the saw is never used without chain oil. Chain oil lubricates the guide bar and saw chain. Operating the chain saw without chain oil decreases cutting performance and increases the wear of the bar and chain. If the saw is hot, allow it to cool before refueling. Before starting your saw, move it from the place where you filled the tank to avoid starting a fire.

One Final Check

Develop the habit of inspecting your chain saw before each use. Are all the safety features in working order? The handles and outer casing should be free from cracks. Check to see that all screws and bolts are in place and tightened.

Starting the Saw

The safest starting method is to place the chain saw on the ground with the chain clear of any obstructions. Put your right foot in the rear handle and grip the front handle with your left hand. Make sure that your left foot is away from the chain (Figure 5). Place the switch in the “on” position. If the saw is cold, pull out the choke and lock the throttle. Grip the starter handle and pull gently to find the point of compression. Once this point is found give a quick pull on the starter handle. Repeat this procedure until the engine fires, keeping hold of the starter handle as the rope retracts. When the engine has fired, push in the choke. The saw should start within the next couple of pulls. When the saw starts, rev up the engine briefly to release the throttle lock.

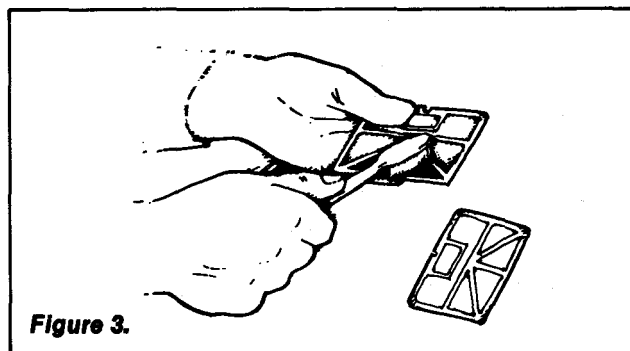


Figure 3.

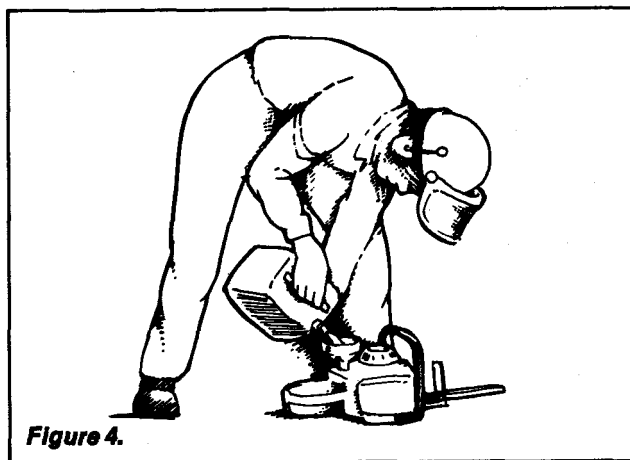


Figure 4.

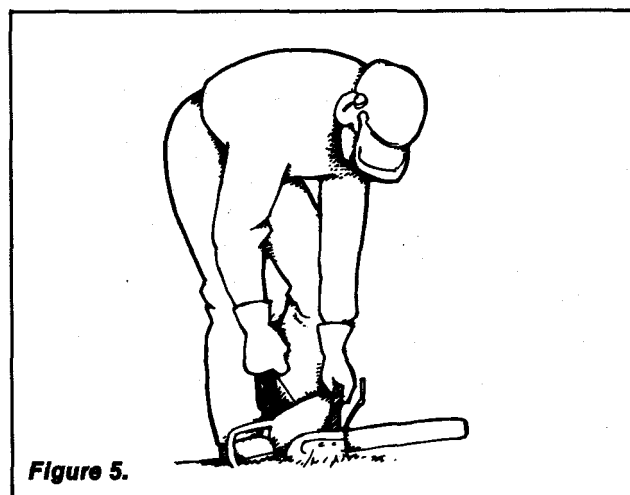
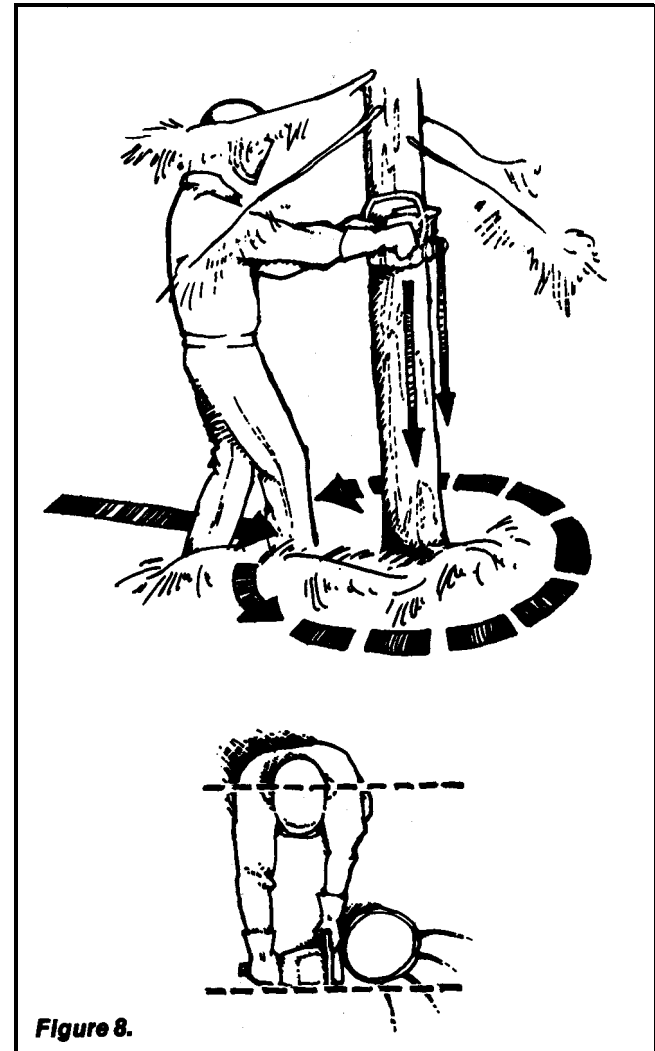
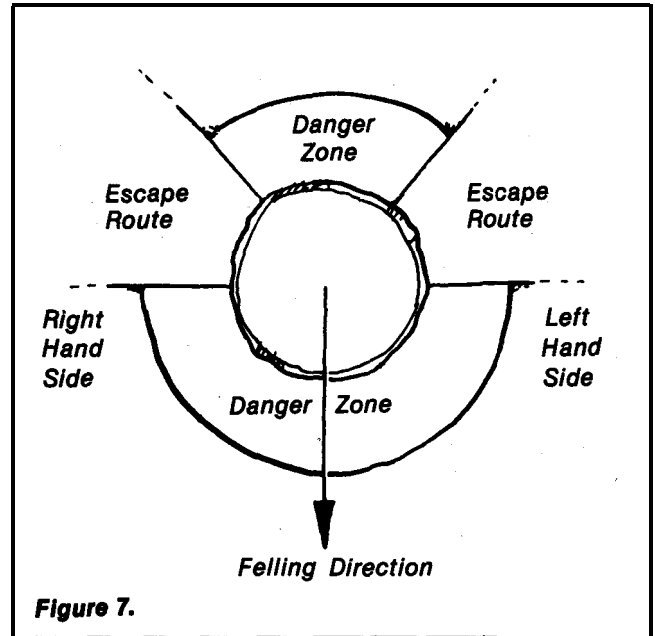
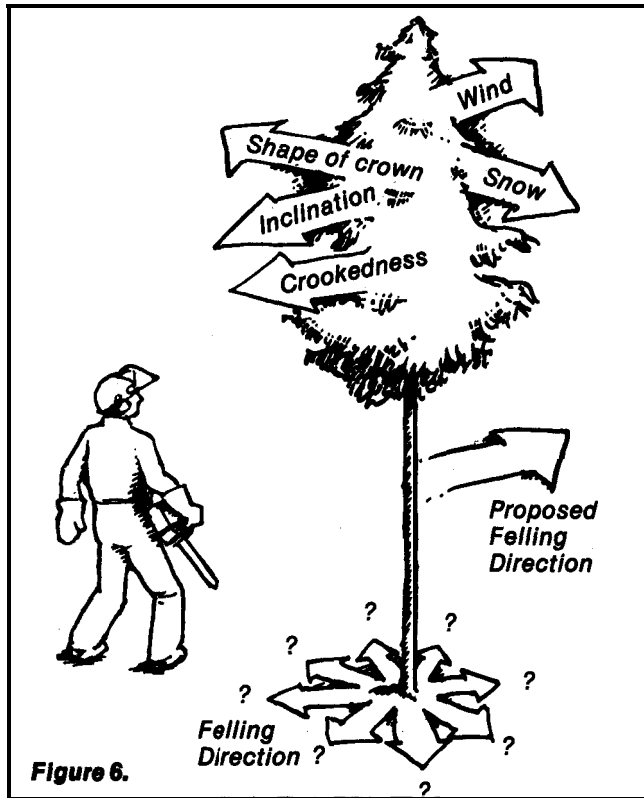


Figure 5.

The same procedure should be used to start a hot engine except that pulling out the choke or locking the throttle is not required.

Tree Felling

The objective of safe tree felling is to bring the tree down as near to the desired place as possible without damaging the saw or injuring yourself. This requires consideration of several factors which influence the direction of fall (Figure 6).



Which way is the wind blowing? The crown of a tree acts like a sail, so it is important to determine wind direction. If possible, fell with the wind.

Is the tree leaning or crooked? What is the shape of the crown? A tree's lean, crookedness and crown shape all affect its center of gravity and influence the natural direction of fall. You must correctly weigh all of these factors—a small error in the felling work may result in an unexpected and dangerous situation. This is why you must plan the work area carefully.

Having decided upon the exact felling direction, clear around the base of the tree. Prepare a path of retreat on a diagonal away from the felling direction (Figure 7).

Prelimbing

At times it will be necessary to remove twigs or branches on the lower portion of the trunk before felling the tree. This is dangerous and you should be careful to avoid a kickback. Hold your left hand on the side of the front handle, keeping the tree between yourself and the bar. This ensures that you are not in line with the saw in the event of a kickback (Figure 8). Move around the tree in a counter-clockwise fashion, cutting branches with a downward motion. NEVER USE A CHAIN SAW ABOVE SHOULDER LEVEL. Be sure that the chain is moving at full speed before making any cut. Cut off the branches flush against the stem and avoid using the bar tip.

Cutting the Notch

The notch determines which direction the tree will fall, so it is critical that it be made correctly. Take a firm stance behind the tree and look in the felling direction. Make the top cut first. Position the saw so that the front handle points toward the felling direction (Figure 9). Give the saw full throttle and cut downward at an angle of about 60 degrees through one-fourth of the tree's diameter (Figure 10).

Remove the saw from the cut and make the bottom cut. Keep the guide bar level by gripping the front handle midway along the side. Wrap your left thumb around the front handle. Give the saw full throttle and complete the notch. By looking down the kerf of the top cut, you can see when the two cuts meet and avoid cutting too deeply (Figure 11).

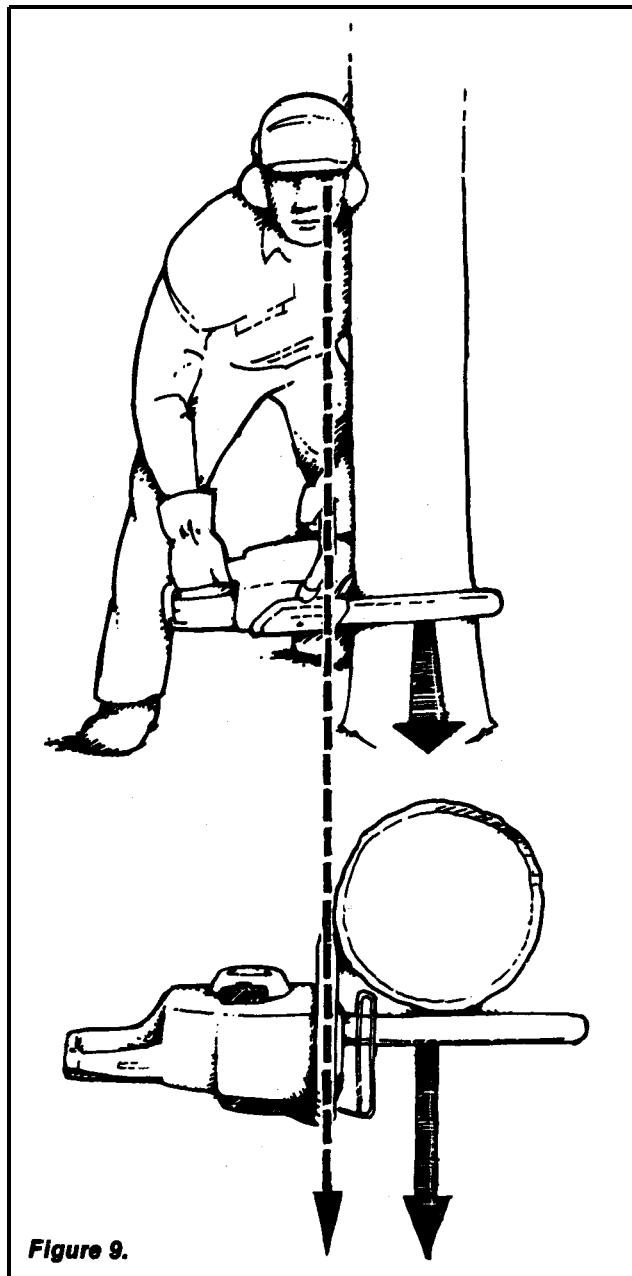


Figure 9.

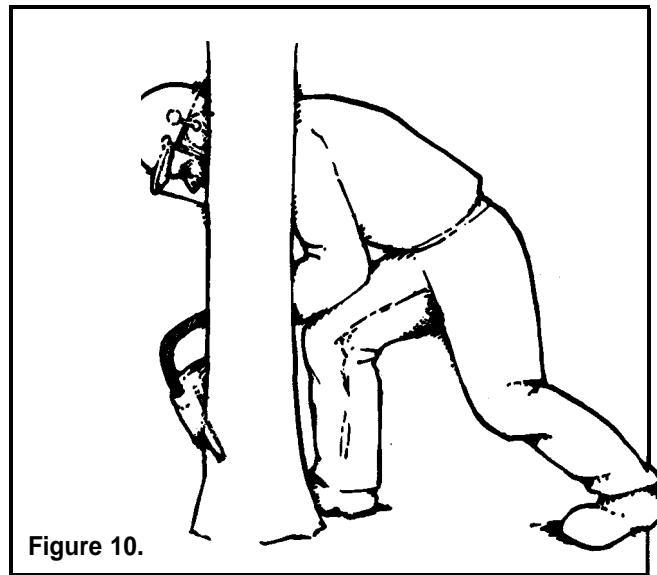


Figure 10.

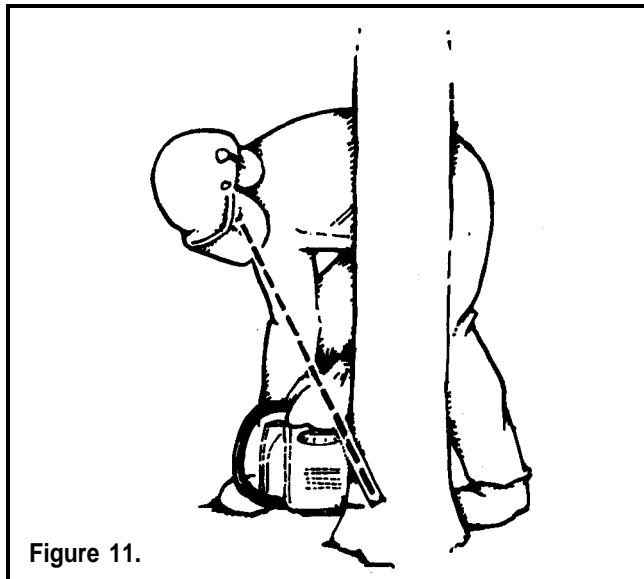


Figure 11.

The Felling Cut

To begin the felling cut, take up a comfortable stance on the left side of the tree. With the guide bar level, start the felling cut about an inch above the bottom of the notch. Cut forward towards the notch. STOP WHEN THERE IS ABOUT AN INCH OF WOOD REMAINING BETWEEN THE FELLING CUT AND THE NOTCH (Figure 12). This is the holding wood and guides the tree in its fall. NEVER SAW RIGHT THROUGH THE STEM – AS YOU WILL LOSE CONTROL OF THE TREE. In the case of large-diameter trees, or trees with rotten centers, leave a thicker holding wood (approximately 1 1/2 inches; Figure 13). It is important that the holding wood be of equal width across the diameter of the tree.

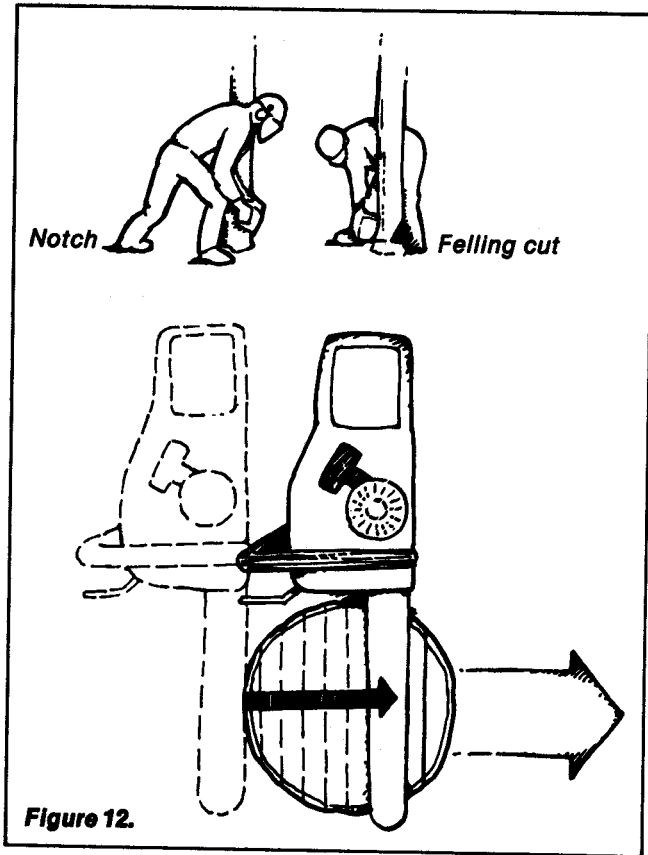


Figure 12.

In some instances you may be cutting trees whose diameter is greater than the guide bar length. To fell such a tree, make the notch as described above. Staying on the same side of the tree, saw half of the felling cut leaving sufficient holding wood (Figure 15). Remove the saw and insert a felling lever or wedge into the cut. Move to the other side of the tree and complete the felling cut, making sure that the holding wood is of equal width (Figure 16).

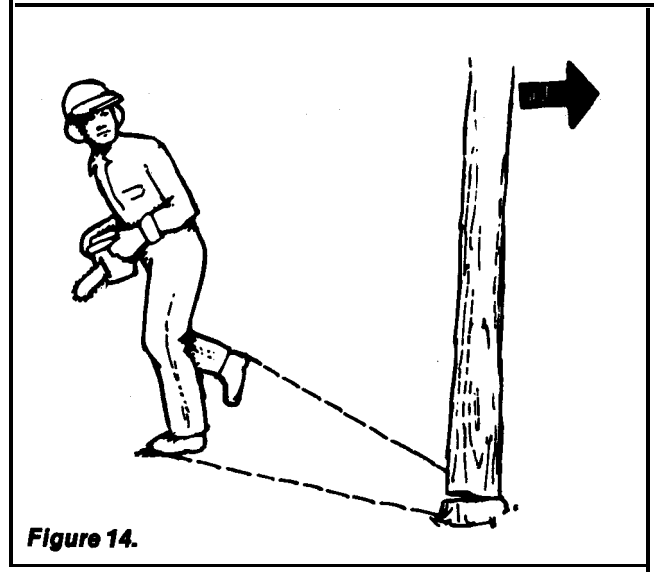


Figure 14.

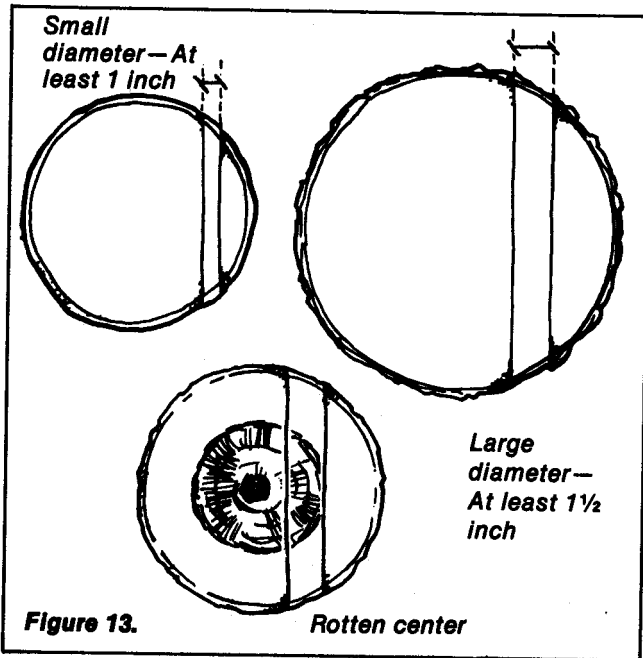


Figure 13.

Rotten center

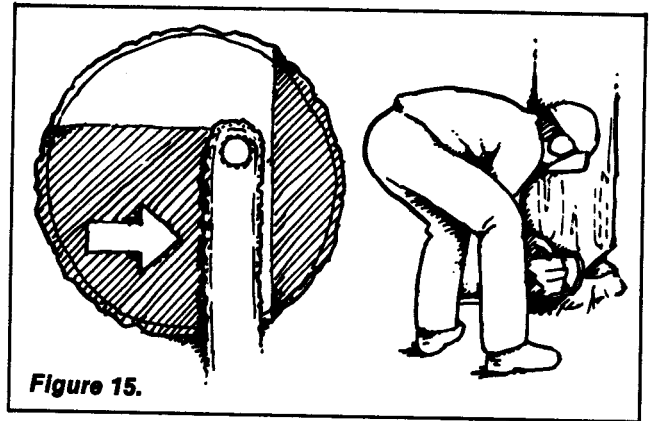


Figure 15.

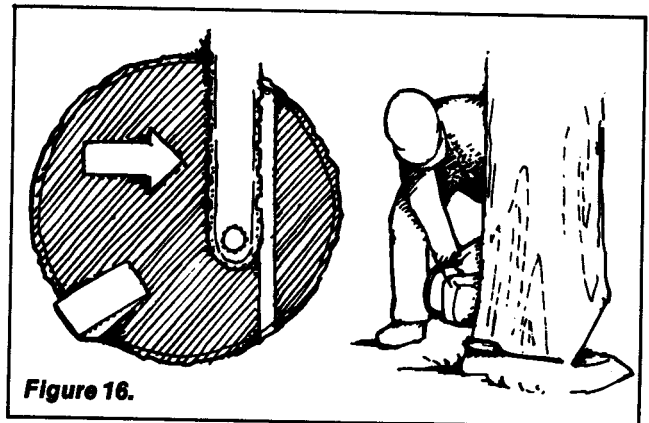


Figure 16.

When the tree falls the butt end may kick up. Generally it does so to the back or to the side of the stump. Consequently, you should move diagonally towards the left without letting the tree out of your sight. Keep both hands on the saw as you retreat and be careful not to let the chain cut your left leg (Figure 14).

Limbing

Before you can cut the tree into desired lengths, you will have to remove the limbs and branches. Limbing is a potentially dangerous job. There are four basic rules to follow when limbing: 1) Always keep your left thumb around the front handle; 2) Never cut with the tip of the guide bar 3) Give the saw full throttle before making any cut; and 4) Have the tree between you and the saw when moving up the stem.

Limbing will proceed much more smoothly if you take a minute to consider how each branch will fall when it is cut from the tree. This will be the deciding factor in determining whether you should begin your cut from the top or bottom. Often branches are bent. The inside of a bend is under the force of compression; the outside, under the force of tension. To remove a bent branch, start the cut from the side under tension to prevent the saw from becoming pinched in the cut (Figure 17). Stand firmly when limbing and avoid reaching – you will be off-balance and this will make your job unnecessarily dangerous and difficult (Figure 18). Whenever possible allow the saw to rest on the tree let it function as a lever in removing branches (Figure 19).

If the tree has large branches you can work from the ends cutting the branch into desired lengths (Figure 20). Remember not to cut above shoulder level.

Figure 17.

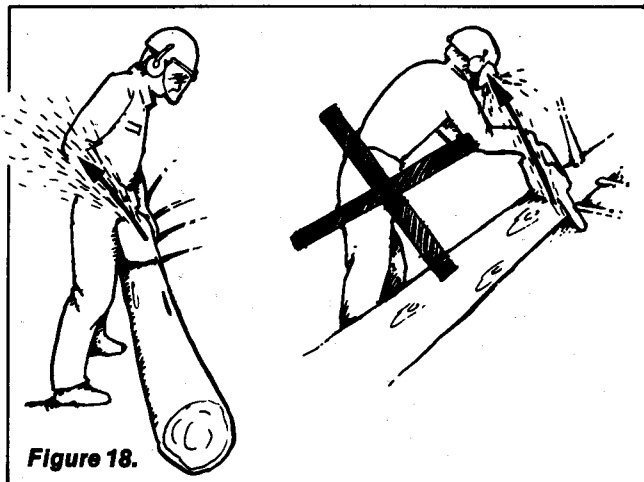
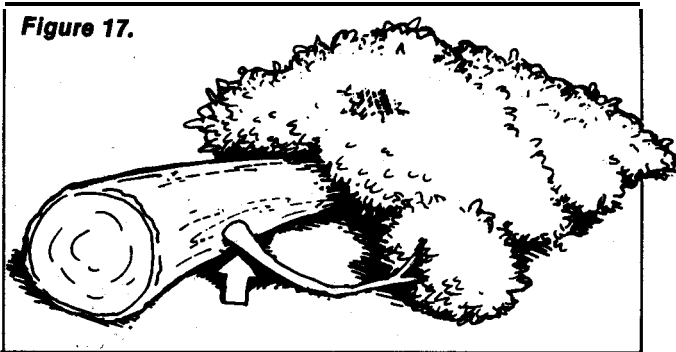


Figure 18.

Figure 19.

The saw should function as a lever.

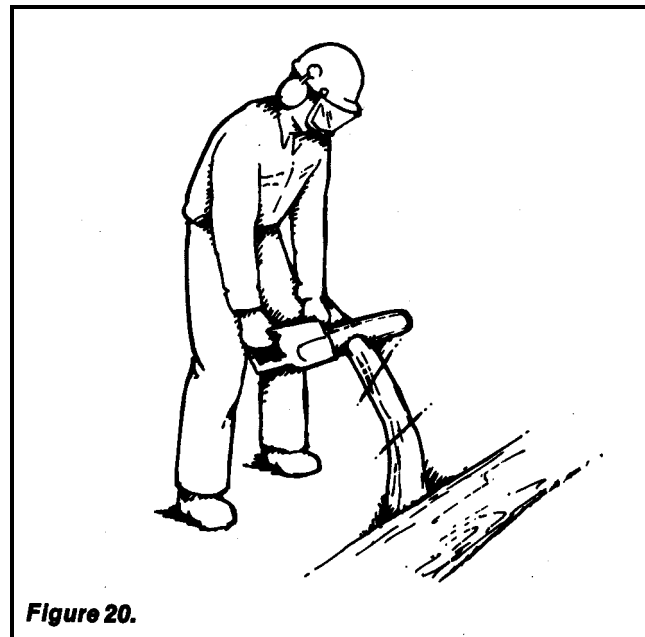
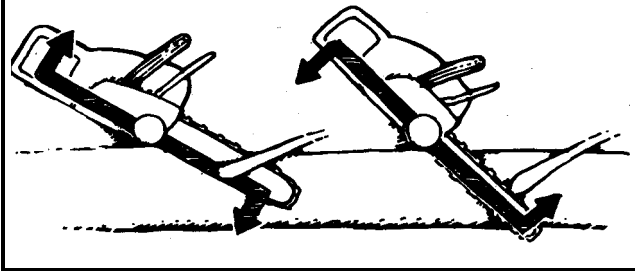


Figure 20.

Bucking

Once the limbs have been removed, it will be necessary to cut the tree into manageable lengths. To avoid pinching the saw when bucking, follow these directions: if the log is supported on two ends, begin the cut from the top. Hold the saw close to your body keep your left foot in line with the front handle and parallel to the guide bar (Figure 21). With the saw at full throttle, cut downwards through no more than one-third of the log diameter (Figure 22). Use that section of the bar nearest the engine. Remove the saw from the cut and place the rear handle against your right knee or thigh. Give the saw full throttle and complete the cut from the underside (Figure 23).

If the log is supported on one end only, reverse the above steps. Begin the cut from the bottom through no more than one-third the log diameter. Remove the saw and complete the cut from the top (Figure 24).

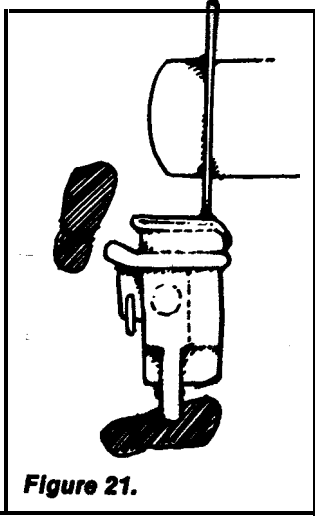


Figure 21.

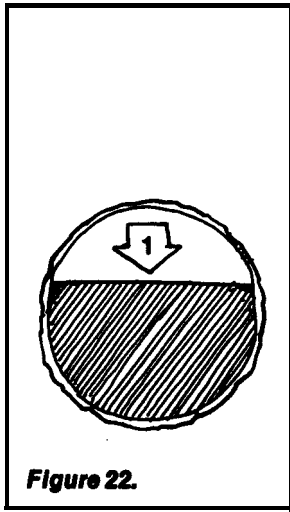


Figure 22.

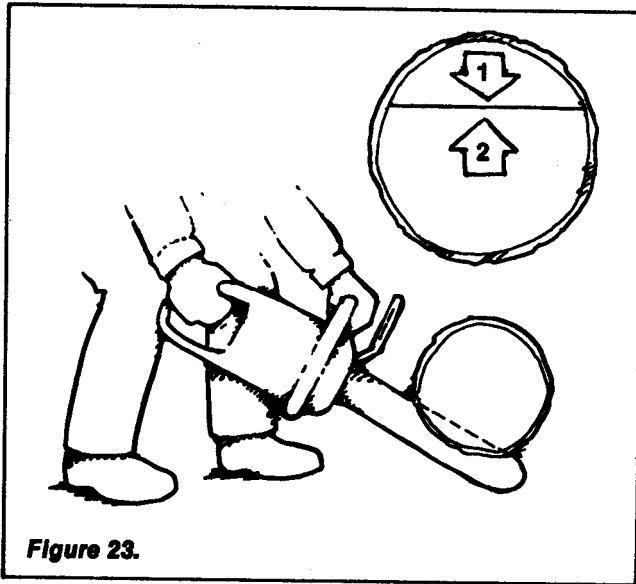


Figure 23.

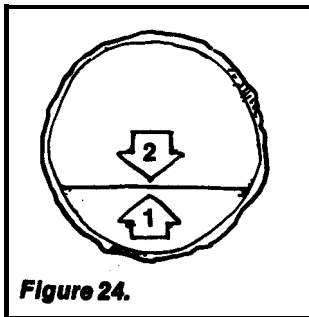


Figure 24.

If the saw gets stuck despite all efforts, do not try to pull it free-you may damage it. To free the saw, use a thick branch to raise the log or change its position (Figure 25).

Tree harvesting is potentially dangerous work. To reduce the risk of injury, only operate a chain saw when you are 1) alert, 2) physically fit, and 3) wearing safety clothing. By following these guidelines you can make tree harvesting a much safer task.

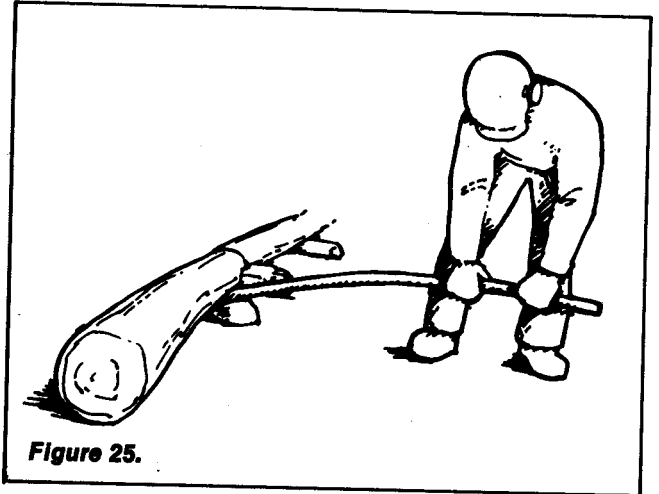


Figure 25.

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