

Chainsaw Safety



Photo taken by Ann Steele, SSAI

This training will prepare you to safely operate chainsaws, as well as perform basic servicing and maintenance.

Personal Protective Equipment

- ANSI approved hard hat
- Hearing protection with attenuation of at least 110 dBA
- ANSI approved safety glasses or goggles, and face shield
- KEVLAR or ballistic nylon pants or chaps
(also use for brush-cutters)
- ANSI approved safety work boots
- Work gloves



Photo taken by Dan Hodkinson, SSAI

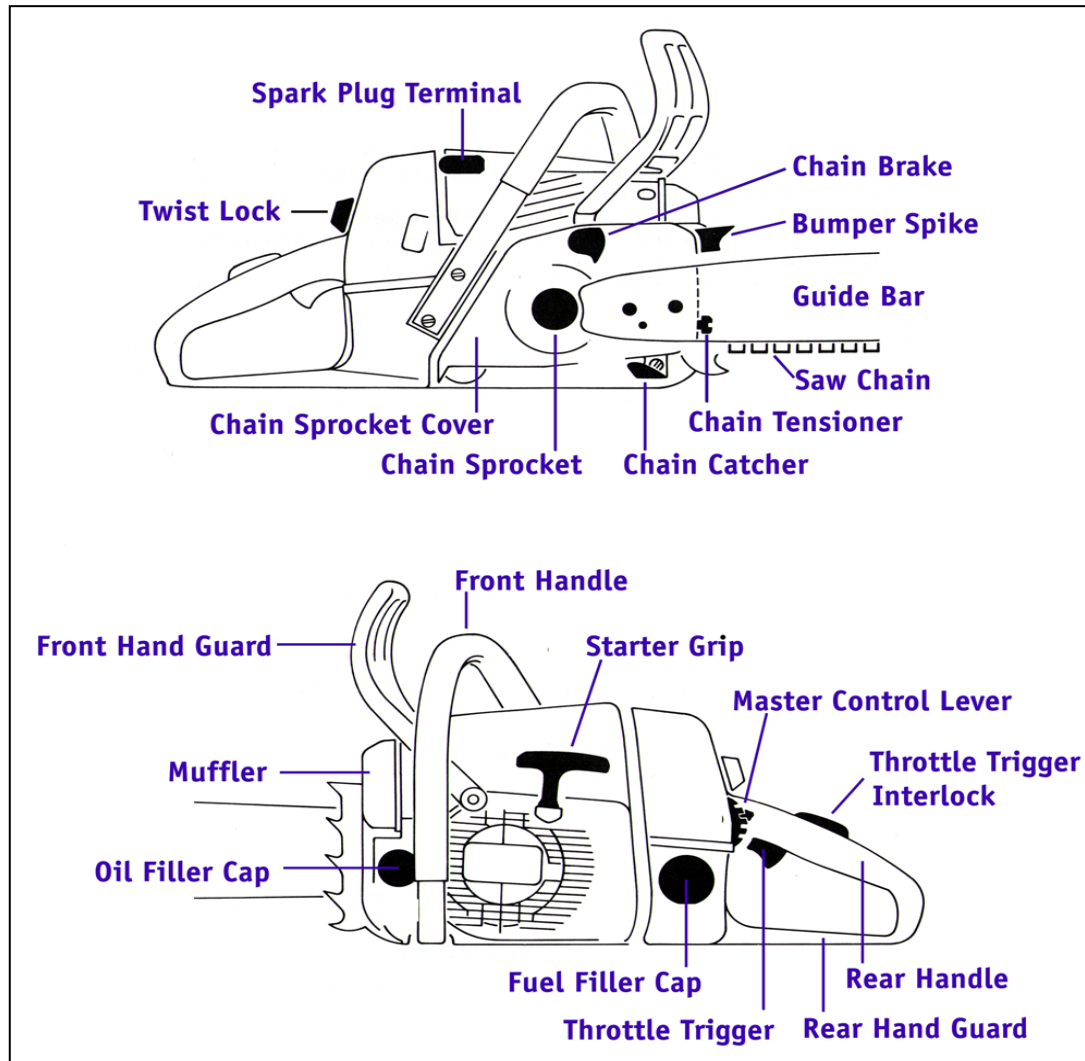
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Chainsaws Types

Select your saw size based on the job.

Saws	Bar size	Type of work
Small	8-12 inch	Small branches and trees 6-10 inches in diameter.
Medium	14-20 inch	Frequent log cutting and felling of small trees 12-18 inches in diameter
Large	More than 20 inch	Professional use

Chainsaw Parts and Mechanics

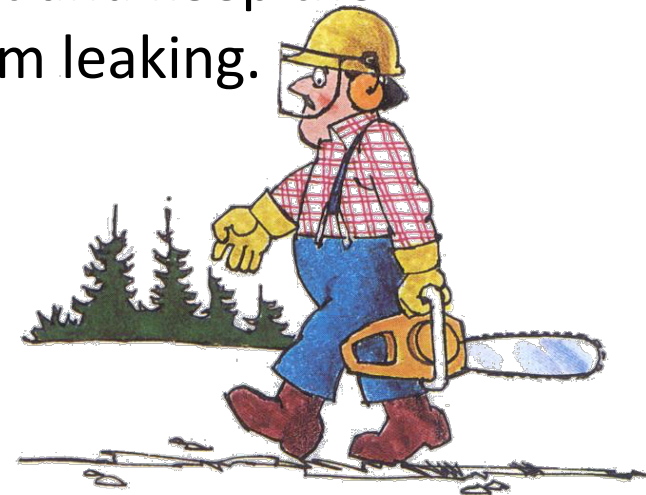


Maintenance Procedures

Maintenance	Frequency
Clean/adjust chain tension	Every use
Check/service the chain oiling system	Every use
Tighten all hardware	Every use
Inspect fuel system	Every use
Inspect the Chain Brake Mechanism	Every use
Inspect the Kickback (nose) Guard	Every use
Clean or replace air filter	Every 10 hours of use
Lubricate the sprocket tip	Every 10 hours of use
Turn the guide bar	Every 10 hours of use
Inspect and clean/replace the spark plug	Every 10 hours of use
Inspect and clean/replace the spark arrester screen	Every 10 hours of use
Replace the Fuel Filter	Every 20 hours of use
Additional maintenance procedures	As needed

Transporting the Saw

- Keep the saw in a carrying case or put the chain guard on the bar when the saw is not in use.
- Always carry the saw at your side with the cutting bar and chain to the rear and to the outside. This will insure that the hot muffler is away from your body.
- Never carry a chain saw in the passenger area of a vehicle.
- In a vehicle, secure the saw from movement and keep the saw with fuel cap up to prevent the fuel from leaking.



Storing the Saw

- Drain any fuel left in the tank in a well ventilated area into an approved container.
- Run the engine until the fuel in the fuel lines and carburetor causes the saw to stop.
- Remove the chain and store it in a container of oil to prevent rust.

Note: These tips are for when the saw is not going to be used for an extended period of time.

Fueling

- Store your fuel in an approved container. An approved container will be stamped by DOT (Department of Transportation)
- Allow saw to cool before fueling.
- Fuel the saw on bare ground.
- Use a funnel or pouring spout to prevent spills.
- Always tighten the fuel container cap when not in use.
- Clean up any spills and move fuel container at least 4m from saw before starting.

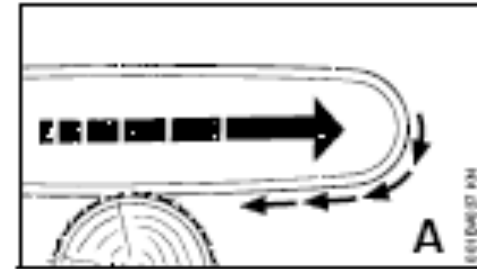


Common Hazards in Chainsaw Use

- **Pull-in** – *The chain at the bottom of the bar is pinched.*
- **Pushback** – *The chain at the top of the bar is pinched.*
- **Kickback** – *The single greatest cause of injury to chain saw users.*
- **Spring Poles** – *Releasing limbs that are under tension.*

Pull-in

Pull-in occurs when the chain at the bottom of the bar is pinched, caught or encounters a foreign object causing the saw to pull forward which may cause the operator to lose control.



To avoid pull-in:

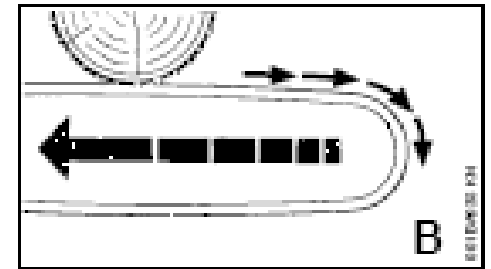
- always start the cut with the chain at full speed and
- ensure the bumper spike makes contact with the wood.

Pushback

Pushback occurs when the chain at the top of the bar is pinched, caught or encounters a foreign object driving the saw rapidly straight back to the operator which may cause them to lose control.

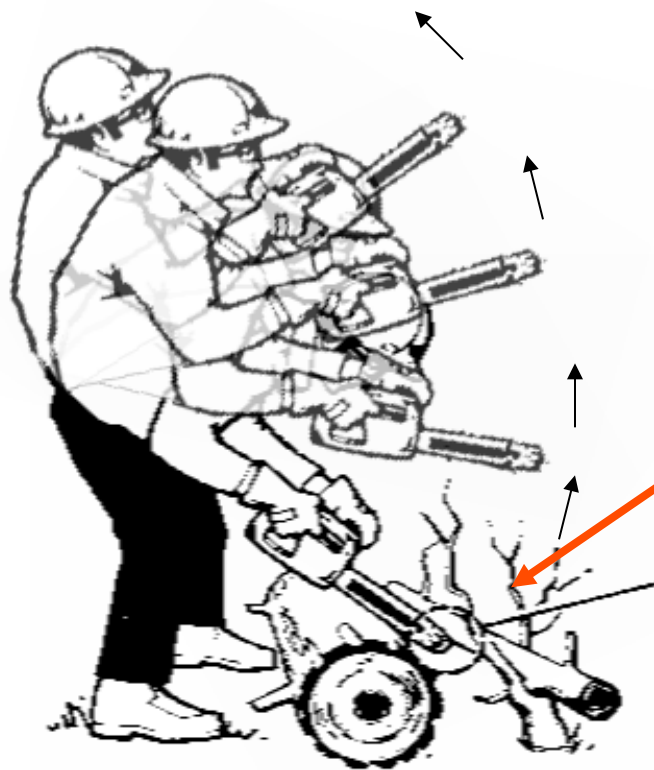
To avoid pushback:

- don't cut more than one log at a time,
- don't twist the saw bar when removing it from a plunge or underbuck cut, and
- be aware of situations that may pinch the top of the chain.



Kickback

Guard against kickback – the violent backward or upward motion that occurs when the nose of the guide bar becomes pinched or contacts an object.



The nose of the saw strikes an object causing it to kick back.

To Avoid Kickback

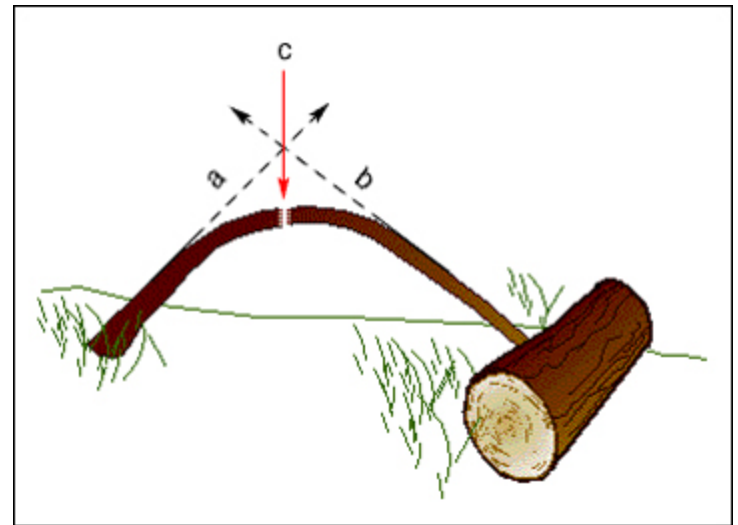
- Hold the chainsaw firmly with both hands.
- Do not over cut or cut above shoulder height.
- Do not let the nose of the guide bar contact a log, branch or other object in the critical area
- Cut at high chain speeds.
- Follow the manufacturer's recommended chain sharpening and maintenance instructions; improper sharpening can increase the possibility of kickback.
- Do not stand directly behind the saw when bucking. Learn to stand to one side of the path of a possible kickback.

Spring Poles

Spring back occurs when you make a cut that releases limbs that are under tension.

To avoid spring back:

- Observe the limbs under tension BEFORE making any cuts.
- Make cut on the side that will release the least amount of tension.
- Make multiple cuts of smaller limb pieces to release tension gradually.



Safe Operating Techniques

- Read the owners manual.
- Do not use chainsaws in the field when the fire index is extreme.
- Keep handles dry, clean and free of oil and fuel.
- Operate only in well ventilated areas to avoid carbon monoxide poisoning.
- Warm up the saw prior to cutting. All cuts should be made at high rpm speeds.
- Do not make adjustments to the chain or guide bar when the motor is running.

Safe Operating Techniques

- Keep all bystanders and animals clear of the work area. Helpers should remain outside the swing radius of the saw.
- Never start cutting until you have a clear work area, secure footing and a planned retreat path from the falling tree.
- Use caution when cutting small diameter brush/saplings. Slender material may catch on the saw and be whipped toward you or pull you off balance.
- Stop the saw before setting it down or carrying it from place to place. Carry the saw with the blade to the rear.
- Upon completing the work, reinstall the blade guard.

Starting the Saw

Two Methods:

GROUND START:

- Remove chain guard.
- Engage chain brake.
- Place saw on the ground.
- Ensure chain is not contacting anything.
- Put right foot through the rear guard handle.
- Grip handle firmly with your left hand.
- Pull cord sharply with right hand.



Starting the Saw

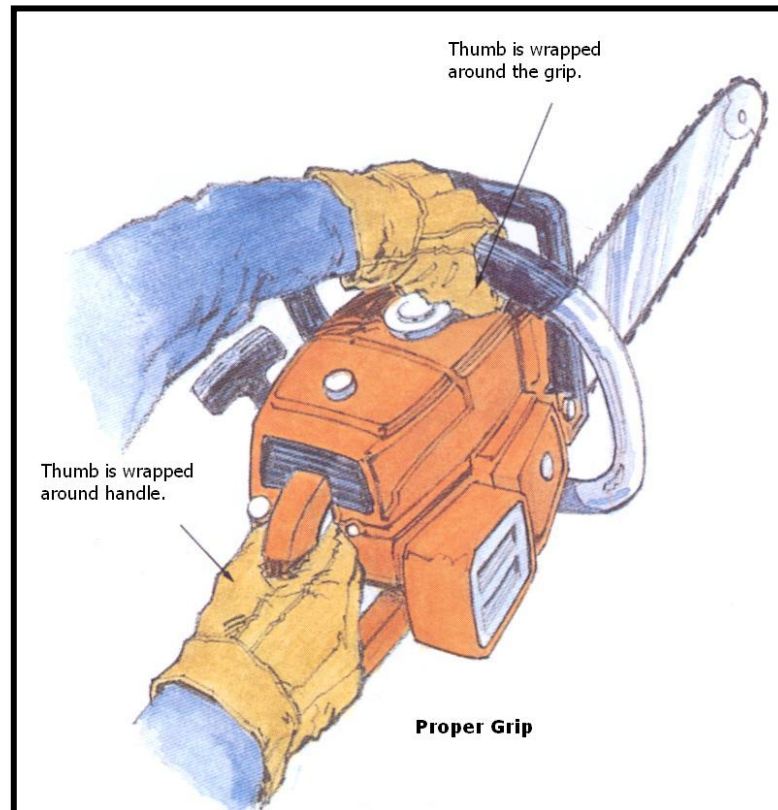
STANDING START:

- Remove chain guard.
- Engage chain brake.
- Grip handle firmly with your left hand, keeping arm in a locked, straight position.
- Hold rear handle tightly between legs, just above the knees.
- Maintain balance and sure footing.
- Pull cord sharply with right hand.



Holding the Saw

The position of the thumbs is very important for control of the saw. Notice in the picture how the thumbs are closing the loop and not just resting on the grips. This allows for positive control of the saw.



Limbing Procedures

- Leave suspension branches in place as long as possible while taking into consideration that every limb cut changes the balance of the tree.
- Always start limbing from the butt end
- Never walk along the tree while limbing
- Watch for spring back
- Check for limbs under tension and make cut on the correct side.



Photo taken by Peter Griffith, SSAI

Spring Pole



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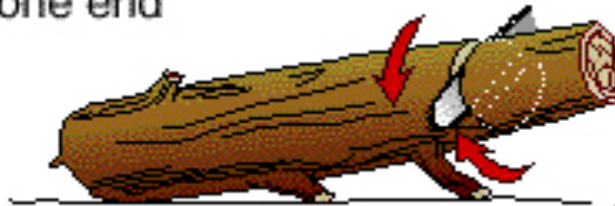
Bucking

a. Tree lying flat on ground



Cut from top (overbuck)
Avoid cutting
into earth

b. Tree supported at
one end



Second cut overbuck
(2 / 3 of the diameter)
to meet the first cut
(to avoid pinching)

First cut underbuck
(1 / 3 of the diameter)
to avoid splintering

c. Tree supported at both ends



First cut overbuck

Second cut underbuck

Bucking Procedures

- Make sure you have firm footing and your weight is evenly distributed.
- If possible, support the log off the ground on limbs or chocks.
- If cutting on a slope, stand on the uphill side.
- Use extreme caution when cutting small-sized brush and saplings, because slender material may catch on the saw chain and be whipped toward you or pull you off balance.
- When cutting a limb that is under tension, be alert for spring back so that you will not be struck when the tension in the wood fiber is released. Start with multiple cuts partially along the tree to relieve tension.
- As soon as you complete a cut, release the throttle trigger, reducing the chance of chain damage through accidental contact with the ground.

Tree Felling Considerations

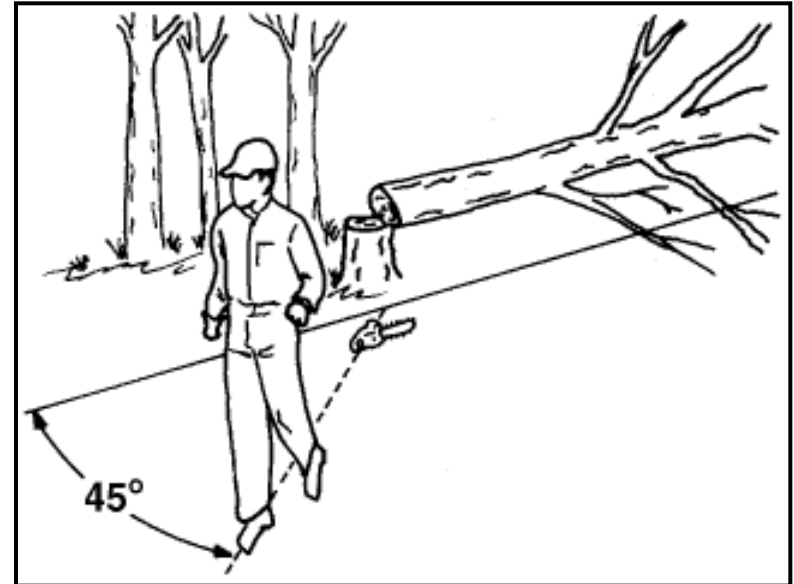
- **Examine the tree** - which way does it lean and how is it weighted?
- **Clear the area** – is it free of people, vehicles, branches, debris, power and utility lines, or anything that would be hit? If you suspect there will be a problem with electrical lines in the vicinity, call the power supplier, they have the expertise to do it safely.
- **Wind** - will the wind have an effect on how and where the tree will fall?
- **Examine neighboring trees** – cut trees can entangle with other trees.



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Tree Felling Considerations

- Determine the direction of fall
- Determine the escape route
 - Always plan an escape route to a safe location from where you are working before any cuts.
 - Your path of retreat should be along a line approximately 45 degrees from the direction of fall of the tree.



Make a Correct Cut

- A ***Felling Notch*** does not exceed 20 percent of the tree's diameter at breast height. This cut is made first.
- The ***Hinge*** is the 10 percent that is left uncut for the operator's safety.
- The ***Felling Cut*** is made last. It occurs on the opposite side of the tree from the felling notch, but it does not go all the way through the tree. The notch and the cut are staggered, so they don't meet.

Types of Tree Felling Cuts

Conventional Notch



Photo taken by Ann Steele, SSAI



Open-faced
Notch



Conventional
Notch



Humboldt
Notch

Open-faced Notch



- Total angle is ideally 90 degrees; at least 70 degrees
- Top cut is angled downward 70 degrees
- Bottom cut is angled upward 20 degrees
- Back cut is horizontal; at the same height as the corner of the notch
- Depth is $\frac{1}{4}$ to $\frac{1}{3}$ of tree diameter
- Point of notch closure is just before the tree hits the ground
- Degree of safety is high
- Advantages:
 - Greater accuracy of felling into target area
 - Hinge stays intact until the tree hits the ground
 - Less danger of kickback and other out-of-control movement
- Disadvantages:
 - Hinge may have to be cut off

Conventional Notch

- Total angle is 45 degrees
 - Top cut is angled downward 45 degrees
 - Bottom cut is flat horizontal
 - Back cut is horizontal; at least 2.5cm above the bottom cut
 - Depth is $\frac{1}{4}$ to $\frac{1}{3}$ of tree diameter
 - Point of notch closure is at the middle of fall
 - Degree of safety is medium
-
- Advantage:
 - Familiar to many loggers
 - Disadvantage:
 - Hinge breaks early



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Humboldt Notch

- Total angle is 45 degrees
 - Top cut is flat horizontal
 - Bottom cut is angles upward 45 degrees
 - Back cut is horizontal; at least 2.5cm above the top cut
 - Depth is $\frac{1}{4}$ to $\frac{1}{3}$ of tree diameter
 - Point of notch closure is at the middle of fall
 - Degree of safety is medium
-
- Advantage:
 - Familiar to many loggers
 - Saves slightly more wood
 - Disadvantage:
 - Hinge breaks early

