



POLE PRUNER SAFETY MANUAL



DANGER!



Misuse may result in serious or fatal injuries. You must read, understand, and follow these safety instructions and the instructions in your Operator's Manual before operating a Power Pruner.



DANGER!



Overhead pruning can result in serious injury or death. Wear head, eye, face and ear protection that meets ANSI standards to avoid injury from falling objects or prolonged noise exposure. Place blade cover on blade when transporting or storing unit.

To locate your nearest Echo dealer, visit our website at www.echo-usa.com, or call 1-800-432-ECHO (3246). Ask how to obtain a FREE Safety Video. Echo's supplemental Safety Video provides helpful safety and operating information.

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CONTENTS



SYMBOL MEANINGS AND WARNINGS	3
DEFINITION OF TERMS	4
SAFETY APPAREL	7
SAFETY PRECAUTIONS	8
FORCES TO CONTROL	14
BALANCE AND BODY POSITION FOR CUTTING	16
PINCHING, BINDING, SPLITTING	17
LIMBING AND BUCKING	18
WHEN TO CALL A PROFESSIONAL	19
PRUNING: TIMING AND TECHNIQUE	20

SYMBOL MEANINGS AND WARNINGS



A circle and slash symbolizes prohibited actions and behaviors. Failure to follow warnings that are marked with a circle and slash can lead to serious, immediate and irreversible injury or death.



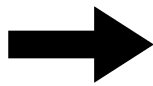
This symbol accompanied by the words WARNING and DANGER call attention to an act or a condition which can lead to serious, immediate and irreversible injury or death.



This symbol is used to denote that a specific safety precaution is more applicable for gas powered Pruners.



This symbol is used to denote that a specific safety precaution is more applicable for electric powered Pruners.

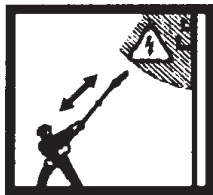


These symbols seen together are used to denote that a specific safety precaution is applicable for both gas powered and electric powered Pruners.



Keep people and animals at a minimum distance of 15m (50 feet) to avoid injury to bystanders or helpers.

SYMBOL MEANINGS AND WARNINGS



Maintain a distance 15m (50 feet) from electrical lines and electrical sources to avoid electrocution or electrical shock.



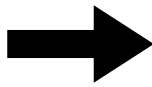
Wear sturdy, protective safety shoes or boots with non-skid soles. Maintain secure footing and balance.



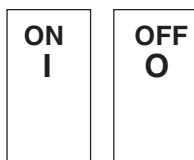
Read and understand Operator's Manual to avoid injury.



Wear head, eye, face and ear protection that meets ANSI standards to avoid injury from falling objects or prolonged noise exposure.



Hold the Power Pruner™ firmly with both hands with thumbs and fingers encircling the front and rear handles. To avoid injury never grasp exposed blades or use product with one hand.



Make sure engine switch is off or unit is unplugged (for electric) and blades have stopped moving before clearing jammed material.

DEFINITION OF TERMS



UNIT - Power head, handles, cutting assembly and pole.

GASOLINE ANDELECTRIC POWERED TERMS

CHOKE LEVER - The engine control attached to the carburetor that is used to enrich the fuel mixture for cold starting. Refer to Operator's Manual for more details about correct position and use of the choke lever.

CLUTCH - The mechanism that transmits the rotation of the engine's crankshaft to the cutting assembly.

DIELECTRIC MATERIAL - A material that reduces the likelihood of shock or electrocution from non-intentional contact during operation by providing protection against current flow through the unit to the operator.

GAUGE - A term that is used to describe the size of wire required when using extension cords with electric units over specific distances.

GFCI - Ground Fault Circuit Interrupter. An electrical circuit breaking device which provides protection against electrical shock hazards.

IGNITION/STOP SWITCH - An electrical switch which allows the engine to start and run, and turns the engine off. Refer to Operator's Manual to learn and understand the stop and start procedure.

THROTTLE TRIGGER - The device that controls the fuel and air flow to the gasoline engine, either increasing or decreasing the engine's RPM. Refer to the Operator's Manual for an illustrated description.

THROTTLE TRIGGER LOCKOUT LEVER - A lever on the top of the throttle handle which must be depressed before the throttle can be activated. When the operator releases the throttle trigger lockout lever, the throttle trigger will lock in the idle position.

THROTTLE TRIGGER/STOP SWITCH - An electrical switch which allows the electric motor to start and run, and turns the motor off when released. Refer to Operator's Manual to learn and understand the stop and start procedure.

THROTTLING BACK - Releasing the throttle trigger to allow a decrease in engine speed (RPM).

THROTTLING UP - To increase the engine's RPM by depressing the throttle trigger to desired level.

GENERAL TERMS

ANSI Z87.1 - The established standard for eye protection devices set forth by the American National Standards Institute.

BALLISTIC - A special material used in protection devices designed to reduce the risk of penetration from saw chain contact.

BINDING - Closing the cut or shifting the wood, possibly trapping the saw blade in the cut. Binding includes pinching. (Also, see PINCH on page 6.)

BRANCH - A secondary shoot or stem arising from one of the main axes of a tree or woody plant.

BRANCH COLLAR - Trunk tissue that forms around the base of a branch between the main stem and the branch.

BRUSHING OUT - Cutting or otherwise removing undergrowth and brush in the cutting area and along the planned path of retreat.

BUCKING - Generally the standard cross cuts made to section a log or felled tree. Variations include overbucking (cutting from top down) and underbucking (from under-side).

CHAIN TENSIONER - The device which permits precise adjustment of the saw chain tension.

CHAPS - Specially designed leg protection which can reduce the risk of injury due to contact with a moving saw chain.

CHOKE - The engine control used to enrich the fuel mixture for cold starting.

CLEARING - Removing undergrowth and saplings from an area.

CLOSURE - The process of woundwood covering a cut or other tree injury.

CROTCH - The angle formed at the attachment between a branch and another branch, leader, or trunk.

CROWN - The upper portion of a tree from the lowest branch on the trunk to the top.

DEFINITION OF TERMS



CROWN CLEANING - The removal of dead, dying, diseased, crowded, weakly attached branches from the tree's crown.

CROWN REDUCTION - The reduction of the top, sides, or individual limbs by the means of removal of the leader or longest portion of a limb.

CROWN THINNING - The selective removal of branches to increase light penetration and air movement, and to reduce weight.

CUT - The exposed wood area resulting from the removal of a branch or a portion of it.

CUTTING SHOE - The lower front of the guide bar cover used as a work stop and/or pivot point when sawing the blade into the wood.

DECAY - Degradation of woody tissue caused by biological organisms.

FACE MASK - A mask to shield the face from flying objects. Face masks alone do not provide adequate protection for your eyes. Eye protection goggles or glasses meeting ANSI Standard Z87.1 must be worn underneath the face mask. See **GOGGLES/GLASSES** (below).

FACE SHIELD - A device worn in front of the eyes and a portion of, or all of, the face to supplement eye protection. A face shield alone does not provide adequate protection for your eyes. Eye protection goggles or glasses meeting ANSI Standard Z87.1 or CE Standard must be worn underneath the face mask. See **GOGGLES/GLASSES** (below).

FACILITY - Equipment or structure used to deliver or provide protection for the delivery of an essential service such as electricity.

FOLLOW THROUGH - After the saw completes a cut and is no longer supported by the wood, the bar and chain can continue on its path and strike the legs, feet or body of the operator or helper.

GOGGLES/GLASSES - A device covering the eyes and sockets, having impact-resistant lenses. Such goggles/glasses must meet the ANSI Z87.1 or CE Standard. "Z87" or "CE" is stamped on approved goggles/glasses.

GUIDE BAR - The railed structure that supports and guides the saw chain.

HEARING PROTECTION DEVICES - These are ear-muff or plug-type devices worn to reduce exposure to harmful noises while permitting an operator to hear certain sounds.

HOT STICK - Is a non conductive insulated pole used by electric utilities in moving live downed power lines. Cleaning material designed with "hot stick" is certified for cleaning dielectric tools.

JAMMING - The restriction of the motion of the saw chain or blade while the engine is running due to an excessive cutting load or pinching as the cut closes against the guide bar and saw chain. This can occur when attempting to cut branches or stems with an excessive feed rate to the blades.

KICKBACK - This describes two highly dangerous reactions that can occur. When used alone in this manual, the term "kickback" refers to rotational kickback. Kickback can occur if the unshielded guide bar nose touches an object or the ground.

- **ROTATIONAL KICKBACK** - The violent reaction that can occur when the saw chain at the upper section of the nose is suddenly stopped or impeded, thereby dangerously driving the guide bar nose in an upward arc toward the operator.
- **LINEAR KICKBACK** - A push reaction, which can occur under certain conditions when the guide bar is buried in a cut and the cut closes, pinching the saw chain along the top rails of the guide bar and propelling the saw straight back toward the operator.

LEADER - A dominant upright stem, usually the main trunk. There can be several leaders in one tree.

LIMB - Same as branch, but larger and more prominent.

OBSTRUCTING - To hinder, block, close off, or be in the way of; to hinder or retard a desired effect or shape.

PARENT BRANCH OR STEM - The tree trunk; or a large limb from which lateral branches grow.

PINCH - Specifically the closing-in of the wood which pinches and stops the saw chain along the top rails of the guide bar during a cut. This can result in the saw being propelled straight back toward the operator (called a Linear Kickback). Pinch can also occur on the lower rails of the guide bar, resulting in the saw being pulled away from the operator.

DEFINITION OF TERMS



PRECUT OR PRECUTTING - The two-step process to remove a branch before the finished cut is made so as to prevent splitting or bark tearing into the parent stem. The branch is first undercut, then cut from the top before the final cut.

PRUNING - Removal of plant parts.

RECIPROCATING CUTTING BLADE - A moving blade that alternately changes direction on a linear cutting axis.

REDUCED-KICKBACK SAW CHAIN - A saw chain which has been demonstrated to reduce kickback on some saw models during ANSI testing.

SCABBARD - A sheath to cover the saw chain and guide bar during transport and at other times when the pruner is not in use.

SKATING - When the guide bar and saw chain or blade fails to dig in during a cut, the guide bar or blade can begin hopping or dangerously skidding along the surface of the branch, possibly resulting in the loss of control of the pruner. To prevent or reduce skating, properly hold the pruner with two hands and make sure the saw chain or blade has established a groove for cutting.

SPRING POLE - Be alert for spring poles and stay clear of them during cutting. A spring pole can spring suddenly when cut, or when the wood holding it down is cut away. A spring pole can strike you or deflect the saw into your body.

STUB - An undesirable short length of a branch remaining after a break or incorrect pruning cut is made.

STRESS FRACTURE - Structural blade or housing damage resulting from jamming in a cut, using the guide bar/blade as a lever, dropping the unit, or other abuse.

TERMINAL ROLE - Branch that assumes the dominant vertical position on the top of a tree.

THINNING - The removal of a branch or branches at the point of original or the shortening of a branch or branches.

TREE CUTTING WOUND - The opening that is created any time the tree's protective bark covering is penetrated, cut, or removed. Pruning a live branch creates a wound, even when the cut is properly made.

UTILITY - An entity that delivers a public service such as electricity or communication.

UTILITY SPACE - The physical area occupied by the utility's facilities and the additional space required to ensure its operation.

PUSH AND PULL - When cutting is done along the bottom rails of the guide bar, the reaction on the saw is a pull away from the operator. When the top of the guide bar is used, the reaction pushes the saw toward the operator. Both are normal reactions that must be controlled by the operator.

QUALIFIED LINE CLEARANCE TREE TRIMMER - A tree worker who, through related training and on-the-job experience is familiar with the techniques in line clearance and has demonstrated his/her ability in the performance of the special techniques involved. This qualified person may or may not be currently employed by a line clearance contractor.

QUALIFIED TREE WORKER, PERSON, OR PERSONNEL - Person(s) who, through related training and on-the-job experience, are familiar with the hazards of pruning, trimming, repairing, maintaining or removing trees and with the equipment used in such operations, and have demonstrated ability in the performance of the special techniques involved.

REASONS FOR PRUNING - The reasons for tree pruning may include, but are not limited to, reducing hazards, maintaining or improving tree health and structure, improving aesthetics, or satisfying a specific need such as: removing diseased, dead, dying, decayed, interfering or obstructing branches; training young trees; and, utility line clearance. Before pruning, the primary objective should be clearly defined. That objective should be accomplished in the manner most beneficial to the health of the tree.

Always wear eye protection conforming to the ANSI Z87.1 or CE Standard when operating a pole saw (Z87 or CE is stamped on the eye protection). Wood chips, dust, snapping branches and other debris can be tossed by the cutting saw chain into the operator's facial area. Eye protection may also offer some protection in the event the chain hits the operator in the eye area. If conditions warrant that a ventilated face shield be worn, eye protection must be worn underneath it. Hay fever (rhinitis) sufferers may purchase disposable masks at hardware or medical supply stores to help reduce the intake of allergenic particles.

Also, ECHO recommends wearing hearing protection at all times or hearing loss can occur. You should reduce the risk of hearing damage by wearing either "headset" type protectors or approved ear plugs. (Note: Stuffing ears with cotton is not recommended.) All persons who make part of their living using saws should be tested periodically for hearing deterioration.



WARNING DANGER

Operate a pole saw only while wearing eye and/or face protection that conforms to ANSI Z87.1 or CE Safety Standard (Z87 or CE is stamped on the eye protection).

Never wear loose clothing, unbuttoned jackets, flared sleeves and cuffs, scarfs, tie strings, neckties, cords, chains, or jewelry. Also, secure long hair which could snag or become entangled in the saw chain, power head or underbrush.

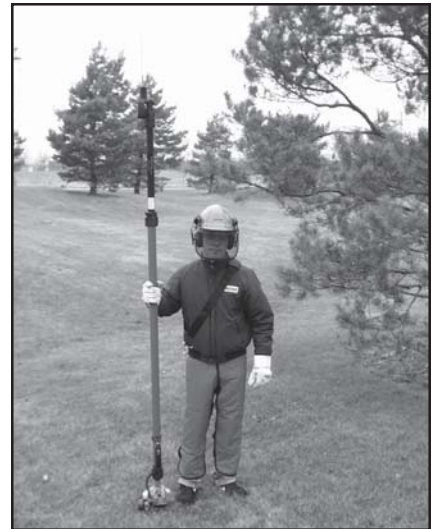
Never operate a pole saw when you are alone. Arrange to have someone remain within calling distance in case you need help.

During transportation a guide bar or blade cover known as a scabbard, should always be used.

Failure to follow these warnings can result in serious injury or death.

Always wear a "hard hat" when felling or working under trees. Wear heavy duty, nonslip gloves for improved grip, and also for protection against cold and vibration. Safety tip shoes or boots with nonslip soles should be worn. To reduce the risk of back strain, consider the use of a lumbar support brace or belt.

Clothing should be of sturdy, protective material. It should be snug-fitting to resist snagging, but roomy enough for freedom of movement. Trousers legs should not be flared or cuffed, and should be either tucked into the boot tops or trimmed short. Safety vests, leg chaps and logger's pants of ballistic material are available. It is the operator's responsibility to wear such additional protection if conditions warrant.



SAFETY PRECAUTIONS



WARNING DANGER

Do not attempt to start or operate your pole saw until you have carefully read and completely understand your Operator's and Safety Manuals. Locate, understand and follow the warning decals on your pole saw. Be familiar with the controls and the proper use of the unit. Know how to shut the unit off. Failure to follow these warnings can result in serious injury or death.



WARNING DANGER

Kickback Safety Precaution for Pole Saw Users

KICKBACK may occur when the nose or tip of the guide bar touches an object, or when the wood closes in and pinches the saw chain in the cut. Tip contact in some cases may cause a lightning-fast reverse reaction, kicking the guide bar up and back toward the operator (this is called a rotational kickback). Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back toward the operator (this is called a linear kickback). Either of these reactions may cause you to lose control of the unit, which could result in serious injury.



Do not rely exclusively upon the safety devices built into your pole saw. As a pole saw user, you should take several steps to keep your cutting jobs free from accident or injury.

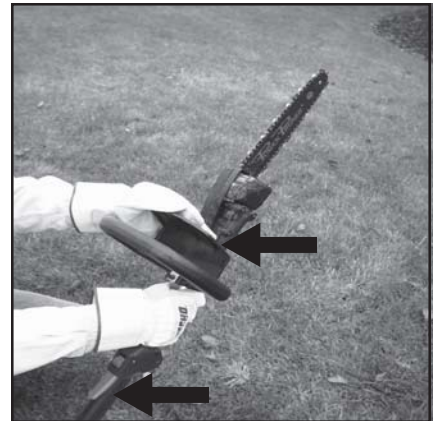
- With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents. Understand that rotational kickback is preventable by keeping an unshielded guide bar nose from touching an object or the ground.
- Do not operate a pole saw with one hand! This can result in the pole saw "skating" or skidding, which can result in personal injury due to loss of control. Serious injury to the operator, helpers or bystanders may result from one-handed operation. For proper control, always use two hands when operating a pole saw.
- Keep a good firm grip on the pole saw with both hands, with the right hand on the rear handle and the left hand on the front handle, when the engine or motor is running. Use a firm grip with thumbs and fingers encircling the pole saw handles and grips. A firm grip will help you reduce kickback and maintain control of the pole saw. Don't let go.
- Make sure that the area in which you are cutting is free from obstructions. Do not let the unshielded guide bar nose contact a log, branch, or any other obstruction while you are operating the unit.
- Normally cutting at high engine speeds will reduce the likelihood of kickback. However, cutting at part-throttle or low engine speeds may be preferable to control the pole saw in tight situations and may also reduce the likelihood of kickback.



SAFETY PRECAUTIONS



- Follow sharpening and maintenance instructions for the saw chain in your Operator's Manual. Do not resharpen saw blades.
- Use only replacement guide bars, saw chains or blades specified by the manufacturer.
- Do not over reach.
- Do not operate the unit if you are fatigued, or under the influence of alcohol, medication or any substance that can affect your vision, dexterity or judgment. You must be in good physical and mental health to operate a pole saw safely.
- Never operate your pole saw unit without its proper guards, shields, and protective devices in place. Check to make sure before operating.
- Do not operate a unit in disrepair, or with damaged or missing parts. Use only genuine ECHO replacement parts. Check that the cutting attachment, guide bar and saw chain are firmly attached and in safe operating condition.
- All maintenance specified in your pole saw Operator's Manual should be performed by you or an authorized ECHO servicing dealer. Any service or repair work that the Operator's Manual does not address should be done by an authorized ECHO servicing dealer only. For a dealer near you dial 1-800-432-ECHO (3246).
- Use caution when handling fuel. Move the pole saw at least 3m (10 feet) from the fueling point before starting the engine.
- Do not allow other persons to be near the pole saw when you are starting or cutting with the saw. Keep bystanders and animals 15m (50 feet) away from the work area. Do not let anyone hold wood for you to cut.



DEALER?
Call
1-800-432-ECHO



SAFETY PRECAUTIONS



- Keep all parts of your body away from the saw chain or blade when the engine is running.
- Before you start the engine or motor, make sure the saw chain or blade is not contacting anything.
- Carry the pole saw with the engine or motor stopped, the guide bar and saw chain or blade to the front, and keep the hot muffler away from your body.
- Do not operate a pole saw that is damaged, improperly adjusted, or not completely and securely assembled. Be sure that the saw chain or blade stops moving when the throttle control trigger is released.
- Shut off the engine or motor before setting the unit down.
- Use extreme caution when cutting small-size brush and saplings because slender material may catch the saw chain and be whipped toward you or pull you off balance.
- When cutting a limb that is under tension, be alert for springback so that you will not be struck by the limb or saw when the tension in the wood fibers is released.
- Keep the handles dry, clean, and free of oil or fuel mixture.
- Do not operate a pole saw standing in a tree.
- Fuel your pole saw safely. Handle flammable fuel with care. Use an approved gasoline container. Do not smoke or bring sparks or flame near the fuel supply. Use proper fueling procedures recommended in the pole saw Operator's Manual. Do not over fill the fuel tank. If spilling occurs, clean up before you attempt to start the unit. Always make sure engine fuel cap is securely tightened before operating.
- Use only one ECHO approved extension on your pole saw.
- Do not hit rocks, stones, or other foreign objects with the saw chain or blade.
- If the cutting attachment strikes an obstruction, stop the engine or motor immediately and inspect the cutting attachment for damage, do not contact ground with saw chain or blade.
- When transporting your pole pruner use the appropriate guide bar or blade scabbard.



SAFETY PRECAUTIONS



- Do not run the gasoline engine indoors, or where there is poor ventilation. Engine exhaust contains deadly carbon monoxide poison.
- Keep both feet on the ground. Do not work from off-the-ground positions. Working from ladders is extremely dangerous because ladders can slip, as well as, limit your control of the pole saw. Working aloft should be left to professionals.
- Use your saw only to cut wood or wood products. Do not cut solid metal, sheet metal, plastics or any non-wood materials.
- Stay on the uphill side when pruning, limbs may roll down hill when cut.
- Work only when there is adequate lighting to see clearly.
- When there are several workers, they should be stationed where they will not interfere with one another. During cutting operations, only one person should be working on a tree.
- Before cutting, clear the area of materials likely to start brush fires or interfere with you or the saw. Be sure the path of retreat is clear. It is wise to plan two exit paths in case one becomes blocked.
- Do not go under trees during periods of high wind or heavy precipitation. If a fallen or broken tree creates an emergency, leave removal to a professional tree removal service.
- Any tree with a hollow rotted trunk, thick loose bark, and dead branches is extremely dangerous to disturb by cutting. Such trees should be worked on by professionals.
- Do not allow anyone to enter a zone of 15m (50 feet) from where you are working. If the risk of eye injury exists to people outside of 15m (50 feet), require them to wear ANSI or CE approved eye protection.
- Always disconnect and move the spark plug wire away from the spark plug before you work on the unit or leave it unattended.
- Ensure that the operator can see where the cutting action is occurring. Use the proper tools. If the branch or limb cannot be safely cut with your pole saw, use other tools such as hand pruners or hand saws or consult with a professional.
- Be aware of local ordinances which may restrict the use of a pole pruner product.
- Use only certified dielectric cleaning material such as “hot stick” for cleaning dielectric tools. Refer to your Operator’s Manual for additional information.



SAFETY PRECAUTIONS



WARNING DANGER

The pole saw's engine can continue to run when the blade is jammed. Before attempting to release or free the jam, always switch the engine off, disconnect the spark plug wire from the spark plug. After assuring the blade and engine have stopped, proceed to clear the jam. Wear gloves while clearing material from the jammed blades. Never grasp the sharp, exposed cutting blade of the pole saw. If you contact the cutting blade, serious personal injury may occur.

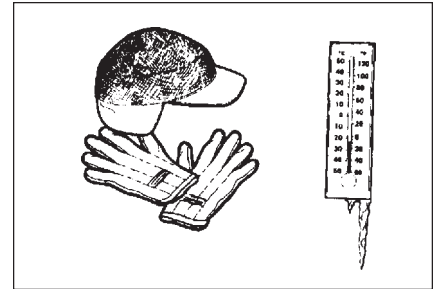
- Do not misuse the blade or the unit. Never use the unit for anything other than it was intended. Do not use it as a hammer, lever, or crowbar.
- To avoid burns, always make sure that the muffler side of the engine is away from your body.
- Shut off the pole saw immediately if the unit starts to shake or vibrate excessively. This could be a sign of danger. A part may be broken or loose.
- After shutting off the engine or motor, keep your fingers and body away from the cutting attachment until all movement has stopped. Saw chain or blade will coast to a stop after releasing the throttle.



SOME ADDITIONAL SAFETY PRECAUTIONS



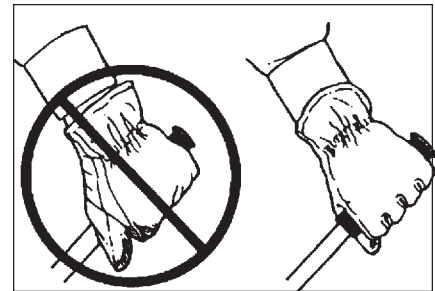
PRECAUTIONS IN HOT, HUMID WEATHER - Heavy clothing can increase an operator's fatigue. Heat stroke or heat exhaustion is possible. Under these adverse conditions, you must judge whether wearing heavy protective clothing or lighter but less protective items bears the least risk. Or you might wisely choose to delay work until the temperature drops.



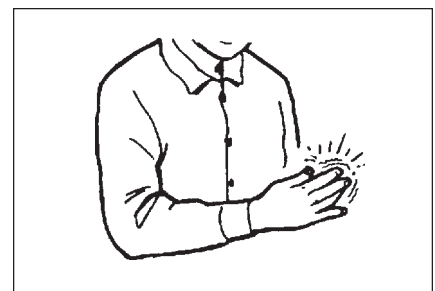
PRECAUTIONS AGAINST VIBRATION AND COLD - It is believed that a condition called Raynaud's Phenomenon, which affects the fingers of certain individuals, may be brought about by exposure to cold and vibration. Accordingly, your ECHO pole saw has a vibration reduction system designed to reduce the intensity of vibration received through the handles. Exposure to cold and vibration may cause tingling and burning followed by loss of color and numbness in the fingers. We strongly recommend that you take the following precautions because the minimum exposure which might trigger the ailment is unknown.



- Keep your body warm, especially the head, neck, feet, ankles, hands and wrists.
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks and also by not smoking.
- Limit the number of hours of cutting operation. Try to fill a part of each work day with jobs other than pruning.
- If you experience discomfort, redness and swelling of the fingers, followed by whitening and loss of feeling, consult your physician before further exposing yourself to cold and vibration.



PRECAUTIONS AGAINST REPETITIVE STRESS INJURIES - It is believed that overusing the muscles and tendons of the fingers, hands, arms and shoulders may cause soreness, swelling, numbness, weakness and extreme pain to the areas just mentioned. Certain repetitive hand activities may put you at a high risk for developing a repetitive stress injury (RSI). An extreme RSI condition is Carpal Tunnel Syndrome (CTS), which can occur when your wrist swells and squeezes a vital nerve that runs through the area. Some believe that prolonged exposure to vibration may contribute to CTS. CTS can cause severe pain for months or even years. To reduce the risk of RSI/CTS, do the following:



- Avoid using your wrist in a bent, extended or twisted position. Instead, try to maintain a straight wrist position. Also, when grasping, use your whole hand, not just the thumb and index finger.
- Take periodic breaks to minimize repetition and rest your hands.
- Reduce the speed and force in which you do the repetitive movement.
- Do exercises to strengthen the hand and arm muscles.
- Immediately stop using all power equipment and consult a doctor if you feel tingling, numbness or pain in the fingers, hands, wrists or arms. The sooner RSI/CTS is diagnosed, the more likely permanent nerve and muscle damage can be prevented.

EQUIPMENT TO BRING ALONG - When using gasoline powered engines, fuel supplies should be carried in approved fuel containers. Bring an extinguisher or shovel in case of a fire. Despite the precautions which can be taken, operating a pole saw presents some dangers so keep a first aid kit handy.

FORCES TO CONTROL

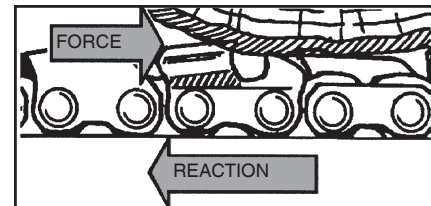
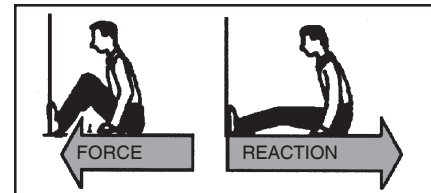


This section is about forces which must be controlled to avoid injury when operating a pole saw. Pros and cons of various safety devices are included in the discussion. Always remember that your best defenses are to exercise caution and use the pole saw properly.

Here is an example of a reaction to an action: if you sit on the floor and push forcefully enough against a wall with your feet, your body will slide away from the wall. For pole saw operators, when the saw chain forces its way into the wood from one direction, the reaction tends to move the pole saw in the opposite direction.

PULL, PUSH and KICKBACK - terms for the direction a reaction takes.

- **PULL** - This occurs when you are cutting on top of a log with the lower portion of the saw chain moving toward you. The pole saw will be pulled into the wood and away from you.
- **PUSH** - This is the cutting on the underside of a log with the top of the bar. It pushes the pole saw toward you.
- **ROTATIONAL KICKBACK** - This happens when the saw chain is moving downward around the upper nose of the bar. Solid contact in this situation may dangerously drive the guide bar tip upward in an arc toward you.
- **LINEAR KICKBACK** - Describes a sudden PUSH reaction when the guide bar is buried in a cut which closes and pinches the saw chain along the top rails of the guide bar. This propels the pole saw straight back toward the operator.



Rotational kickback is predictable, preventable and controllable. If the operator is not alert to the possibility of a kickback, it may come as a complete surprise. The best defense against rotational kickback is making sure the saw chain contacts nothing solid at the upper nose of the guide bar. PUSH and PULL forces are controlled by anticipating which reaction will happen and adjusting your position and stance to compensate.



FORCE OF GRAVITY - When you are operating a pole saw you must accommodate for gravity. Maintain proper grip and stance. Keep good footing. Don't cut while off balance — gravity may work against you. Never reach too far with the pole saw.

FOLLOW THROUGH - When you're about to complete a cut, be ready to throttle back and hold up the pole saw so that the cutting attachment will not follow through into you or hit the ground after the guide bar or blade cuts through the branch.

SKATING - This condition occurs when the saw chain or blade does not dig in properly when starting a cut. In other words, the saw chain or blade does not get tracked as it attempts to penetrate the wood. The guide bar or blade can then begin hopping or skidding side-to-side along the surface. At this point, you do not have full control of the saw, and the guide bar nose or blade could strike an obstruction and create a kickback.

If you are holding the saw with one hand and a branch with the other, the saw could skate laterally into your hand holding the branch. To prevent or reduce skating, hold the pole saw with two hands and make sure the saw chain or blade has established a groove for cutting. Throttling down the saw chain or blade speed may help to get a groove started, but once the saw chain or blade is grooved, throttle the unit up to complete the cut.



FORCES TO CONTROL



On guide bar and saw chain configured pole saws, proper saw chain tension cannot be maintained when and if the:

- Drive sprocket is worn.
- Guide bar is improperly clamped to the pole saw.
- Tension adjuster has not engaged the guide bar, thus allowing the guide bar to shift.
- Guide Bar rails are in poor condition.
- Guide bar and saw chain are improperly lubricated.

WARNING DANGER

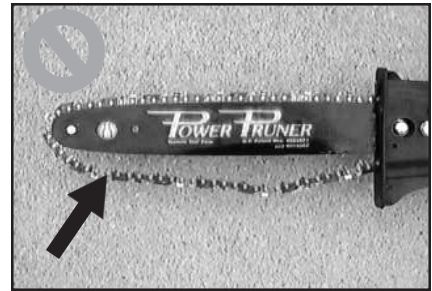
Equipment, including your pole saw, should not be transported in the same compartment as passengers, and must be secured in some manner. Cover the saw chain and guide bar or blade with a scabbard or serious injury may occur.

PROPER GRIP ON THE POLE SAW - A firm grip is one requirement for pole saw control. The saw should always be held firmly with both hands with thumbs and fingers encircling the front and rear handles whenever the engine or motor is running.

- Wear heavy duty nonslip gloves to improve your grip on the handles.
- Grasp the front handle firmly with your left hand. Use the proper grip with fingers encircling and the thumb on the underside. Thumb position is the key to a strong grip.
- Grasp the rear handle in the same manner as the front handle. Use index finger to work the throttle trigger, and practice operating the engine stop switch without losing your hold on the unit.

WARNING DANGER

Always use a wraparound grip. Never use a grip where the thumb and finger do not encircle the unit handles. If you use an improper grip, even a slight push or kick of the unit may dislodge your hand and cause serious injury.



BALANCE AND BODY POSITION FOR CUTTING



Pole saws are designed for light to medium trimming of limbs and branches up to 20.3 cm (8 in.) in diameter. After starting, pick up the pole saw and proceed as follows:

- Plan cut carefully. Check direction branch will fall.
- Do not stand directly beneath branch being cut.
- Plan a retreat path from falling branches. Branches may bounce when striking the ground.
- Stand with your weight on both feet. Adjust your stance so as to be away from the saw chain or blade and the line the limb will fall.
- When ready to cut:
Hold front cutting guide against branch. This will prevent the branch from whipping. **DO NOT** use back and forth sawing action.
- Look out for the branch immediately behind the one being cut. If the saw chain hits the rear branch damage to the saw chain may occur (or kickback).
- Accelerate to full throttle.
- Apply cutting pressure.
- Ease cutting pressure when nearing end of cut to maintain control.
- When pruning a limb 10.2cm (4 inches) in diameter or larger cut as follows:
 1. Under cut 1/4 limb diameter near tree trunk.
 2. Finish top cut slightly further out on limb from tree trunk.
 3. Flush cut stub at trunk.
- Long branches should be removed in several pieces.
- At completion of the cut, let go of the throttle trigger, carefully lift the pole saw clear, and idle the engine before moving away.
- **DO NOT** use Pole Saw for felling or bucking.



WARNING DANGER

Moving toward the next place to cut before throttling down and lifting the saw clear of the cut can cock the saw chain or blade against the sides of the cut. Always throttle down and let the saw chain or blade come to a stop and lift the saw clear of the wood before moving away. Failure to do so may result in serious injury.

- Review your cuts carefully. Sometimes the way the branch is stressed will endanger you.

WARNING DANGER

If a branch starts to fall, causing your saw to bind, **LEAVE THE SAW AND GET AWAY FAST!** or serious injury may occur.

- Do not let the nose of the guide bar come near any solid object while the saw chain is rotating. Never let the guide bar dip into the ground.
- Keep your body out of the path of a potential kickback. During all cutting, do not bend toward or otherwise crowd the guide bar or blade.
- Cut only one piece of wood at a time.
- Do not thrust the nose of the guide bar into a pile of branches or dense brush where you cannot see if the nose is in the clear.
- When starting a cut, be ready to control any tendency of the guide bar to skate as it attempts to penetrate the wood. Kickback could be a secondary reaction if the guide bar nose or blade skates into an obstruction.

BALANCE AND BODY POSITION FOR CUTTING



- When completing an elevated cut, be ready to hold up the pole saw as it cuts into the clear, so it will not follow through.
- Limit your cutting to the range within which you can control the pole saw fully. Don't reach out because you could lose your balance.
- Make limbing and pruning cuts one at a time. Do not try to prune more than one branch at a time.
- Do not prune near power lines.



PINCHING, BINDING, SPLITTING



Wind bends trees. Gravity bends branches that are not flat on the ground. A branch weakened by a cut over 1/3 the diameter is like two branches hinged together. The cut may either close or open wider, depending on how the branch is lying.

When cutting branches, always make the weakening cut from the direction (opposite the hinge side) which causes the cut to widen. If made from the wrong side, the cut will close, binding the guide bar and pinching the saw chain or blade.



If the branch is under heavy stress, prevent splitting by making a shallow cut (up to 1/3 diameter) on the hinge side first. But, always finish with the weakening cut in a direction toward the hinge side.

When the branch is supported on both ends and is to be cut in between, underbuck (cut upward from the bottom side) for the finishing cut.



LIMBING AND BUCKING



When you wish to cut off an unsupported section from the end of a branch, the weakening or finishing cut should be an overbuck (from top down). However, you may begin with a shallow underbuck to avoid splitting and some damage to the tree or limb.

WARNING DANGER

Do not cut, walk or stand on a limb while cutting. Serious personal injury may result.

If the saw chain becomes pinched in a bind, SHUT OFF THE ENGINE OR MOTOR. Free the bind by lifting the limb. Use levers, poles, etc. for lifting. This avoids back injuries.

When a branch is held off the ground by its limbs, determine which of these are needed for support. Leave these while you cut off all the other limbs and branches.

You will lose support of the limbs as sections of the branch are cut. Go to the high ground side of the branch to buck off limbs. Be sure to have a retreat path should the limb roll toward you as branches are removed.

WARNING DANGER

Do not use SRS models for bore cutting or serious personal injury may result.

WARNING DANGER

There is danger of kickback during boring. It is not recommended to bore cut with a pole pruner. Do not use SRS models for bore cutting. Serious personal injury or death can result from improper bore cutting.

Avoid windfalls. Windfalls are tangled branches, roots and trees. Clean these out only by cutting from the perimeter.



WHEN TO CALL A PROFESSIONAL



There are times that the solution to a problem with a mature tree is best handled by a professional arborist.

When do you call for professional help?

1. When you don't have the expertise and proper equipment to safely accomplish the job.
2. When the tree is too large and pruning requires extension equipment like a bucket truck.
3. When the tree is located near utility lines, buildings or a highway you should consult a professional.
4. When major storm damage requires judgment on whether and how to save a tree.
5. If you are not sure when or how to prune.



Be selective about who you hire to care for your trees. Look for a company that uses certified arborists trained to properly care for trees. Inquire about the equipment they use. For example, will they use a bucket truck to reach your high branches or do they use extended-reach pruning equipment? Do they use safety accessories and safe equipment, like insulated power equipment for use around high-voltage wires? Always ask a tree care company for customer references. Take the time to visit them and look at the job that was done on their trees.



PRUNING: TIMING AND TECHNIQUE



Pruning is vital to the health and beauty of trees. Pruning controls the size and direction of growth, improves a tree's health, diminishes risk of infection and increases the size of flower and fruit production. Proper pruning also encourages growth by opening up the tree's canopy and branch structure.

But first and foremost, proper pruning is important for tree health. Dead wood that is left on a tree is a food source for fungi and bacteria that can damage a tree. Such dead and decaying wood can also open passageways for invasive insects.

TIMING

On most trees, the ideal time to prune is during the winter months when sap flow has either stopped entirely in northern regions or slowed considerably in southern regions. Early spring is also a good time to prune, as long as trees have six weeks of healing time before the first signs of growth.

There are exceptions. Trees and shrubs that flower in the early spring, such as lilacs and redbuds, are best pruned within the two-week period following blossom drop. Many varieties of needled evergreens are best pruned in the spring as well, just as new growth emerges.

Pruning should be matched to the needs of each tree, in technique and timing. Some trees require frequent pruning while others require very little.

PRUNING TECHNIQUES

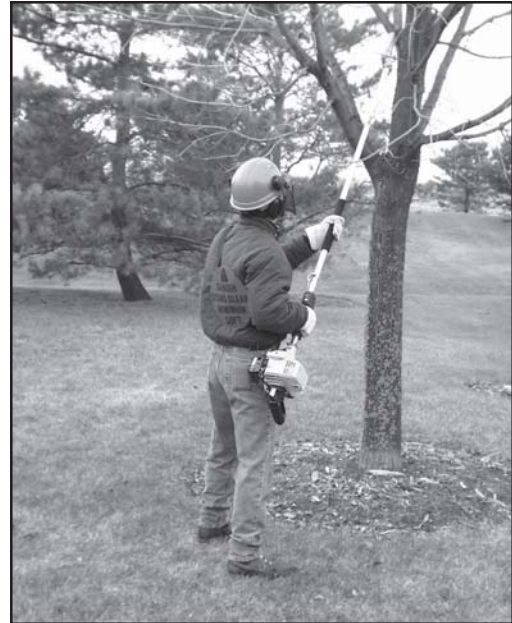
Before pruning any tree, determine the objective. There are several reasons to prune a tree. As a general rule, prune a tree first for safety reasons, then for health, and then for aesthetics.

No matter what the reason is for pruning, as a general rule of thumb, remove no more than a quarter of the tree's foliage.

Pruning techniques vary depending on the size and location of the branch.

When a small branch is pruned away, the cut should be made close to where it emerges from a larger branch. This way, the plant's natural growth pattern is encouraged. Cuts on branches or stems should be made at a moderate angle; too great an angle exposes a large, oblong wound that takes longer to heal and is more susceptible to infection.

When trimming side branches, the final pruning cuts should be made at the outside edge of the branch collar (the slightly swollen area where the branch attaches to the trunk). On larger, heavy branches pruning cuts may have to be made several inches from where the branch emerges, to avoid any tearing of the bark when the branch falls.



PRUNING: TIMING AND TECHNIQUE



- **WOUND DRESSINGS** - Wound dressings have been shown to interfere with the natural development of callus tissues that eventually close the pruning wound. In some cases, wound dressings can even harbor disease organisms much like what occurs when a Band-Aid is left on a skin cut too long. It is far more important to make the cut smooth, outside of the collar and allow the wound to dry.

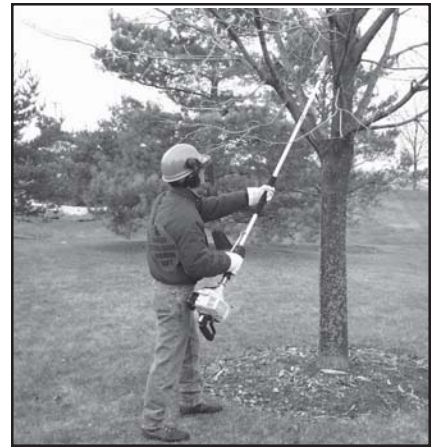
If a wound dressing is desired for aesthetic purposes, use a very thin coat, just enough to darken the wound area. The best are the aerosol sprays of water-emulsified asphalt sold in garden centers. Do not use oil-based paints, thick tars or other materials containing petroleum solvents.



- **MAINTAIN TREE HEALTH** - The key to good wound closure following pruning is to maintain a healthy tree through proper watering, fertilizer application and pest control. Trees under stress from drought, over-watering, pest attack, lawn mower and other mechanical damage, and poor nutrition cannot successfully fight off invasion of disease.

For larger branches, a three-step approach is recommended to avoid tearing or ripping the tree's bark.

1. The first cut should be a shallow notch, made on the underside of the branch several inches from the branch collar.
2. The second cut, which goes entirely through the branch, is made just outside the first cut.
3. The remaining stub is then cut just outside the branch collar.



Always prune branches to the point of origin. Remove small twigs where they emerge from small branches and remove large branches at the juncture with a larger branch or at the trunk.

Be sure to remove all dead or damaged branches first, followed by branches that interfere with each other or those that form weak angles. Retain the strongest, best placed branches; remove the weaker ones.

SHRUBS

Many shrubs have growth patterns similar to trees, but on a smaller scale. They should be pruned like trees, with these considerations:

- A. Prime pruning periods for deciduous shrubs depend on the purposes for which the shrubs are grown. For example, shrubs whose foliage is the greatest attribute can be pruned anytime during the winter to early spring. Shrubs whose spring flowers are their best feature are best pruned immediately after the blooming period. And shrubs grown primarily for their summer blossoms can be pruned during the winter.
- B. Up to one-third of a deciduous shrub's growth can be removed at any one time. By selectively removing the oldest, heaviest branches at ground level, you automatically reduce its height. Some of the most sturdy hedge plants can be cut back further, to within six or eight inches of the ground during late winter. These plants will shoot up new growth in the spring, thickening a young hedge or rejuvenating an old one.



- C. With most needled evergreens, pruning is confined to trimming back a portion of new growth to control height or spread, or to even the shape. Pine growth tips (commonly called candles) can be cut back from one-third to three-quarters prior to the time the needles of the candles unfold. The growth tips of spruce and fir can be trimmed back by as much as three-quarters while the shoots are still tender and flexible.

TECHNIQUE

When trimming shrubs and hedges, there are two approaches. One involves pruning away old wood to induce new shoots and growth; the other involves clipping or trimming the shrub to reduce its total height. Small-leaf, close-textured shrubs respond well to repeated clipping and make the best formal hedges. Larger-leaf, open shrubs are better suited for pruning and not trimming with a hedge clipper.

When operating hedge shears or clippers, hold the cutting blades parallel to the surface you're trimming, and cut back to the point where you've previously sheared. By starting low and working your way up, it makes it easier to trim the top part of the hedge. Tools like ECHO'S new shaft hedge trimmers help to extend reach while the articulating hedge trimmer makes sculpting a breeze and facilitates reaching across the top of taller hedges while still maintaining a parallel cut.

When the trimming project is done, remove the bulk of the clippings, but don't worry about the few that remain on top of the hedge or that fall within its borders.

In a few days they will shrivel up and die.

PRUNING DO'S AND DON'TS

Two common practices are particularly harmful to trees and should be avoided at all costs.

- One is referred to as topping, the indiscriminate heading of large upright branches to reduce the height of a tree.
- The other is called tipping, the cutting away of lateral branches to reduce crown width.

Both practices not only leave behind an unsightly tree, they also inflict damage that will kill the remainder of the cut branch and quite possibly cause additional tree stress.

Still, one of the most common ways trees are injured is to simply not follow recommended pruning practices that needlessly rip away bark or otherwise leave trees susceptible to insects, disease and decay. Also, latest research has shown that painting tree wounds is not necessary. Trees develop their own barriers to seal off damaged or freshly pruned tissues.

Routine pruning is vital to the health of all trees and shrubs. When done properly, it will work to maintain health, vigor and beauty and help ensure these landscape elements deliver years of trouble-free enjoyment to property owners.



NOTES





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