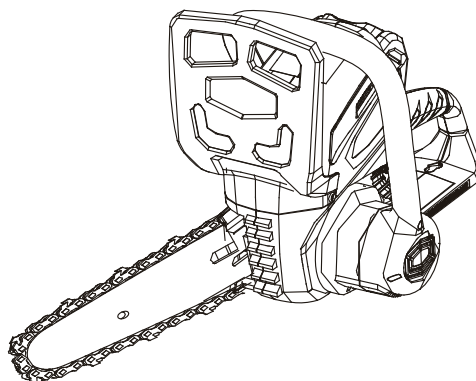




40V LITHIUM-ION CORDLESS 12" CHAIN SAW 20262



Some Greenworks Lithium-Ion products are sold with
or without battery and charger.

To order: Battery (Sold Separately)(Model # 29472 & 29462)
Charger (Sold Separately)(Model # 29482)



Owner's Manual

TOLL-FREE HELPLINE: 1-888-90WORKS (888.909.6757)

 Read all safety rules and instructions carefully before operating this tool.

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PRODUCT SPECIFICATIONS

40V LITHIUM-ION CHAIN SAW

Type.....	Cordless, battery-powered
Motor	40 V
Bar length	12" (30.4 cm)
Chain pitch	3/8" (9.5 mm)
Chain gauge	.05" (1.27 mm)
Chain type	91PJ040X(Oregon)
Guide bar type	12"120SDEA041(Oregon)
Chain oil tank capacity	1.8 oz (50 ml)



SAFETY INFORMATION

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT

READ AND UNDERSTAND ALL INSTRUCTIONS. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious personal injury.

WARNING

When use a electric chainsaw, basic safety preccation should be always followed to reduce the risk of fire, electric shock, and injury to persons, including the following.

- Do not start cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree. Cluttered areas invite accidents.
 - Keep all children, bystanders, visitors, and animals out of the work area while starting or cutting with the chain saw.
 - Do not operate chain saw in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.
 - Wear snug fitting clothing. Always wear heavy, long pants, overalls, jeans or chaps made of cut resistant material or ones that contain cut resistant inserts. Wear non-slip safety footwear. Wear non-slip heavy duty gloves to improve your grip and to protect your hands. Do not wear jewellery, short pants, sandals, or go barefoot. Do not wear loose fitting clothing, which could be drawn into the motor or catch the chain or underbrush. Secure hair so it is above shoulder level.
 - Heavy protective clothing may increase operator fatigue, which could lead to heat stroke. During weather that is hot and humid, heavy work should be scheduled for early morning or late afternoon hours when temperatures are cooler.
 - Wear eye protection which is marked to comply with ANSI Z87.1 as well as hearing and head protection when operating this equipment.
 - Always be aware of what you are doing when using the chain saw. Use common sense. Do not operate the chain saw when you are tired, ill, or under the influence of alcohol, drugs, or medication.
 - Do not expose the chain saw to rain.
 - Do not use the chain saw in damp or wet locations.
 - Stay alert and pay attention to what you are doing. Use common sense when using this unit.
 - Keep all parts of your body away from the saw chain when the unit is running.
 - Always carry the chain saw by the front handle with the battery removed and the guide bar and saw chain positioned to the rear.
 - Never let anyone use your chain saw who has not received adequate instructions in its proper use. This applies to rentals as well as privately owned saws.
 - Before you start the unit, make sure the saw chain is not contacting any object.
 - Stop the chain saw before setting it down.
 - To avoid accidental starting, never carry the unit with your finger on the switch trigger.
 - Maintain the unit with care. Keep the cutting edge sharp and clean for best performance and to reduce the risk of injury. Follow instructions for lubricating and changing accessories.
 - Keep handles dry, clean, and free of oil and grease.
-

SAFETY INFORMATION

- a. use only the following type and size batteries (GMAX 4Ah & 2Ah Battery / # 29472 & 29462)
- b. do not dispose of batteries in a fire, the cell may explode, check with local codes for possible special disposal instruction.
- c. do not open or mutilate the batteries, released electrolyte is corrosive and may cause damage to the eyes or skin, if may be toxic if swallowed.
- d. exercise care in handling battery in order not to short the battery with conducting material such as rings, bracelets and keys. the battery or conductor may overheat and cause burns.
- Do not operate a chain saw with one hand! Use a firm grip with thumbs and fingers encircling the chain saw handles. Serious injury to the operator, helpers, bystanders, or any combination of these persons may result from one-handed operation. A chain saw is intended for two-handed use.
- Avoid body contact with grounded surfaces such as metal pipes and wire fences. There is an increased risk of electric shock if your body is grounded.
- Do not operate a chain saw that is damaged, improperly adjusted, or not completely and securely assembled. Chain should slow to a stop when the switch trigger is released. If the chain continues to turn after the switch trigger has been released, have the unit serviced by your nearest GREENWORKS service dealer.
- Check for damaged parts. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service dealer unless otherwise indicated elsewhere in this manual.
- All chain saw service, other than the items listed in the operation and maintenance sections, should be performed by your nearest GREENWORKS service dealer.
- Always maintain a proper stance.
- Do not use chain saw if switch does not turn it on and off. Have defective switch replaced by authorized service centre.
- Remove the battery when not in use, before servicing, and when making adjustments and changing attachments, such as saw chain and guard.
- Do not cut vines and/or small underbrush.
- Do not operate a chain saw in a tree, on a ladder, or scaffold; this is extremely dangerous.

NOTE: The size of the work area depends on the job being performed as well as the size tree or work piece involved. For example, felling a tree requires a larger work area than making bucking cuts.

- Use extreme caution when cutting small size brush and saplings, because small 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 spring back so that you will not be struck when the tension in the wood fibers is released.
- Do not force the chain saw. The job can be performed better and safer at the rate for which it was intended.
- Always use the right product for your application. The chain saw should be used for cutting wood only. Never use the chain saw to cut plastic, masonry or non-wood building materials.
- Do not use the chain saw for purposes not intended.
- Store chain saw when not in use. Chain saw should be stored in a dry and high or locked area out of the reach of children.
- Save these instructions. Refer to them frequently and use them to instruct others who may use this tool. If you loan someone this tool, loan them these instructions also.

SAFETY INFORMATION

WARNING **Proposition 65**

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- lead from lead-based paints,
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well-ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

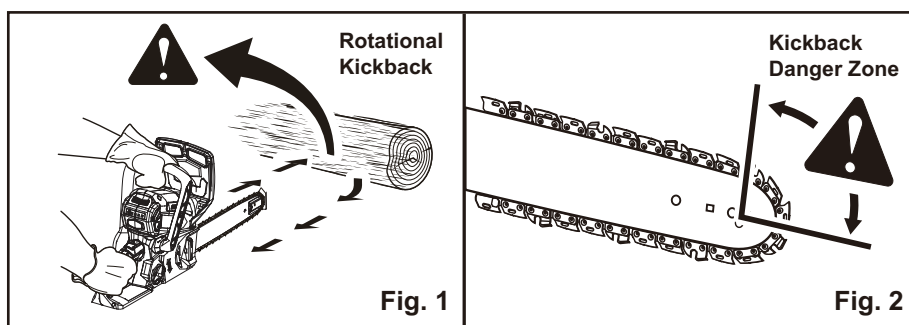
SAFETY INFORMATION

KICKBACK (See Figure 1-2)

WARNING

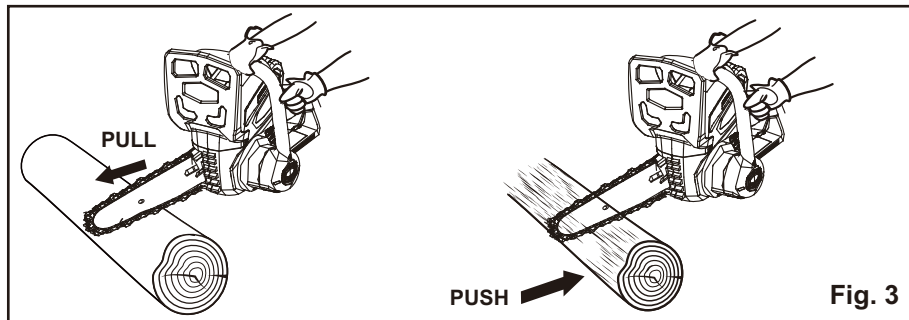
Kickback may occur when the moving chain contacts an object at the upper portion of the tip of the guide bar or when the wood closes in and pinches the saw chain in the cut. Contact at the upper portion of the tip of the guide bar can cause the chain to dig into the object and stop the chain for an instant. The result is a lightning fast, reverse reaction which kicks the guide bar up and back toward the operator. If the saw chain is pinched along the top of the guide bar, the guide bar can be driven rapidly back toward the operator. Either of these reactions can cause loss of saw control which can result in serious injury. Do not rely exclusively upon the safety devices built into the saw. As a chain saw user, you should take several steps to keep your cutting jobs free from accident or injury.

- The following precautions should be followed to minimize kickback:
 1. Always grip the saw firmly with both hands. Hold the saw firmly with both hands when the unit is running. Place your right hand on the rear handle and your left hand on the front handle with your thumbs and fingers encircling the chain saw handles. A firm grip together with a stiff left arm will help you maintain control of the saw if kickback occurs.
 2. Make sure that the area in which you are cutting is free from obstructions. Do not let the nose of the guide bar contact a log, branch, fence, or any other obstruction that could be hit while you are operating the saw.
 3. Always cut with the unit running. Fully squeeze the switch trigger and maintain cutting speed.
 4. Use only the replacement guide bars and low kickback chains specified by the manufacturer for the saw.
- With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.
- Keep proper footing and balance at all times.
- Do not cut above shoulder height or overreach when cutting.
- Follow the sharpening and maintenance instructions for the saw chain.

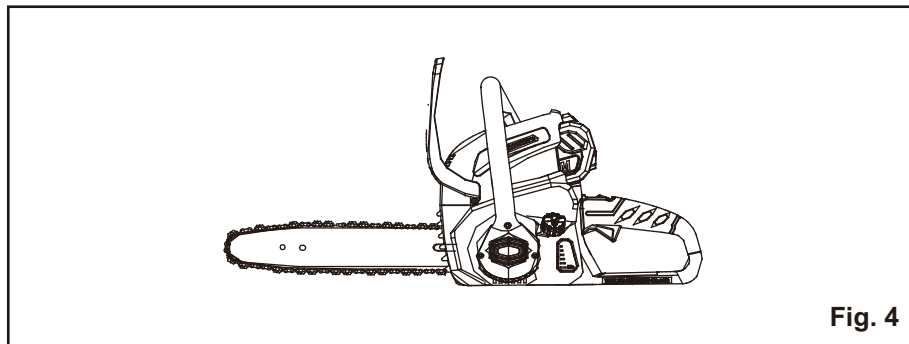


SAFETY INFORMATION

- Push and Pull - This reaction force is always opposite to the direction the chain is moving where wood contact is made. Thus, the operator must be ready to control the PULL when cutting on the bottom edge of the bar, and PUSH when cutting along the top edge. (See Figure 3)



UNDERSTANDING YOUR CHAIN SAW SAFETY DEVICES (See Figure 4)



LOW KICKBACK SAW CHAIN

The rakers (depth gauges) ahead of each cutter can minimize the force of a kickback reaction by preventing the cutters from digging in too deeply at the kickback zone. Only use replacement chain that is equivalent to original chain or has been certified as low kickback chain per ANSI B175.1. Low kickback/skip tooth saw chain is a chain that has met the kickback performance requirements of ANSI B175.1 - 1991 (American National Standard for Power Tools - Gasoline-Powered Chain Saws-Safety Requirements) when tested on the representative sample of chain saws below 3.8 c.i.d. specified in ANSI B175.1 - 1991. As saw chains are sharpened during their useful life, they lose some of the low kickback qualities and extra caution should be used.

SYMBOLS

Some of the following symbols may be used on this product. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the product better and safer.

SYMBOL	NAME	DESIGNATION/EXPLANATION
V	Volts	Voltage
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
W	Watts	Power
hrs	Hours	Time
n_0	No Load Speed	Rational speed, at no load
	Class II Construction	Double-insulated construction
/min	Per Minute	Revolutions, strokes, surface speed, orbits etc., per minute
	Lithium-Ion Battery Recycling	Designates that this tool is in compliance with Lithium-Ion battery recycling program requirements
	Safety Alert Symbol	Precautions that involve your safety.
	Read the Operator's Manual	To reduce the risk of injury, user must read and understand operator's manual before using this product.
	Eye and Head Protection	Wear eye and head protection when operating this equipment.
	Gloves	Wear non-slip, heavy-duty protective gloves when handling the pole saw and the blade.
	Safety Footwear	Wear non-slip safety footwear when using this equipment.
	Kickback	DANGER! Beware of kickback.
	Operate With Two Hands	Hold and operate the saw properly with both hands.
	One Handed	Do not operate the saw using only one hand.
	Bar Nose Contact	Avoid bar nose contact.
	Keep Bystanders Away	Keep all bystanders at least 50' (15 m) away.

SYMBOLS

The following signal words and meanings are intended to explain the levels of risk associated with this product.

SYMBOL	SIGNAL	MEANING
	DANGER	Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.
	WARNING	Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.
	CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.
	CAUTION	(Without Safety Alert Symbol) Indicates a situation that may result in property damage.

SERVICE

Servicing requires extreme care and knowledge and should be performed only by a qualified service technician. For service we suggest you return the product to your nearest **AUTHORIZED SERVICE CENTER** for repair. When servicing, use only identical replacement parts.

WARNING

To avoid serious personal injury, do not attempt to use this product until you have read this Owner's Manual thoroughly and understand it completely. If you do not understand the warnings and instructions in this Owner's Manual, do not use this product. Call the Toll-free Helpline (1-888-909-6757) for assistance.

WARNING

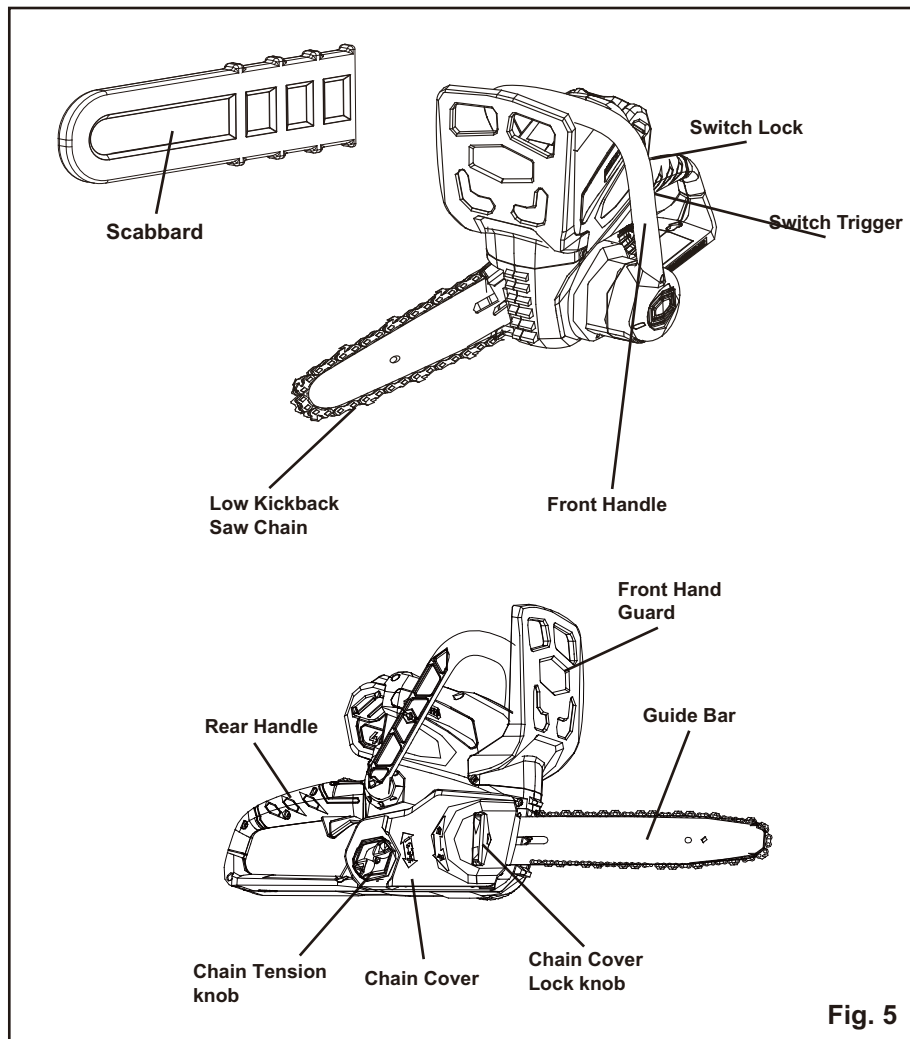


The operation of any power tool can result in foreign objects being thrown into your eyes, which can result in severe eye damage. Before beginning power tool operation, always wear safety goggles or safety glasses with side shields and, when needed, a full face shield. We recommend Wide Vision Safety Mask for use over eyeglasses or standard safety glasses with side shields. Always use eye protection which is marked to comply with ANSI Z87.1.

SAVE THESE INSTRUCTIONS

KNOW YOUR CHAIN SAW

Read this operator's manual and safety rules before operating your chain saw. Compare the illustration in Figure 5 to your lawn mower in order to familiarize yourself with the location of various controls and adjustments. Save this manual for future reference.



ASSEMBLY INSTRUCTIONS

Switch trigger: The on-off switch shall be of the momentary-contact type with no provision for being locked in the on position and shall be constructed to meet at least one of the following:

a) The switch shall be guarded completely around the switch in the plane of the switch motion.

A continuous loop formed by the handle and body of the chainsaw is an acceptable construction;

b) The switch shall be equipped with a device that automatically locks it in the off position when the actuator is released so that two motions are required to energize the tool; or

c) The equivalent.

Handles: A handle or tool grip shall be so positioned or guarded in order to prevent unintentional contact with the chain, operating mechanism, or other moving part likely to cause injury if contacted.

Guide Bar: The chain saw shall be provided with means for adjusting the guide bar to obtain proper saw tension. The guide bar shall not have an opening within the cutting area of the guide bar with a dimension greater than 0.40 inch (10.2 mm).

Kickback: At least two features for a chainsaw that meet the acceptance criteria of 30.3—such as a bar tip guard, chain brake, low-kickback saw chain, reduced-kickback guide bar, or other feature—and that significantly reduce the risk of injury to persons from kickback shall be provided on chainsaw. 30.2A chainsaw shall comply with the requirements in 30.3.30.3 When evaluated in accordance with the kickback test requirements in Safety Requirements for Gasoline Powered Chain Saws, ANSI B175.1-1991, either the chain saw shall not exceed a 45° Computed Kickback Angle, or the moving chain shall be stopped before the chainsaw exceeds a 45° Computed Kickback Angle. 30.3 revised October 14, 1994 30.4 The supply voltage is to be adjusted to 120V or 240V, depending upon the chainsaw rating. 30.5 The weight, center of gravity, and polar moment of inertia measurements are to be made with no extension cord plugged into the saw. Any length of cord attached to the saw is to be rolled back over the rear handle in a direction perpendicular to the front handle and taped or tied in position. 30.6 When the saw is to be energized, the cord is to be secured and routed from the front handle so as to closely follow the axis of rotation in a manner that it will not impede the free rotation of the chain saw.

Chain Brake or Hand Guard: A chain brake or front hand guard shall be provided that meets the requirements specified in Table. All dimensions shall be taken parallel or perpendicular to the center line of the guide bar.

Enclosures and Guards: A moving part shall be so enclosed or guarded as to acceptably reduce the likelihood of injury to persons, except only as such parts are necessarily exposed during intended operation of the chainsaw. Among the factors to be considered in determining the acceptability of an exposed moving part are: The degree of exposure; The sharpness of the moving part; The likelihood of unintentional contact therewith; The speed of the moving part; The likelihood that fingers, arms, feet, or clothing would be endangered by the moving part. The factors are to be considered with respect to the intended operation of the chainsaw and also during setting of any adjustment. Features of guards that will be considered include each of the following: Removability of the guard without the use of tools; Removability for servicing and the need for replacement; Strength and rigidity; Completeness; Creation of additional risks, such as pinch points, and the necessity for additional handling because of increased need for servicing, such as cleaning and unjamming. Except for an opening for the cutting edge of the chainsaw, an opening in a guard or enclosure around a moving part capable of causing injury, such as a fan pulley, gear, or saw chain, shall have a baffle to prevent contact with that part or the opening shall have a minimum dimension less than 1 inch (25.4 mm). The unobstructed distance from the opening to the moving part mentioned in 23.4 shall not be less than 8D–1.5 inches (8D–38.1 mm), in which D is the minimum or dimension of the opening in inches (mm), except that a fan is considered to be acceptably guarded if it can not be contacted with a probe having a diameter of 1/2 inch (12.7 mm).

OPERATING YOUR CHAIN SAW

UNPACKING

This product has been shipped completely assembled.

- Carefully remove the product and any accessories from the box. Make sure that all items listed in the packing list are included.
- Inspect the product carefully to make sure no breakage or damage occurred during shipping.
- Do not discard the packing material until you have carefully inspected and satisfactorily operated the product.
- If any parts are damaged or missing, please call 1-888-909-6757 for assistance.

PACKING LIST

• Chain saw • Scabbard • Hexagon ring spanner • Owner's Manual

WARNING

If any parts are damaged or missing, do not operate this product until the parts are replaced. Failure to heed this warning could result in serious personal injury.

WARNING

Do not attempt to modify this product or create accessories not recommended for use with this product. Any such alteration or modification is misuse and could result in a hazardous condition leading to possible serious personal injury.

WARNING

Do not fit on the battery until assembly is complete. Failure to comply could result in accidental starting and possible serious personal injury.

WARNING

Do not allow familiarity with this product to make you careless. Remember that a careless fraction of a second is sufficient to inflict serious injury.

WARNING

Always wear safety goggles or safety glasses with side shields when operating power tools. Failure to do so could result in objects being thrown into your eyes, resulting in possible serious injury.

WARNING

Do not use any attachments or accessories not recommended by the manufacturer of this product. The use of attachments or accessories not recommended can result in serious personal injury.

APPLICATIONS

You may use this product for the purposes listed below:

- Basic limbing, felling, and woodcutting
 - Removing buttress roots
-

OPERATING YOUR CHAIN SAW

ADDING BAR AND CHAIN LUBRICANT (See Figure 6)

Use GREENWORKS Bar and Chain Lubricant. It is designed for chains and chain oilers, and is formulated to perform over a wide temperature range with no dilution required.

NOTE: Chain saw comes from the factory with no bar and chain oil added. Level should also be checked after every 20 minutes of use and refilled as needed.

- Remove oil cap.
- Carefully pour the bar and chain oil into the tank.
- Wipe off excess oil.
- Check and fill the oil tank when quick view oil indicator is below the MIN. Line.
- Repeat as needed.

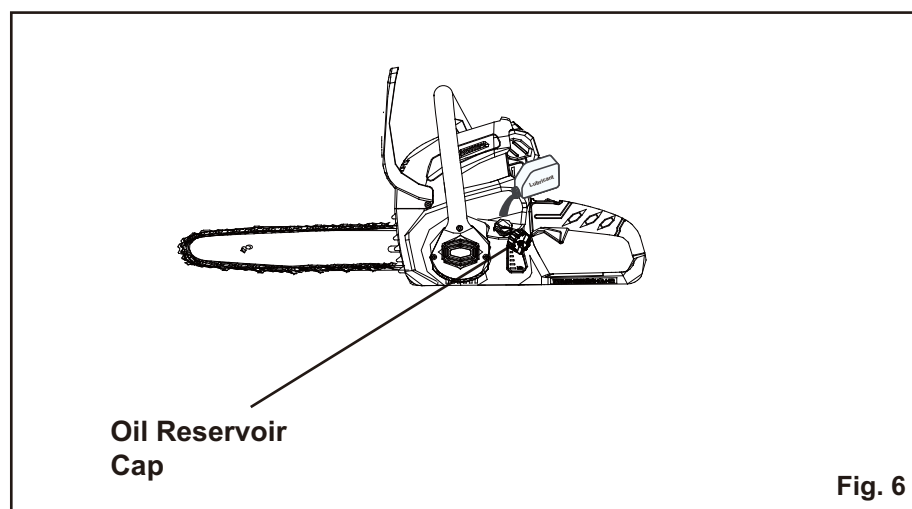
NOTE: Do not use dirty, used or otherwise contaminated oils. Damage may occur to the bar or chain.

*NOTE: There is foam inserted inside the oil reservoir to filter dirt and debris from the oil pump. **DO NOT re-move the foam.***

NOTE: It is normal for oil to seep from the saw when not in use. To prevent seepage, empty the oil tank after each use then run for one minute. When storing the unit for a long period of time (three months or longer) be sure the chain is lightly lubricated; this will prevent rust on the chain and bar sprocket.

! IMPORTANT

To preserve natural resources, please recycle or dispose of oil properly. Consult your local waste authority for information regarding available recycling and/disposal options.



OPERATING YOUR CHAIN SAW

BATTERY PACK *(See Figure 7)*



IMPORTANT

The battery pack is not charged when it is purchased. Before using the chain saw for the first time, place the battery pack in the battery charger and charge it fully. Be sure to read all safety precautions, and follow the instructions in the section entitled Charging Procedure. With regular use, the battery will require shorter charging times. When storing the chain saw for a prolonged period of time, remove the battery. When the chain saw is going to be used again, charge the battery pack for at least a full charging period. This product has no memory effect.

REMOVING THE BATTERY PACK

- Press the latch button (1) on the battery pack down and hold.
- Grasp the chain saw (2) firmly, and pull the battery pack out of the handle.

Note: The battery pack fits into the handle snugly in order to prevent accidental dislodging. It may require a strong pull to remove it.

OPERATING YOUR CHAIN SAW

INSTALLING THE BATTERY PACK

- Align the tongue (3) of the battery pack with the cavity.
- Grasp the chain saw (2) firmly.
- Push the battery pack into the handle until the latch locks into place.
- Do not use force when inserting the battery pack. It should slide into position and “click”.

⚠ WARNING

Follow these instructions in order to avoid injury and to reduce the risk of electric shock or fire:

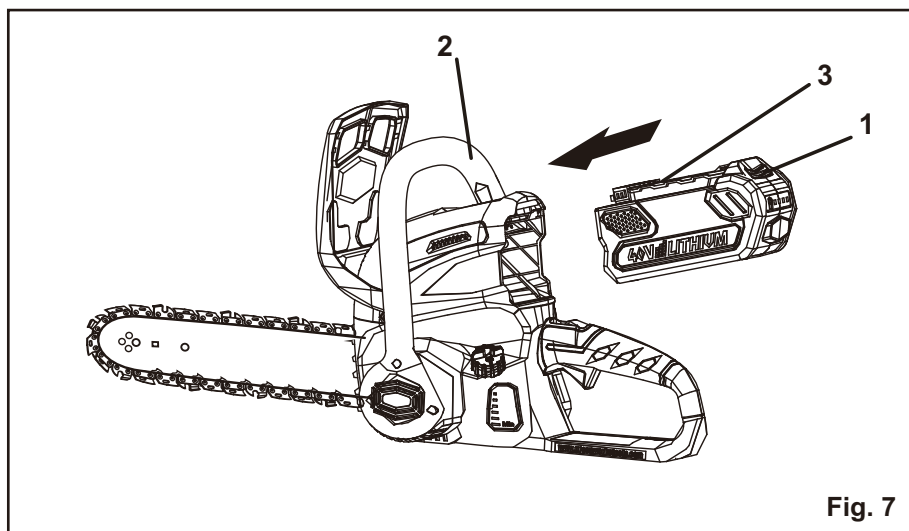
- Replace the battery pack or the charger immediately if the battery case or charger cord is damaged.
 - Verify that the switch is in the OFF position before inserting or removing the battery pack.
 - Verify that the battery pack is removed and the switch is in the OFF position before inspecting, adjusting, or performing maintenance on any part of the chain saw.
 - Read, understand, and follow the instructions contained in the section entitled Charging Procedure.
-

⚠ IMPORTANT

This Lithium-ion battery pack is equipped with an internal circuit breaker which will automatically shut off the power to the tool and then reset itself once cooled.

Follow these steps if an overload occurs while under heavy use:

1. Release the power switch and restart tool by depressing switch.
 2. The battery may need to be removed for approximately 1 minute, allowed to cool and then reinstalled for use.
-



OPERATING YOUR CHAIN SAW

STARTING AND STOPPING THE CHAIN SAW (See Figure 8)

WARNING

Keep body to the left of the chain line. Never straddle the saw or chain, or lean over past the chain line.

STARTING THE CHAIN SAW:

- Make sure chain tension is at desired setting. Refer to Adjusting the Chain Tension in the Maintenance of this manual.
- Make sure the chain cover lock bolt is tight to the chain cover.
- Make sure no objects or obstructions are in immediate vicinity which could come in contact with the bar and chain.
- Fit the battery pack into the chain saw.
- Press and hold the switch lock. This makes the switch trigger operational.
- Press and hold the switch trigger, release the switch lock and continue to squeeze the switch trigger for continued operation.

STOPPING THE CHAIN SAW:

NOTE: It is normal for the chain to coast to a stop once the trigger switch is released.

- Release the switch trigger to stop the chain saw.
- Upon release of the switch trigger, the switch lock will be automatically reset to the lock position.

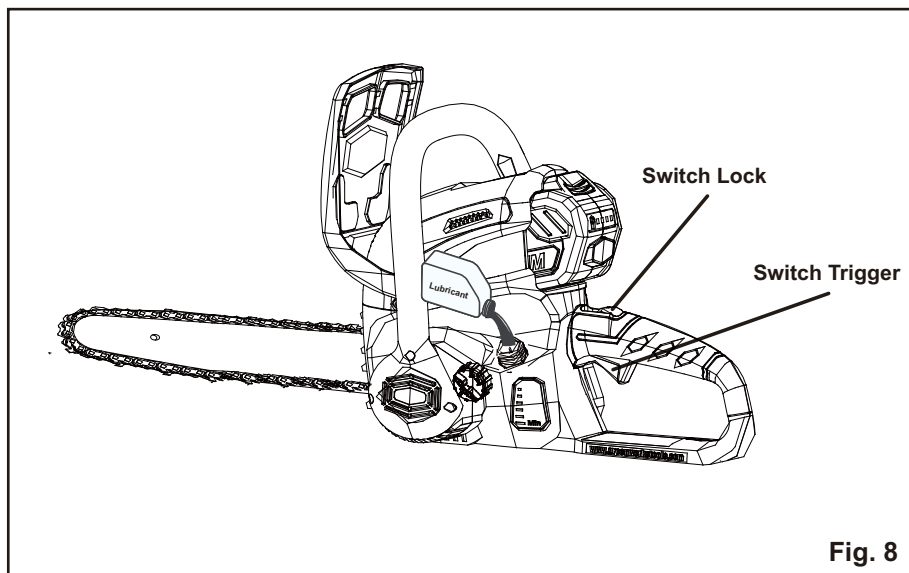


Fig. 8

OPERATING YOUR CHAIN SAW

PREPARING FOR CUTTING

PROPER GRIP ON HANDLES (See Figure 9)

See General Safety Rules for appropriate safety equipment.

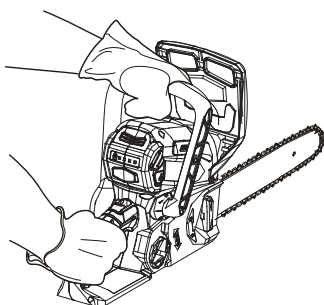
- Wear non-slip gloves for maximum grip and protection.
- Hold the saw firmly with both hands. Always keep your left hand on the front handle and your right hand on the rear handle so that your body is to the left of the chain line.
- Maintain a proper grip on the saw whenever the motor is running. The fingers should encircle the handle and the thumb is wrapped under the handlebar. This grip is least likely to be broken by a kickback or other sudden reaction of the saw. Any grip in which the thumb and fingers are on the same side of the handle is dangerous because a slight kick of the saw can cause loss of control.

WARNING

Never use a left-handed (cross-handed) grip or any stance that would place your body or arm across the chain line.

Fig. 9

PROPER HAND GRIP POSITION



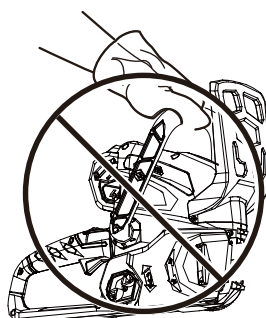
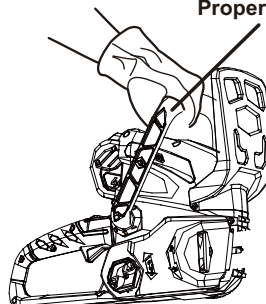
WARNING

DO NOT operate the switch trigger with your left hand and hold the front handle with your right hand. Never allow any part of your body to be in the chain line while operating a saw.



CHAIN
LINE →

Proper Grip

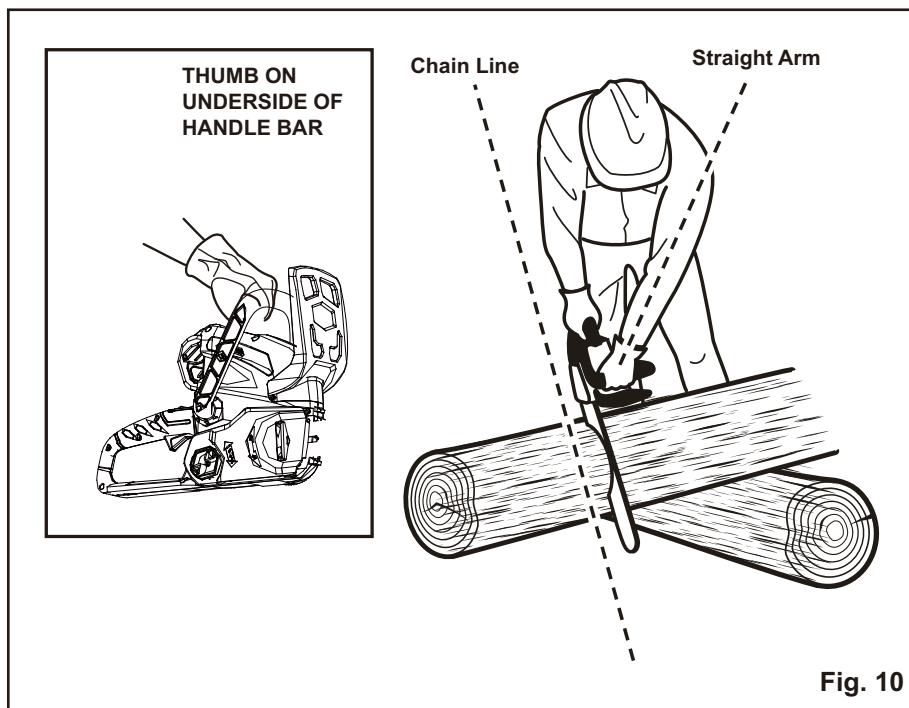


IMPROPER GRIP

OPERATING YOUR CHAIN SAW

PROPER CUTTING STANCE (See Figure 10)

- Balance your weight with both feet on solid ground.
- Keep left arm with elbow locked in a “straight arm” position to withstand any kickback force.
- Keep your body to the left of the chain line.
- Keep your thumb on underside of handlebar.



OPERATING YOUR CHAIN SAW

BASIC OPERATING/CUTTING PROCEDURES

Practice cutting a few small logs using the following technique to get the “feel” of using the saw before you begin a major sawing operation.

- Take the proper stance in front of the wood with the saw idling.
- Press the switch lock and squeeze the switch trigger then release switch lock and let the chain accelerate to full speed before entering the cut.
- Begin cutting with the saw against the log.
- Keep the unit running the entire time you are cutting, maintain a steady speed.
- Allow the chain to cut for you; exert only light downward pressure. Forcing the cut could result in damage to the bar, chain, or motor.
- Release the switch trigger as soon as the cut is completed, allowing the chain to stop. If you run the saw without a cutting load, unnecessary wear can occur to the chain, bar, and unit.
- Do not put pressure on the saw at the end of the cut.

WORK AREA PRECAUTIONS *(See Figure 11)*

- Cut only wood or materials made from wood; no sheet metal, no plastics, no masonry, no non-wood building materials.
- Never allow children to operate the saw. Allow no person to use this chain saw who has not read this operator's manual or received adequate instructions for the safe and proper use of this chain saw.
- Keep everyone – helpers, bystanders, children, and animals – a SAFE DISTANCE from the cutting area. During felling operations, the safe distance should be a least twice the height of the largest trees in the felling area. During bucking operations, keep a minimum distance of 15' (4.6 m) between workers.
- Always cut with both feet on solid ground to prevent being pulled off balance.
- Do not cut above chest height as a saw held higher is difficult to control against kickback forces.
- Do not fell trees near electrical wires or buildings. Leave this operation for professionals.
- Cut only when visibility and light are adequate for you to see clearly.



OPERATING YOUR CHAIN SAW

FELLING TREES

HAZARDOUS CONDITIONS

W A R N I N G

Do not fell trees during periods of high wind or heavy precipitation. Wait until the hazardous weather has ended.

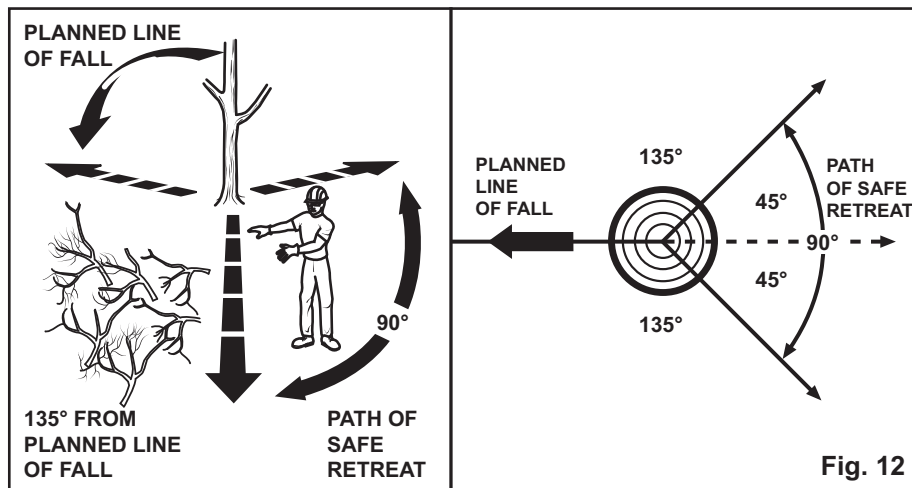
When felling a tree, it is important that you heed the following warnings to prevent possible serious injury.

- Do not cut down trees having an extreme lean or large trees with rotten limbs, loose bark, or hollow trunks. Have these trees pushed or dragged down with heavy equipment, then cut them up.
- Do not cut trees near electrical wires or buildings.
- Check the tree for damaged or dead branches that could fall and hit you during felling.
- Periodically glance at the top of the tree during the backcut to assure the tree is going to fall in the desired direction.
- If the tree starts to fall in the wrong direction, or if the saw gets caught or hung up during the fall, leave the saw and save yourself!

OPERATING YOUR CHAIN SAW

PROPER PROCEDURE FOR TREE FELLING (See Figure 12-15)

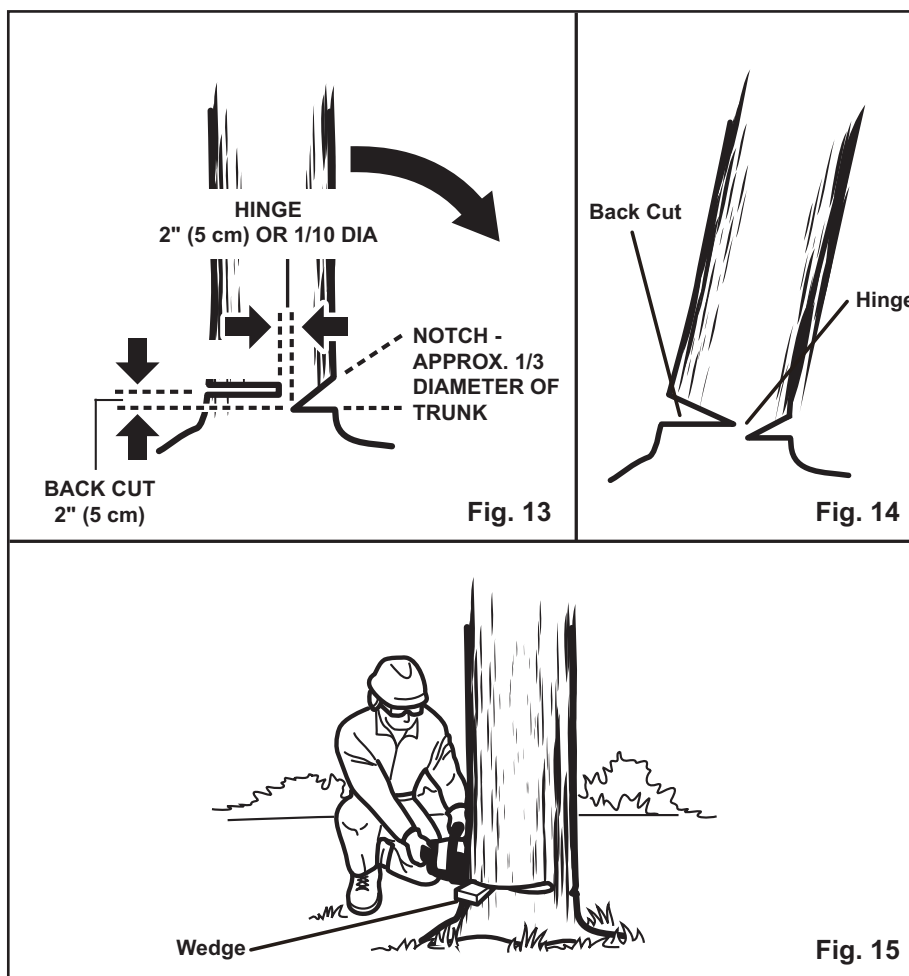
- Felling a tree — When bucking and felling operations are being performed by two or more persons, at the same time, the felling operation should be separated from the bucking operation by a distance of at least twice the height of the tree being felled. Trees should not be felled in a manner that would endanger any person, strike any utility line or cause any property damage. If the tree does make contact with any utility line, the utility company should be notified immediately.
- Operator should keep on the uphill side of terrain as the tree is likely to roll or slide after it is felled.
- Pick your escape route (or routes in case the intended route is blocked). Clear the immediate area around the tree and make sure there are no obstructions in your planned path of retreat. Clear the path of safe retreat approximately 135° from the planned line of fall.
- Consider the force and direction of the wind, the lean and balance of the tree, and the location of large limbs. These things influence the direction in which the tree will fall. Do not try to fell a tree along a line different from its natural line of fall.
- Remove dirt, stones, loose bark, nails, staples, and wire from the tree where felling cuts are to be made.
- Notched Undercut. Cut a notch about 1/3 the diameter of the trunk in the side of the tree. Make the notch cuts so they intersect at a right angle to the line of fall. This notch should be cleaned out to leave a straight line. To keep the weight of the wood off the saw, always make the lower cut of the notch before the upper cut.
- Felling Backcut. As the felling cut gets close to the hinge the tree should begin to fall. If there is any chance the tree may not fall in the desired direction or it may rock back and bind the saw chain, stop cutting before the felling cut is complete and use wedges of wood, plastic or aluminum to open the cut and drop the tree along its desired line of fall. Make the backcut level and horizontal, and at a minimum of 2" (5 cm) above the horizontal cut of the notch.



OPERATING YOUR CHAIN SAW

NOTE: Never cut through to the notch. Always leave a band of wood between the notch and back cut (approximately 2" (5 cm) or 1/10 the diameter of the tree). This is called "hinge" or "hingewood." It controls the fall of the tree and prevents slipping or twisting or shoot back of the tree off the stump.

- On large diameter trees, stop the back cut before it is deep enough for the tree to either fall or settle back on the stump. Then insert soft wooden or plastic wedges into the cut so they do not touch the chain. Drive wedges in, little by little, to help jack the tree over.
- As tree starts to fall, stop the chain saw and put it down immediately. Retreat along the cleared path, but watch the action in case something falls your way.



OPERATING YOUR CHAIN SAW

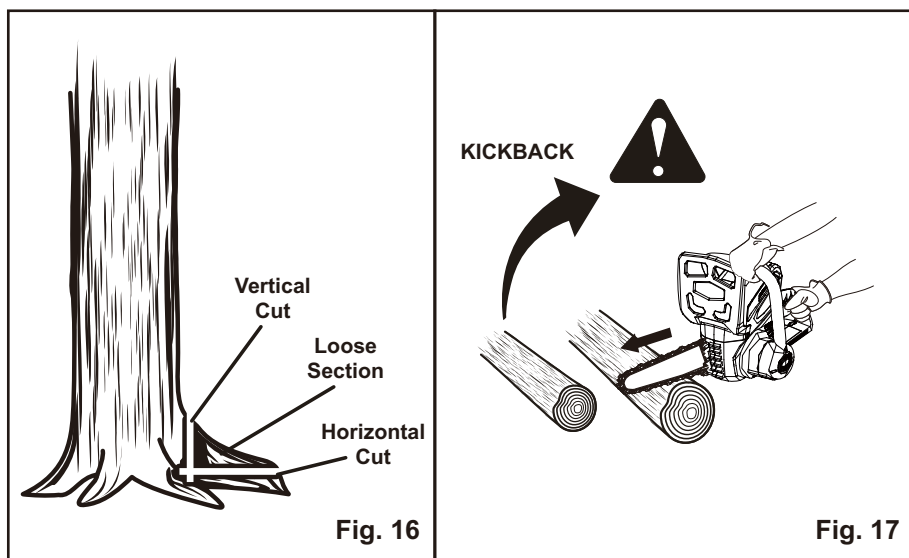
REMOVING BUTTRESS ROOTS (See Figure 16)

A buttress root is a large root extending from the trunk of the tree above the ground. Remove large buttress roots prior to felling. Make the horizontal cut into the buttress first, followed by the vertical cut. Remove the resulting loose section from the work area. Follow the correct tree felling procedure as stated in Proper Procedure For Tree Felling after you have removed the large buttress roots.

BUCKING (See Figure 17)

Bucking is the term used for cutting a fallen tree to the desired log length.

- Always make sure your footing is secure and your weight is distributed evenly on both feet.
- Cut only one log at a time.
- Support small logs on a saw horse or another log while bucking.
- Keep a clear cutting area. Make sure that no objects can contact the guide bar nose and chain during cutting, this can cause kickback. Refer to Kickback earlier in this manual.
- When bucking on a slope, always stand on the uphill side of the log. To maintain complete control of the chain saw when cutting through the log, release the cutting pressure near the end of the cut without relaxing your grip on the chain saw handles. Do not let the chain contact the ground. After completing the cut, wait for the saw chain to stop before you move the chain saw. Always stop the motor before moving from tree to tree.



OPERATING YOUR CHAIN SAW

BUCKING WITH A WEDGE (See Figure 18)

If the wood diameter is large enough for you to insert a soft bucking wedge without touching the chain, you should use the wedge to hold the cut open to prevent pinching.

BUCKING LOGS UNDER STRESS (See Figure 19)

When the log is supported on one end, cut $\frac{1}{3}$ the diameter from the underside. Then make the finished cut by overbucking to meet the first cut.

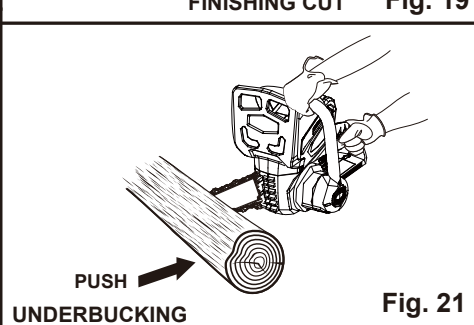
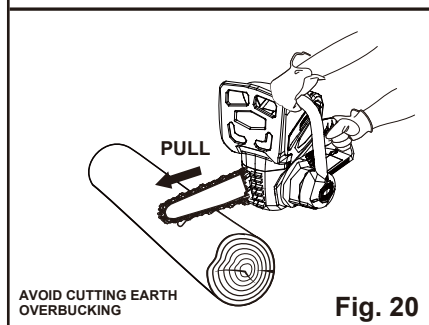
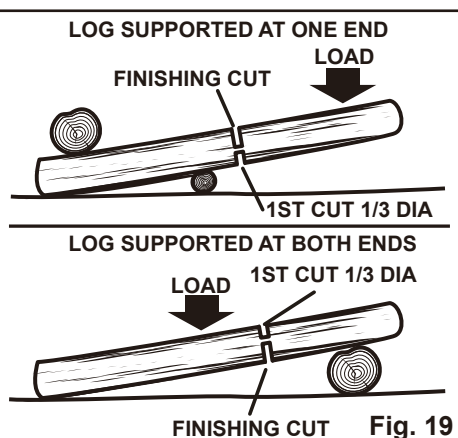
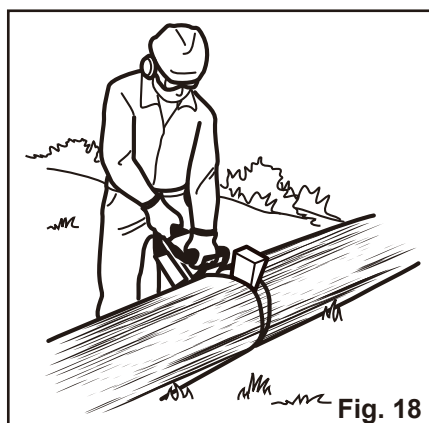
When the log is supported on both ends, cut $\frac{1}{3}$ of the diameter from the top overback. Then make the finished cut by under bucking the lower $\frac{2}{3}$ to meet the first cut.

OVERBUCKING (See Figure 20)

Begin on the top side of the log with the bottom of the saw against the log; exert light pressure downward. Note that the saw will tend to pull away from you.

UNDERBUCKING (See Figure 21)

Begin on the under side of the log with the top of the saw against the log; exert light pressure upward. During under bucking, the saw will tend to push back at you. Be prepared for this reaction and hold the saw firmly to maintain control.



OPERATING YOUR CHAIN SAW

LIMBING (See Figure 22)

Limbing is removing branches from a fallen tree.

- Work slowly, keeping both hands on the chain saw with a firm grip. Always make sure your footing is secure and your weight is distributed evenly on both feet.
- Leave the larger support limbs under the tree to keep the tree off the ground while cutting.
- Limbs should be cut one at a time. Remove the cut limbs from the work area often to help keep the work area clean and safe.
- Branches under tension should be cut from the bottom up to avoid binding the chain saw.
- Keep the tree between you and the chain saw while limbing. Cut from the side of the tree opposite the branch you are cutting.

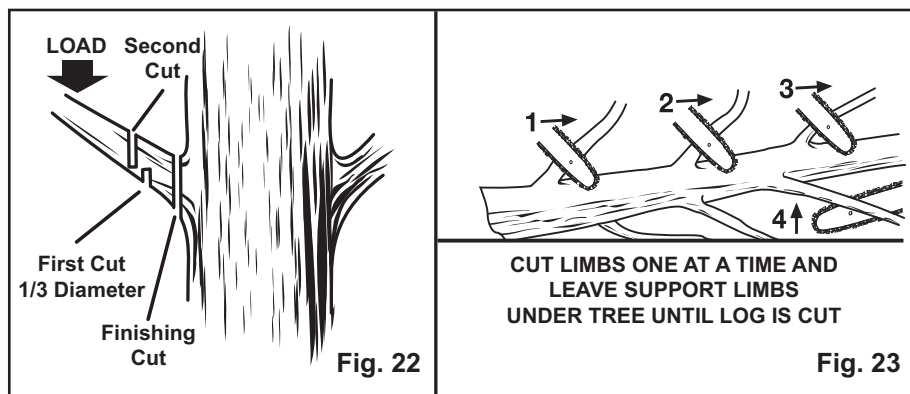
PRUNING (See Figure 23)

Pruning is trimming limbs from a live tree.

- Work slowly, keeping both hands on the chain saw with a firm grip. Always make sure your footing is secure and your weight is distributed evenly on both feet.
- Do not cut from a ladder, this is extremely dangerous. Leave this operation for professionals.
- Do not cut above chest height as a saw held higher is difficult to control against kickback.
- When pruning trees it is important not to make the finishing cut next to the main limb or trunk until you have cut off the limb further out to reduce the weight. This prevents stripping the bark from the main member.
- Underbuck the branch 1/3 through for your first cut.
- Your second cut should overbuck to drop the branch off.
- Now make your finishing cut smoothly and neatly against the main member so the bark will grow back to seal the wound.

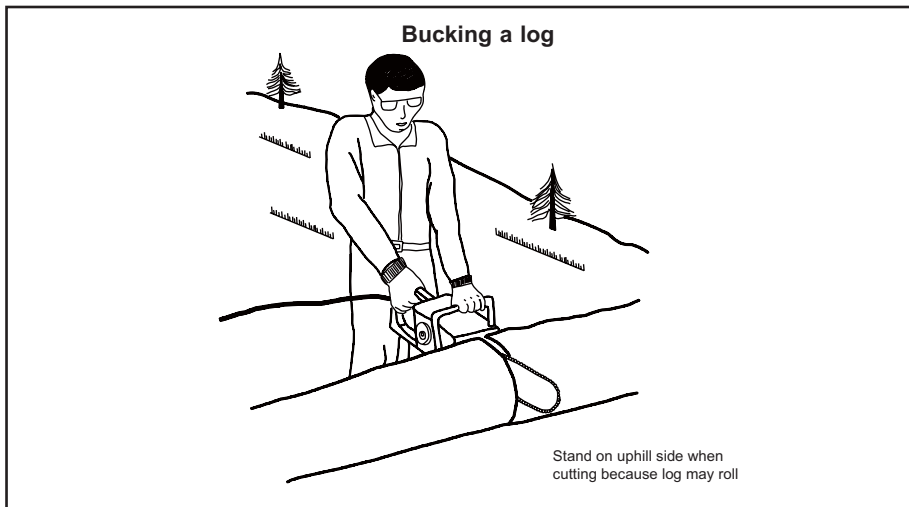
WARNING

If the limbs to be pruned are above chest height, hire a professional to perform the pruning.



OPERATING YOUR CHAIN SAW

When bucking on a slope always stand on the uphill side of the log. when cutting through to maintain complete control release the cutting pressure near the end of the cut without relaxing your grip on the chainsaw handle. Don't let the chain contact the ground. After completing the cut wait for the saw chain to stop before you move the chainsaw. Always stop the motor before moving from tree to tree.

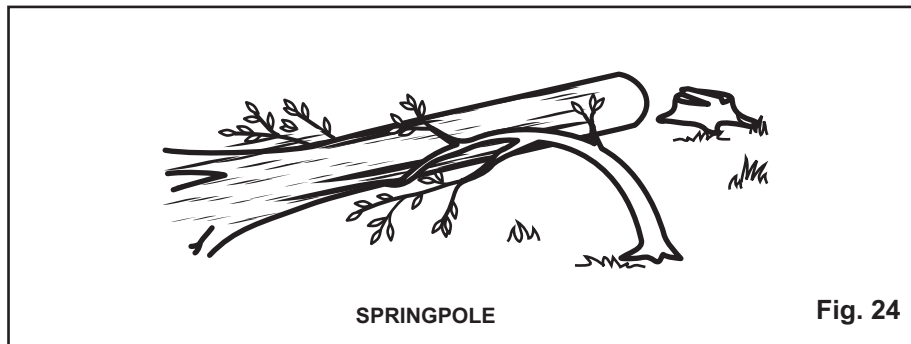


CUTTING SPRINGPOLES (See Figure 24)

A springpole is any log, branch, rooted stump, or sapling which is bent under tension by other wood so that it springs back if the wood holding it is cut or removed. On a fallen tree, a rooted stump has a high potential of springing back to the upright position during the bucking cut to separate the log from the stump. Watch out for springpoles — they are dangerous.

⚠ WARNING

Springpoles are dangerous and could strike the operator, causing the operator to lose control of the chain saw. This could result in severe or fatal injury to the operator.

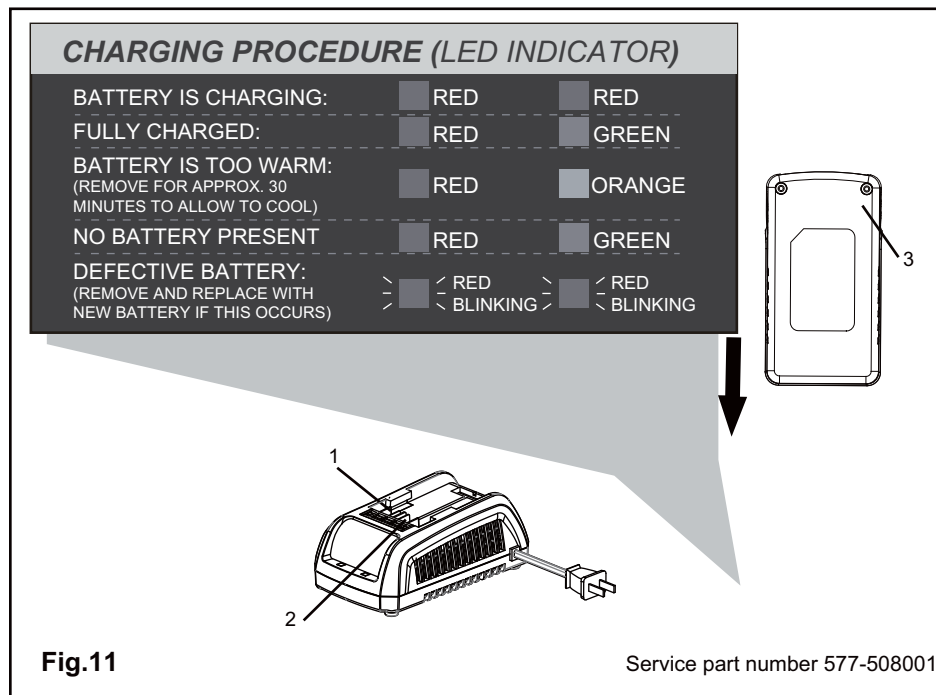


BATTERY CHARGER

CHARGING PROCEDURE (See Figure 11.)

NOTE: The battery is not shipped fully charged. It is recommended to fully charge before first use to ensure that maximum run time can be achieved. This lithium-ion battery will not develop a memory and may be charged at any time. A fully discharged battery pack will require approximately 90 minutes to fully charge from a discharged state.

1. Plug the charger into an AC power outlet.
 2. Insert the battery pack (3) into the charger.
- This is a diagnostic charger. The Charger LED Lights will illuminate in specific order to communicate the current battery status. They are as follows:



CHECKING THE CHARGE

If the battery pack does not charge properly:

- Check the current at the power outlet with another tool. Make sure that the outlet is not turned off.
- Check that the charger contacts have not been shorted by debris or foreign material.
- If the surrounding air temperature is not normal room temperature, move the charger and battery pack to a location where the temperature is between 50°F and 100°F .

BATTERY CHARGER

WARNING

If the battery is inserted into the charger when warm or hot, the CHARGING LED indicator light on the charger may switch on and illuminate ORANGE. If this occurs allow the battery to cool outside of the charger for approximately 30 minutes.

CHARGER MAINTENANCE

- Keep the charger clean and clear of debris. Do not allow foreign material into the recessed cavity or on the contacts. Wipe with a dry cloth. Do not use solvents, water, or place in wet conditions.
- Always unplug the charger when there is no battery pack in it.
- The battery pack may be stored in the charger. however, it is recommended to disconnect the charger from the power source. To ensure safety and reliability all repairs should be performed by a qualified service technician.
- Check that the charger contacts have not been shorted by debris or foreign material.
- If the surrounding air temperature is not normal room temperature, move the charger and battery pack to a location where the temperature is between 50 and 100°F

CHARGER MOUNTING *(See Figure 12.)*

1. This charger can be installed hanging on a wall using two screws (not supplied)
2. Locate the placement for the charger to be wall mounted.
3. If fastening to wood studs use 2 wood screws.
4. Drill two holes 2 3/8" (6 cm) on center ensuring they are level.
5. If fastening to drywall use wall anchors and screws to secure the charger to the wall.

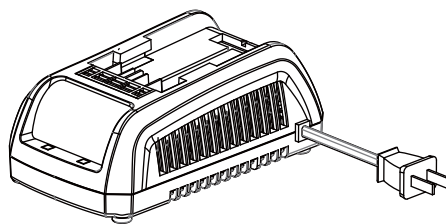


Fig. 12

MAINTENANCE

WARNING

When servicing, use only identical replacement parts. Use of any other parts may create a hazard or cause product damage.

WARNING

Always wear safety goggles or safety glasses with side shields during power tool operation or when blowing dust. If operation is dusty, also wear a dust mask.

GENERAL MAINTENANCE

Avoid using solvents when cleaning plastic parts. Most plastics are susceptible to damage from various types of commercial solvents and may be damaged by their use. Use clean cloths to remove dirt, dust, lubricant, grease, etc. firmly to maintain control.

WARNING

Do not at any time let brake fluids, gasoline, petroleum-based products, penetrating oils, etc., come in contact with plastic parts. Chemicals can damage, weaken, or destroy plastic, which may result in serious personal injury.

LUBRICATION

All of the bearings in this product are lubricated with a sufficient amount of high grade lubricant for the life of the unit under normal operating conditions. Therefore, no further lubrication is required.

REPLACING THE GUIDE BAR AND CHAIN *(See Figure 28-34)*

DANGER

Never start the motor before installing the guide bar, chain, chain cover, and chain cover lock knob. Without all these parts in place, the clutch can fly off or explode, exposing the user to possible serious injury.

WARNING

To avoid serious personal injury, read and understand all the safety instructions in this section.

WARNING

Before performing any maintenance, make sure the battery is removed. Failure to heed this warning could result in serious personal injury.

MAINTENANCE

⚠ CAUTION

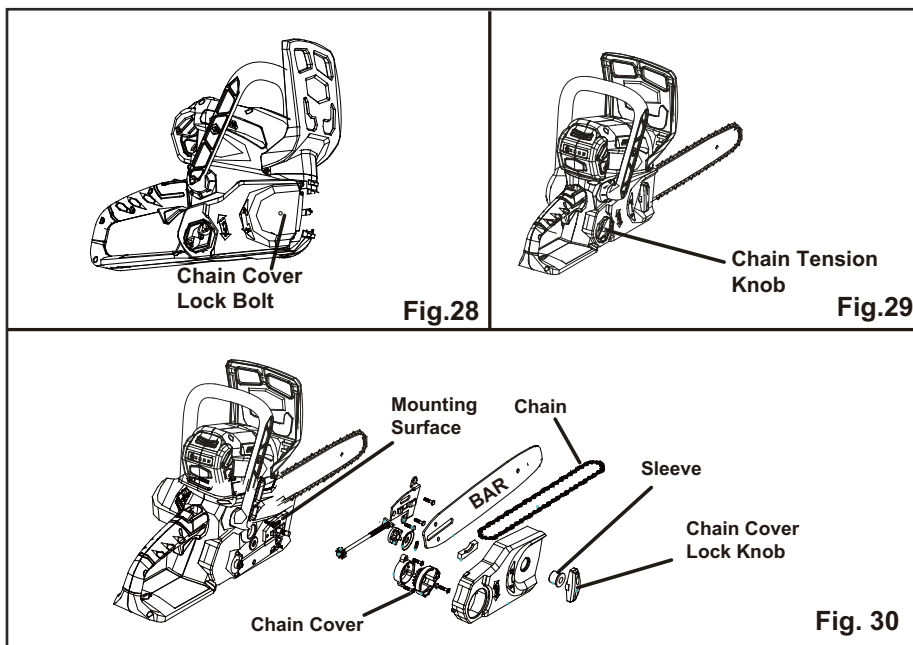
Always wear gloves when handling the bar and chain; these components are sharp and may contain burrs.

⚠ WARNING

Never touch or adjust the chain while the motor is running. The saw chain is very sharp; always wear protective gloves when performing maintenance to the chain to avoid possible serious lacerations.

NOTE: When replacing the guide bar and chain, always use the specified bar and chain listed in the Bar and Chain Combinations section later in this manual.

- Remove the battery from the chain saw.
- Rotate the chain cover lock bolt counterclockwise and remove knob and sleeve .
- Remove the chain cover.
- Remove the bar and chain from the mounting surface.
- Remove the old chain from the bar.
- Lay out the new saw chain in a loop and straighten any kinks. The cutters should face in the direction of chain rotation. If they face backwards, turn the loop over.
- Place the chain drive links into the bar groove as shown.



MAINTENANCE

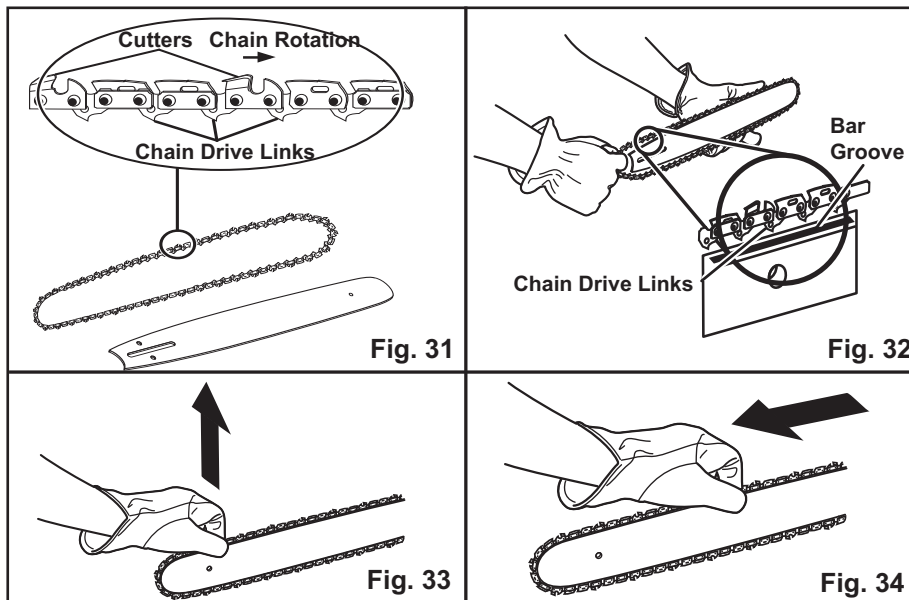
NOTE: Make certain of direction of chain.

- Position the chain so there is a loop at the back of the bar.
- Hold the chain in position on the bar and place the loop around the sprocket.
- Fit the bar flush against the mounting surface so that the bar studs are in the long slot of the bar.

NOTE: When placing the bar on the bar studs, ensure that the adjusting pin is in the chain tension pin hole.

- Replace the chain cover.
- Replace the sleeve and chain cover lock bolt; use a hexagon ring spanner to rotate bolt clockwise to tension. The bar should still be free to move for tension adjustment.
- Remove all slack from the chain by turning the chain tensioning bolt clockwise with a hexagon ring spanner until the chain seats snugly against the bar with the drive links in the bar groove.
- Lift the tip of the guide bar up to check for sag.
- Release the tip of the guide bar and turn the chain tensioning bolt 1/2 turn clockwise. Repeat this process until sag does not exist.
- Hold the tip of the guide bar up and tighten the chain cover lock bolt. The chain is correctly tensioned when there is no sag on the underside of the guide bar, the chain is snug, but it can be turned by hand without binding.

NOTE: If chain is too tight, it will not rotate. Loosen the chain cover lock bolt slightly and turn the chain tensioning bolt 1/4 turn counterclockwise. Lift the tip of the guide bar up and retighten the chain cover lock bolt. Ensure that the chain will rotate without binding.



MAINTENANCE

ADJUSTING THE CHAIN TENSION (See Figure 35-36)

⚠ WARNING

Never touch or adjust the chain while the motor is running. The saw chain is very sharp. Always wear protective gloves when performing maintenance on the chain.

- Stop the motor and remove the battery from the chain saw before setting the chain tension.
- Slightly loosen the chain cover lock bolt.
- Turn the chain tensioning bolt clockwise to tension the chain.

NOTE: A cold chain is correctly tensioned when there is no slack on the underside of the guide bar, the chain is snug, and it can be turned by hand without binding.

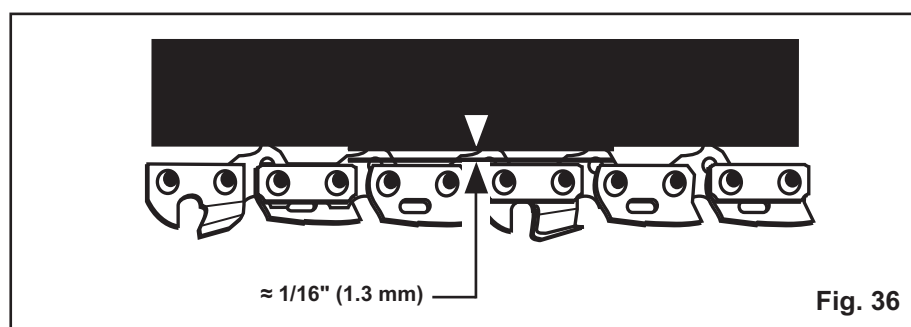
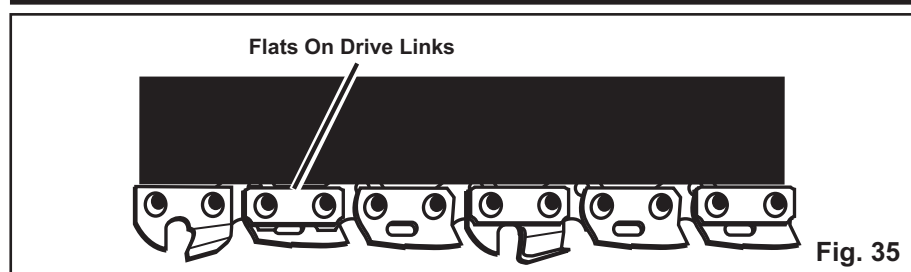
- Rotate the chain cover lock bolt clockwise to secure. Retension the chain whenever the flats on the drive links hang out of the bar groove.

NOTE: During normal saw operation, the temperature of the chain increases. The drive links of a correctly tensioned warm chain will hang approximately 1/16" (1.3 mm) out of the bar groove.

NOTE: New chains tend to stretch; check the chain tension frequently and tension as required.

⚠ CAUTION

A chain tensioned while warm may be too tight upon cooling. Check the "cold tension" before next use.



MAINTENANCE

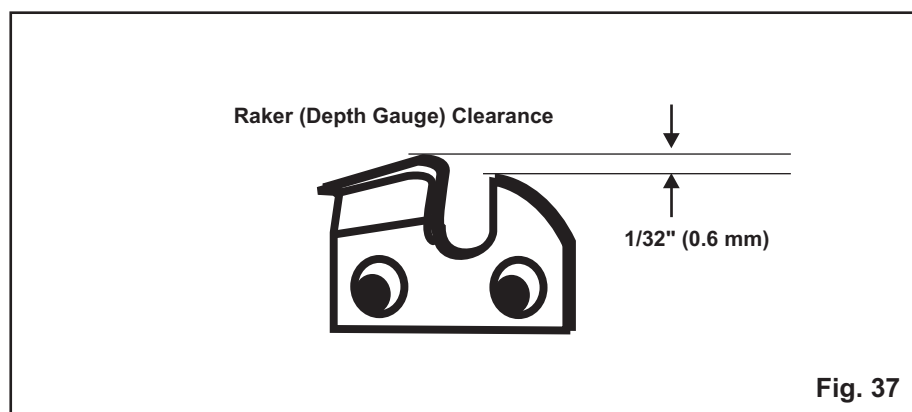
CHAIN MAINTENANCE (See Figure 37)

Use only a low-kickback chain on this saw. This fast-cutting chain provides kickback reduction when properly maintained. For smooth and fast cutting, maintain the chain properly. The chain requires sharpening when the wood chips are small and powdery, the chain must be forced through the wood during cutting, or the chain cuts to one side. During maintenance of the chain, consider the following:

- Improper filing angle of the side plate can increase the risk of severe kickback.
- Raker (depth gauge) clearance.
 - Too low increases the potential for kickback.
 - Not low enough decreases cutting ability.
- If the cutter teeth hit hard objects such as nails and stones, or are abraded by mud or sand on the wood, have an authorized service center sharpen the chain.

NOTE: Inspect the drive sprocket for wear or damage when replacing the chain. If signs of wear or damage are present in the areas indicated, have the drive sprocket replaced by an authorized service center.

NOTE: If you do not fully understand the correct procedure for sharpening the chain after reading the instructions that follow, have the saw chain sharpened by an authorized service centre or replace with a recommended low-kickback chain.



MAINTENANCE

SHARPENING THE CUTTERS (See Figure 38-41)

Be careful to file all cutters to the specified angles and to the same length, as fast cutting can be obtained only when all cutters are uniform.

CAUTION

Make sure the battery is removed from the chain saw before you work on the saw.

WARNING

The saw chain is very sharp. Always wear protective gloves when performing maintenance to the chain to prevent serious personal injury.

- Tension the chain prior to sharpening. Refer to Adjusting The Chain Tension.
 - Use a 5/32" (4 mm) diameter round file and holder. Do all of your filing at the midpoint of the bar.
 - Keep the file level with the top plate of the tooth. Do not let the file dip or rock.
 - Using light but firm pressure. Stroke towards the front corner of the tooth.
 - Lift the file away from the steel on each return stroke.
 - Put a few firm strokes on every tooth. File all left hand cutters in one direction. Then move to the other side and file the right hand cutters in the opposite direction.
 - Remove filings from the file with a wire brush.
-

CAUTION

A dull or improperly sharpened chain can cause excessive motor speed during cutting, which may result in severe motor damage.

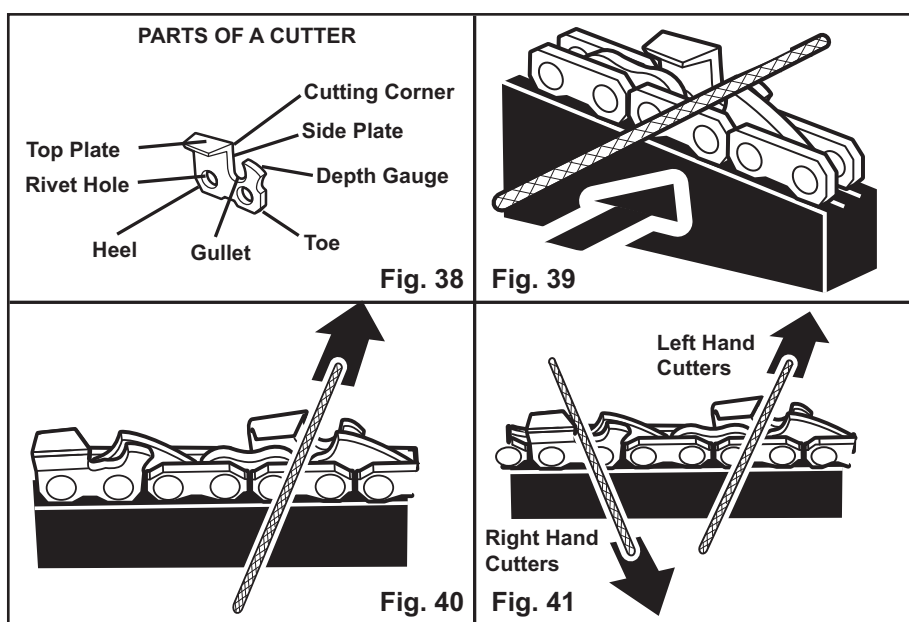
WARNING

Improper chain sharpening increases the potential of kickback.

WARNING

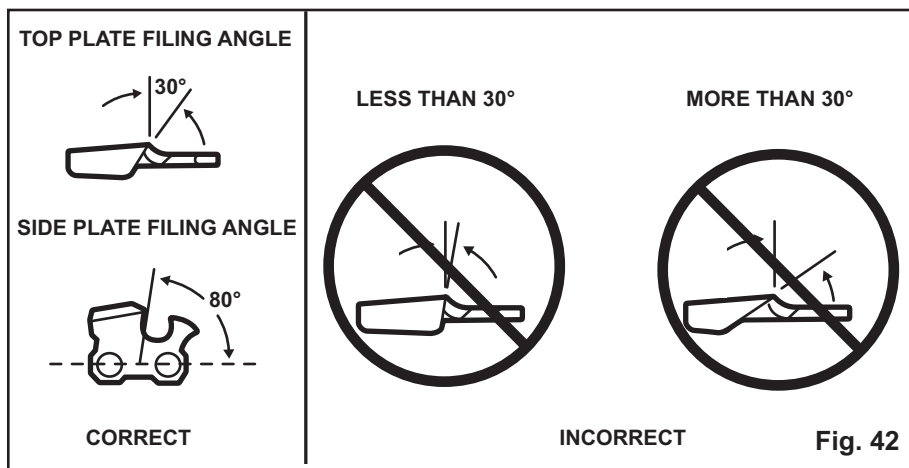
Failure to replace or repair a damaged chain can cause serious injury.

MAINTENANCE



TOP PLATE FILING ANGLE (See Figure 42)

- CORRECT 30° – file holders are marked with guide marks to align file properly to produce correct top plate angle.
- LESS THAN 30° – for cross cutting.
- MORE THAN 30° – feathered edge dulls quickly.



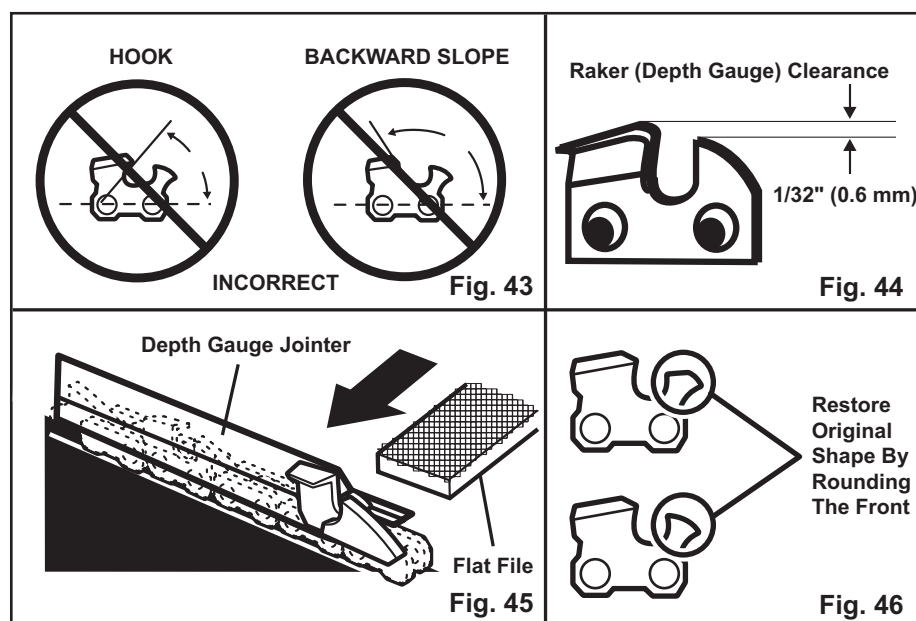
MAINTENANCE

SIDE PLATE ANGLE (See Figure 43)

- **CORRECT 80°** – Produced automatically if you use the correct diameter file in the file holder.
- **HOO**K – “Grabs” and dulls quickly; increases the potential of KICKBACK. Results from using a file with a diameter too small or a file held too low.
- **BACKWARD SLOPE** – Needs too much feed pressure; causes excessive wear to the bar and chain. Results from using a file with a diameter too large or file held too high.

SIDE PLATE ANGLE (See Figure 44-46)

- Maintain the depth gauge at a clearance of 1/32" (0.6 mm) Use a depth gauge tool for checking the depth gauge clearances.
- Every time the chain is filed, check the depth gauge clearance.
- Use a flat file and a depth gauge jointer to lower all gauges uniformly. Use a 1/32" (0.6 mm) depth gauge jointer. After lowering each depth gauge, restore original shape by rounding the front. Be careful not to damage adjoining drive links with the edge of the file.
- Depth gauges must be adjusted with the flat file in the same direction the adjoining cutter was filed with the round file.
- Use care not to contact cutter face with flat file when adjusting depth gauges.



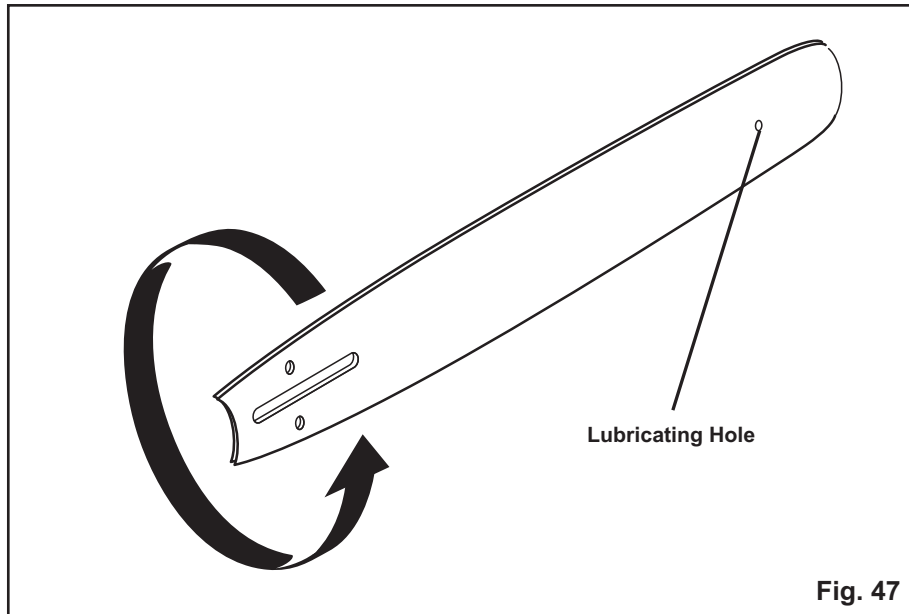
MAINTENANCE

MAINTAINING THE GUIDE BAR (See Figure 47)

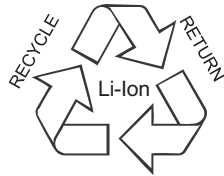
Every week of use, reverse the guide bar on the saw to distribute the wear for maximum bar life. The bar should be cleaned every day of use and checked for wear and damage. Feathering or burring of the bar rails is a normal process of bar wear. Such faults should be smoothed with a file as soon as they occur. A bar with any of the following faults should be replaced:

- Wear inside the bar rails that permits the chain to lay over sideways
- Bent guide bar
- Cracked or broken rails
- Spread rails

Lubricate guide bars weekly with a sprocket at their tip. Using a grease syringe, lubricate weekly in the lubricating hole. Turn the guide bar and check that the lubrication holes and chain groove are free from impurities.



ENVIRONMENTALLY SAFE BATTERY DISPOSAL



The batteries used in this chain saw's battery pack contain the following toxic and corrosive material: LITHIUM-ION.

WARNING

Toxic materials must be disposed of in a specified manner in order to prevent contamination of the environment. Before disposing of damaged or worn out Lithium-Ion battery packs, contact your local waste disposal agency or the local Environmental Protection Agency for information and specific instructions. Take the batteries to a local recycling and/or disposal centre that is certified for disposal. If the battery pack cracks or breaks, whether it leaks or not, do not recharge it and do not use it. Dispose of it and replace it with a new battery pack. **DO NOT ATTEMPT TO REPAIR IT!**

Follow these instructions in order to avoid injury and the risk of fire, explosion, or electric shock, and to avoid damage to the environment:

- Cover the battery's terminals with heavy-duty adhesive tape.
- Do not attempt to remove or destroy any of the components of the battery pack.
- Do not attempt to open the battery pack.
- If a leak develops, the electrolytes that are released are corrosive and toxic. Do not get the solution in the eyes or on the skin, and do not swallow it.
- Do not place batteries in regular household trash.
- **DO NOT** incinerate batteries.
- **DO NOT** place batteries where they will become part of any waste landfill or municipal solid waste stream.
- Dispose of batteries at a certified recycling or disposal centre.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Bar and chain running hot and smoking.	Check chain tension for overtightened condition.	Tension chain. Refer to Chain Tension earlier in this manual.
	Chain oil tank empty.	Check oil tank.
Motor runs, but chain is not rotating.	Chain tension too tight.	Retention chain. Refer to Chain Tension earlier in this manual.
	Check guide bar and chain assembly.	Refer to Replacing the Bar and Chain earlier in this manual.
	Check guide bar and chain for damage.	Inspect guide bar and chain for damage.
Motor runs, chain rotates but does not cut.	Dull chain.	Sharpen chain.
	Chain on backwards.	Reverse direction of chain.

LIMITED FOUR-YEAR WARRANTY



GREENWORKS™ hereby warrants this product, to the original purchaser with proof of purchase, for a period of four (4) years against defects in materials, parts or workmanship. GREENWORKS™, at its own discretion will repair or replace any and all parts found to be defective, through normal use, free of charge to the customer. This warranty is valid only for units which have been used for personal use that have not been hired or rented for industrial/commercial use, and that have been maintained in accordance with the instructions in the owners' manual supplied with the product from new.

Battery carries a one (2) year warranty against defects in workmanship and materials. Batteries must be charged in accordance with the operator's manuals directions and regulations in order to be valid.

ITEMS NOT COVERED BY WARRANTY:

1. Any part that has become inoperative due to misuse, commercial use, abuse, neglect, accident, improper maintenance, or alteration; or
2. The unit, if it has not been operated and/or maintained in accordance with the owner's manual; or
3. Normal wear, except as noted below;
4. Routine maintenance items such as lubricants, blade sharpening;
5. Normal deterioration of the exterior finish due to use or exposure.

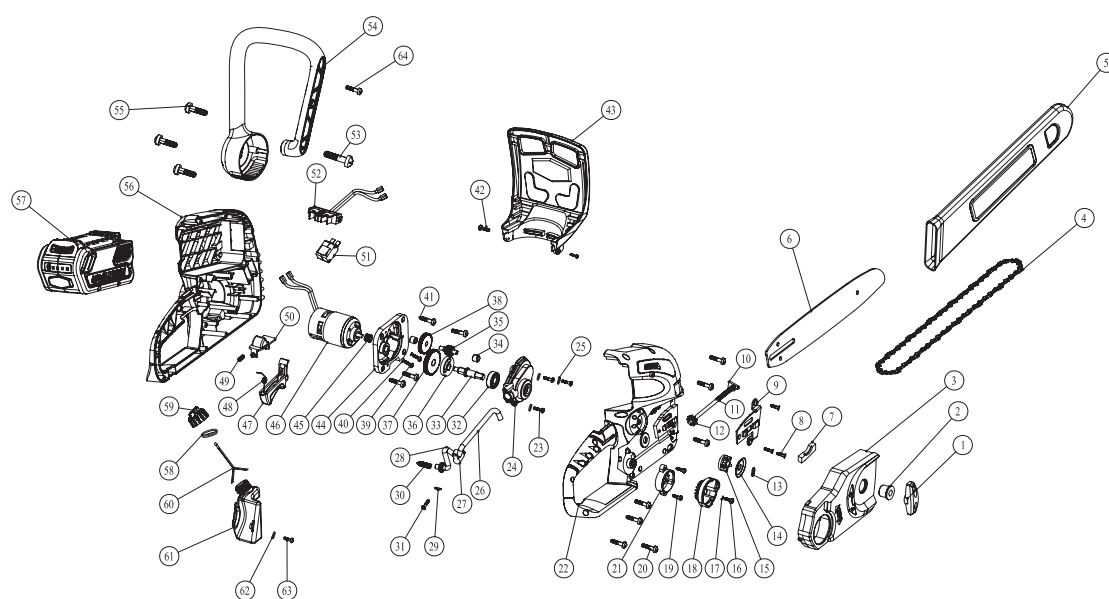
GREENWORKS HELPLINE (1 888 90WORKS):

Warranty service is available by calling our toll-free helpline, 9 a.m. to 5 p.m. EST. Monday – Friday at **1 888 909 6757 (1 888 90WORKS)**.

TRANSPORTATION CHARGES:

Transportation charges for the movement of any power equipment unit or attachment are the responsibility of the purchaser. It is the purchaser's responsibility to pay transportation charges for any part submitted for replacement under this warranty unless such return is requested in writing by GREENWORKS.

EXPLODED VIEW



PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	34109583	side cover knob	1
2	33901420	bush	1
3	34110583	side cover	1
4	31101420-1	chain	1
5	34114155-1	sheath	1
6	31100581-1	bar	1
7	34203420	rubber clip	1
8	32201329	screw ST4 .2X 10	3
9	33301583	bar washer	1
10	33305420	tension board	1
11	32207159-1	tension gear shaft	1
12	33904159	tension gear	1
13	32900420	washer	1
14	33301420	washer HSF	1
15	33900420	chain wheel	1
16	3220313A	screw ST4 .2X 14	1
17	3290186A	washer	1
18	34108583	tension knob	1
19	32202391	screw ST3.5 X 12-F	2
20	3220313A	screw	2
21	34108420	tension knob clip	1
22	34100581	right housing	1
23	3220205	screw M4X10	3
24	33100420-1	gear box cover	1
25	32911301A	spring washer	3
26	34201420	oil outlet tube	1
27	31100329	oil pump assy	1
28	34202420	oil tube	1
29	3290186A	washer	1
30	32208159-1	spring	1
31	3221198	screw M4X14	1
32	32104159	6000 bearing	1
33	33203420	output shaft	1
34	3210111	bearing	3
35	33202329-1	gear B	1
36	33902420	cam for oil pump	1
37	33903329	gear C	1
38	33902329	gear A	1
39	32201155	screw M5X9	2

PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
40	32916131	spring washer	2
41	3220313A	screw ST4 .2X 14	4
42	3220248	screw ST3.8X 9	2
43	3290186A	washer	1
44	34104581	oil tank	1
45	34107583	oil tank distaff	1
46	34106583	oil can cover	1
47	34202583	oil can washer	1
48	31104975	battery assy	1
49	34101581	left housing	1
50	3220313A	screw ST4 .2X 14	2
51	34102581	handle	1
52	3220404	screw ST4 .2X 25	1
53	34104978	braket	1
54	36300420	switch	1
55	33200420	switch knob	1
56	33904524	spring	1
57	33200420	tortion spring	1
58	34112583	switch trigger	1
59	36103420	motor	1
60	33901329	gearing	1
61	33100420-2	gear box	1
62	34103581	guard	1



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Rev:02(06-07-11)

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