

# STIHL 028

**Warning!**

Read and follow all safety precautions in Owner's Manual – improper use can cause serious or fatal injury.

To reduce risk of kickback injury use STIHL reduced kickback bar and STIHL TM 1 (.325") or RM 2 ( $\frac{3}{8}$ ") chain depending on sprocket pitch or other available low kickback components.

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# STIHL®

## Important Safety Precautions for Chain Saw Users

### A. Kickback Safety Precautions

#### Warning!

**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 towards the operator. **Pinching** the saw chain along the top of the guide bar may push the guide bar rapidly back towards the operator. Either of these reactions may cause you to lose control of the saw which could result in serious personal injury.

Section 4.12 of ANSI B 175.1-1985 sets certain performance and design criteria related to chain saw kickback. STIHL has developed a color code system using green and yellow to help you select a powerhead, bar and chain combination that complies with the kickback requirements of the ANSI Standard. See the sections entitled "Safety Precautions" and "Specifications" of this Manual.

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

1. With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.

2. Keep a good firm grip on the saw with both hands, the right hand on the rear handle, and the left hand on the front handle, when the engine is running. Use a firm grip with thumbs and fingers encircling the chain saw handles. A firm grip will help you reduce kickback and maintain control of the saw. Don't let go.
3. Make sure that area in which you are cutting is free from obstructions. Do not let the nose of the guide bar contact a log, branch, or any other obstruction which could be hit while you are operating the saw.
4. Cut at high engine speeds.
5. Do not overreach or cut above shoulder height.
6. Follow manufacturer's sharpening and maintenance instructions for the saw chain.
7. Only use replacement bars and chains specified by the manufacturer or the equivalent.

### B. Other Safety Precautions

1. Do not operate a chain saw when you are fatigued.
2. Use safety footwear; snug-fitting clothing; protective gloves; and eye, hearing, and head protection devices.
3. Use caution when handling fuel. Move the chain saw at least 10 feet (3 m) from the fueling point before starting the engine.

continued on the back inside cover →

# STIHL 028 AV electronic Quickstop Wood Boss, 028 AV Super electronic Quickstop

This Manual contains operating and safety instructions for all STIHL 028 series power saws.

Pay special attention to the safety precautions outlined on the inside cover and on pages 4 to 23. Allow only persons who understand this Manual to operate your chain saw.

To receive maximum performance and satisfaction from your STIHL chain saw, it is important that you read and understand the maintenance and safety precautions before using your saw. Contact your STIHL dealer or the STIHL distributor for your area if you do not understand any of the instructions in this Manual.

## Warning!

Because a chain saw is a high-speed wood-cutting tool, some special safety precautions must be observed as with any other power saw to reduce the risk of personal injury. Careless or improper use may cause serious or even fatal injury.

STIHL's philosophy is to continually improve all of its products. As a result, engineering changes and improvements are made from time-to-time. If the operating characteristics or the appearance of your saw differs from those described in this Manual, please contact your STIHL dealer for information and assistance.

## Operating Instructions

### Sharpening and Maintenance of Saw Chains

## Contents

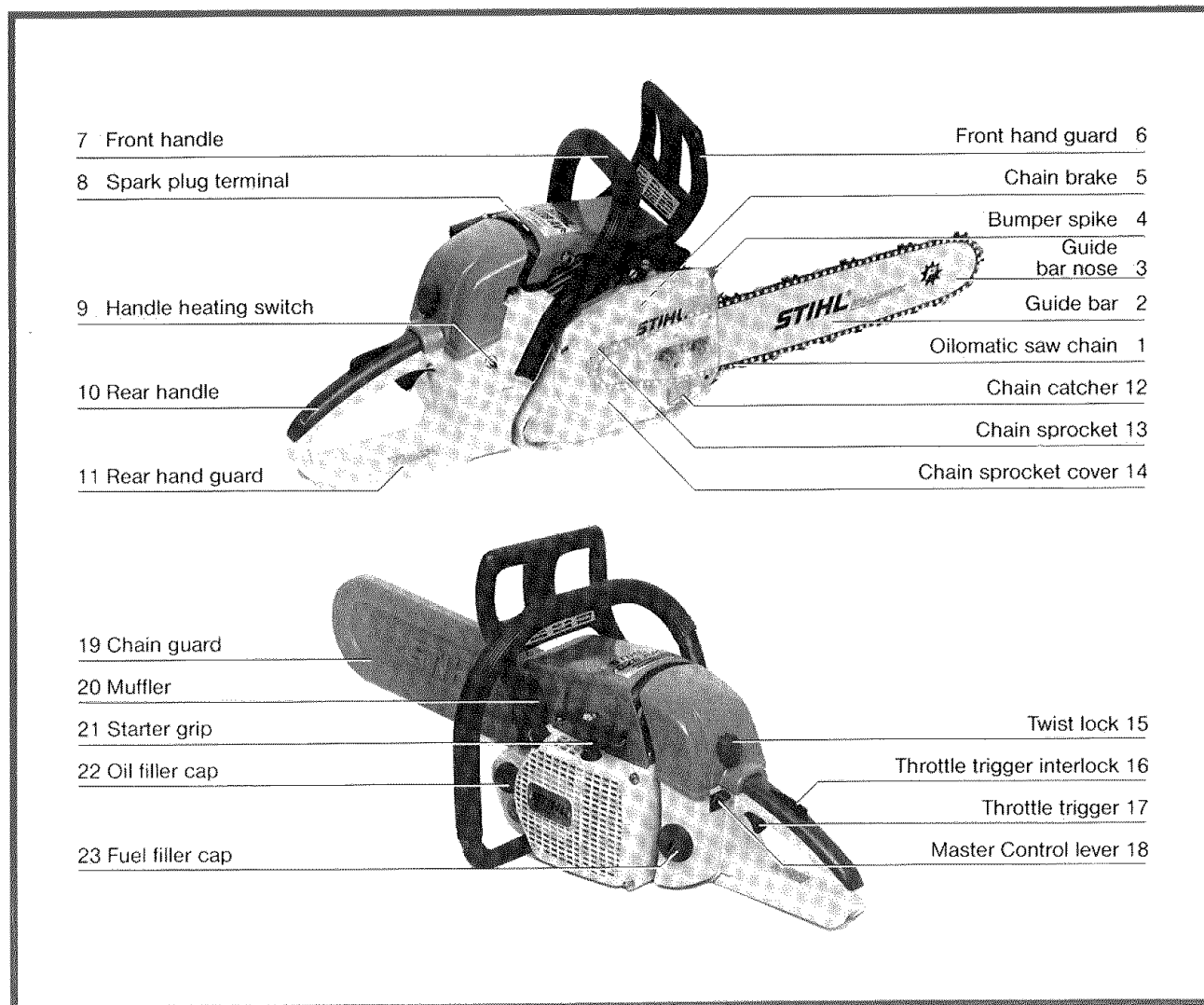
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## Parts of the Chain Saw



## Definitions

1. **Oilomatic Saw Chain.** A loop of chain having cutters, tie straps and drive links.
  2. **Guide Bar.** Supports and guides the saw chain.
  3. **Guide Bar Nose.** The exposed end of the guide bar.
  4. **Bumper Spike.** Toothed stop for holding saw steady against wood.
  5. **Chain Brake.** A device to stop the rotation of the chain if activated in a kickback situation by the operator's hand or by inertia.
  6. **Front Hand Guard.** Provides protection against projecting branches and helps prevent the left hand from touching the chain if it slips off the handle bar.
  7. **Front Handle.** Handle bar for the left hand at front of saw.
  8. **Spark Plug Terminal.** Connects the spark plug with the ignition wire.
  9. **Handle Heating Switch.** For switching the electric handle heating on and off.
  10. **Rear Handle.** The support handle for the right hand, located at or toward the rear of the saw.
  11. **Rear Hand Guard.** Gives added protection to operator's right hand.
  12. **Chain Catcher.** Helps to reduce the risk of operator contact by a chain when it breaks or comes off the bar.
  13. **Chain Sprocket.** The toothed wheel that drives the saw chain.
  14. **Chain Sprocket Cover.** Covers the clutch and the sprocket.
  15. **Twist Lock.** Lock for carburetor box cover.
  16. **Throttle Trigger Interlock.** Must be depressed before the throttle trigger can be activated.
  17. **Throttle Trigger.** Controls the speed of the engine.
  18. **Master Control Lever.** Lever for choke control, starting throttle, run and stop switch position.
  19. **Chain Guard (Scabbard).** Covers the bar and the chain when the saw is not in use.
  20. **Muffler.** Reduces engine exhaust noise and directs the exhaust gases.
  21. **Starter Grip.** The grip of the starter for starting the engine.
  22. **Oil Filler Cap.** For closing the oil tank.
  23. **Fuel Filler Cap.** For closing the fuel tank.
- Clutch.** Couples engine to chain sprocket when engine is accelerated beyond idle speed. (not illustrated).

## Safety Precautions

The use of any chain saw may be hazardous. The saw chain has many sharp cutters. If the cutters contact your flesh, they will cut you, even if the chain is not moving. At full throttle, the chain speed can reach 45 mph (20 m/s). It is important that you read, fully understand and observe the following safety precautions and warnings. Read the owner's manual **and** the safety instructions periodically.

Pay special attention to the section on reactive forces, pages 10 to 16.

### Warning!

Reactive forces, including kickback, can be dangerous. Careless or improper use of any chain saw may cause serious or fatal injury.

All safety precautions that are generally observed when working with an axe or a hand saw also apply to the operation of chain saws. However, because a chain saw is a highspeed, fast-cutting power tool, special safety precautions must be observed to reduce the risk of personal injury.

Have your STIHL dealer show you how to operate your chain saw. Observe all applicable local safety regulations, standards and ordinances.

### Warning!

Minors should never be allowed to use a chain saw. Bystanders, especially children and animals should not be allowed in the area where a chain saw is in use (ill. 1). Never let the saw run unattended. Store it in a locked place away from children and empty the fuel tank before storing for longer than a few days.

Do not lend or rent your chain saw without the Owner's Manual. Be sure that anyone using your saw reads and understands the information contained in this Manual.



These safety precautions and warnings apply to the use of all STIHL chain saws. Different models may have different parts and controls. See the appropriate section of your Owner's Manual for a description of the controls and function of the parts of your model saw.

Safe use of a chain saw involves

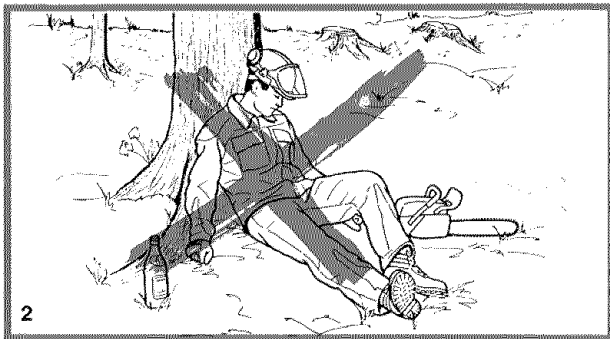
1. the operator
2. the saw
3. the use of the saw.

## THE OPERATOR

### Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgment.

Do not operate a chain saw when you are fatigued (ill. 2). Be alert – If you get tired while operating your chain saw, take a break. Tiredness may result in loss of control. Working with any chain saw can be strenuous. If you have any



condition that might be aggravated by strenuous work, check with your doctor before operating a chain saw.

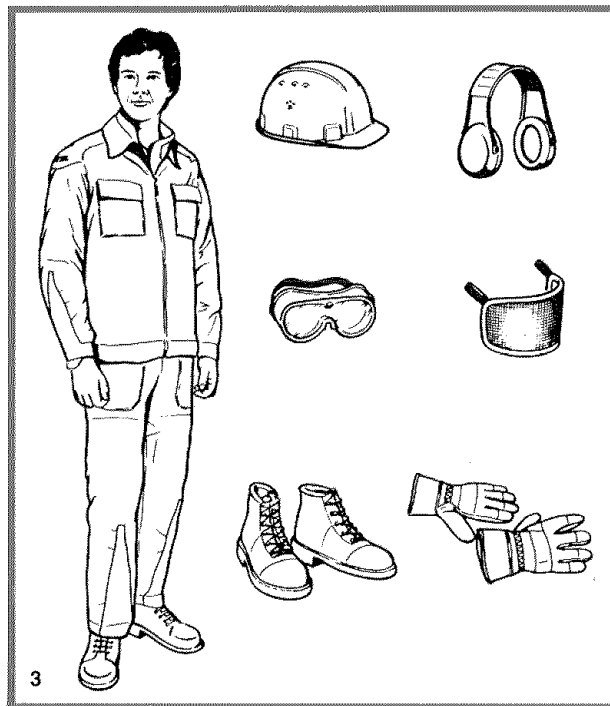
**Warning!**

Prolonged use of chain saws (or other machines) exposing the operator to vibrations may produce whitefinger disease (Raynaud's phenomenon). This phenomenon reduces the hand's ability to feel and regulate temperature, produces numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.

Many STIHL models are available with an anti-vibration (AV) system designed to reduce engine vibration. An anti-vibration system is recommended for those using chain saws on a regular or sustained basis.

Heated handles help to reduce the risk of whitefinger disease and are recommended for cold weather use. Most STIHL powerheads are available with heated handles.

Anti-vibration systems and heated handles do not guarantee that you will not sustain whitefinger disease. Therefore, continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice immediately.



**Proper Clothing**

Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loose-fitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, or anything that could become entangled with the saw or brush. Wear overalls or jeans with a reinforced cut resistant insert (ill. 3).

Protect your hands with gloves when handling saw and saw chain. Heavy-duty, nonslip gloves improve your grip and protect your hands.

Good footing is most important in chain saw work. Wear sturdy boots with nonslip soles. Steel-toed safety boots are recommended.

Proper eye protection is a must. Non-fogging, vented goggles or a face screen is recommended. Their use reduces the risk of eye injury.

Wear an approved safety hard hat to protect your head. Chain saw noise may damage your hearing. Always wear sound barriers (ear plugs or ear muffs) to protect your hearing. Continual and regular users should have their hearing checked regularly.

## THE SAW

Parts of the chain saw; for illustrations and definitions of the parts see pages 2 and 3!

### Warning!

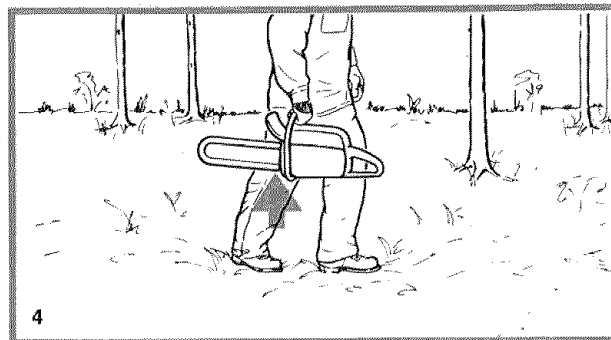
Never modify a chain saw in any way. Only attachments and parts supplied by STIHL or expressly approved by STIHL for use with the specific STIHL saw models are authorized. Although certain unauthorized attachments are useable with the STIHL powerhead, their use may, in fact, be extremely dangerous.

## THE USE OF THE SAW

### Transporting the chain saw

#### Warning!

Always stop the engine before putting a chain saw down or carrying it. Carrying a chain saw with the engine running is extremely dangerous. Accidental acceleration of the engine can cause the chain to rotate. During operation,



the powerhead muffler and the material around it reach extremely high temperatures. Avoid touching the hot muffler, you could receive serious burns.

**By hand:** When carrying your saw by hand, the engine must be stopped and the saw must be in the proper position. Grip the front handle and place the muffler away from the body (ill. 4).

The chain guard (scabbard) should be over the chain and the guide bar, which should point backwards. When carrying your saw, the bar should be behind you (ill. 4).

**By vehicle:** When transporting in a vehicle, keep chain and bar covered with the chain guard. Properly secure your saw to prevent turnover, fuel spillage and damage to the saw.

### Preparation for the use of the saw

Take off the chain guard and inspect for safety in operation. For assembly, follow the procedure described in the section entitled "Mounting the Bar and Chain" of your Owner's Manual.



STIHL Oilomatic chain, guide bar and sprocket must match each other in gauge and pitch.

Before replacing any bar and chain, see the sections on "Specifications", kickback and the ANSI B 175.1-1985 chain saw kickback standard in this Manual.

#### **Warning!**

Proper tension of the chain is extremely important. In order to avoid improper setting, the tensioning procedure must be followed as described in your Manual. Always make sure the hexagonal nut(s) for the sprocket cover is (are) tightened securely after tensioning the chain. Never start the saw with the sprocket cover loose. Check chain tension once more after having tightened the nut(s) and thereafter at regular intervals (whenever the saw is shut off). If the chain becomes loose while cutting, shut off the engine and then tighten. Never try to tighten the chain while the engine is running!

#### **Fueling**

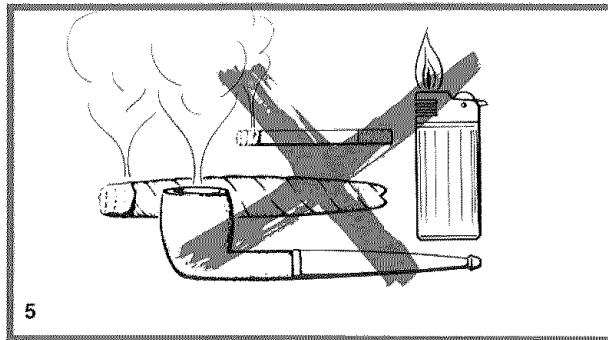
Your STIHL chain saw uses an oil-gasoline mixture for fuel (see chapter entitled "Fuel" of your Owner's Manual).

#### **Warning!**

Gasoline is an extremely flammable fuel. Use extreme caution when handling gasoline or fuel mix. Do not smoke or bring any fire or flame near the fuel (ill. 5).

#### **Fueling Instructions**

Fuel your chain saw in well-ventilated areas, outdoors only.



Always shut off the engine and allow it to cool before refueling. Relieve fuel tank pressure by loosening fuel cap slowly.

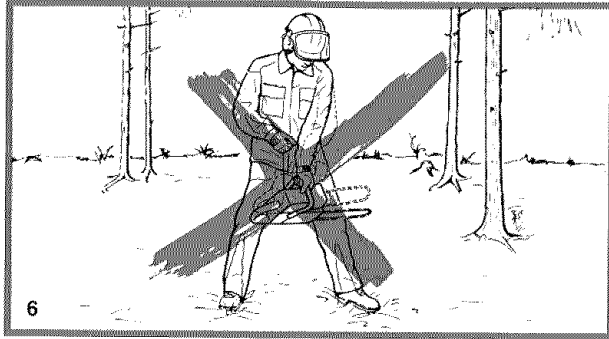
Select bare ground for fueling and move at least 10 feet (3 m) from fueling spot before starting the engine. Wipe off any spilled fuel before starting your saw, and check for leakage.

Check for fuel leakage while refueling and during operation. If fuel or oil leakage is found, do not start or run the engine until leak is fixed and spilled fuel has been wiped away. Tighten the fuel cap after filling to avoid spillage and risk of fire.

#### **Starting**

#### **Warning!**

Your chain saw is a one-person saw. Do not allow other persons to be near the running chain saw. Start and operate your saw without assistance. For specific starting instructions, see the appropriate section of the Owner's Manual. Proper starting methods reduce the risk of injury.



Do not drop start. This method is very dangerous because you may lose control of the saw (ill.6).

There are two recommended methods for starting your chain saw. With the **first method**, the chain saw is started on the ground. Engage the chain brake (see “Chain Brake” chapter in your Owner’s Manual) and place the chain saw on firm ground or other solid surface in an open area. Maintain good balance and secure footing. Grip the front handlebar of the saw firmly with your left hand and press down. For saws with a rear handle level with the ground, put the toe of your right foot into the rear handle and press down. With your right hand pull out the starter grip slowly until you feel a definite resistance and then give it a brisk, strong pull.

The **second** recommended **method** for starting your chain saw allows you to start the saw without placing it on the ground. Engage the chain brake, grip the front handle of the chain saw firmly with your left hand. Keep the arm on the front handle in a locked (straight) position. Hold the rear handle of the saw tightly between your legs just above the knees. Maintain good balance and secure footing. Pull the starting grip slowly with your right hand until you feel a definite resistance and then give it a brisk, strong pull.

### Warning!

Be sure that the guide bar and chain are clear of you and all other obstructions and objects, including the ground. When the engine is started, the engine speed with the starting throttle lock engaged will be fast enough for the clutch to engage the sprocket and turn the chain. If the upper quadrant of the tip of the bar touches any object, it may cause kickback to occur (see section on reactive forces on pp. 10–16). To reduce this risk, always engage the chain brake before starting. Never attempt to start the chain saw when the guide bar is in a cut or kerf.

When you pull the starter grip, do not wrap the starting rope around your hands. Do not allow the grip to snap back, but guide the starter rope slowly back to permit the rope to rewind properly. Failure to follow this procedure may result in injury to hand or fingers and may damage the starter mechanism.

### Important adjustments

#### Warning!

At correct idle speed, the chain should not rotate. For directions to adjust idle speed, see the appropriate section of this Owner’s Manual.

Do not use a saw with incorrect idle speed adjustment.

If you cannot set the correct idle speed, have your STIHL dealer check your saw and make proper adjustments or repairs.

After adjusting a chain, start the saw, let the engine run for a while, then switch engine off and recheck chain tension. Proper chain tension is very important at all times.

### Working Conditions

Operate your chain saw only outdoors in a ventilated area. Operate the saw under good visibility and daylight conditions only.

Don't work alone. Keep within calling distance of others in case help is needed.

#### Warning!

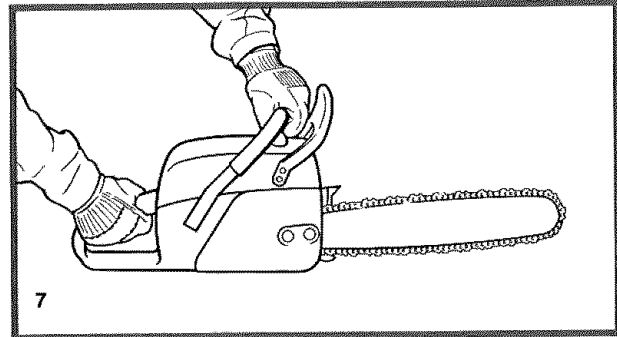
Take extreme care in wet and freezing weather (rain, snow, ice). Put off the work when the weather is windy, stormy or rainfall is heavy. Clear the area where you are working.

#### Warning!

Avoid stumbling on obstacles such as stumps, roots or rocks and watch out for holes or ditches. Be extremely cautious when working on slopes or uneven ground. There is increased danger of slipping on freshly debarked logs.

### Cutting Instructions

Grip: Always hold the saw firmly with both hands when the engine is running. Place your left hand on front handle bar and your right hand on rear handle and throttle trigger. Left-handers should follow this instructions too.



Wrap your fingers tightly around the handles, keeping the handles cradled between your thumb and forefinger (ill.7). With your hands in this position, you can best oppose and absorb the push, pull and kickback forces of your saw without losing control (see section on reactive forces). Make sure your chain saw handles and grip are in good condition and free of moisture, pitch, oil or grease.

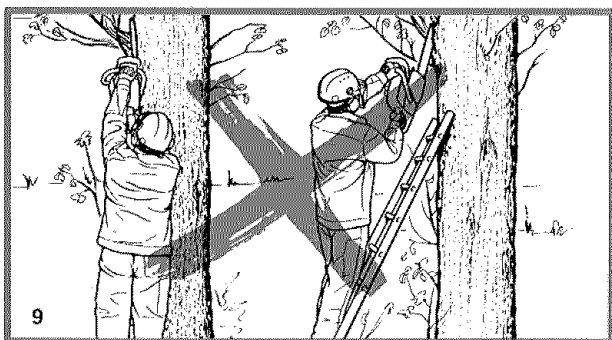
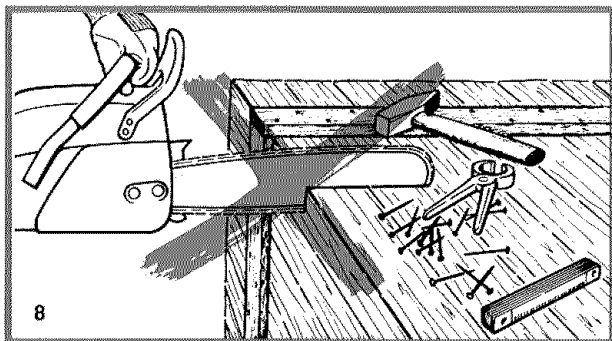
#### Warning!

Never use the saw with one hand. You cannot control reactive forces (see pages 10 to 16) and may lose control of the saw.

Even for those compact saws designed for use in confined spaces, one-handed operation is dangerous because the operator may lose control.

#### Warning!

Do not operate your chain saw with the starting throttle lock engaged. Cutting with the starting throttle lock engaged does not permit the operator proper control of the saw or chain speed.



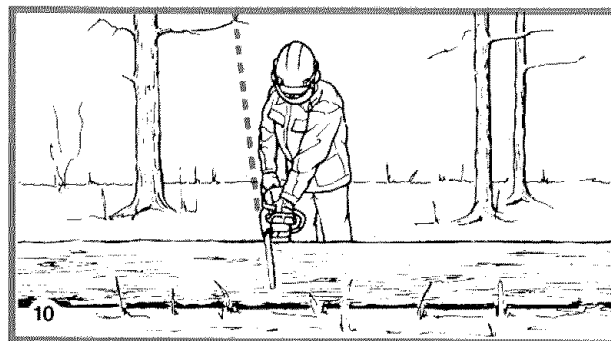
**Warning!**

Never touch a chain with your hand or any part of your body when the engine is running, even when the chain is not rotating. The chain continues to rotate for a short period after the throttle trigger is released.

**Warning!**

Do not cut any material other than wood or wooden objects.

Use your chain saw for cutting only. It is not designed for prying or shoveling away limbs, roots or other objects.



When sawing, make sure that the saw chain does not touch any foreign materials such as rocks, fences, nails and the like (ill.8). Such objects may be flung off, damage the saw chain or cause the saw to kick back.

In order to keep control of your saw, always maintain a firm foothold. Never work on a ladder, in a tree or on any other insecure support. Never use the saw above shoulder height (ill. 9).

Position the chain saw in such a way that your body is clear of the cutting attachment whenever the engine is running. Stand to the left of cut while bucking (see ill. 10).

Don't put pressure on the saw when reaching the end of a cut. The pressure may cause the bar and rotating chain to pop out of the cut or kerf, go out of control and strike the operator or some other object. If the rotating chain strikes some other object, a reactive force (see pages 10 to 16) may cause the moving chain to strike the operator.

**Reactive forces including kickback**

**Warning!**

Reactive forces may occur any time the chain is rotating.

Reactive forces can be dangerous! In any chain saw, the powerful force used to cut wood can be reversed (and work against the operator).

If the rotating chain is suddenly stopped by contact with any solid object like a log or branch or is pinched, the reactive forces may occur instantly. These reactive forces may result in loss of control which may, in turn, cause serious or fatal injury. An understanding of the causes of these reactive forces may help you avoid loss of control.

The most common reactive forces are

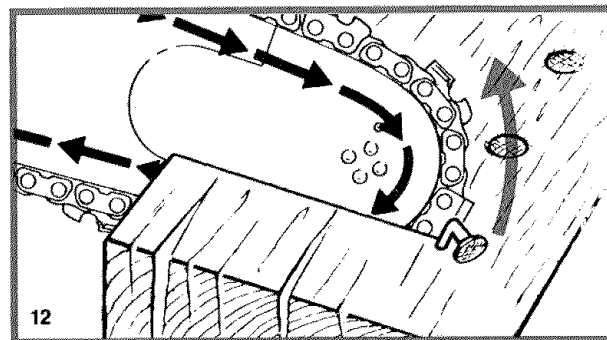
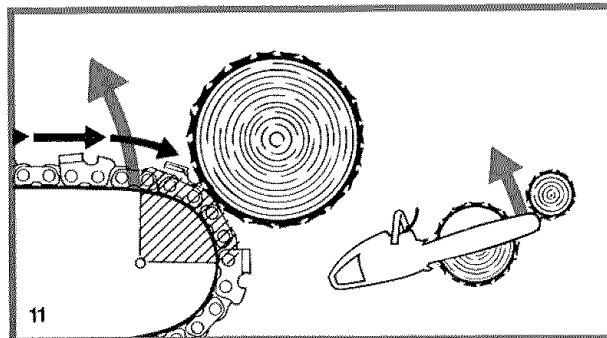
- kickback,
- pushback,
- pull-in.

#### **Kickback:**

Kickback occurs when the upper quadrant of the bar nose contacts a solid object or is pinched (ill. 11). The reaction of the cutting force of the chain causes a rotational force on the chain saw in the direction opposite to the chain movement. This may fling the bar up and back in an uncontrolled arc mainly in the plane of the bar. Under some cutting circumstances the bar moves towards the operator, who may suffer severe or fatal injury. Kickback may occur when the nose of the guide bar is pinched unexpectedly, unintentionally contacts solid material in the wood, (ill. 12) or is incorrectly used to begin a plunge or boring cut. It may also occur during limbing.

The greater the force of the kickback reaction, the more difficult it becomes for the operator to control the saw.

Many factors influence the occurrence and force of the kickback reaction. These include chain speed, the speed at which the bar and chain contact the object, the angle of contact, the condition of the chain and other factors.



The type of bar and saw chain you use is an important factor in the occurrence and force of the kickback reaction. Some STIHL bar and chain types are designed to reduce kickback forces. STIHL recommends the use of reduced kickback bars and low kickback chains.

#### **ANSI B 175.1–1985 chain saw kickback standard**

Section 4.12 of ANSI standard B 175.1–1985, sets certain performance and design criteria related to chain saw kickback.

To comply with section 4.12 of ANSI B 175.1–1985:

a) saws with a displacement of less than 3.8 cubic inches

- must, in their original condition, meet a 45° computer derived kickback angle when equipped with certain cutting attachments described on page 12,
- and must be equipped with at least two devices to reduce the risk of kickback injury, such as a chain brake, low kickback chain, reduced kickback bar, etc.

b) saws with a displacement of 3.8 cubic inches and above

- must be equipped with at least one device designed to reduce the risk of kickback injury such as a chain brake, low kickback chain, reduced kickback bar, etc.

These kickback requirements do not apply to chain saws fitted with bow guides. Bow-equipped saws are only for use by thoroughly instructed and experienced operators. Use of bow guides may result in serious or fatal injury. See section entitled “Bow Guides” of this Manual.

The computer derived angles for saws below 3.8 cubic inch displacement are measured by applying a computer program to test results from a kickback test machine.

**Warning!**

The computer derived angles of § 4.12 of ANSI B 175.1–1985 may bear no relationship to actual kickback bar rotation angles that may occur in real life cutting situations. Compliance with § 4.12 of ANSI B 175.1–1985 does not automatically mean that in a real life kickback the bar and chain will rotate at most 45°.

**Warning!**

In order for powerheads below 3.8 cubic inch displacement to comply with the computed kickback angle requirements of § 4.12 of ANSI B 175.1–1985 use only the following cutting attachments:

- bar and chain combinations listed as complying in the “Specifications” section of the Owner’s Manual or
- other replacement bar and chain combinations marked in accordance with the standard for use on the powerhead or
- replacement chain designated “low kickback saw chain”<sup>1)</sup>

**Warning!** There are potential powerhead and bar combinations with which low kickback saw chains can be used which have not been specifically certified to comply with the 45° computer derived kickback angle of § 4.12 of ANSI B 175.1–1985. Some low kickback chains have not been tested with all powerhead and bar combinations.

STIHL offers a variety of bars and chains. STIHL reduced kickback bars and low kickback chains are designed to reduce the risk of kickback injury. Other chains are designed to obtain higher cutting efficiency or sharpening ease but may result in higher kickback tendency.

STIHL has developed a color code system to help you identify the STIHL reduced kickback bars and low kickback chains. Cutting attachments with green warning decals or green labels on the packaging are designed to reduce the risk of kickback injury. The matching of green decalated powerheads under 3.8 cubic inch displacement with green labeled bars and green labeled chains gives compliance with the computed kickback angle requirements of ANSI B 175.1–1985 when the products are in their original condition. Products with yellow decals or labels are for users with extraordinary cutting needs and experience

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<sup>1)</sup> “Low kickback saw chain” is a chain which has met the kickback performance requirements of § 4.12.2.4 of ANSI B 175.1–1985 (Safety Requirements for Gasoline-Powered Chain Saws) when tested on a selected representative sample of chain saws below 3.8 cubic inch displacement specified in ANSI B 175.1–1985.

and specialized training for dealing with kickback.

**STIHL recommends the use of its green labeled reduced kickback bars, green labeled low kickback chains and a STIHL Quickstop chain brake for both experienced and inexperienced chain saw users.**

Please ask your STIHL dealer to properly match your powerhead with the appropriate bar/chain combinations to reduce the risk of kickback injury. Green labeled bars and chains are recommended for all powerheads. See your "STIHL Bar and Chain Information" leaflet for details.

**Warning!** Use of other, non-listed bar/chain combinations may increase kickback forces and increase the risk of kickback injury.

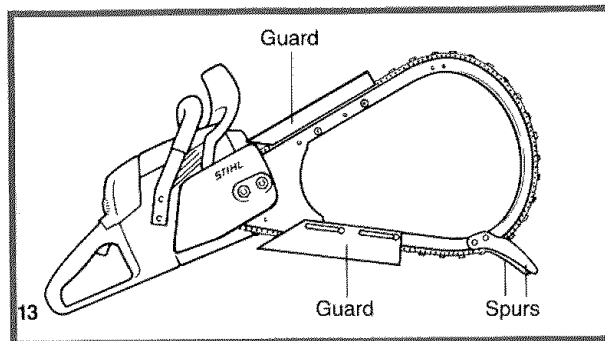
New bar/chain combinations may be developed after publication of this literature, which will, in combination with certain powerheads, comply with § 4.12 of ANSI B 175.1–1985. Check with your STIHL dealer for such combinations.

### Bow Guides

**Warning!** Any chain saw equipped with a bow guide is potentially very dangerous. Improper use can result in kickback, pushback or pull-in, and very serious injury or death. Only thoroughly instructed and experienced operators should use a chain saw equipped with a bow guide.

A bow guide (or bow bar) is a specially designed substitution for a regular guide bar. Like a regular guide bar, it supports and guides the saw chain. Unlike a regular guide bar, it consists of a narrow rail structure with a large open space in the middle.

**Warning!** The risk of kickback is increased with a bow guide because of the increased kickback contact area. STIHL recommends the use of the STIHL Quickstop chain brake. Low kickback chain **will not** significantly reduce the risk of kickback injury when used on a bow guide.



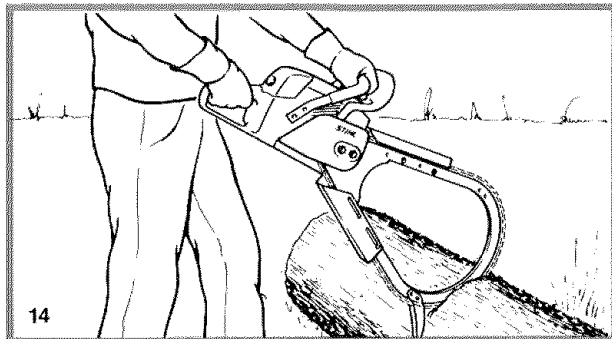
Only STIHL bow guides are approved for use with STIHL powerheads. The use of other bow guides with a STIHL powerhead can be hazardous to the operator due to the absence of safety guards and spurs and necessary unauthorized modifications needed to mount the bow guide to the STIHL powerhead.

Do not use a STIHL bow guide on any powerhead except a STIHL powerhead. Unauthorized combinations are dangerous.

### Warning!

Never attempt to operate a chain saw equipped with a bow guide unless the spurs and both guards are in place (ill. 13). Under no circumstances should any of the spurs or guards be removed. Keep the nuts which hold these items in place tightened at all times.

The guards at the top and bottom of the bow guide are required to reduce the possibility of injury caused by contact with the chain. These guards are slotted to allow positioning as close to the powerhead as possible. After the bow guide is mounted on the chain saw, slide the guards as close to the powerhead as possible.



The spurs should always be placed firmly against the wood before starting a cut (ill. 14) and should be kept against the wood until the cut is completed. Failure to keep the spurs firmly against the wood during the entire cut could cause the saw to react violently and could result in serious injury or death to the operator.

**Warning!**

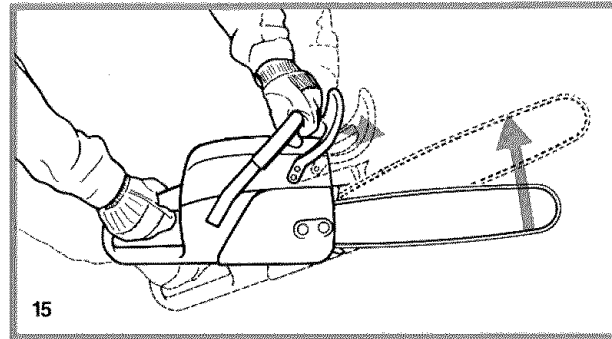
Be sure to keep the chain properly tensioned. A chain which “sags” or is too loose could jump off the bow and result in serious injury to the operator. Felling with a bow bar is dangerous, because it is more difficult to follow safe felling techniques.

Cut only one log at a time.

A chain catcher which has been removed to allow mounting of a bow guide must be reattached when remounting the regular guide bar.

**Devices for reducing the risk of kickback injury**

STIHL recommends the use of the STIHL Quickstop chain brake on your powerhead with green labeled reduced kickback bars and low kickback chains.



**Quickstop chain brake**

STIHL has developed a chain stopping system designed to reduce the risk of injury in certain kickback situations. It is called a Quickstop chain brake. The Quickstop is available as standard equipment on your STIHL chain saw and is available for installation on most older STIHL saws. Ask your dealer to retrofit your older model saw with a chain brake.

When a kickback occurs, the guide bar may rotate around the front handle. If the cutting position is such that the operator’s left hand is gripping the front handle behind the hand guard, and if the left hand rotates around the front handle and contacts the front hand guard, which is the Quickstop activating lever, this contact will activate the Quickstop (see ill. 15). The chain brake on most new model STIHL chain saws can also be activated by inertia. See the chapter entitled “Chain Brake” of your Owner’s Manual.

**Warning!**

Never operate your chain saw without a front hand guard. In a kickback situation this guard helps protect your left hand or other parts of your body. In addition, removal of the hand guard on a saw equipped with a chain brake will deactivate the chain brake.



**Warning!**

No Quickstop or other chain brake device prevents kickback. These devices are designed to reduce the risk of kickback injury, if activated, in certain kickback situations. In order for the Quickstop to reduce the risk of kickback injury, it must be properly maintained and in good working order. See the chapter entitled "Chain Brake" and "Maintenance, Repair and Storing" of your Owner's Manual. In addition, there must be enough distance between the bar and the operator to ensure that the Quickstop has sufficient time to activate and stop the chain before potential contact with the operator.

**Warning!**

An improperly maintained chain brake may increase the time needed to stop the chain after activation, or may not activate at all.

**Reduced kickback bar**

STIHL green labeled reduced kickback bars are designed to reduce the risk of kickback injury when used with STIHL green labeled low kickback chains.

**Warning!**

When used with other, more aggressive chains, these bars may be less effective in reducing kickback, and may result in higher kickback forces.

**Low kickback chain**

Some types of saw chain have specially designed components to reduce the force of nose contact kickback. STIHL has developed low kickback chain for your powerhead.

**Warning!**

A dull or improperly sharpened chain may reduce or negate the effects of the design features intended to reduce kickback energy. Improper lowering or sharpening of the depth gauges or shaping of the cutters may increase the chance and the potential energy of a kickback. Always cut with a properly sharpened chain.

**Warning!**

Reduced kickback bars and low kickback chains do not prevent kickback, but they are designed to reduce the risk of kickback injury. They are available from your STIHL dealer.

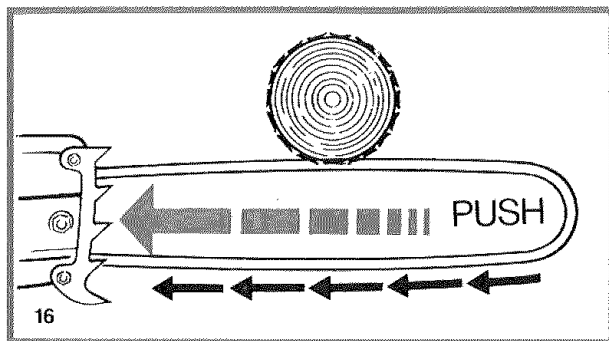
**Warning!**

Even if your saw is equipped with a Quickstop, a reduced kickback bar and/or low kickback chain, this does not eliminate the risk of injury by kickback. Therefore always observe all safety precautions to avoid kickback situations.

**To avoid kickback**

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

1. Hold the chain saw firmly with both hands and maintain a secure grip.
2. Be aware of the location of the guide bar nose at all times.
3. Never let the nose of the guide bar contact any object. Do not cut limbs with the nose of the guide bar. Be especially careful when cutting small, tough limbs, small size brush and saplings which may easily catch the chain.
4. Don't overreach.
5. Don't cut above shoulder height.
6. Begin cutting and continue at full throttle.
7. Cut only one log at a time.
8. Use extreme caution when re-entering a previous cut.
9. Do not attempt to plunge cut (see page 20) if you are not experienced with these cutting techniques.
10. Be alert for shifting of the log or other forces that may cause the cut to close and pinch the chain.
11. Maintain saw chain properly. Cut with a correctly sharpened, properly tensioned chain at all times.
12. Stand to the side of the cutting path of the chain saw.

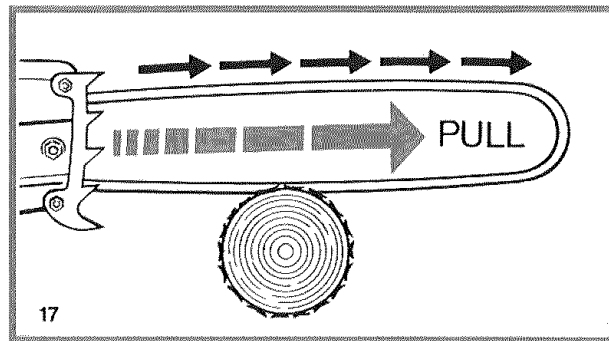


### Pushback:

Pushback occurs when the chain on the top of the bar is suddenly stopped when it is pinched, caught or encounters a foreign object in the wood. The reaction of the chain drives the saw straight back toward the operator and may cause loss of saw control. Pushback frequently occurs when the top of the bar is used for cutting (see ill. 16).

### To avoid pushback

1. Be alert to forces or situations that may cause material to pinch the top of the chain.
2. Do not cut more than one log at a time.
3. Do not twist the saw when withdrawing the bar from a plunge cut or underbuck cut (figures 26 to 30 and 34, pages 19, 20 and 22), because the chain can pinch.



### Pull-in:

Pull-in occurs when the chain on the bottom of the bar is suddenly stopped when it is pinched, caught or encounters a foreign object in the wood (see ill. 17). The reaction of the chain pulls the saw forward and may cause the operator to lose control.

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

### Warning!

Use extreme caution when cutting small size brush and saplings which may easily catch the chain and pull you off balance.

### To avoid pull-in

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

## Cutting Techniques

### Felling

Felling is cutting down a tree.

Before felling a tree, consider carefully all conditions which may affect the direction of fall, including:

The intended direction of the fall.

The natural lean of the tree.

Any unusually heavy limb structure.

Surrounding trees and obstacles.

The wind direction and speed.

### Warning!

Always observe the general conditions of the tree. Look for decay and rot in the trunk. If it is rotted inside, it could snap and fall toward the operator while being cut.

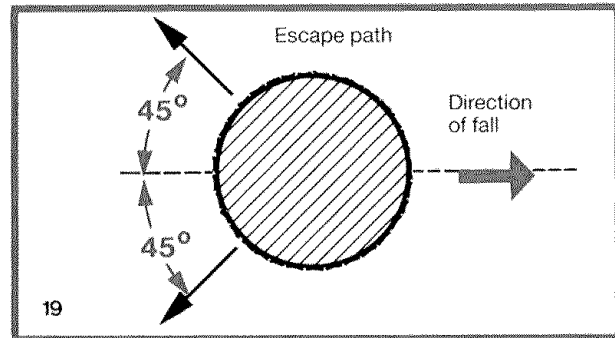
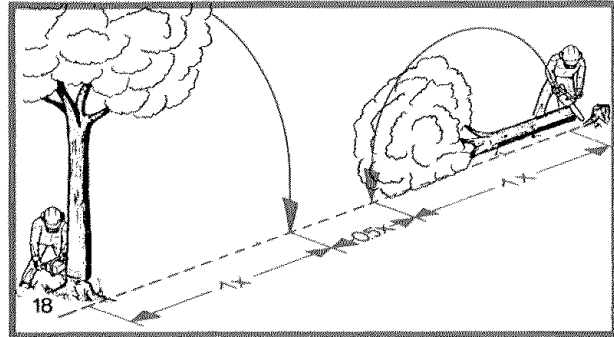
Also look for broken or dead branches which could vibrate loose and fall on the operator. When felling on a slope, the operator should stand on the uphill side if possible.

When felling in the vicinity of roads, railways and power lines, etc., take extra precautions. Inform the police, utility company or railway authority before beginning to cut.

When felling, maintain a distance of at least 2½ tree lengths from the nearest person (see ill. 18).

### Note:

The noise of your engine may drown any warning call.



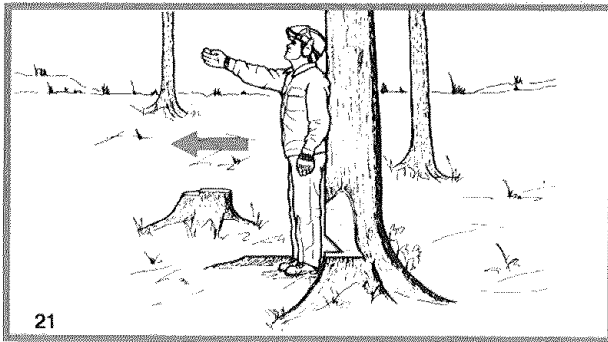
### Felling Instructions:

First clear the tree base and work area from interfering limbs and brush and clean its lower portion with an axe.

Then, establish a path of escape and remove all obstacles. This path should be generally opposite to the planned direction of the fall of the tree and about at a 45° angle (ill. 19). An alternate path must also be selected. Place all tools and equipment a safe distance away from the tree, but not on the escape path.



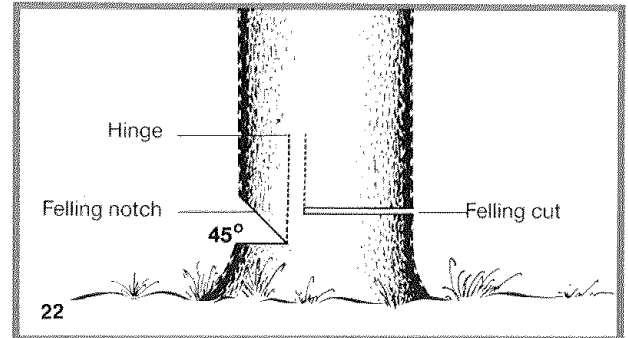
20



21

If the tree has large buttress roots, cut into the largest buttress vertically first (horizontally next) and remove the resulting piece (ill. 20).

Two felling techniques are recommended, the conventional cut and the open-face cut. With either technique the first step is to determine the placement of the felling notch on the side of the tree in the planned direction of the fall. (ill. 21). When properly placed the felling notch determines the direction in which the tree will fall. It is made perpendicular to the line of fall and should be close to the ground.



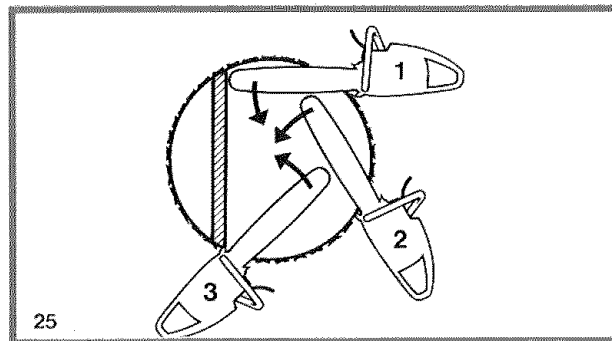
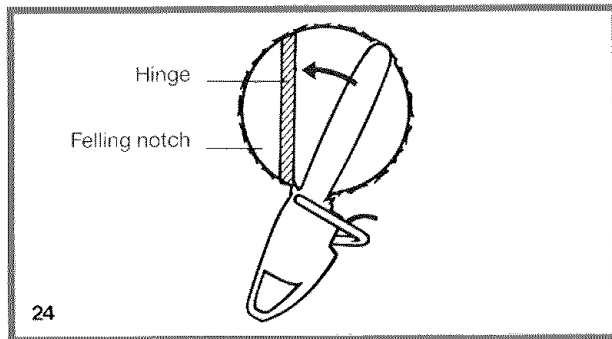
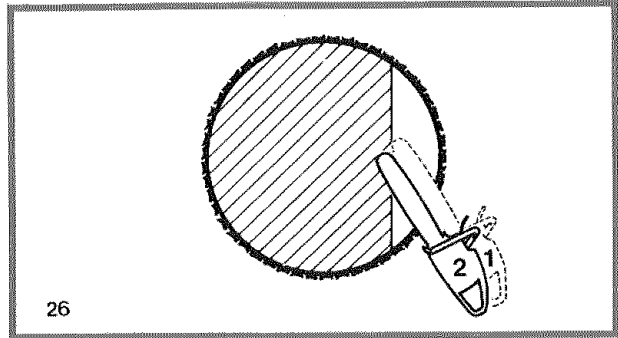
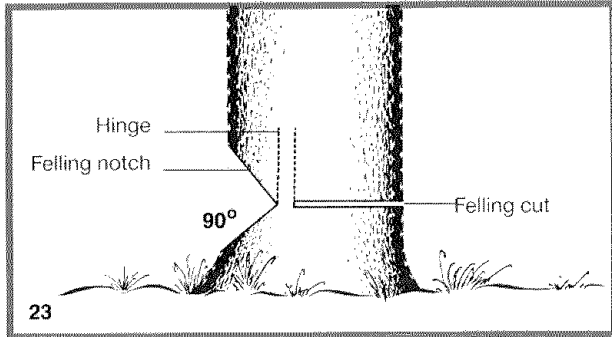
22

With the **conventional cut** begin with the top cut of the felling notch, and cut down at approximately a 45-degree angle to a depth of about  $\frac{1}{5}$  to  $\frac{1}{4}$  of the trunk diameter. Make the second or lower cut horizontal until it meets the first cut. Remove the resulting 45-degree piece (ill. 22).

With the **open-face technique**, the object is to make a 90-degree notch in the tree trunk to a depth of approximately  $\frac{1}{5}$  to  $\frac{1}{4}$  of the tree's diameter. Beginning with the top cut of the notch, cut down at approximately a 50-degree angle to a depth of approximately  $\frac{1}{5}$  to  $\frac{1}{4}$  of the diameter of the tree. Make a second cut from below also at approximately a 40-degree angle. Remove the resulting 90-degree open-face piece (ill. 23).

With both techniques, the felling notch should be made very carefully. When making the second cuts, look through the previously made kerf to insure that the two cuts meet properly.

Once the felling notch has been completed, you are ready to begin the felling cut on the opposite side of the tree. With the **conventional notch**, begin the felling cut 1 to 2



inches higher than the center of the felling notch (ill. 22). With the **open-face notch**, begin the felling cut on the same level as the center of the felling notch (ill. 23). Cut horizontally through the tree towards the felling notch. Engage the bumper spikes of the chain saw directly behind the uncut portion of wood and cut towards the notch. (ill. 24). Leave approximately  $\frac{1}{10}$  of the tree diameter uncut. This is the hinge. Do not cut through the hinge because you could lose control of the direction of the fall. Drive wedges into the felling cut where necessary to control the fall.

#### Warning!

If the tip of the bar contacts a wedge, it may cause kick-back.

Wedges should be of wood or plastic – never steel which can damage the chain.

Always keep to the side of the falling tree. When the tree starts to fall, withdraw the bar, shut off the engine and walk away on the preplanned escape path. Watch out for falling limbs.

### Warning!

Be extremely careful with partially fallen trees which are poorly supported.

When the tree hangs or for some other reason does not fall completely, set the saw aside and pull the tree down with a cable winch, block and tackle or tractor. If you try to cut it down with your saw, you may be injured.

### Sectioning Method

#### Warning!

Felling a tree that has a diameter greater than the length of the guide bar requires use of either the sectioning or plunge-cut method. These methods are extremely dangerous because they involve the use of the nose of the guide bar and can result in kickback. Only properly trained professionals should attempt these techniques.

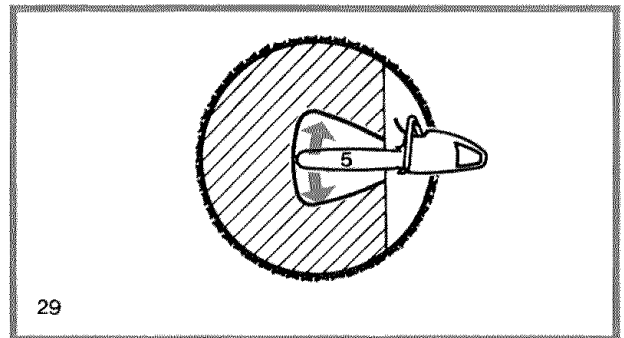
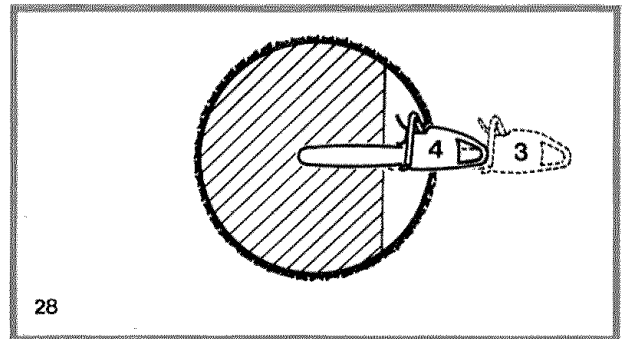
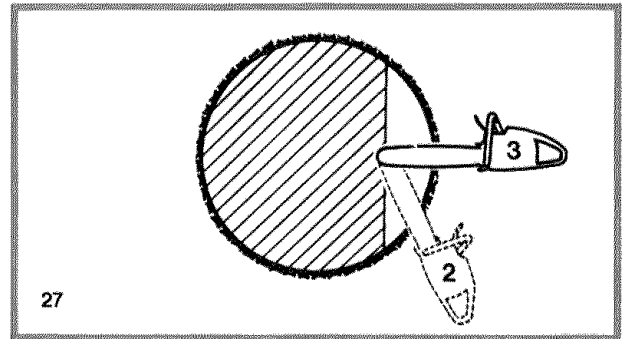
For the sectioning method (ill. 25) make the first part of the felling cut with the guide bar fanning in toward the hinge. Then, using the bumper spike as a pivot, reposition the saw for the next cut. Avoid repositioning the saw more than necessary. When repositioning for the next cut, keep the guide bar fully engaged in the kerf to keep the felling cut straight. If the saw begins to pinch, insert a wedge to open the cut. On the last cut, do not cut the hinge.

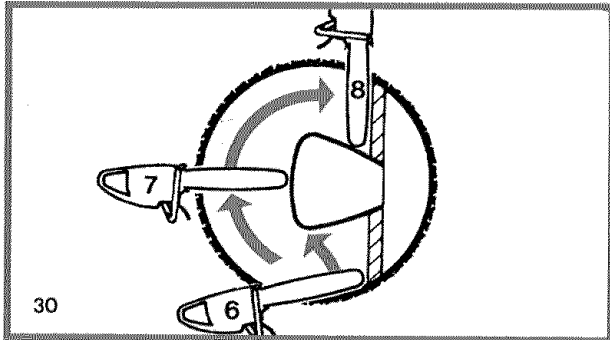
### Plunge-Cut Method

Timber having a diameter more than twice the length of the guide bar requires the use of the plunge-cut method before making the felling cut.

First, cut a large, wide felling notch. Make a plunge cut in the center of the notch.

The plunge cut is made with the guide bar nose. Begin the plunge cut by applying the lower portion of the guide bar nose to the tree at an angle (ill. 26). Cut until the depth of the kerf is about the same as the width of the guide bar





(ill. 27). Next, align the saw in the direction in which the recess is to be cut.

With the saw at full throttle, insert the guide bar in the trunk (ill. 28).

Enlarge the plunge cut as shown in illustration (ill. 29).

**Warning!**

There is an extreme danger of kickback at this point. Extra caution must be taken to maintain control of the saw. To make the felling cut, follow the sectioning method described previously (ill. 30).

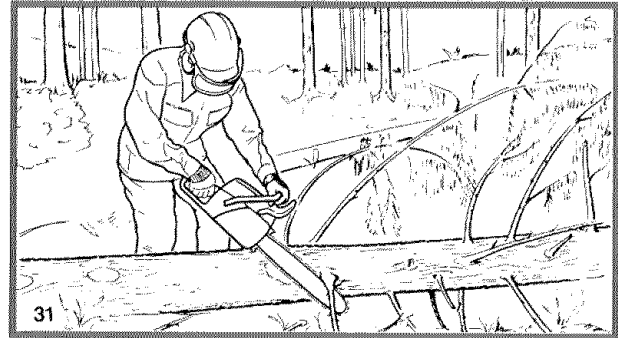
If you are inexperienced with a chain saw, plunge-cutting should not be attempted. Seek the help of a professional.

**Limbing**

Limbing is removing the branches from a fallen tree.

**Warning!**

There is an extreme danger of kickback during the limbing operation. Do not work with the nose of the bar. Be extremely cautious and avoid contacting the log or other limbs with the nose of the guide bar.



Do not stand on a log while limbing it – you may slip or the log may roll.

Start limbing by leaving the lower limbs to support the log off the ground (ill. 31). When underbucking freely hanging limbs, a pinch may result or the limb may fall, causing loss of control.

If a pinch occurs, stop the engine and remove the saw, by lifting the limb.

**Warning!**

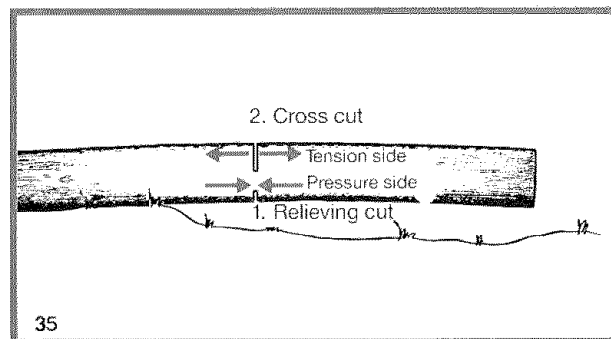
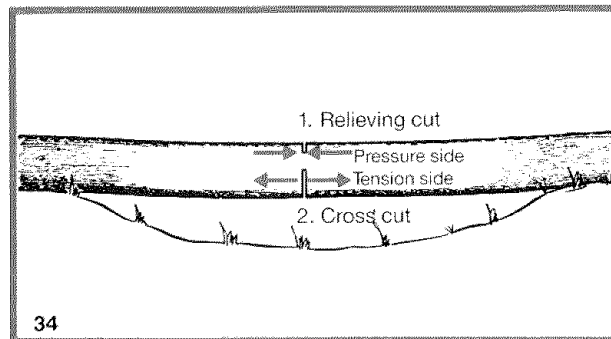
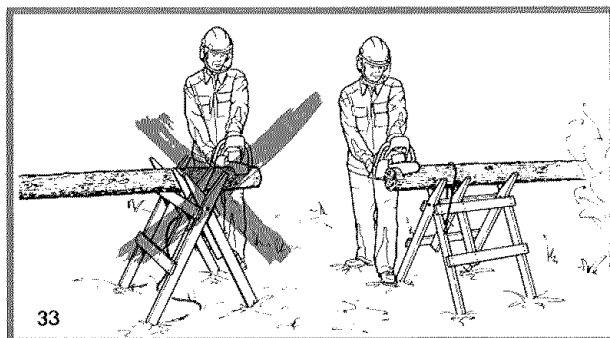
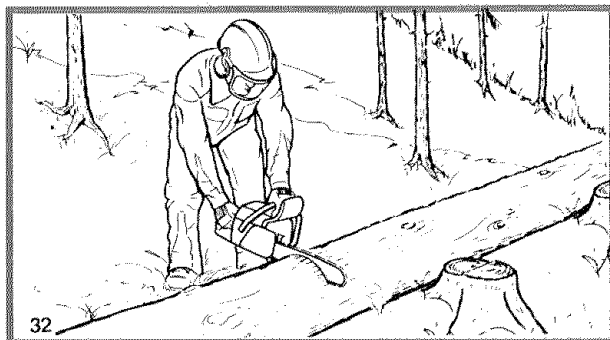
Be extremely cautious when cutting limbs or logs under tension (spring poles). The limbs or logs could spring back toward the operator and cause loss of control of the saw and severe or fatal injury to the operator.

**Bucking**

Bucking is cutting a log into sections.

**Warnings!**

1. When bucking, do not stand on the log. Make sure the log will not roll downhill. If on a slope, stand on the uphill side of the log (see ill.32). Watch out for rolling logs.



2. Cut only one log at a time.
3. Shattered wood should be cut very carefully. Sharp splinters of wood may be caught and flung in the direction of the operator of the saw.
4. When cutting small logs, use a sawhorse (ill. 33). Never permit another person to hold the log. Never hold the log with your leg or foot.
5. Logs under strain require special attention to prevent

the saw from pinching. The first cut is made on the compression side to relieve the stress on the log (see ill. 34, 35). The bucking cut is then made as shown. If the saw pinches, stop the engine and remove it from the log.

6. Only properly trained professionals should work in an area where the logs, limbs and roots are tangled. Working in blowdown areas is extremely hazardous.
7. Drag the logs into a clear area before cutting. Pull out exposed and cleared logs first.



## MAINTENANCE, REPAIR AND STORING

Use only STIHL replacement parts for maintenance and repair. Use of parts manufactured by others may cause serious or fatal injury.

Never operate a chain saw that is damaged, improperly adjusted or not completely or securely assembled. Follow the maintenance and repair instructions in the appropriate section of your Owner's Manual, especially those in the chapters entitled "Guide Bar, Chain and Sprocket", "Sharpening and Maintenance of Saw Chain" and "Chain Brake".

**Warning!** Always stop the engine and ensure that the chain is stopped before making any adjustments, maintenance or repair work, changing the saw chain or cleaning the saw. Do not attempt any maintenance or repair work not described in your Owner's Manual. Have such work performed at your STIHL service shop only.

Check fuel filler cap for leaks at regular intervals. Use the specified spark plug and make sure it and the ignition lead are always in good condition.

**Warning!** A worn or damaged muffler is a fire hazard and may cause loss of hearing. Check to see that the muffler is in good condition. The chain saw must not be operated if the muffler is faulty or has been removed. Remember that the risk of forest fires is greater in hot weather. Use the fire-safe muffler supplied with the unit. Never touch a hot muffler or burn will result.

Keep the chain, bar and sprocket clean; replace worn sprockets or chains.

Keep the chain sharp. You can spot a dull chain when easy-to-cut wood becomes hard to cut and burn marks appear on the wood.

Keep the chain at proper tension. Tighten all nuts, bolts and screws except the carburetor adjustment screws after each use.

**Warning!** In order for the chain brake on your STIHL chain saw to properly perform its function of reducing the risk of kickback and other injuries, it must be properly maintained. Like an automobile brake, a chain saw chain brake incurs wear each time it is engaged.

The amount of wear will vary depending upon usage, conditions under which the saw is used and other factors. Excessive wear will reduce the effectiveness of the chain brake and can render it inoperable. For the proper and effective operation of the chain brake the brake band and clutch drum must be kept free of dirt, grease and other foreign matter which may reduce friction of the band on the drum.

For these reasons, each STIHL chain saw should be returned to trained personnel such as your Stihl servicing dealer for periodic inspection and servicing of the brake system according to the following schedule:

Heavy usage – every three months,

Moderate usage – twice a year,

Occasional usage – annually.

The brake band should be replaced whenever wear has reduced any portion of its original thickness by 25% or more. Additionally, the daily maintenance schedule for your chain saw set forth in your STIHL Owner's Manual should be strictly followed.

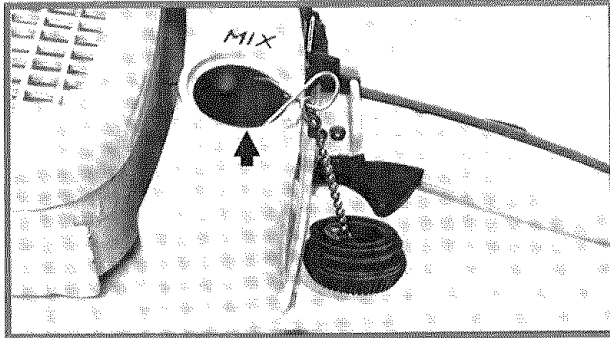
Keep spark plug and wire connection tight and clean. The spark plug electrode gap should be checked with a feeler gauge at least every 50 operating hours and reset if necessary. Fit a new spark plug if the electrodes are badly pitted.

Store chain saw in a dry place and away from children. Before storing for longer than a few days always empty the fuel tank.

## Fuel



Fuel filler cap removed



Your two-stroke engine runs on a mixture of gasoline and two-stroke, air-cooled engine oil.

Use regular branded gasoline, leaded or unleaded, with a minimum octane number of 90 ROZ (U.S.A./Canada: pump octane min. 87!). If the octane number of the regular grade gasoline in your area is lower, it may cause preignition ("pinging") which is accompanied by a rise in engine temperature. This increases the risk of piston seizure and damage to the engine.

The chemical composition of the fuel is also important. Some fuel constituents not only detrimentally affect elastomers (carburetor diaphragms, oil seals, fuel lines etc.), but magnesium castings as well. This could cause running problems or even damage the fuel tank. For this reason it is essential that you use only name branded fuels!

Use only STIHL two-stroke engine oil or equivalent branded two-stroke air-cooled engine oils for mixing. We recommend STIHL 50:1/40:1 two-stroke engine oil since it is specially formulated for use in STIHL engines. The mix ratio with STIHL oil is 50:1/40:1 (50/40 parts gasoline to 1 part oil), or 25:1 (25 parts gasoline to 1 part oil) with other branded two-stroke air-cooled engine oils.

Do not use BIA or TCW (two-stroke water cooled) mix oils!

Gasoline	STIHL-oil 50:1		STIHL-oil 40:1		Other branded two-stroke eng. oils (25:1)		
	U.S. gal	U.S. oz	U.S. Lit.	U.S. oz	U.S. Lit.	U.S. oz	
1.0	—	0.020	—	0.025	—	0.04	—
—	1.0	—	2.56	—	3.2	—	5.12
5.0	—	0.100	—	0.125	—	0.20	—
—	2.5	—	6.4	—	8.0	—	12.8
10	—	0.200	—	0.250	—	0.40	—
—	5.0	—	12.8	—	16.0	—	25.6

Take care when handling gasoline. Avoid direct contact with the skin and avoid inhaling fuel vapour.

When mixing, pour oil into the canister first, and then add gasoline. The canister should be kept tightly closed in order to avoid any moisture getting into the mixture. The fuel mixture must not be stored for long periods of time. Do not store large quantities. Always mix sufficient fuel for about a few month's work or the project in hand.

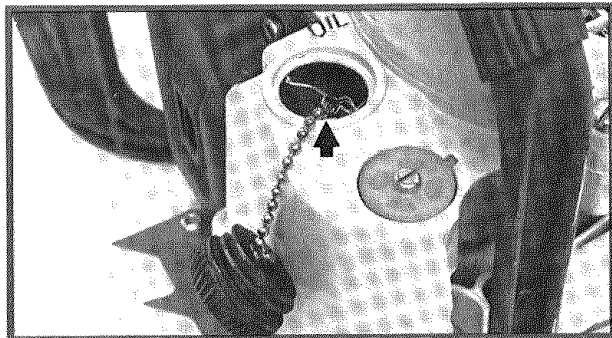
Always thoroughly shake the mixture in the canister before fueling your machine. The fuel tank may be under pressure. Remove cap slowly!

The fuel tank and the canister in which fuel mix is stored should be cleaned from time to time. Before storing your machine for a long period, drain and clean the fuel tank and run engine until carburetor is dry.

Change the filter element in the fuel pick up body every year.

## Chain Oil

Oil filler cap removed

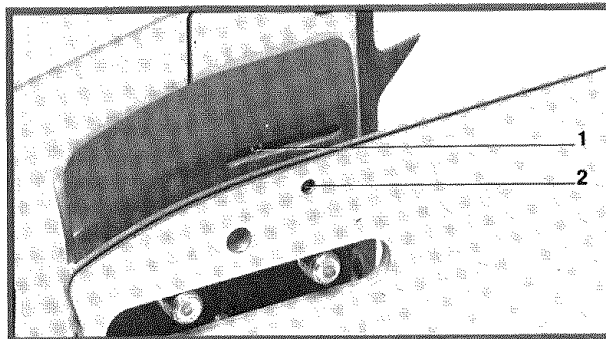


The saw chain and guide bar must be continuously lubricated during operation to protect them from abnormal wear. This is assured by the automatic chain oiling system. The speed-controlled oil pump always draws the amount of oil required out of the tank and feeds it to the guide bar groove. The oil pump feed rate is designed to provide adequate lubrication of the bar and chain under normal operating conditions using a standard length Ecomatic guide bar. If you would like to increase the oil feed rate, contact your STIHL Dealer for assistance.

The capacities of the oil and fuel tanks are balanced in such a way that a certain amount of oil, depending on pump feed rate, is always left in the oil tank when the fuel tank is empty. This avoids the risk of the saw being used unintentionally without chain lubrication.

Always fill the oil tank with chain oil when you refuel.  
**Important:** If you find the oil tank is still full although the fuel tank is completely empty, the reason may be a fault in the chain oil supply system. In such a case, check chain lubrication and, if necessary, clean the oilways or contact your STIHL Dealer for assistance.

- 1 = Oilway in crankcase
- 2 = Oil inlet hole in guide bar



The service life of the saw chain and guide bar is greatly dependent on the quality of the lubricant. Only use the chain oil approved and recommended by STIHL.

### Warning!

Medical studies have shown that renewed contact with waste oil can cause skin cancer. Avoid direct contact with waste oil. If waste oil does get on your skin, wash with soap and water. **Do not use** waste oil for any purpose, and dispose of it only at authorized disposal locations.

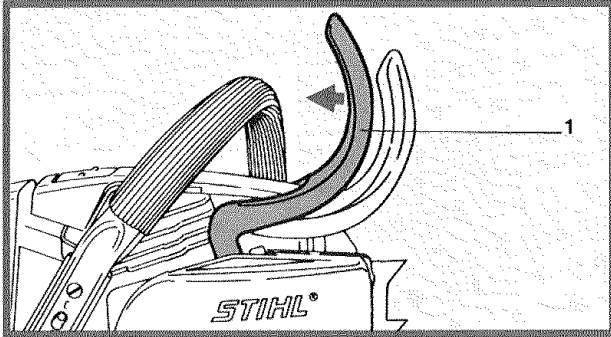
If special chain lubricant is not available you may – in an emergency – use one of the high-duty, single grade engine oils listed below. Choose the oil according to the prevailing outside temperature.

Outside temperature	Grade
+10 °C to +40 °C (50 °F to 104 °F)	SAE 30
+10 °C to –10 °C (50 °F to 14 °F)	SAE 20
–10 °C to –30 °C (14 °F to 22 °F)	SAE 20 W or SAE 10 W

Before refilling, carefully clean the filler cap and the area around it to ensure that no dirt falls into the tank.

## Mounting the Bar and Chain

Chain brake released



There are two types of chain tensioner. Depending on the model you have, tensioning is performed either through the side of the sprocket cover or from the front of the machine.

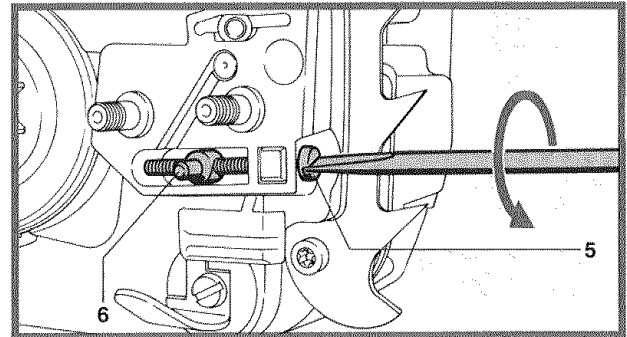
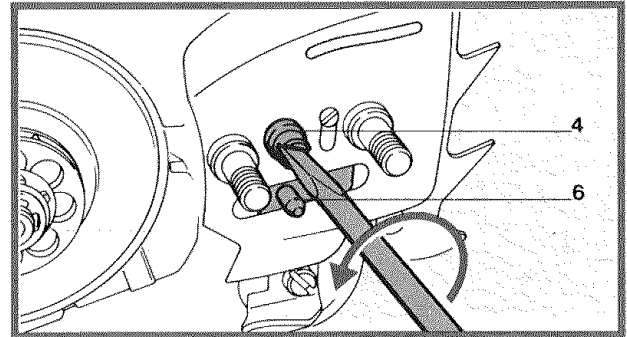
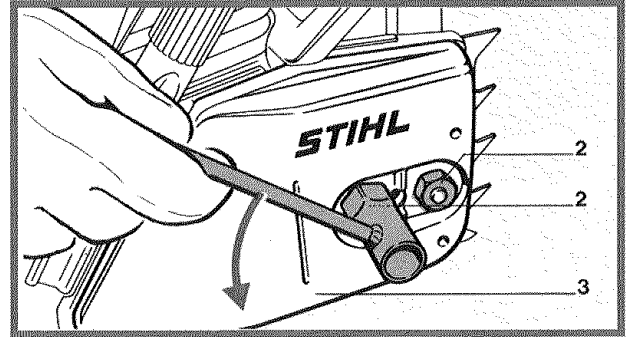
Release the chain brake by pulling the front hand guard (1) back toward the handlebar.

Unscrew the hexagon nuts (2) and take off the chain sprocket cover (3).

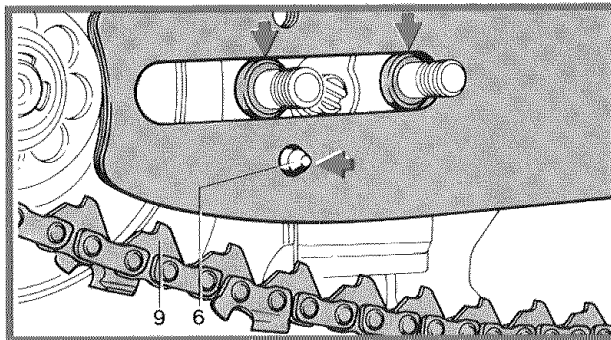
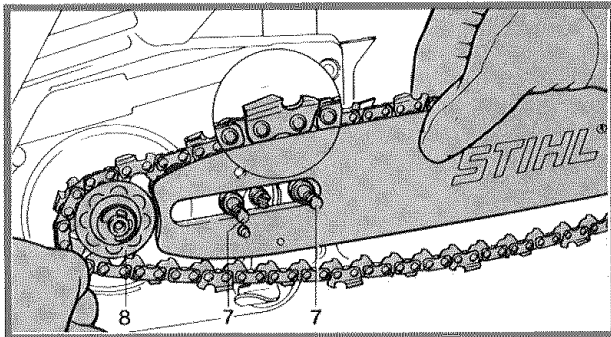
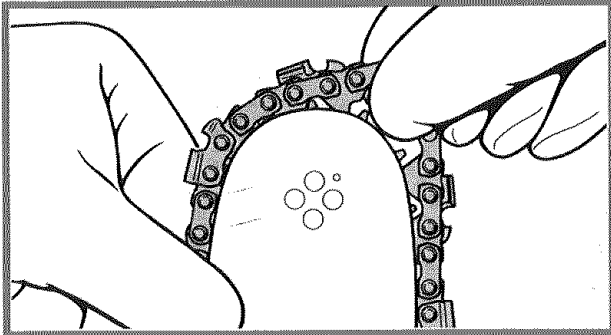
Use the screwdriver end of the combination wrench to turn the adjusting screw (4) (lateral chain tensioner) or the tensioning screw (5) (front chain tensioner) counterclockwise as far as the stop. This backs off the tensioner slide or tensioning nut (6).

The cutting edges of the chain are very sharp. You should always wear gloves to protect your hands from injury when fitting the chain, mounting the guide bar, tensioning the chain and checking chain tension.

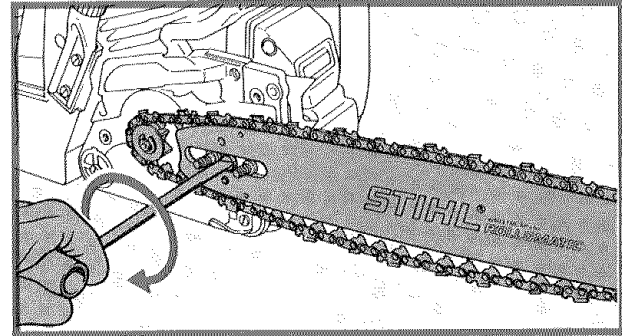
Top: Removing chain sprocket cover  
Center: Backing off tensioner slide on lateral chain tensioner  
Bottom: Backing off tensioning nut on front chain tensioner



- Top: Fitting saw chain on guide bar
- Center: Fitting the chain on the sprocket – cutting edges point toward bar nose
- Bottom: Peg of tensioner slide/tensioning nut in locating hole – guide bar flat against saw body



Pretensioning the chain (lateral chain tensioner)



Hold the guide bar vertically with the nose upward and fit the Oilomatic chain on it, starting at the bar nose.

With the chain in position, locate the slot of the guide bar over the studs (7) and place the Oilomatic chain over the sprocket (8) at the same time. Be sure that the cutting edges on the top of the bar point toward the bar nose. The peg of the tensioner slide/tensioning nut (6) must engage the lower guide bar locating hole.

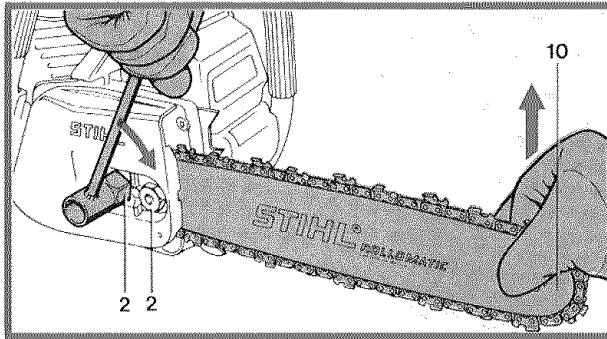
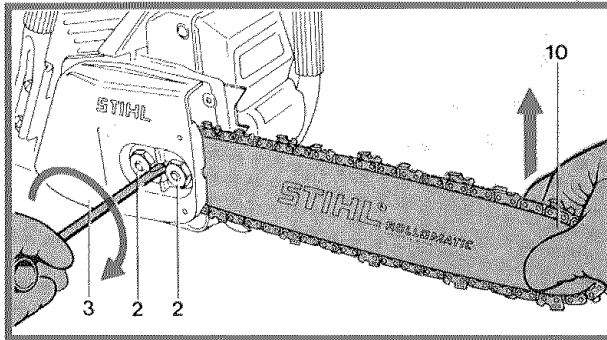
Now tension the chain by turning the adjusting screw (4) or tensioning screw (5) clockwise until there is very little chain sag on the underside of the bar. Make sure that the drive link tangs (9) are properly located in the guide bar groove.

Fit the sprocket cover (3) on the studs (7) and screw on the hexagon nuts (2) finger-tight.

## Tensioning the Saw Chain

Top: Tensioning the chain (lateral chain tensioner)

Bottom: Holding bar nose up and tightening the hexagon nuts

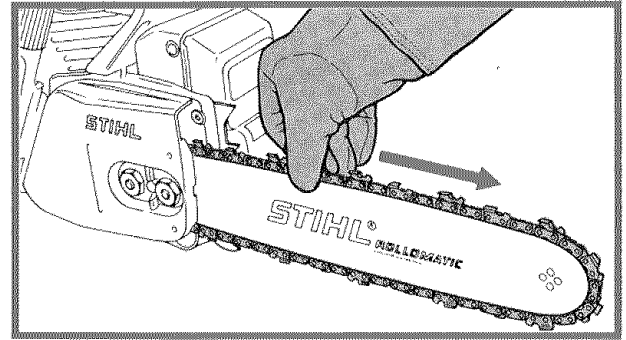


The chain must be tensioned after initial assembly and retensioned during cutting work.

To retension the chain, first slacken off the hexagon nuts (2). Insert screwdriver end of combination wrench through hole in chain sprocket cover.

Hold the bar nose (10) up and turn the adjusting screw (lateral chain tensioner) or tensioning screw (front chain tensioner) clockwise with the screwdriver until the chain lies against the underside of the bar. While still holding the bar nose up, **firmly** tighten down the hexagon nuts (2).

Checking chain tension



The Oilomatic chain is correctly tensioned when it fits snugly against the underside of the bar but can still be pulled easily along the bar by hand (with chain brake disengaged). Important: Wear protective gloves when performing this work.

Proper chain tension and lubrication are critically important for the cutting performance and service life of your whole cutting attachment. Always check chain lubrication before starting work.

Chain tension should be checked frequently during cutting work and corrected as necessary. For further details see Chapter "Bar, Chain and Sprocket".

## Chain Brake

The chain brake can be activated either manually or by inertia.

- Manual engagement is effected by pushing the front hand guard forwards with the left hand.
- The mass moment of inertia of the front hand guard also engages the chain brake in certain situations.

If the kickback force of the saw is high enough, the mass moment of inertia of the hand guard provides the activating impulse for the chain brake.

### Warning!

The hand guard is an integral part of the chain braking system. **It must not** be modified in any way otherwise it will be deactivated.

The great advantage of the inertia chain brake is that the brake is activated after severe kickback even if the operator's left hand is not behind the front hand guard, e. g. as is the case when performing the felling cut.

### Engaging the chain brake

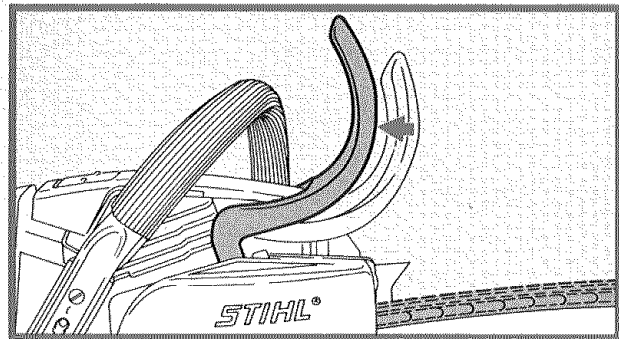
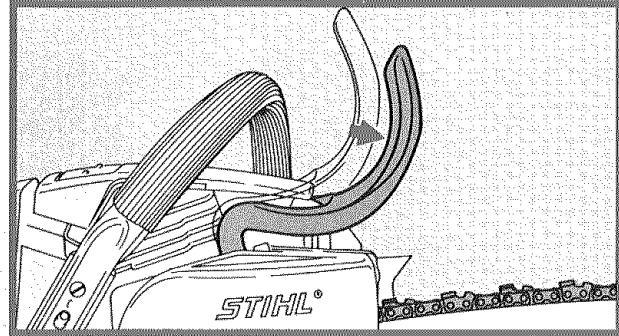
When the hand guard is moved towards the nose of the guide bar (either manually or by inertia), the brake lever is unlatched and the brake band is clamped round the clutch drum at the same instant. This causes the saw chain to be brought to a standstill and locked in position.

**Important:** Apart from starting and emergencies, the chain brake may be engaged only when the saw is idling.

### Releasing the chain brake

The locked saw chain must be released before cutting can be continued. To do this, pull the hand guard back toward the handlebar – this disengages the brake band from the clutch drum.

Top: Chain brake engaged  
Bottom: Chain brake released



### Maintenance

The chain brake is subject to normal wear. Dust, oil or foreign debris in the chain brake mechanism may lead to increase chain stopping times. It is therefore necessary to have it regularly serviced and maintained! For specific chain brake maintenance instructions, see section "Maintenance, Repair and Storing" of the owner's manual.

Always carry out an operational check by activating the chain brake at least once before starting work. Make sure the hand guard is free from dirt to ensure that its smooth operation is not impaired in any way.

## General Notes on Operation

### Starting for first time

A factory new machine should be run with the carburetor set slightly on the rich side for the first three tank fillings (see chapter on "Carburetor") so that the cylinder bore and the bearings receive additional lubrication during the break-in period.

As all the moving parts have to bed in during the break-in period, the frictional resistances in the engine are greater during this period. For this reason the engine only develops its maximum power after about 5 to 15 tank fillings. The carburetor setting must never be made leaner in order to achieve an apparent increase in power as this could cause the engine to exceed its maximum permissible rpm (see "Specifications" and "Carburetor").

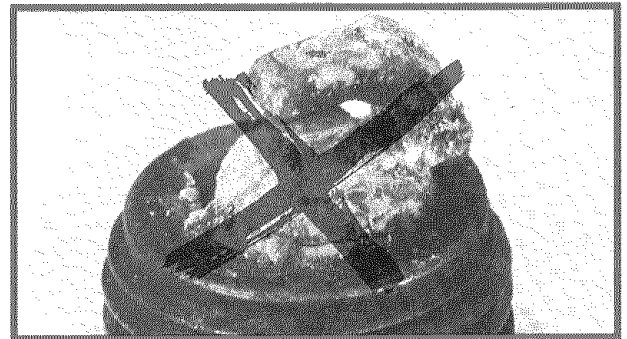
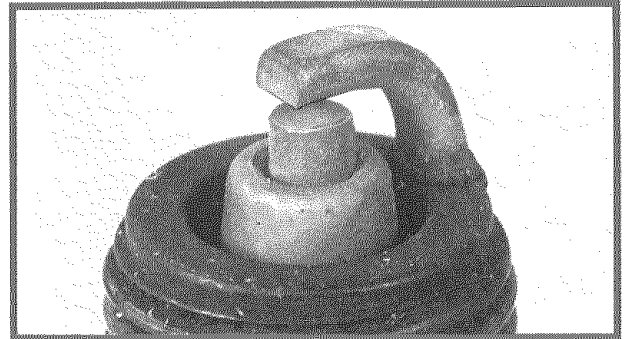
### During operation

After a long period of working at full load it is advisable not to shut off the engine immediately, but let it run for a short while at idling speed. This allows the heat which has been generated in the engine during full throttle operation to be dissipated by the flow of cooling air and also protects engine-mounted components (ignition, carburetor) from thermal overload.

### Spark plug

An incorrect carburetor setting, the wrong fuel mix (too much engine oil in the gasoline), a dirty air filter and unfavorable running conditions (mostly at part throttle etc.) affect the condition of the spark plug. These factors cause deposits to form on the insulator nose which may result in trouble in operation.

Top: Spark plug in good condition  
Bottom: Spark plug fouled because of incorrect running conditions



If the engine is down on power, difficult to start or runs poorly at idling speed, check the spark plug before looking any further. If the spark plug is dirty, clean it and check the electrode gap. Readjust if necessary; the correct gap is 0.5 mm (0.02 in). The spark plug should be replaced after about 100 operating hours or earlier if the electrodes are badly eroded.

In order to ensure trouble-free operation it is necessary to rectify the faults which have caused fouling of the spark plug.



## Master Control

The Master Control lever (1) controls the various engine functions. Depending on its position, it acts on the carburetor's choke valve, the throttle trigger (2) or the ground contact (for stopping the engine).

Note the following when operating the Master Control lever:

The position between "START" and "STOP" is the normal operating position.

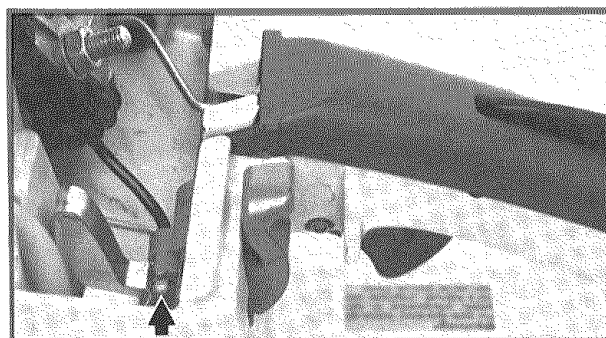
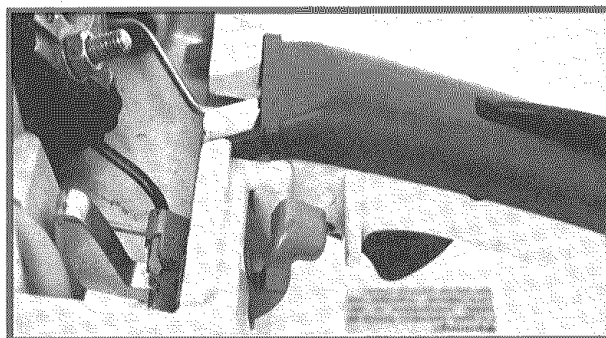
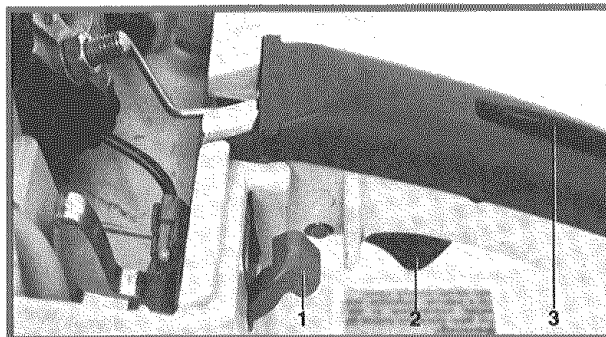
The safety throttle lock (3) must be pressed down before the Master Control lever (1) is moved from the normal operating position to "START". It is possible to move from "START" to "CHOKE" or vice versa without touching any other controls.

In the "START" position the choke valve is open and the throttle trigger is in the starting-throttle position. When in this position, the Master Control lever (1) is locked by the throttle lever and must not be forced into the normal operating position. It returns automatically to the normal operating position as soon as the throttle trigger (2) is squeezed.

In the "CHOKE" position (cold start) the choke valve is closed and the throttle trigger is in the starting-throttle position.

In the "STOP" position the ground contact engages the contact spring – this cuts out the ignition system.

Top: Master Control lever locked by throttle lever (start position)  
Center: Master Control lever in operating position  
Bottom: Ground contact touching contact spring (stop position)



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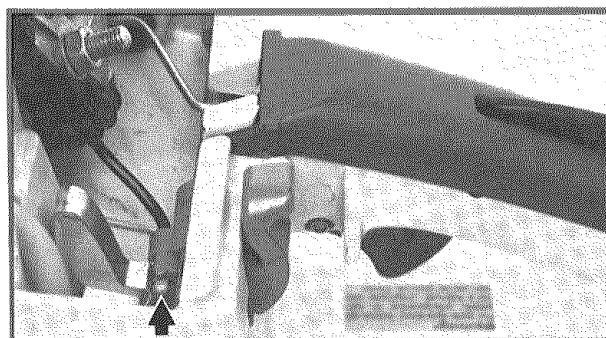
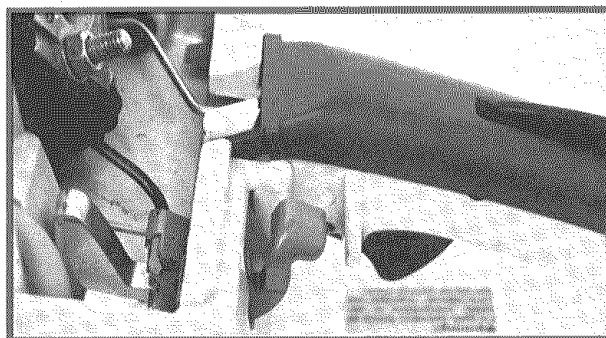
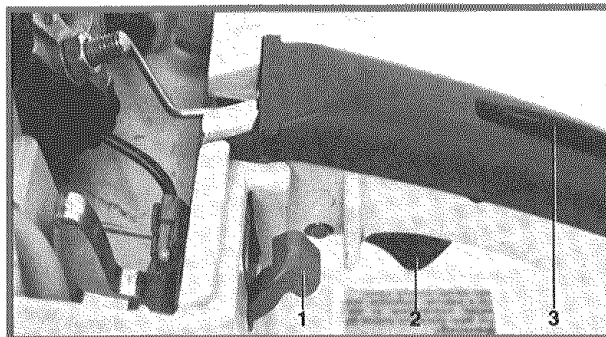
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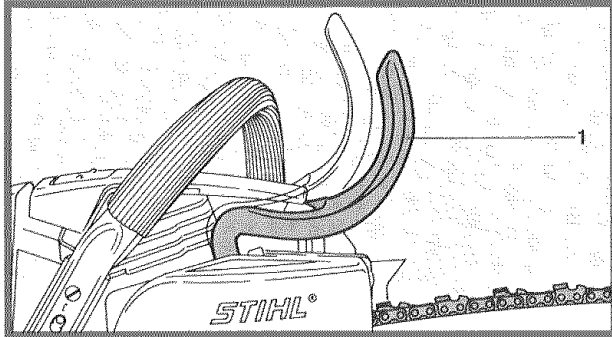
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## Starting

Chain brake engaged



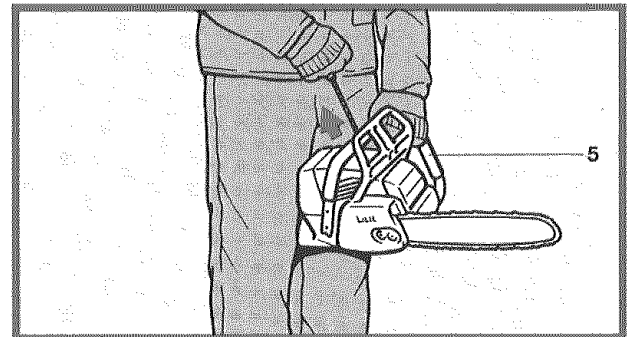
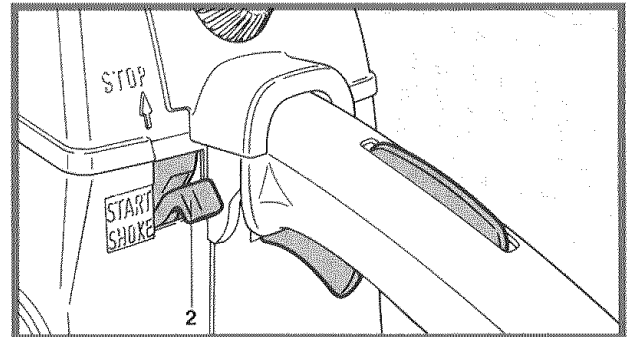
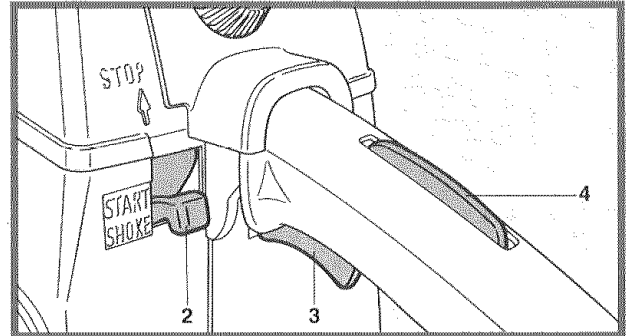
Regardless of the starting method chosen maintain secure footing and be sure that the guide bar and chain are clear of you and all other obstructions and objects, including the ground. Bystanders must be kept well clear of the general work area of the saw.

### Starting procedure

1. Engage the chain brake by pushing the hand guard (1) towards the bar nose.
2. If the engine is cold, set Master Control lever (2) to "CHOKE". If the engine has been warmed up, set Master Control lever (2) to "START". This also applies if the engine has been running but is still cold. The throttle trigger interlock (4) must always be engaged before moving the Master Control lever (2) to the "START" or "CHOKE" position. This automatically sets the throttle trigger (3) in the starting-throttle position.
3. **Starting the saw**
  - 3.1 Starting above the ground

Grip the front handle (5) of the saw with your left hand. Hold the rear handle of the saw tightly between your legs, just above the knees.

Top: Master Control lever on "CHOKE" (cold start)  
Center: Master Control lever on "START" (warm start)  
Bottom: Starting above the ground



Keep the arm on the front handle in a locked (straight) position.

### 3.2 Starting on ground level

Hold the saw firmly on the ground with your left hand on the front handle (5), and put your right foot into the rear handle (6) and press down.

4. Pull the starter grip (7) slowly with your right hand until you feel the starter engage, then give the grip a brisk strong pull. The starter rope must not be pulled out more than 70 cm (about 28 in) as it might otherwise break.

Do not let the starter grip (7) snap back. Guide it slowly into the housing so that the starter rope can rewind properly.

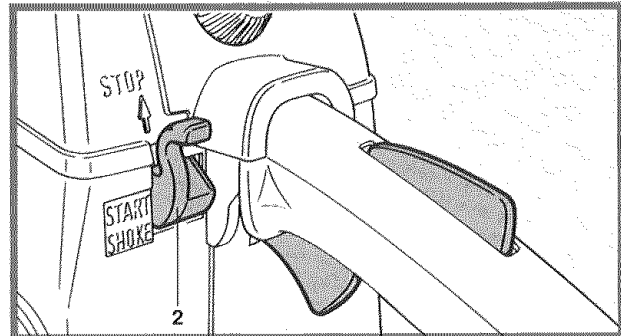
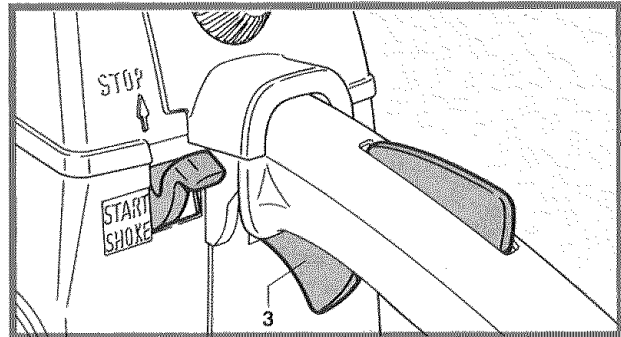
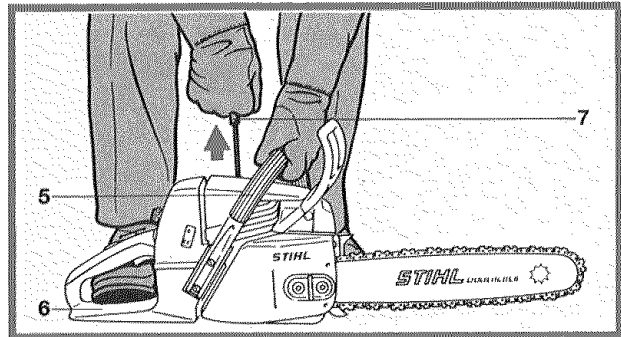
5. Crank the engine until it begins to fire. If starting from cold, immediately open the choke (Master Control to "START") and continue cranking.

As soon as the engine is running, **immediately** squeeze the throttle trigger (3) to disengage it from the starting throttle position. The Master Control lever moves from the start position to its normal operating position and the engine runs at idle speed.

Damage may be caused to the clutch if the engine is not **immediately** returned to idle speed.

6. Disengage the chain brake before starting work by pulling the hand guard (1) back toward the handle-bar (5).
7. The engine is stopped by moving the Master Control lever (2) to "STOP".

Top: Starting on the ground  
Center: Master Control lever in normal operating position – throttle trigger in idle position  
Bottom: Master Control lever on "STOP"



**Caution:**

If the Master Control lever is in the “START” position, it must first be disengaged from this position by squeezing the throttle trigger. Only then can the Master Control lever be moved to the “STOP” position.

**Other points to observe when starting:**

The choke valve is operated by the Master Control lever (see “Master Control”).

When starting a cold engine only keep the Master Control lever in the “CHOKE” position until the engine fires. Then move Master Control lever immediately to “START”, even if the engine stops and you have continue cranking. If you leave the Master Control lever on “CHOKE”, the combustion chamber will flood and stall the engine.

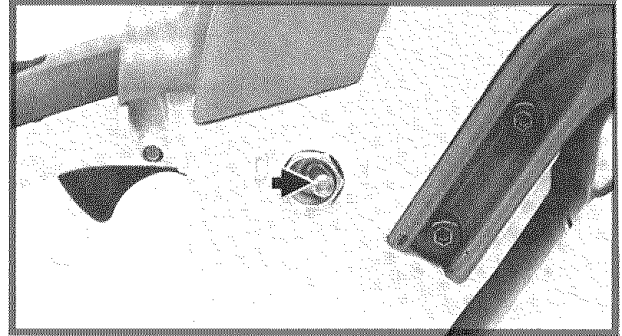
If you have moved the Master Control lever to “START” and the engine still does not run after several attempts, it is already flooded. In such a case, remove and dry off the spark plug. With the spark plug still removed, set the Master Control lever to “STOP” and crank the engine over several times with the starter to clear the combustion chamber. When you now try to start, move the Master Control lever to “START” – even if the engine is cold.

At very low outside temperatures you should still move the Master Control lever to “START” and disengage the throttle trigger from the starting throttle position by briefly accelerating the engine – but then warm up the engine at part throttle for a short period.

A new engine or one which has been run until the fuel tank is dry will not start first time after fueling because fuel will only begin to reach the carburetor after the engine has been cranked over several times.

## Electric Handle Heating (Option)

Heating switched on



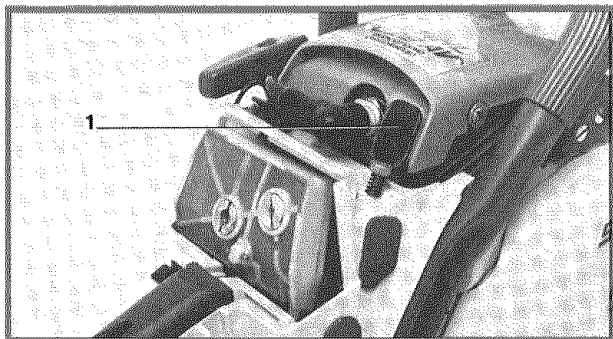
The handle heating system keeps the handle bar and pistol grip comfortably warm while the chain saw is being operated at extremely low outside temperatures.

Control is by means of a switch mounted on the tank housing. Integrally cast symbols on both sides of the switch indicate the operating condition: “O” for heating off – “I” for heating on. The switch must, therefore, be moved to “I” to start the heating process.

The heating system is designed to provide an adequate level of heat in the handle bar and pistol grip. There is no risk of overheating during continuous operation. The entire system is maintenance-free.

## Intake Air Preheating (Optional Extra)

Plug fitted in shroud



The intake air preheating kit prevents the air filter and carburetor becoming iced in very cold weather and also stops snow entering the fan housing.

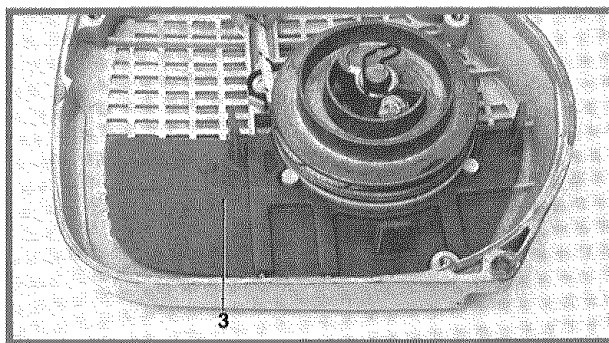
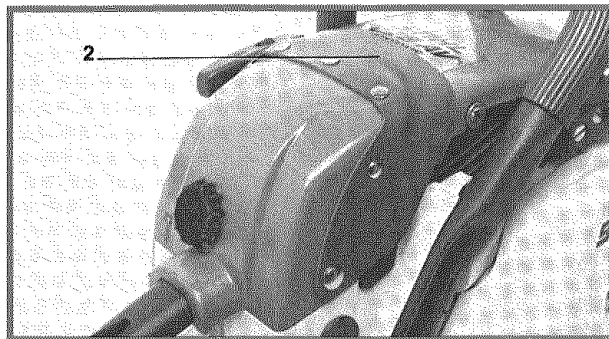
Carry out the conversion to intake air preheating as follows: Remove the standard carburetor box cover and take the plug (1) out of the shroud.

Fit the carburetor box cover with seal (2). The engine now draws in air heated by the cylinder.

The cover plate (3) should be placed in the fan housing to stop snow being drawn into the machine through the intake slots.

The standard guard in the chain sprocket cover can be replaced by the smooth contour guard supplied with the kit. It ensures optimum chip discharge even in wet conditions.

Top: Carburetor box cover with seal  
Bottom: Cover plate in fan housing



**Caution:** The following parts of the intake air preheating kit may be installed only under the conditions specified below. This is necessary in order to exclude the risk of the engine overheating.

Carburetor box cover with seal below +10 °C (+50 °F)

Cover plate in fan housing below -10 °C (+ 4 °F)

Every intake air preheating kit comes complete with detailed assembly instructions.

## Guide Bar, Chain and Sprocket

### Guide bar

The nose and underside of the guide bar are subject to a particularly high rate of wear. To avoid one-sided wear, turn the bar over every time you resharpen or replace the chain. Regular cleaning of the oil inlet holes and guide bar groove is also important. The bar can be examined for signs of wear at the same time.

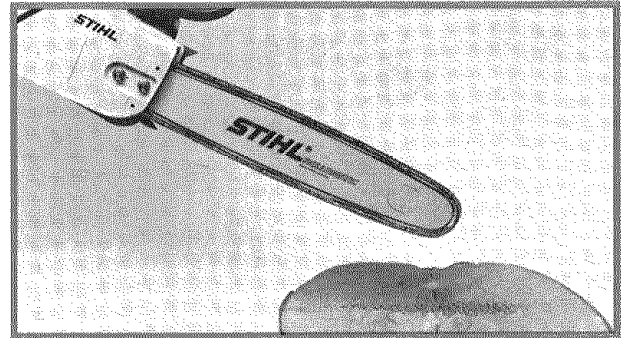
A minimum bar groove depth must be maintained in order to prevent the drive links contacting the bottom of the groove (the heels of the cutter and tie strap would no longer ride on the guide bar rails). The groove depth varies according to chain type and pitch:

Chain type	Chain pitch	Minimum depth
Rapid	0.325"	6.0 mm (0.24")
Topic	0.325"	6.5 mm (0.26")

The groove depth should be measured at the point where the bar is stressed most. That is the bar nose on Duromatic bars and the area where most of the cutting is done on Rollomatic bars. The guide bar must be replaced when groove depth is less than the specified minimum.

On Rollomatic guide bars it is not necessary to separately lubricate the sprocket nose bearing because the chain oil which flows to the bearing by way of the bar groove during normal operation is adequate for lubrication.

### Checking chain lubrication



### Breaking in Oilomatic chain

Every new chain has to be broken in for about 2 to 3 minutes. Ample chain lubrication is essential during this period. After breaking in, check chain tension and adjust if necessary.

### Chain lubrication

Never operate the chain saw without proper chain lubrication. If the chain is allowed to run dry the whole cutting attachment will be irretrievably damaged within a very short time. For this reason you should always check operation of the chain lubricating system and the level in the oil tank before starting work.

Start the saw and hold the cutting attachment over a light patch of ground. Take care – the Oilomatic chain must not touch the ground; hold it at least 20 cm (8 in) clear of the ground. Run the engine at about half throttle. If an increasing film of oil can be seen on the ground, chain lubrication is operating correctly.

## Chain tension

Apart from chain lubrication, chain tension is the factor that has the greatest influence of the cutting attachment's useful life. It is therefore necessary to check chain tension before starting work and at regular short intervals during cutting work. Chain tension is correct in the cold condition when the chain fits snugly against the underside of the bar and can still be pulled along the bar by hand (wear gloves!).

As it warms up to normal operating temperature the chain expands and sags noticeably. The saw chain must be retensioned when the drive links begin to come out of the groove on the underside of the bar. If this is not done, there is a risk of the chain jumping off the bar.

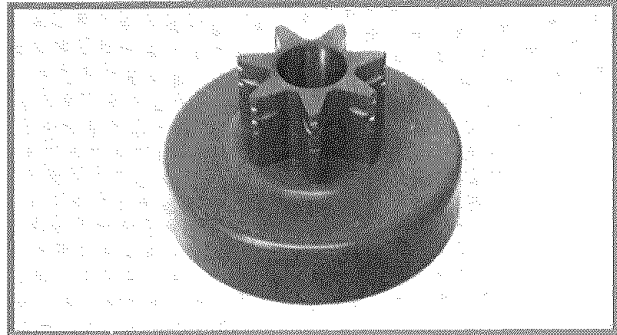
If the chain is retensioned during cutting work it must always be slackened off again after finishing work. This is necessary because high contraction stresses would otherwise occur as the chain cools down to ambient temperature, especially at extremely low outside temperatures, and cause damage to the crankshaft and bearings.

A new chain must be retensioned more frequently than a used one because it stretches during the initial break-in period.

## Chain sprocket

The stress and strain on the chain sprocket are particularly high. If the wear marks on the teeth are very pronounced (about 0.5 mm/0.02 in deep), the sprocket should be replaced. A worn sprocket reduces the service life of the saw chain. The chain sprocket should be replaced as a matter of routine with every second Oilo-matic chain. It is best to use two saw chains alternately with one sprocket.

Worn chain sprocket





## Air Filter

The air filter's function is to hold back dust and dirt in the intake air and thus reduce wear on engine components to a minimum.

Dirty air filters reduce engine power, increase fuel consumption and make starting more difficult.

**Clean the air filter daily or even more often if the air is exceptionally dusty in the work area.**

For removing the carburetor box cover on 028 AV turn the twist lock and on 028 WB the slotted nut (1) in counterclockwise direction. Before taking out the air filter, remove all the wood chips, etc. from around the filter. Afterwards remove on 028 AV the slotted nuts (2 and 3) and on 028 WB the slotted nut (3) with a screwdriver. The air filter may now be completely pulled off the stud bolts. Pry the filter halves apart with a screwdriver.

For daily cleaning it is sufficient to clean both parts of the filter and the prefilter in the carburetor box cover with a natural bristle paint brush. In addition to this you should wash the complete air filter in a fresh, non-flammable cleaning solution (lukewarm soapy water, engine cleaner etc.) at least once a week and blow it out with compressed air if possible.

**Important:** Flocked filter elements must not be cleaned with compressed air, brushes or rags.

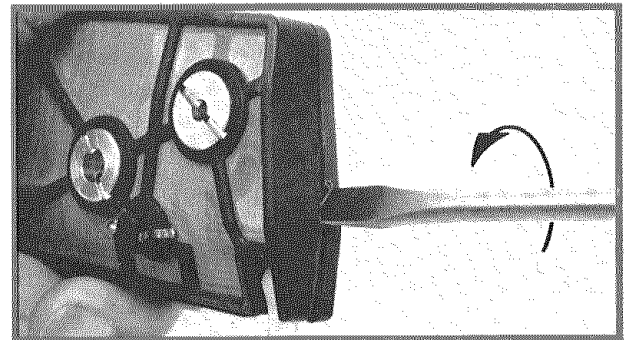
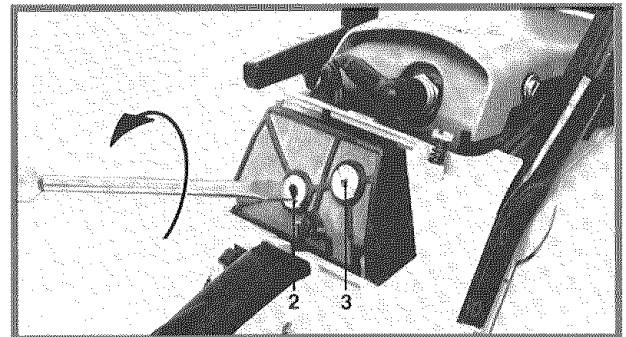
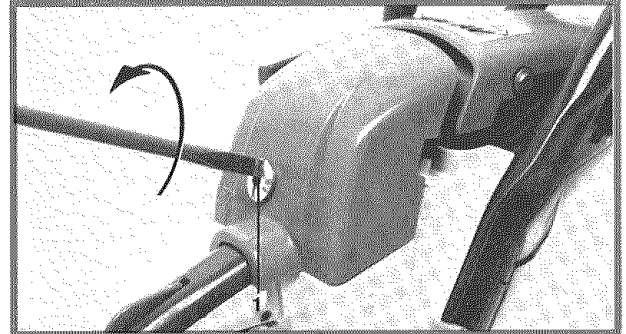
If the wire mesh is damaged on either half of the air filter (or if the flocking is damaged), always fit a new part. It is best to carry a spare filter element with you at all times.

Before you refit the air filter, check that the choke shutter is in good condition.

Top: Loosening the carburetor box cover (028 WB)

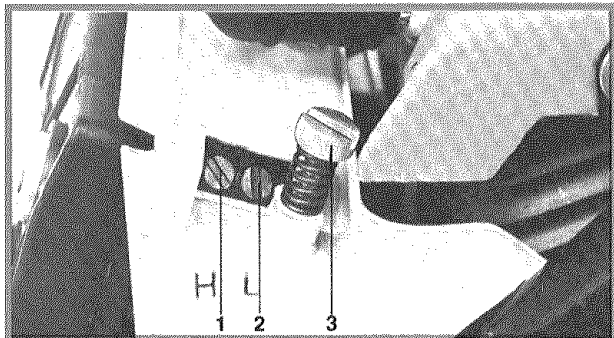
Center: Loosening the air filter (028 AV)

Bottom: Prying apart the air filter halves



## Carburetor

- 1 = High speed adjusting screw
- 2 = Low speed adjusting screw
- 3 = Idle speed adjusting screw



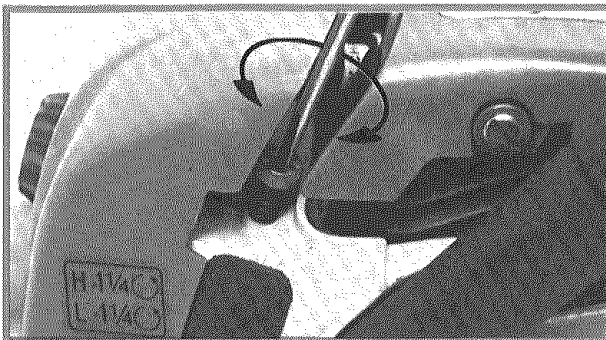
When the engine is tested at the factory the carburetor is set to obtain a slightly richer mixture to ensure that the cylinder bore and the bearings receive additional lubrication during the break-in period. This setting should be left as it is for the first three tank fillings. The high speed adjusting screw may then be turned no more than  $\frac{1}{4}$  turn clockwise (leaner mixture). Caution: The engine's maximum permissible rpm must not be exceeded!

If you use your chain saw at high altitudes (mountains) or at sea level it may be necessary to change the carburetor setting slightly. Carry out the correction at the two adjusting screws (L and H) as follows: Turn clockwise (leaner) for high altitude operation or counterclockwise (richer) for operation at sea level.

Note that even slight alterations on the adjusting screws have a noticeable effect on the engine's running behavior. Only carry out carburetor adjustments after cleaning the air filter and warming up the engine.

**Caution:** Adjustment of the high speed adjusting screw not only affects the power output but also the maximum off-load engine speed. If the setting is too lean (screw turned too far clockwise), the maximum permissible

Regulating idle speed adjusting screw



engine speed will be exceeded. This can cause engine damage, brought about by lack of lubrication and overheating in particular. Corrections to the setting of the high speed adjusting screw may be carried out only if an accurate tachometer is available to check the maximum engine speed of 13,000 r.p.m. (12,500 = 028 WB) (with bar and correctly tensioned chain).

### Basic setting

If it is necessary to readjust the carburetor again from the beginning, first carry out the basic setting to obtain a starting point for fine adjustment. To do this, carefully screw the two adjusting screws down onto their seats (clockwise). Then make the following adjustment:

**High speed adjusting screw H:**  
back off  $\frac{1}{4}$  complete turn

**Low speed adjusting screw L:**  
back off  $\frac{1}{4}$  complete turn

If you have no means of checking the maximum engine speed, do not set the high speed adjusting screw any leaner by turning it beyond the basic setting.

## **Notes for adjusting idle speed**

### **Engine stops while idling**

Turn idle speed adjusting screw (LA) clockwise until chain begins to run. Then back off one quarter of a turn.

### **Chain runs when engine is idling**

Turn idle speed adjusting screw (LA) counterclockwise until chain stops running and then turn it about another quarter turn in the same direction.

### **Erratic idling behavior; poor acceleration**

Idle setting too lean; turn low speed adjusting screw (L) counterclockwise until engine runs and accelerates smoothly.

### **Exhaust smokes at idle speed**

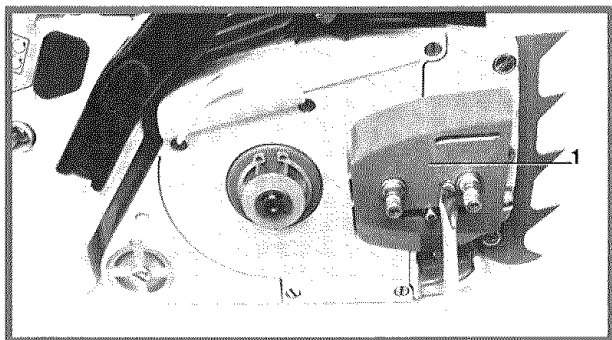
Idle speed setting too rich; turn low speed adjusting screw (L) clockwise until engine speed drops. Then turn screw back one quarter turn and check that engine still accelerates smoothly when you open the throttle.

A correction at the low speed adjusting screw usually necessitates a change in the setting of the idle speed adjusting screw (LA).

Apart from minor readjustments, you should leave all carburetor setting and repair work to your STIHL dealer. STIHL dealers have trained staff and all the necessary servicing tools and equipment.

# Replacing the Chain Sprocket

Removing the side plate



## Spur sprocket

First disengage the chain brake by pulling the hand guard back against the handlebar.

Now remove the chain sprocket cover, Oilomatic chain and guide bar. Release and unscrew the six pan head screws which hold the side plate (1) and cover (2).

Insert a pointed knife or similar tool behind the E-clip (3) to ease it clear of the warts on the thrust washer (4) and then use a small screwdriver to prise the E-clip off the crankshaft.

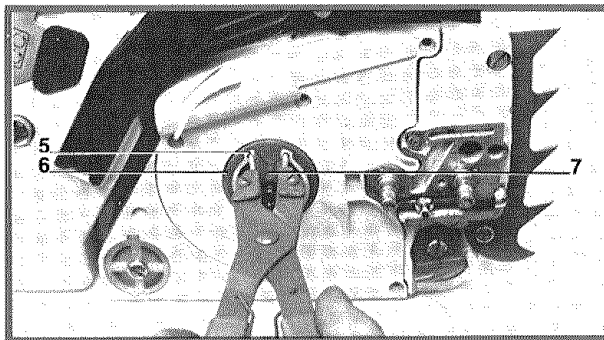
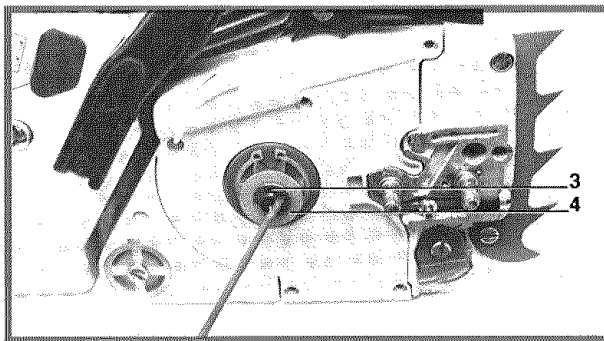
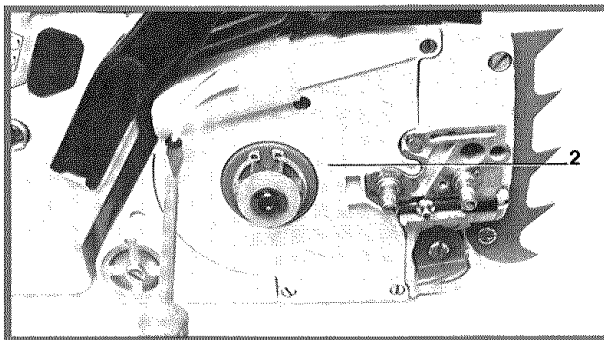
Pull off the thrust washer and use circlip pliers 5910 893 1805 (special accessory available from your STIHL dealer) to take the circlip (5) off the chain sprocket.

The washer (6) can now be removed from the chain sprocket. Removal of this washer (6) is made easier if you hold the chain sprocket (7) steady and prise the cover (2) slightly away from the crankcase. Then take off the cover as well.

Top: Unscrewing the cover

Center: Removing E-clip

Bottom: Removing circlip



Remove the oil pump drive worm (8) from the pump shaft by turning it clockwise and pulling it at the same time. The chain sprocket (7) can now be pulled off the crankshaft together with the spur gear (9) and needle cage. The spur gear (9) can be prised off the chain sprocket (7) with the aid of two screwdrivers.

Clean the stub of the crankshaft, wash the needle cage, spur gear (9) and worm (8) in clean gasoline. Lubricate the needle cage with STIHL multipurpose grease.

Reverse the above sequence for reassembly. Examine spur gear (9) and worm (8) for worn or broken teeth and replace if necessary. Coat the teeth of the spur gear and worm with STIHL multipurpose grease when installing. The circlip (5) must be fitted so that both its ends locate on the top of a tooth as illustrated.

### Rim sprocket

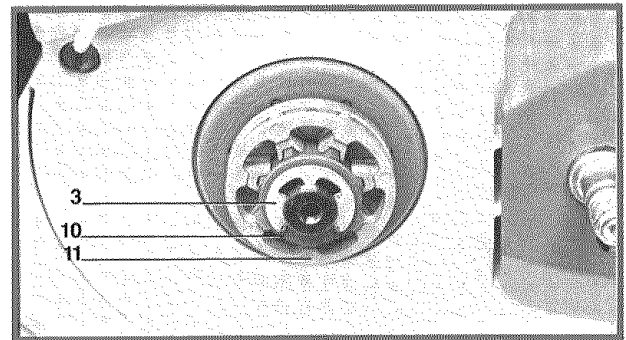
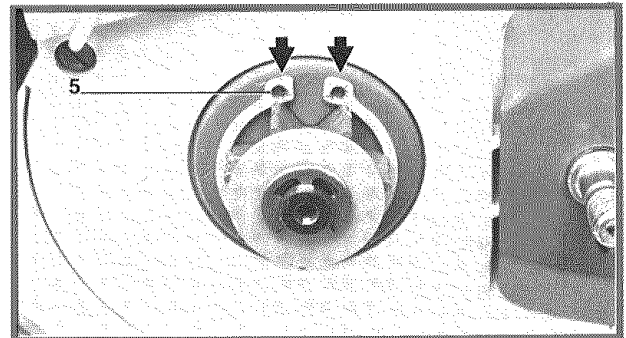
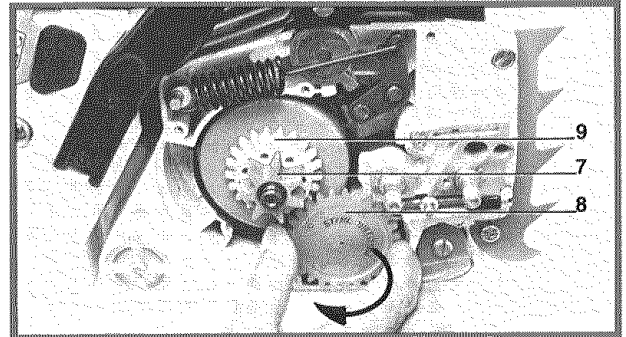
First remove the chain sprocket cover, Oilomatic chain and guide bar.

Insert a pointed knife or similar tool behind the E-clip (3) to ease it clear of the warts on the thrust washer (10) and then use a small screwdriver to prise the E-clip off the crankshaft. Take off the thrust washer and rim sprocket (11).

Fit the new rim sprocket so that the side with the cavities faces outward.

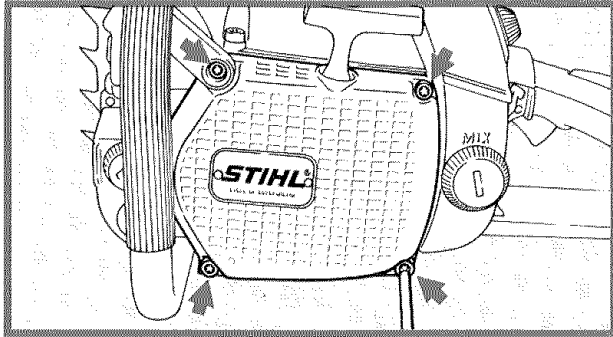
Finish off by refitting the thrust washer (10) and E-clip (3) on the crankshaft.

Top: Removing drive worm  
Center: Circlip correctly fitted  
Bottom: Rim sprocket in position

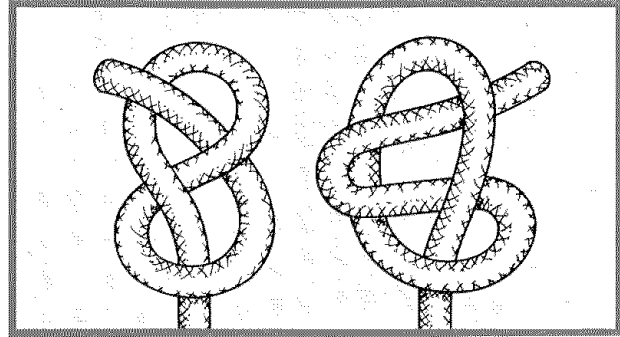


## Starter Assembly

Remove the mounting screws



Top: Special knots  
Bottom: Component parts of starter assembly



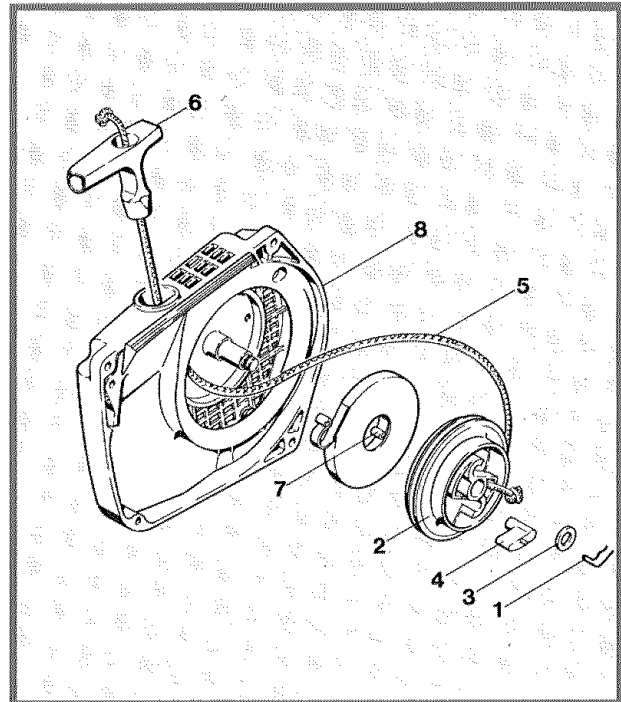
### Replacing a broken starter rope

First remove the four screws which retain the fan housing. Then lift the base of the fan housing clear of the crankcase so that you can pull it downwards and remove it from the machine.

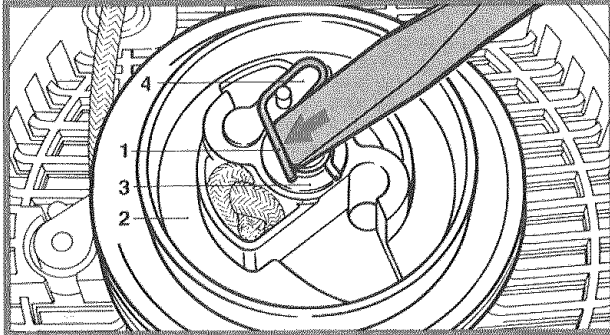
Use a screwdriver or a suitable pair of pliers to carefully remove the spring clip (1) from the starter post. Now take off the rope rotor (2) together with the washer (3) and pawl (4).

Remove any remaining rope from the rope rotor. Thread a new 3.5 mm (0.14 in) diameter and 960 mm (37.8 in) long starter rope (5) into the rope rotor and secure it with a simple overhand knot. Seal the ends of the rope with a match or lighter flame to prevent ravelling. Thread the other end of the rope through the rope guide in the fan housing from inside, pass it upwards through the underside of the starter grip and secure it with a figure 8 or looped overhand knot (see illustration of knots). Do not wind the rope onto the rotor at this stage.

Clean and lubricate the rope rotor's bushing with a non-resinous oil. Slide the rotor onto the starter post and turn it back and forth until the slotted area engages the anchor loop of the rewind spring (7).



#### Installing the spring clip



Now insert the pawl (4) in the rope rotor (2) and fit the washer (3) on the starter post. Use a screwdriver or a suitable pair of pliers to press the spring clip (1) onto the starter post, making sure that the spring clip engages on the pawl's guide pin and points in the clockwise direction. Finish off by tensioning the rewind spring (see below).

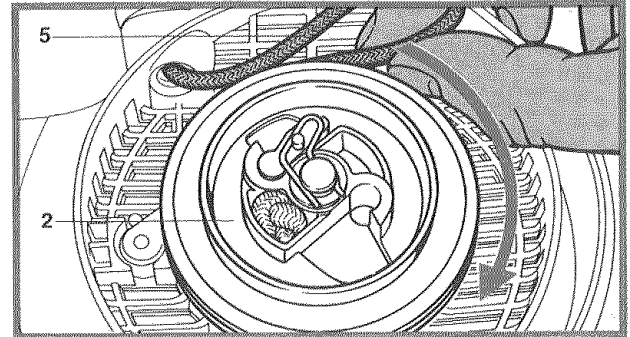
#### Replacing a broken rewind spring

First remove the rope rotor (2). Take the spring housing and rewind spring (7) out of the fan housing (8).

The replacement spring and spring housing are supplied as an assembly. Lubricate the spring with a few drops of non-resinous oil before installing it.

Drop the rewind spring (7) and housing assembly (bottom plate area must face up) into the fan housing (8), making sure the outer spring loop engages over the cast lug on the fan housing. If the spring should pop out of its housing during installation, refit it in the counterclockwise direction, starting outside and working inwards. Reassemble the rope rotor (2) as above.

#### Tensioning the rewind spring



#### Tensioning the rewind spring

With the starter rope (5) fully extended, make a loop in the rope between the rotor (2) and fan housing and use it to turn the rope rotor (2) six full revolutions clockwise. Hold the rope rotor steady in this position. Pull out and straighten the twisted rope (5). Now release the rope rotor gradually and allow spring force to wind the starter rope fully onto the rope rotor.

The rewind spring is correctly tensioned if the starter grip is held firmly in place against the starter housing and does not droop to one side. If this is not the case and more tension is required, add one more turn on the rope rotor. When the starter rope is fully extended it must be possible to rotate the rope rotor at least another half turn before maximum spring tension is reached. If this is not the case, hold the rope rotor firmly and take off one turn of the rope.

**The rewind spring will break prematurely if it is over-tensioned.**

Finish off by refitting the fan housing.

# Maintenance Chart

		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	if faulty	if damaged	as required	see page:
Complete machine	Visual inspection (condition, leaks)	x		x						
	Clean		x							
Throttle trigger, safety throttle lock, Master Control	Check operation	x		x						
Chain brake	Check operation	x		x						29
	Clean by STIHL Dealer								x	
Filter in fuel tank	Clean wire filter					x				
	Replace felt									
Fuel tank	Clean					x				
Chain oil tank	Clean					x				
Chain lubrication	Check	x								36
Saw chain	Inspect, also check sharpness	x		x						
	Check chain tension	x		x						37
	Sharpen								x	47
Guide bar	Inspect (wear, damage)	x								36
	Clean and turn over				x		x			
	Deburr				x					
	Replace							x	x	
Chain sprocket	Check				x					37
Air filter	Clean	x					x			38
	Replace									38
Cooling inlets	Clean		x					x		
Cylinder fins	Clean					x				
Carburetor	Check idle adjustment – chain must not turn	x		x						39
	Readjust idle								x	39
Spark plug	Readjust electrode gap						x			30
All accessible screws and nuts (not adjusting screws)	Retighten								x	
Rubber vibration buffers	Inspect				x					
	To be replaced only by STIHL Dealer							x		
Spark arrestor screen	Inspect	x								
	Clean or replace							x		
Chain catcher	Check	x								
	Replace							x		



## Specifications

### Engine

STIHL single-cylinder two-stroke engine

	<b>028</b>	<b>028 S</b>
Piston displacement:	47 cm <sup>3</sup> (2.86 cu.in)	51.5 cm <sup>3</sup> (3.14 cu.in)
Cylinder bore:	44 mm (1.73 in)	46 mm (1.81 in)
Piston stroke:	31 mm (1.22 in)	31 mm (1.22 in)
Max. engine speed with bar and chain:	12,500 r.p.m.	13,000 r.p.m.

### Ignition System

Principle:	Breakerless, transistor or thyristor controlled magneto
Ignition timing:	2.2–2.9 mm (0.087–0.114 in) before T.D.C. at 8,000 r.p.m.
Spark plug (suppressed):	Bosch WSR 6 F or NGK BPMR 7 A Heat value 200 Electrode gap 0.5 mm (0.02 in) Spark plug thread M 14 x 1.25; 9.5 mm (0.37 in) long

### Fuel/Oil System

Carburetor:	All position diaphragm carburetor with integral fuel pump
Air filter:	Bisectional flat wire mesh type
Fuel tank capacity:	0.5 L (1.06 US pt)
Fuel mixture:	See chapter "Fuel"
Chain lubrication:	Fully automatic oil pump
Oil tank capacity:	0.3 L (0.63 US pt)

### Weight

without bar and chain: 5.7 kg (12.6 lb)

### Cutting Attachment

Recommended cutting attachments for compliance with § 4.12 of ANSI Standard B 175.1–1985 (see page 12 of this Manual):

---

STIHL reduced kickback bar (with green label):  
Rollomatic with sprocket nose  
40, 45 or 50 cm (16, 18 or 20 in)  
STIHL low kickback chain\* (with green label):  
8.25 mm (0.325") Topic-Micro 1 (26 TM 1) or  
9.32 mm (3/8") Rapid-Micro 2 (33 RM 2, 36 RM 2)  
Chain sprocket:  
7-tooth for 0.325" pitch or 8-tooth for 3/8" pitch

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Since new bar/chain combinations may be developed after publication of this Manual, ask your STIHL dealer for the latest STIHL recommendations.

Other bars and chains available for this powerhead are:

STIHL yellow-labeled bar:  
Rollomatic "S" with sprocket nose  
40, 45 or 50 cm (16, 18 or 20 in)  
Duromatic with stellite tipped nose  
40, 45 or 50 cm (16, 18 or 20 in)  
STIHL yellow-labeled chain:  
for 0.325" pitch:  
Topic Micro (26 TM), Topic Super (26 TS)  
for 3/8" pitch:  
Topic Micro (33 TM, 36 TM), Topic Super (33 TS, 36 TS)

In order to comply with the kickback performance requirements of § 4.12 of ANSI Standard B 175.1–1985, do not use replacement saw chain unless it has been designated as meeting the ANSI § 4.12 requirements on this specific powerhead, or has been designated as "low kickback" saw chain\* in accordance with the ANSI B 175.1–1985 standard.

\* See definition of "low kickback chain" on page 12.

# Sharpening and Maintenance of Saw Chain

## Description of chains

The illustration on the right shows the component parts of a STIHL saw chain. Every chain manufactured by STIHL features the Oilomatic system. Apart from the three basic types (Rapid, Topic and Picco), there are three different versions whose names denote the cutter shape, i.e. chipper tooth = Standard, semi-chisel = Micro and full chisel = Super.

The main size measurement on a saw chain is the pitch. It is determined by measuring the distance between one rivet and the next but one and dividing the measurement by two. The result is the pitch which is generally specified in inch ( $\frac{3}{8}'' = 9.32 \text{ mm}$ ).

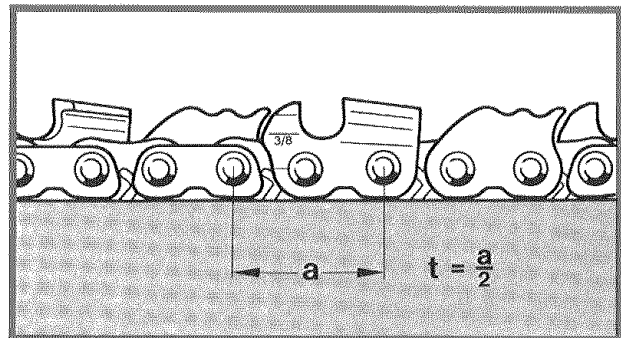
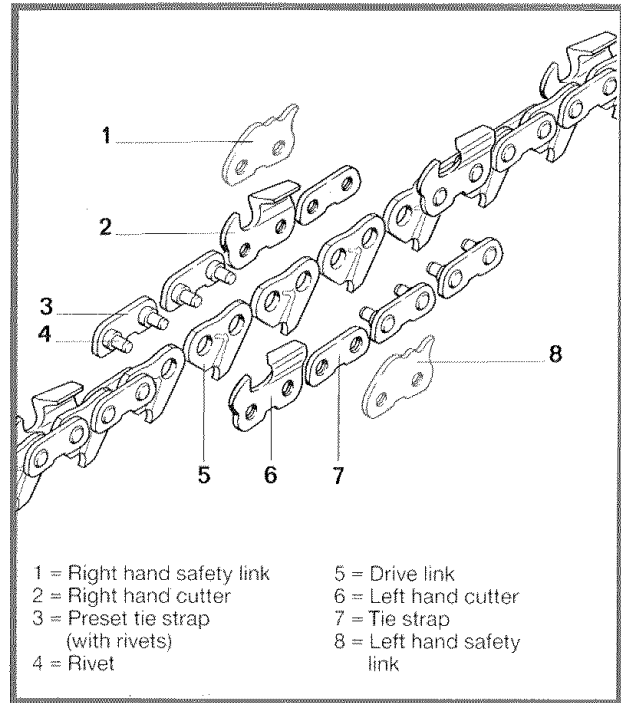
Like any other cutting tool, the saw chain is subject to normal wear and tear. A properly sharpened chain slices through wood and requires very little infeed effort. For this reason alone you should never attempt to cut with a dull or damaged chain. There are a few crucial angles which must be observed in order to obtain good results when sharpening a chain. They are explained below.

## Filing angle

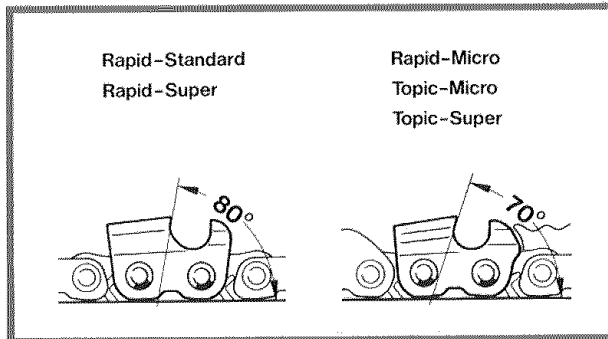
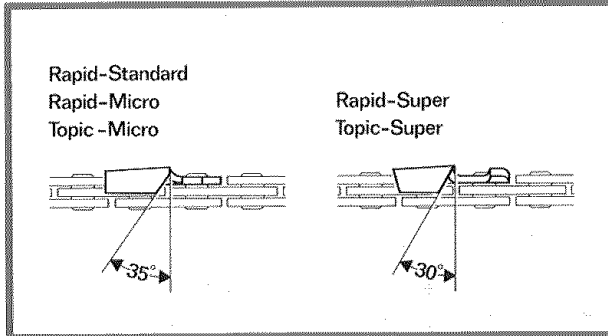
The filing angle for Rapid-Standard, Rapid-Micro and Topic-Micro chains is 35°; these chains are sharpened to this angle before leaving the factory. However, if you want to use the chain primarily for cutting hardwood or frozen timber, it is best to sharpen it to an angle of 30°. Rapid-Super and Topic-Super chains are always sharpened to 30°.

It is essential to ensure that the filing angle is kept exactly the same on all cutters. Irregular angles will cause the chain to run roughly and unevenly as well as accelerate the rate of wear and increase the risk of breakage.

Top: Component parts of an Oilomatic chain  
Bottom: Measuring chain pitch "t"



Top: Filing angle  
 Center: Side plate angle  
 Bottom: Table of file diameters



Chain pitch	File dia.	File No.
.325" (8.25 mm)	Rapid $\frac{3}{16}$ " (4.8 mm)	0811 411 8088
.325" (8.25 mm)	Topic $\frac{5}{32}$ " (4.0 mm)	0814 242 3383
$\frac{3}{8}$ " (9.32 mm)	Rapid $\frac{3}{16}$ " (4.8 mm)	0811 411 8088
$\frac{3}{8}$ " (9.32 mm)	Topic $\frac{5}{32}$ " (4.0 mm)	0814 242 3383
.404" (10.26 mm)	$\frac{3}{16}$ " (4.8 mm)	0811 411 8088
$\frac{1}{2}$ " (12.7 mm)	$\frac{1}{4}$ " (6.3 mm)	0811 411 8118

### Side plate angle

The upright cutting edge just below the top plate is known as the side plate cutting edge. The side plate angle is, therefore, the angle between the side plate cutting edge and the horizontal line formed by the cutter toe and heel. The following side plate angles are specified:

Rapid-Standard	80°	Topic-Micro	70°
Rapid-Micro	70°	Topic-Super	70°
Rapid-Super	80°		

These angles are obtained automatically if you use a file holder or roller filing guide with the specified size of file (diameter) and hold the file correctly during sharpening.

### Top plate cutting angle

The top plate cutting angle is the most important angle since it influences the chain's cutting behavior. It is also obtained automatically if sharpening is performed properly with a suitable STIHL sharpening tool.

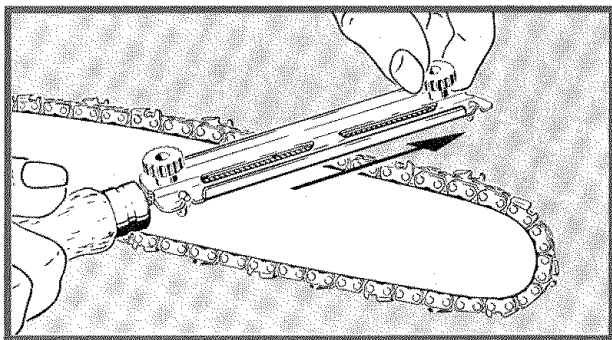
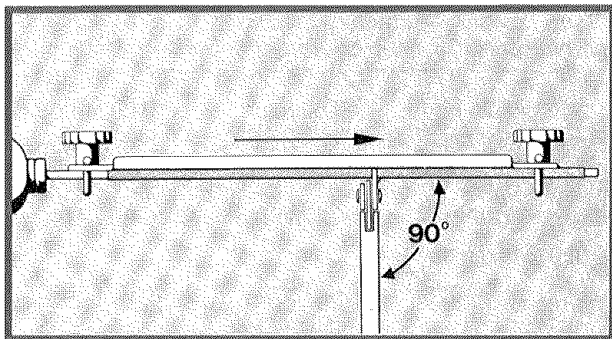
### Sharpening

Only special saw chain files may be used for sharpening and they must match the chain concerned (basic type, pitch). The shape and cut of machinists' files makes them unsuitable for saw chain. It is best to use the special chain file with a file holder or other filing aid. **Always file from the inside to the outside of the cutter.** If you sharpen the chain while it is on the bar, increase chain tension before filing and reset it to correct tension afterward.

All cutters must be filed to the same length. Since the top plate slopes downward to the rear (clearance angle), the

Top: File position for Rapid-Standard, Rapid-Micro and Topic-Micro

Bottom: Sharpening with file holder

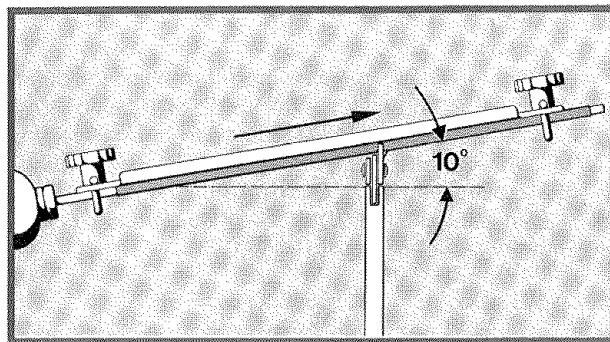


cutter heights will be uneven if the cutter lengths are different. If the cutters are not all the same height the chain will run roughly and eventually break.

As it is very important to achieve uniform cutter lengths, it is best to measure them with a slide caliper. Find and sharpen the shortest cutter first and then use it as a master for all the others, i.e. all cutters must be filed back to the same length as the master cutter. Sharpen all the cutters on one side of the chain first and then repeat the procedure on the other side.

The file must be held level for **Rapid-Standard, Rapid-**

File position for Rapid-Super and Topic-Super



**Micro and Topic-Micro chain** so that it is at 90° to the perpendicular faces of the chain links or the guide bar.

On **Rapid-Super and Topic-Super chains** the file must be guided so that the handle is 10° lower than the tip of the file, i.e. in this case the file must run upward at an angle of 10° to the horizontal. A filing aid (file holder, filing tool) must always be used for sharpening Rapid-Super and Topic-Super chains.

File evenly and steadily and note that the file **only sharpens on the forward stroke**. Lift the file off the cutter on the backstroke. Make sure you do not touch the tie straps and drive links with the file. Use a piece of hardwood to remove burrs from the cutting edge.

**Important:** Sharpen the chain frequently and take away as little material as possible. Two or three strokes of the file are usually sufficient to keep the chain sharp. Variations in angles and the lengths of the cutters cannot be completely avoided during manual sharpening. For this reason the chain should be restored to its original condition with a workshop chain sharpener (STIHL USG, STIHL FG 2) after it has been resharpened about five times by hand.

## Depth gauges

The depth gauge determines the height at which the cutter enters the wood and thus the thickness of the chip removed. The cutting capacity and life of a saw chain are therefore influenced by the distance between the depth gauge and the cutting edge, i.e. the depth gauge setting. This setting varies according to chain pitch and must be checked with the appropriate filing gauge.

The best cutting results are obtained with the settings listed in the table. However, the depth gauge setting may be increased by 0.2 mm for cutting softwood in mild weather conditions.

Since the depth gauge setting is reduced when the cutter is sharpened, its height must be checked and lowered if necessary. If the depth gauge projects from the filing gauge, it must be filed down level with the gauge using a flat or triangular file. The contour of the depth gauge must also be rounded off on Rapid chain. In the case of Topic chains the depth gauge should be rounded off in line with the stamped markings.

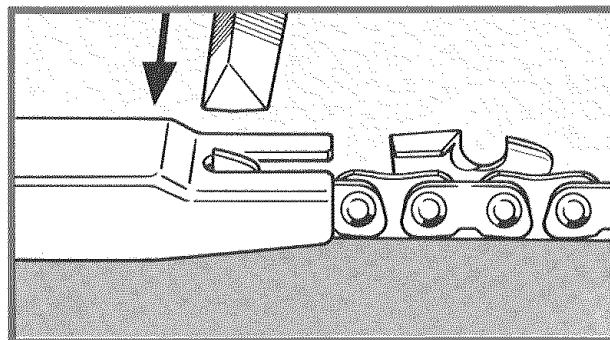
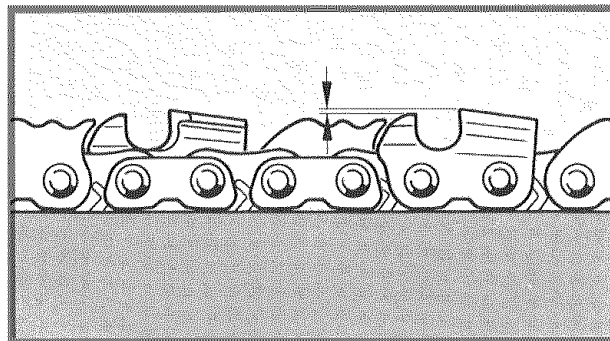
## General chain maintenance

Chain maintenance begins as soon as the chain is fitted on the bar and sprocket. The essential points are **correct chain tension and ample lubrication**. See also "Guide Bar, Chain and Sprocket".

Clean the chain thoroughly in gasoline after sharpening to remove filings or grinding dust. Then lubricate the chain by

Top: Table of recommended depth gauge settings  
Center: Depth gauge setting  
Bottom: Filing down depth gauge (Topic chain)

Chain pitch	Setting	Filing gauge
.325" (8.25 mm)	0.65 mm	1110 893 4000
3/8" (9.32 mm)	0.65 mm	1110 893 4000
.404" (10.26 mm)	0.8 mm	1106 893 4000
1/2" (12.7 mm)	0.8 mm	1106 893 4000
090 G chain saw		
1/2" (12.7 mm)	1.2 mm	1106 893 4010



immersing it in an oil bath. If you are not going to use the chain for a prolonged period, clean it with a brush and immerse it in an oil-paraffin bath.

Carefully examine chain for cracks in the links or damaged rivets while you are sharpening and cleaning it. Any damaged or worn parts must be replaced. The new parts must be reworked to match the shape and size of the original parts.

Chain repairs can be carried out with the STIHL handheld chain breaking and rivet spinning tool, the STIHL NG 1 or NG 5 rivet spinners and the STIHL NG 4 chain breaker.

### Tools for chain maintenance

There is a range of chain sharpening aids and tools to suit the user's needs (frequency of sharpening, time required etc.).

**File holders**, which have reference marks for the filing angle, simplify chain sharpening and are available for all types of chain.

The **FG 1 filing tool** attaches to the guide bar and sharpens all types of chain.

The **STIHL FG 2 Filerite** and **USG universal electric sharpener** are workshop tools suitable for sharpening all types of chain.

Table of file holders

Chain pitch inch (mm)	Chain	File holder Part No.
.325 (8.25)	Rapid-Micro	5605 750 4326
.325 (8.25)	Rapid-Super	5605 750 4336
.325 (8.25)	Topic-Micro	5605 750 4321
.325 (8.25)	Topic-Super	5605 750 4351
$\frac{3}{8}$ (9.32)	Rapid-Standard	5605 750 4326
$\frac{3}{8}$ (9.32)	Rapid-Micro	5605 750 4326
$\frac{3}{8}$ (9.32)	Rapid-Super	5605 750 4336
$\frac{3}{8}$ (9.32)	Topic-Micro	5605 750 4321
$\frac{3}{8}$ (9.32)	Topic-Super	5605 750 4351
.404 (10.26)	Rapid-Standard	5605 750 4326
.404 (10.26)	Rapid-Micro	5605 750 4326
.404 (10.26)	Rapid-Super	5605 750 4336

## Ordering Spare Parts

For ordering spare parts fill in below the model name of your power tool, the machine number as well as the part number of your chain and guide bar.

This makes ordering of a new chain and bar easier as both parts are wearing parts. The part number for the chain sprocket which from time to time must be replaced as well is already filled in; also the part numbers for the standard chain and guide bar are already filled in.

When purchasing these parts it is sufficient to just mention the model and the respective part number.

The machine number is found at the crankcase, the part number for the chain is marked on the chain box and the one of the guide bar can be found on the guide bar packaging.

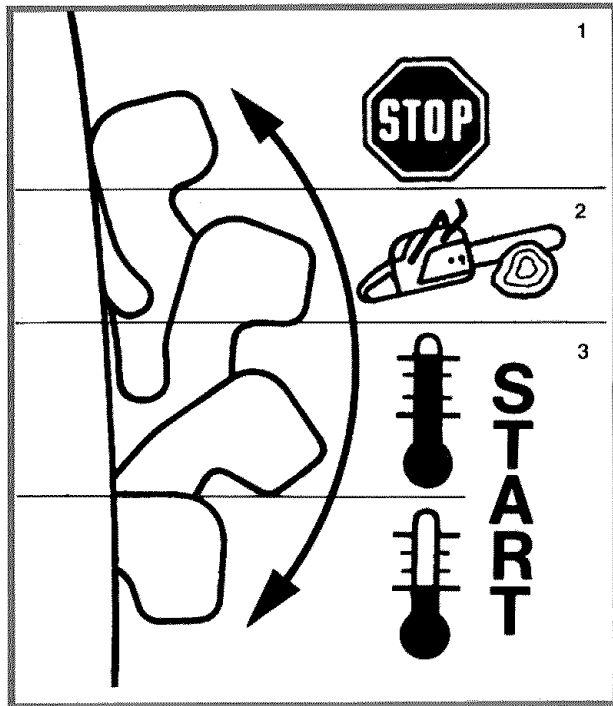
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<b>Serial number</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<b>Chain part number</b>	<input type="text"/> <input type="text"/> <input type="text"/>
<b>Guide bar part number</b>	<input type="text"/> <input type="text"/> <input type="text"/>
<b>Sprocket part number</b>	<input type="text"/> <input type="text"/> <input type="text"/>

For recommended STIHL reduced kickback cutting attachments see section "Specifications" of this Owner's Manual.

Guaranty for repairs can only be given if the repair work is done by an authorized STIHL-Service Shop using original STIHL spare parts.

## Key to Symbols

1 = "Stop" position      3 = upper part: "warm start" position  
2 = "RUN" position      lower part: "cold start" position





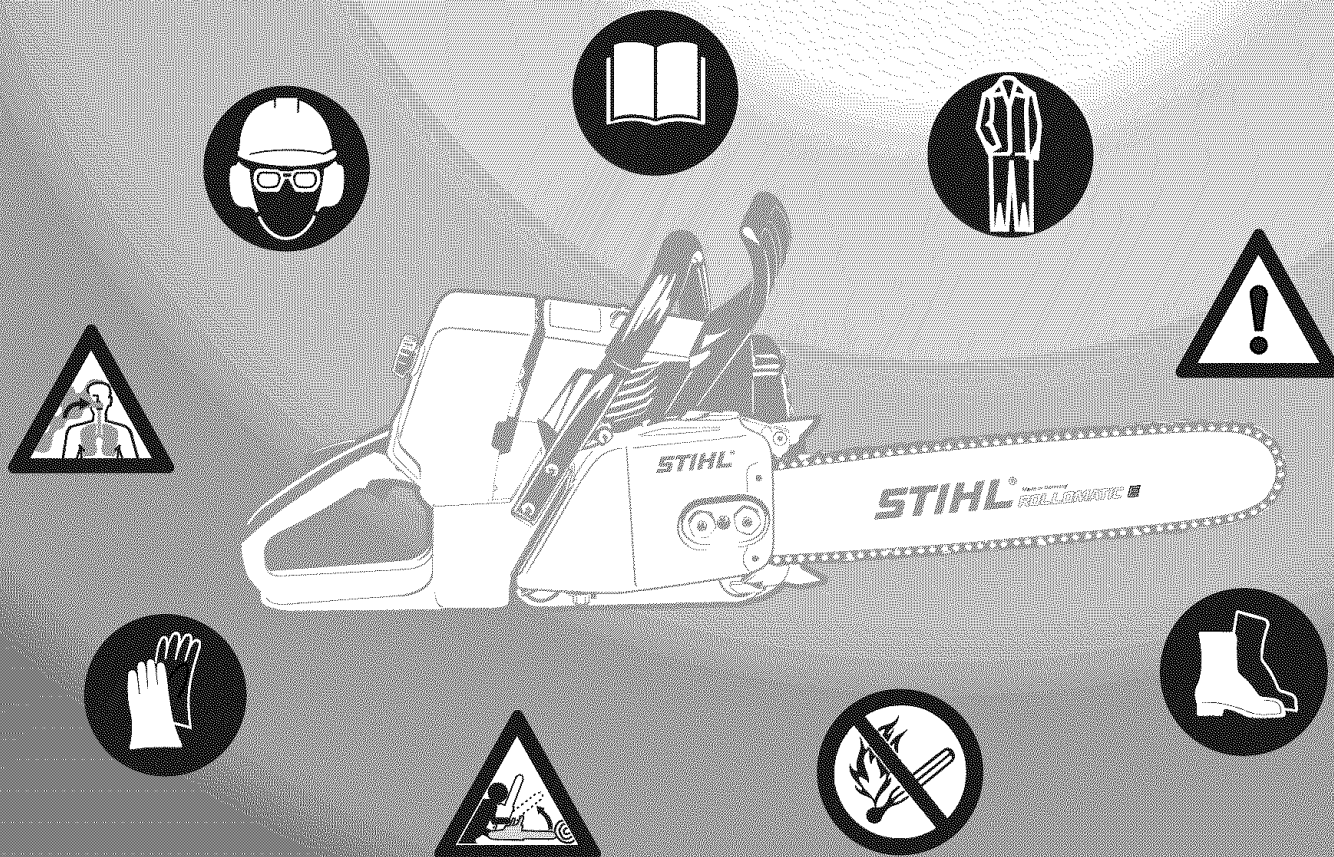
Continuation of  
Important Safety Precautions

4. Do not allow other persons to be near the chain saw when starting or cutting with the chain saw. Keep bystanders and animals out of the work area.
5. Do not start cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree.
6. Keep all parts of your body away from the saw chain when the engine is running.
7. Before you start the engine, make sure that the saw chain is not contacting anything.
8. Carry the chain saw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
9. Do not operate a chain saw that is damaged, improperly adjusted, or not completely and securely assembled. Be sure that the saw chain stops moving when the throttle control trigger is released.
10. Shut off the engine before setting the chain saw down.
11. 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.
12. When cutting a limb that is under tension, be alert for springback so that you will not be struck when the tension in the wood fibers is released.
13. Keep the handles dry, clean, and free of oil or fuel mixture.
14. Operate the chain saw only in well-ventilated areas.
15. Do not operate a chain saw in a tree unless you have been specifically trained to do so.
16. All chain saw service, other than the items listed in the Owner's Manual maintenance instructions, should be performed by competent chain saw service personnel. (For example, if improper tools are used to remove the flywheel or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and could subsequently cause the flywheel to burst.)
17. When transporting your chain saw, use the appropriate guide bar scabbard.
18. Reduced kickback bars and low kickback chains are designed to reduce the risk of kickback injury. Ask your STIHL dealer about these devices.

**Note:**

When using a chain saw for logging purposes, refer to the Code of Federal Regulations, Section 1910.266(5); 2.5.1 of American National Standard Safety Requirements for Pulpwood Logging, ANSI 03.1-1978; and relevant state safety codes.

## Chainsaw Safety Manual



## Contents

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This manual contains the safety precautions and recommended cutting techniques outlined in STIHL chainsaw Owner's Manuals. Even if you are an experienced chainsaw user, it is in your own interests to familiarize yourself with the latest rules and regulations regarding safe use of your chainsaw.

Please note that the illustrations on pages 28 and 29 show the chainsaws STIHL MS 210, 230, 250.

Other chainsaw models may have different parts and controls. You should therefore always refer to the Owner's Manual of your particular saw model.

### **Warning!**

Because a chainsaw is a high-speed wood-cutting tool, some special safety precautions must be observed as with any other power saw to reduce the risk of personal injury. Careless or improper use may cause serious or even fatal injury. Read and follow all safety precautions in current Owner's Manual or Safety Manual. Always use two hands to operate the chainsaw.

### **Warning!**

Avoid contact of bar tip with any object. This can cause the guide bar to kick suddenly up and back, which may result in serious or fatal injury. To reduce the risk of kickback injury STIHL recommends the use of STIHL green labeled reduced kickback bars and low kickback chains and a STIHL Quickstop chain brake. Contact your STIHL dealer or the STIHL distributor for your area if you do not understand any of the instructions in this manual.

## Some Important Safety Precautions for Chain Saw Users

### A. A Summary of Warnings on kickback and other Selected Risks – Taken Primarily from ANSI B 175.1 (See also “Safety Precautions“ section of this Owner’s Manual)

#### Warning!

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 towards the operator. Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back towards the operator. Either of these reactions may cause you to lose control of the saw which could result in serious personal injury.

Section 5.11 of ANSI B 175.1-2000 sets certain performance and design criteria related to chainsaw kickback. STIHL has developed a color code system using green and yellow to help you select a powerhead, bar and chain combination that complies with the kickback requirements of the ANSI Standard. See the sections entitled "Safety Precautions" and "Specifications" of this manual.

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

1. With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.
2. Keep a good firm grip on the saw with both hands, the right hand on the rear handle, and the left hand on the front handle, when the engine is running. Use a firm grip with thumbs and fingers encircling the chainsaw handles. A firm grip will help you reduce kickback and maintain control of the saw. Don't let go.
3. Make sure the area in which you are cutting is free from obstructions. Do not let the nose of the guide bar contact a log, branch, or any other obstruction that could be hit while you are operating the saw.
4. Cut at high engine speeds.
5. Do not overreach or cut above shoulder height.

6. Follow manufacturer's sharpening and maintenance instructions for the saw chain.
7. Only use replacement bars and chains specified by the manufacturer or the equivalent.
8. Reduced kickback bars and low kickback chains are designed to reduce the risk of kickback injury. Ask your STIHL dealer about these devices.

### B. Other Safety Precautions

#### Warning!

1. Do **not** operate a chainsaw with one hand! Serious injury to the operator, helpers, bystanders, or any combination of these persons may result from one-handed operation. A chainsaw is intended to be used with two hands.
2. Do not operate a chainsaw when you are fatigued.
3. Use safety footwear; snug-fitting clothing; protective gloves; and eye, hearing, and head protection devices.

4. Use caution when handling fuel. Move the chainsaw at least 10 feet (3 m) from the fueling point before starting the engine.
  5. Do not allow other persons to be near the chainsaw when starting or cutting with the chainsaw. Keep bystanders and animals out of the work area.
  6. Do not start cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree.
  7. Keep all parts of your body away from the saw chain when the engine is running.
  8. Before you start the engine, make sure that the saw chain is not contacting anything.
  9. Carry the chainsaw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
  10. Do not operate a chainsaw that is damaged, improperly adjusted, or not completely and securely assembled. Be sure that the saw chain stops moving when the throttle trigger is released.
  11. Shut off the engine before setting the chainsaw down.
  12. 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.
  13. When cutting a limb that is under tension be alert for springback so that you will not be struck when the tension in the wood fibers is released.
  14. Keep the handles dry, clean, and free of oil or fuel mixture.
  15. Operate the chainsaw only in well-ventilated areas.
  16. Do not operate a chainsaw in a tree unless you have been specifically trained to do so.
  17. All chainsaw service, other than the items listed in the Owner's Manual maintenance instructions, should be performed by competent chainsaw service personnel. (For example, if improper tools are used to remove the flywheel or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and could subsequently cause the flywheel to burst).
  18. When transporting your chainsaw, use the appropriate chain guard (scabbard).
- Other important safety precautions are contained in the body of the Owner's Manual especially in the General Safety Precautions.
- Note:**
- When using a chainsaw for logging purposes, refer to the Code of Federal Regulations, Parts 1910 and 1928.

## Safety Precautions



The use of any chainsaw may be hazardous. The saw chain has many sharp cutters. If the cutters contact your flesh, they will cut you, even if the chain is not moving. At full throttle, the chain speed can reach 45 mph (20 m/s). It is important that you read, fully understand and observe the following safety precautions and warnings. Read the Owner's Manual and the Safety Precautions periodically. Pay special attention to the section on reactive forces.



**Warning!**  
Reactive forces, including kickback, can be dangerous. Careless or improper use of any chainsaw may cause serious or fatal injury.

All safety precautions that are generally observed when working with an axe or a hand saw also apply to the operation of chainsaws. However, because a chainsaw is a high-speed, fast-cutting power tool, special safety precautions must be observed to reduce the risk of personal injury.

Have your STIHL dealer show you how to operate your chainsaw. Observe all applicable local safety regulations, standards and ordinances.



**Warning!**  
Minors should never be allowed to use a chainsaw. Bystanders, especially children, and animals should not be allowed in the area where a chainsaw is in use. Never let the saw run unattended. Store it in a locked place away from children and empty the fuel tank before storing for longer than a few days.



Do not lend or rent your chainsaw without the Owner's Manual. Be sure that anyone using your saw reads and understands the information contained in this manual.

These safety precautions and warnings apply to the use of all STIHL chainsaws. Different models may have different parts and controls. See the appropriate section of your Owner's Manual for a description of the controls and function of the parts of your model saw.

Safe use of a chainsaw involves

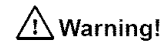
1. the operator
2. the saw
3. the use of the saw.

## THE OPERATOR

### Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgement.

Do not operate a chainsaw when you are fatigued. Be alert - If you get tired while operating your chainsaw, take a break. Tiredness may result in loss of control. Working with any chainsaw can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating a chainsaw.



**Warning!**  
Prolonged use of chainsaws (or other machines) exposing the operator to vibrations may produce whitefinger disease (Raynaud's phenomenon) or carpal tunnel syndrome.

These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.

All factors which contribute to whitefinger disease are not known, but cold weather, smoking and diseases or physical conditions that affect blood vessels and blood transport, as well as high vibration levels and long periods of exposure to vibration are mentioned as factors in the development of whitefinger disease. In order to reduce the risk of whitefinger disease and carpal tunnel syndrome, please note the following:

- Many STIHL models are available with an anti-vibration (AV) system designed to reduce the transmission of vibrations created by the engine and cutting attachment to the operator's hands. An AV system is recommended for those persons using chainsaws on a regular or sustained basis.
- Wear gloves and keep your hands warm. Heated handles, which are available on most STIHL powerheads, are recommended for cold weather use.

- Keep the saw chain sharp and the saw, including the AV system, well maintained. A dull chain will increase cutting time, and pressing a dull chain through wood will increase the vibrations transmitted to your hands. A saw with loose components or with damaged or worn AV buffers will also tend to have higher vibration levels.
- Maintain a firm grip at all times, but do not squeeze the handles with constant, excessive pressures. Take frequent breaks.

All the above mentioned precautions do not guarantee that you will not sustain whitefinger disease or carpal tunnel syndrome. Therefore, continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice immediately.

### **Warning!**

The ignition system of your unit produces an electromagnetic field of a very low intensity. This field may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemaker should consult their physician and the pacemaker manufacturer before operating this tool.

## **Proper Clothing**

### **Warning!**

To reduce the risk of injury, the operator should wear proper protective apparel.



Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loose-fitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become entangled with the saw or brush. Wear overalls or jeans with a reinforced cut retardant insert or cut retardant chaps.



Protect your hands with gloves when handling saw and saw chain. Heavy-duty, nonslip gloves improve your grip and protect your hands.



Good footing is most important in chainsaw work. Wear sturdy boots with nonslip soles. Steel-toed safety boots are recommended.

Never operate a chainsaw unless wearing goggles or properly fitted safety glasses with adequate top and side protection complying with your national standard.



Wear an approved safety hard hat to protect your head. Chainsaw noise may damage your hearing. Always wear sound barriers (ear plugs or ear muffers) to protect your hearing. Continual and regular users should have their hearing checked regularly.

## THE SAW

Parts of the chainsaw; for illustrations and definitions of the parts see the chapter on "Main Parts of Saw".



### Warning!

Never modify a chainsaw in any way. Only attachments and parts supplied by STIHL or expressly approved by STIHL for use with the specific STIHL saw models are authorized. Although certain unauthorized attachments are usable with the STIHL powerhead, their use may, in fact, be extremely dangerous.

## THE USE OF THE SAW

### Transporting the chainsaw



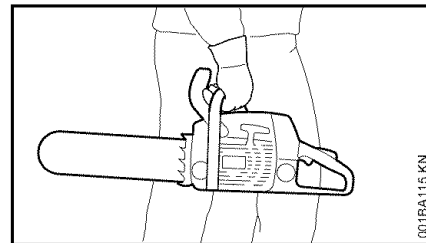
### Warning!

Always stop the engine before putting a chainsaw down or carrying it. Carrying a chainsaw with the engine running is extremely dangerous.

Accidental acceleration of the engine can cause the chain to rotate. During operation, the powerhead muffler and the material around it reach extremely high temperatures. Avoid touching the hot muffler, you could receive serious burns.

**By hand:** When carrying your saw by hand, the engine must be stopped and the saw must be in the proper position.

Grip the front handle and place the muffler away from the body.



The chain guard (scabbard) should be over the chain and the guide bar, which should point backwards. When carrying your saw, the bar should be behind you.

**By vehicle:** When transporting in a vehicle, keep chain and bar covered with the chain guard. Properly secure your saw to prevent turnover, fuel spillage and damage to the saw or vehicle.

### Preparation for the use of the saw

Take off the chain guard and inspect for safety in operation. For assembly, follow the procedure described in the chapter "Mounting the Bar and Chain" of your Owner's Manual.

STIHL Oilomatic chain, guide bar and sprocket must match each other in gauge and pitch.

Before replacing any bar and chain, see the sections on "Specifications", "Kickback" and the "ANSI B 175.1-2000 chainsaw kickback standard" in this manual.



**⚠ Warning!**

Proper tension of the chain is extremely important. In order to avoid improper setting, the tensioning procedure must be followed as described in your manual. Always make sure the hexagonal nut(s) for the sprocket cover is (are) tightened securely after tensioning the chain. Never start the saw with the sprocket cover loose. Check chain tension once more after having tightened the nut(s) and thereafter at regular intervals (whenever the saw is shut off). If the chain becomes loose while cutting, shut off the engine and then tighten. Never try to adjust the chain while the engine is running!

**Fueling**

Your STIHL chainsaw uses an oil-gasoline mixture for fuel (see chapter "Fuel" of your Owner's Manual).

**⚠ Warning!**

Gasoline is an extremely flammable fuel. If spilled or ignited by a spark or other ignition source, it can cause fire and serious burn injury or property damage. Use extreme caution when handling gasoline or fuel mix.



Do not smoke or bring any fire or flame near the fuel or the chainsaw. Note that combustible fuel vapors may be vented from the fuel system.

**Fueling Instructions****⚠ Warning!**

Fuel your chainsaw in well-ventilated areas, outdoors only. Always shut off the engine and allow it to cool before refueling. Gasoline vapor pressure may build up inside the gas tank depending on the fuel used, the weather conditions, and the venting system of the tank. In order to reduce the risk of burns or other personal injury from escaping gas vapor and fumes, remove the fuel filler cap on the STIHL product carefully so as to allow any pressure build-up in the tank to release slowly. Never remove fuel filler cap while engine is running.

Select bare ground for fueling and move at least 10 feet (3 m) from fueling spot before starting the engine. Wipe off any spilled fuel before starting your saw, and check for leakage.

**⚠ Warning!**

Check for fuel leakage while refueling and during operation. If fuel or oil leakage is found, do not start or run the engine until leak is fixed and spilled fuel has been wiped away. Take care not to get fuel on your clothing. If this happens, change your clothing immediately. Different models may have different fuel caps.

**Cap with Grip****⚠ Warning!**

In order to reduce the risk of fuel spillage and fire from an improperly tightened fuel cap, correctly position and tighten the fuel cap in the fuel tank opening.



To do this with this STIHL cap, raise the grip on the top of the cap until it is upright at a 90° angle. Insert the cap in the fuel tank opening with the triangular marks on the grip of the cap and on the fuel tank opening lining up. Using the grip, turn the cap firmly clockwise as far as it will go (approx. a quarter turn).



Fold the grip flush with the top of the cap. If the grip does not lie completely flush with the cap and the detent on the grip does not fit in the

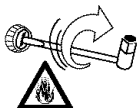
corresponding recess in the filler neck, the cap is not properly seated and tightened and you must repeat the above steps.

### Slotted Cap



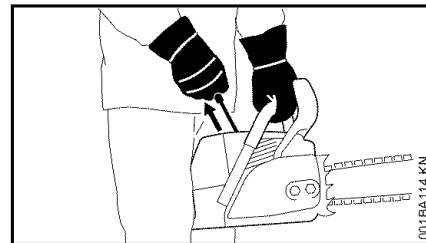
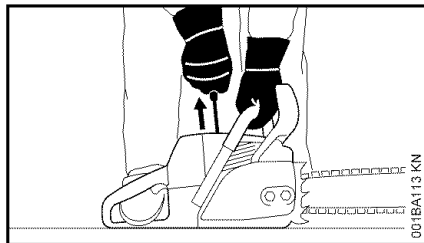
#### Warning!

Unit vibrations can cause an improperly tightened fuel filler cap to loosen or come off and spill quantities of fuel. In order to reduce the risk of fuel spillage and fire, tighten fuel filler cap by hand with as much force as possible.



The screwdriver end of the STIHL combination wrench or other similar tool can be used as an aid in tightening slotted fuel filler caps.

See "Fueling" chapter in your Owner's Manual.



### Starting

The chain brake must be engaged when starting the saw.



#### Warning!

Your chainsaw is a one-person saw. Do not allow other persons to be near the running chainsaw. Start and operate your saw without assistance. For specific starting instructions, see the appropriate section of the Owner's Manual. Proper starting methods reduce the risk of injury. Do not drop start. This method is very dangerous because you may lose control of the saw.

There are two recommended methods for starting your chainsaw.

With the **first** recommended **method**, the chainsaw is started on the ground. Make sure the chain brake is engaged (see "Chain Brake" chapter in your Owner's Manual) and place the chainsaw on firm ground or other solid surface in an open area. Maintain good balance and secure footing.

Grip the front handlebar of the saw firmly with your left hand and press down. For saws with a rear handle level with the ground, put the toe of your right foot into the rear handle and press down. With your right hand pull out the starter grip slowly until you feel a definite resistance and then give it a brisk, strong pull.

The **second** recommended **method** for starting your chainsaw allows you to start the saw without placing it on the ground. Make sure the chain brake is engaged, grip the front handle of the chainsaw firmly with your left hand. Keep your arm on the front handle in a locked (straight) position. Hold the rear handle of the saw tightly between your legs just above the knees. Maintain good balance and secure footing. Pull the starting grip slowly with your right hand until you feel a definite resistance and then give it a brisk, strong pull.

**⚠ Warning!**

Be sure that the guide bar and chain are clear of you and all other obstructions and objects, including the ground. When the engine is started, the engine speed with the starting throttle lock engaged will be fast enough for the clutch to engage the sprocket and, if the chain brake is not activated, turn the chain. If the upper quadrant of the tip of the bar touches any object, it may cause kick-back to occur (see section on reactive forces). To reduce this risk, always engage the chain brake before starting. Never attempt to start the chainsaw when the guide bar is in a cut or kerf.

**⚠ Warning!**

When you pull the starter grip, do not wrap the starting rope around your hands. Do not allow the grip to snap back, but guide the starter rope slowly back to permit the rope to rewind properly. Failure to follow this procedure may result in injury to hand or fingers and may damage the starter mechanism.

**Important adjustments****⚠ Warning!**

To reduce the risk of personal injury from loss of control or contact with the running chain, do not use a saw with incorrect idle adjustment. At correct idle speed, the chain should not rotate. For directions to adjust idle speed, see the appropriate section of your Owner's Manual. If you cannot set the correct idle speed, have your STIHL dealer check your saw and make proper adjustments or repairs. After adjusting a chain, start the saw, let the engine run for a while, then switch engine off and recheck chain tension. Proper chain tension is very important at all times.

**Catalytic converter****⚠ Warning!**

Some STIHL chainsaw models are equipped with a catalytic converter, which is designed to reduce the exhaust emissions of the engine by a chemical process in the muffler. Due to this process, the muffler does not cool down as rapidly as conventional mufflers when the engine returns to idle or is shut off. To reduce the risk of fire and burn injuries, specific safety precautions must be observed.

**⚠ Warning!**

Since a muffler with a catalytic converter cools down less rapidly than conventional mufflers, never set your chainsaw down on or near dry

brush, grass, wood chips or other combustible materials while it is still hot. Let the engine cool down sitting on concrete, metal, bare ground or solid wood (e.g. the trunk of a felled tree) away from any combustible substances.

**⚠ Warning!**

To reduce the risk of fire or burn injury, let the unit cool down before refueling your chainsaw after use.

**⚠ Warning!**

Never disassemble or modify your muffler. The muffler could be damaged and cause an increase in heat radiation or sparks, thereby increasing the risk of fire or burn injury. You may also permanently damage the engine. Have your muffler serviced and repaired by your STIHL Servicing Dealer only.

**⚠ Warning!**

To reduce the risk of fire or burn injury, keep the area around the muffler clean. Remove all debris such as pine needles, branches or leaves.

**⚠ Warning!**

An improperly mounted or damaged cylinder housing or a damaged/ deformed muffler shell may interfere with the cooling effect of the catalytic converter. To reduce the risk of fire or burn injury, do not continue work with a damaged or improperly mounted cylinder housing or a damaged/ deformed muffler shell. Your catalytic converter is furnished with screens designed to reduce the risk of fire from the emission of hot particles. Due to the heat from the catalytic reaction, these screens will normally stay clean and need no service or maintenance. If you experience loss of performance and you suspect a clogged screen, have your muffler maintained by a STIHL Servicing Dealer.

**Working Conditions**

Operate the chainsaw under good visibility and daylight conditions only.

**⚠ Warning!**



Your chainsaw produces poisonous exhaust fumes as soon as the combustible engine is running. These gases (e.g. carbon monoxide) may be colorless and odorless. To reduce the risk of serious or fatal injury from breathing toxic fumes, never run the chainsaw indoors or in poorly ventilated locations. Ensure proper ventilation when working in trenches or other confined areas.

**⚠ Warning!**

Use of this product (including sharpening the saw chain) can generate dust, mists and fumes containing chemicals known to cause respiratory disease, cancer, birth defects, or other reproductive harm. If you are unfamiliar with the risks associated with the particular dust, mist or fume at issue, consult your employer, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, etc. Control dust (such as sawdust), mists (such as oil mist from chain lubrication) and fumes at the source where possible.

In this regard use good work practices and follow the recommendations of OSHA / NIOSH and occupational and trade associations. When the inhalation of toxic dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH / MSHA for the type substance at issue.

**⚠ Warning!**

Breathing asbestos dust is dangerous and can cause severe or fatal injury, respiratory illness or cancer. The use and disposal of asbestos containing products have been strictly regulated by OSHA and the Environmental Protection Agency. Do not cut or disturb asbestos, asbestos containing products (e.g. asbestos containing drywall or other construction products), or products such as pipes which are wrapped or covered with asbestos insulation. If you have any reason to believe that you might be cutting asbestos, immediately contact your employer or a local OSHA representative.

The muffler and other parts of the engine (e.g. fins of the cylinder, spark plug) become hot during operation and remain hot for a while after stopping the engine. To reduce risk of burns do not touch the muffler and other parts while they are hot. Don't work alone. Keep within calling distance of others in case help is needed.

Your chainsaw is equipped with a chain catcher. It is designed to reduce the risk of personal injury in the event of a thrown or broken chain. From time to time the catcher may be damaged or removed.

To reduce the risk of personal injury, do not operate a chainsaw with a damaged or missing catcher.

Inspect buffers periodically. Replace damaged, broken or excessively worn buffers immediately, since they may result in loss of control of the saw.

A "sponginess" in the feel of the saw, increased vibration or increased "bottoming" during normal operation may indicate damage, breakage or excessive wear. Buffers should always be replaced in sets. If you have any questions as to whether the buffers should be replaced, consult your STIHL servicing dealer.

### **Warning!**

Take extreme care in wet and freezing weather (rain, snow, ice). Put off the work when the weather is windy, stormy or rainfall is heavy.

### **Warning!**

Avoid stumbling on obstacles such as stumps, roots or rocks and watch out for holes or ditches. Clear the area where you are working. Be extremely cautious when working on slopes or uneven ground. There is increased danger of slipping on freshly debarked logs.

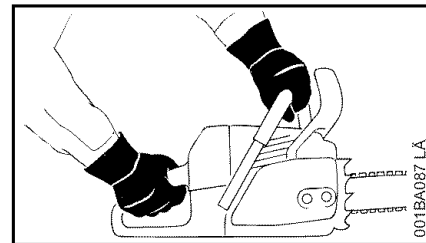
### **Warning!**



To reduce the risk of serious or fatal injury to the operator or bystanders, never use the saw with one hand.

You cannot control reactive forces and you may lose control of the saw, which can result in the skating or bouncing of the bar and chain along the limb or log.

Even for those compact saws designed for use in confined spaces, one-handed operation is dangerous because the operator may lose control.



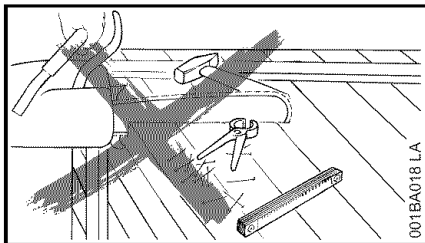
## **Cutting Instructions**

**Grip:** Always hold the saw firmly with both hands when the engine is running. Place your left hand on front handle bar and your right hand on rear handle and throttle trigger. Left-handers should follow these instructions too.

Wrap your fingers tightly around the handles, keeping the handles cradled between your thumb and forefinger. With your hands in this position, you can best oppose and absorb the push, pull and kickback forces of your saw without losing control (see section on reactive forces). Make sure your chainsaw handles and grip are in good condition and free of moisture, pitch, oil or grease.

### **Warning!**

Do not operate your chainsaw with the starting throttle lock engaged. Cutting with the starting throttle lock engaged does not permit the operator proper control of the saw or chain speed.



**⚠ Warning!**

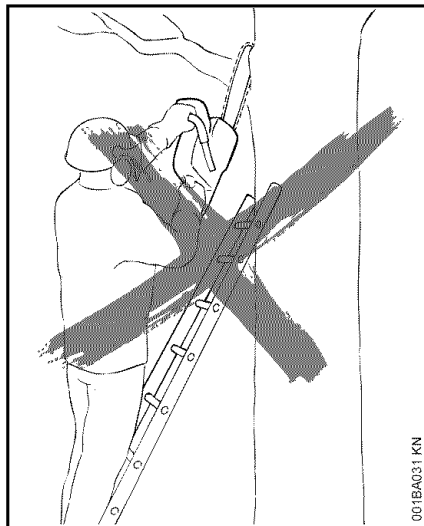
Never touch a chain with your hand or any part of your body when the engine is running, even when the chain is not rotating. The chain continues to rotate for a short period after the throttle trigger is released.

**⚠ Warning!**

Do not cut any material other than wood or wooden objects. Use your saw for chainsawing only. It is not designed for prying or shoveling away limbs, roots or other objects. When sawing, make sure that the saw chain does not touch any foreign materials such as rocks, fences, nails and the like. Such objects may be flung off, damage the saw chain or cause the saw to kickback.

**⚠ Warning!**

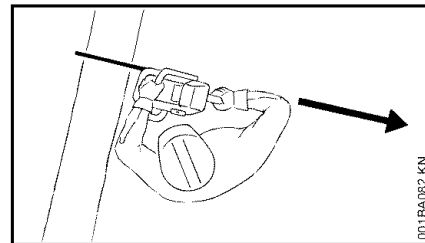
In order to keep control of your saw, always maintain a firm foothold.



Never work on a ladder, or on any other insecure support. Never use the saw above shoulder height.

**⚠ Warning!**

Never work in a tree unless you have received specific, professional training for such work, are properly secured (such as tackle and harness system or a lift bucket), have both hands free for operating the chainsaw in a cramped environment and have taken proper precautions to avoid injury from falling limbs or branches.



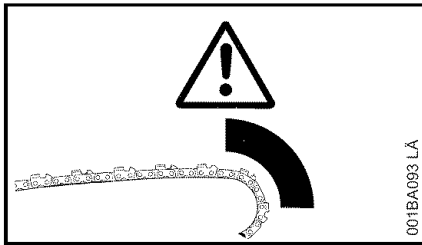
Position the chainsaw in such a way that your body is clear of the cutting attachment whenever the engine is running. Stand to the left of cut while bucking.

Don't put pressure on the saw when reaching the end of a cut. The pressure may cause the bar and rotating chain to pop out of the cut or kerf, go out of control and strike the operator or some other object. If the rotating chain strikes some other object, a reactive force may cause the moving chain to strike the operator.

**Reactive forces including kickback**

**⚠ Warning!**

Reactive forces may occur any time the chain is rotating. Reactive forces can be dangerous! In any chainsaw,



the powerful force used to cut wood can be reversed (and work against the operator). If the rotating chain is suddenly stopped by contact with any solid object like a log or branch or is pinched, there active forces may occur instantly. These reactive forces may result in loss of control which may, in turn, cause serious or fatal injury. An understanding of the causes of these reactive forces may help you avoid loss of control.

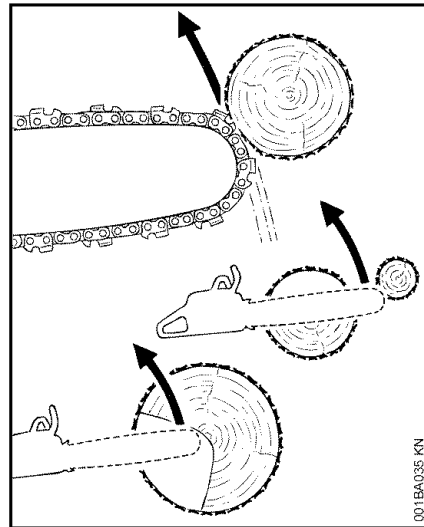
The most common reactive forces are

- kickback,
- pushback,
- pull-in.

#### Kickback:



Kickback may occur when the moving saw chain near the upper quadrant of the bar nose contacts a solid object or is pinched.



The reaction of the cutting force of the chain causes a rotational force on the chainsaw in the direction opposite to the chain movement. This may fling the bar up and back in an uncontrolled arc mainly in the plane of the bar. Under some cutting circumstances the bar moves towards the operator, who may suffer severe or fatal injury.

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

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

The type of bar and saw chain you use is an important factor in the occurrence and force of the kickback reaction. Some STIHL bar and chain types are designed to reduce kickback forces. STIHL recommends the use of reduced kickback bars and low kickback chains.

#### ANSI B 175.1-2000 chainsaw kickback standard

Section 5.11 of ANSI standard B 175.1-2000, sets certain performance and design criteria related to chainsaw kickback.

To comply with section 5.11 of ANSI B 175.1-2000:

- a) saws with a displacement of less than 3.8 cubic inches (62 cm<sup>3</sup>).
  - must, in their original condition, meet a 45° computer derived kickback angle when equipped with certain cutting attachments.
  - and must be equipped with at least two devices to reduce the risk of kickback injury, such as a chain brake, low kickback chain, reduced kickback bar, etc.
  
- b) saws with a displacement of 3.8 cubic inches (62 cm<sup>3</sup>) and above
  - must be equipped with at least one device designed to reduce the risk of kickback injury such as a chain brake, low kickback chain, reduced kickback bar, etc.

The computer derived angles for saws below 3.8 cubic inch (62 cm<sup>3</sup>) displacement are measured by applying a computer program to test results from a kickback test machine.

### **Warning!**

The computer derived angles of § 5.11 of ANSI B 175.1-2000 may bear no relationship to actual kickback bar rotation angles that may occur in real life cutting situations.

In addition, features designed to reduce kickback injuries may lose some of their effectiveness when they are no longer in their original condition, especially if they have been improperly maintained. Compliance with § 5.11 of ANSI B 175.1-2000 does not automatically mean that in a real life kickback the bar and chain will rotate at most 45°.

### **Warning!**

In order for powerheads below 3.8 cubic inch (62 cm<sup>3</sup>) displacement to comply with the computed kickback angle requirements of § 5.11 of ANSI B 175.1-2000 use only the following cutting attachments:

- bar and chain combinations listed as complying in the "Specifications" section of the Owner's Manual or
- other replacement bar and chain combinations marked in accordance with the standard for use on the powerhead or
- replacement chain designated "low kickback saw chain".

See the section on "Low kickback saw chain and reduced kickback bars"

### **Devices for reducing the risk of kickback injury**

STIHL recommends the use of the STIHL Quickstop chain brake on your power-head with green labeled reduced kickback bars and low kickback chains.

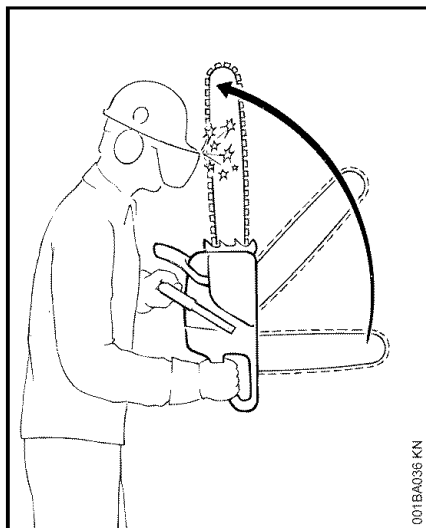
### **Warning!**

To reduce the risk of injury, stop using the saw immediately if the chain brake does not function properly. Take the saw to your local STIHL Service Center! Do not use the saw until the problem has been rectified (see the section "Chain Brake").

### **Quickstop chain brake**

STIHL has developed a chain stopping system designed to reduce the risk of injury in certain kickback situations. It is called a Quickstop chain brake. The Quickstop is available as standard equipment on your STIHL chainsaw and is available for installation on most older STIHL saws. Ask your dealer to retrofit your older model saw with a chain brake.





When a kickback occurs, the guide bar may rotate around the front handle. If the cutting position is such that the operator's left hand is gripping the front handle behind the hand guard, and if the left hand rotates around the front handle and makes a sufficiently forceful contact with the front hand guard, which is the Quickstop activating lever, this contact will activate the Quickstop. The chain brake on most new model STIHL chainsaws can also be activated by inertia. See the chapter entitled "Chain Brake" of your Owner's Manual.

### **⚠ Warning!**

Never operate your chainsaw without a front hand guard. In a kickback situation this guard helps protect your left hand or other parts of your body. In addition, removal of the hand guard on a saw equipped with a chain brake will deactivate the chain brake.

### **⚠ Warning!**

No Quickstop or other chain brake device prevents kickback. These devices are designed to reduce the risk of kickback injury, if activated, in certain kickback situations. In order for the Quickstop to reduce the risk of kickback injury, it must be properly maintained and in good working order. See the chapter entitled "Chain Brake" and "Maintenance, Repair and Storing" of your Owner's Manual. In addition, there must be enough distance between the bar and the operator to ensure that the Quickstop has sufficient time to activate and stop the chain before potential contact with the operator.

### **⚠ Warning!**

An improperly maintained chain brake may increase the time needed to stop the chain after activation, or may not activate at all.

### **⚠ Warning!**

Never run the chainsaw above idle speed for more than 3 seconds when the chain brake is engaged or the chain is pinched or otherwise caught in the cut. Clutch slippage can cause excessive heat, leading to severe damage of the motor housing, clutch and oiler component and may interfere with the operation of the chain brake. If clutch slippage in excess of 3 seconds has occurred, allow the motor housing to cool before proceeding and check the operation of your chain brake as described in the chapter entitled "Chain Brake". Also make sure that the chain is not turning at idle speed (see above "Important Adjustments").

### **Low kickback saw chain and reduced kickback bars**

STIHL offers a variety of bars and chains. STIHL reduced kickback bars and low kickback chains are designed to

reduce the risk of kickback injury. Other chains are designed to obtain higher cutting efficiency or sharpening ease but may result in higher kickback tendency.

STIHL has developed a color codesystem to help you identify the STIHL reduced kickback bars and low kickback chains. Cutting attachments with green warning decals or green labels on the packaging are designed to reduce the risk of kickback injury. The matching of green decaled powerheads under 3.8 cubic inch (62 cm<sup>3</sup>) displacement with green labeled bars and green labeled chains gives compliance with the computed kickback angle requirements of ANSI B 175.1-2000 when the products are in their original condition. Products with yellow decals or labels are for users with extraordinary cutting needs and experience and specialized training for dealing with kickback.

**STIHL recommends the use of its green labeled reduced kickback bars, green labeled low kickback chains and a STIHL Quickstop chain brake for both experienced and inexperienced chainsaw users.**

Please ask your STIHL dealer to properly match your powerhead with the appropriate bar/chain combinations to reduce the risk of kickback injury. Green labeled bars and chains are recommended for all powerheads. See your "STIHL Bar and Chain Information" leaflet for details.

 **Warning!**

Use of other, non-listed bar/chain combinations may increase kickback forces and increase the risk of kickback injury. New bar/chain combinations may be developed after publication of this literature, which will, in combination with certain powerheads, comply with § 5.11 of ANSI B 175.1-2000. Check with your STIHL dealer for such combinations.

 **Warning!**

Reduced kickback bars and low kickback chains do not prevent kickback, but they are designed to reduce the risk of kickback injury. They are available from your STIHL dealer.

 **Warning!**

Even if your saw is equipped with a Quickstop, a reduced kickback bar and/or low kickback chain, this does not eliminate the risk of injury by kickback. Therefore, always observe all safety precautions to avoid kickback situations.

### Low kickback chain

Some types of saw chain have specially designed components to reduce the force of nose contact kickback. STIHL has developed low kickback chain for your powerhead.

"Low kickback saw chain" is a chain which has met the kickback performance requirements of § 5.11.2.4 of ANSI B 175.1-2000 (Safety Requirements for Gasoline-Powered ChainSaws) when tested in its original condition on a selected representative sample of chainsaws below 3.8 cubic inch (62 cm<sup>3</sup>) displacement specified in ANSI B 175.1-2000.

 **Warning!**

There are potential powerhead and bar combinations with which low kickback saw chains can be used which have not been specifically certified to comply with the 45° computer derived kickback angle of § 5.11 of ANSI B 175.1-2000. Some low kickback chains have not been tested with all powerhead and bar combinations.

 **Warning!**

A dull or improperly sharpened chain may reduce or negate the effects of the design features intended to reduce

kickback energy. Improper lowering or sharpening of the depth gauges or shaping of the cutters may increase the chance and the potential energy of a kickback. Always cut with a properly sharpened chain.

### Reduced kickback bar

STIHL green labeled reduced kickback bars are designed to reduce the risk of kickback injury when used with STIHL green labeled low kickback chains.

#### **Warning!**

When used with other, more aggressive chains, these bars may be less effective in reducing kickback, and may result in higher kickback forces.

### Bow Guides

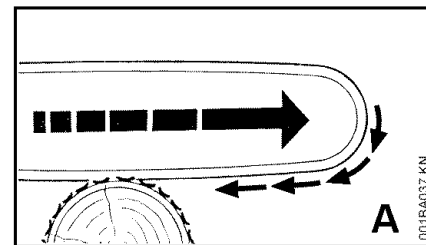
#### **Warning!**

Do not mount a bow guide on any STIHL chainsaw. Any chainsaw equipped with a bowguide is potentially very dangerous. The risk of kickback is increased with a bow guide because of the increased kickback contact area. Low kickback chain will not significantly reduce the risk of kickback injury when used on a bow guide.

### To avoid kickback

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

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



#### **A = Pull-in:**

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

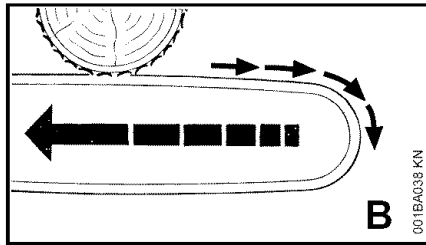
Pull-in frequently occurs when the bumper spike of the saw is not held securely against the tree or limb and when the chain is not rotating at full speed before it contacts the wood.

#### **Warning!**

Use extreme caution when cutting small size brush and saplings which may easily catch the chain and pull you off balance.

### To avoid pull-in

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



### B = Pushback:

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

### To avoid pushback

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

## Cutting Techniques

### Felling

Felling is cutting down a tree.

Before felling a tree, consider carefully all conditions which may affect the direction of fall, including:

The intended direction of the fall.

The natural lean of the tree.

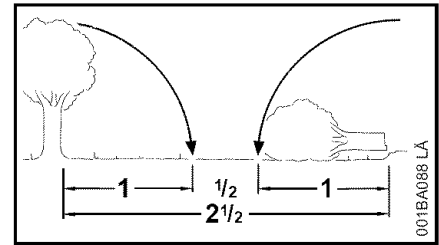
Any unusually heavy limb structure.

Surrounding trees and obstacles.

The wind direction and speed.

### Warning!

Always observe the general condition of the tree. Inexperienced users should never attempt to cut trees which are decayed or rotted inside or which are leaning or otherwise under tension. There is an increased risk that such trees could snap or split while being cut and cause serious or fatal injury to the operator or bystanders. Also look for broken or dead branches which could vibrate loose and fall on the operator. When felling on a slope, the operator should stand on the uphill side if possible.



### Felling Instructions:

When felling, maintain a distance of at least 2 1/2 tree lengths from the nearest person.

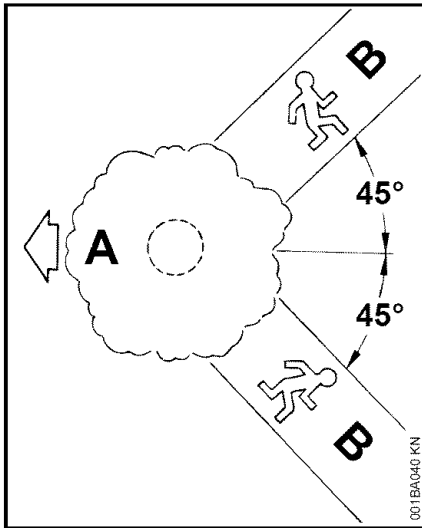
When felling in the vicinity of roads, railways and power lines, etc., take extra precautions. Inform the police, utility company or railway authority before beginning to cut.

### Warning!

The noise of your engine may drown any warning call.

### Warning!

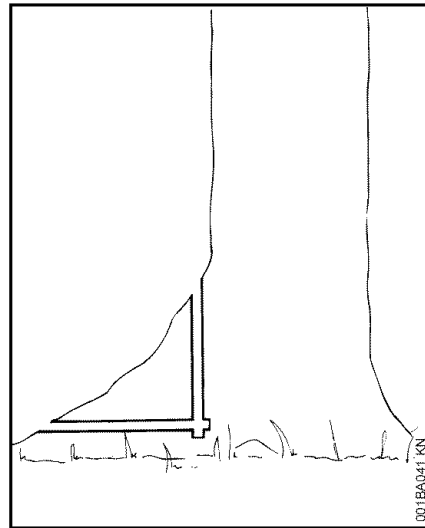
There are a number of factors that may affect and change the intended direction of fall, e.g. wind, lean of tree, sloping ground, one-sided limb structure, wood structure, decay, snow load, etc. To reduce the risk of severe or fatal injury to yourself or others, look for these conditions prior to beginning the cut, and be alert for a change in direction while the tree is falling.



### Escape path

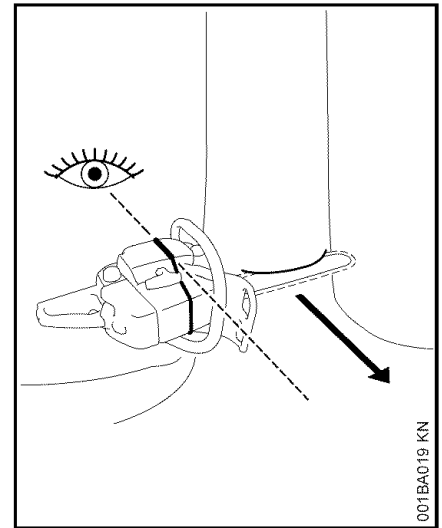
First clear the tree base and work area from interfering limbs and brush and clean its lower portion with an ax.

Then, establish two paths of escape (B) and remove all obstacles. These paths should be generally opposite to the planned direction of the fall of the tree (A) and about at a 45° angle. Place all tools and equipment a safe distance away from the tree, but not on the escape paths.



### Buttress roots

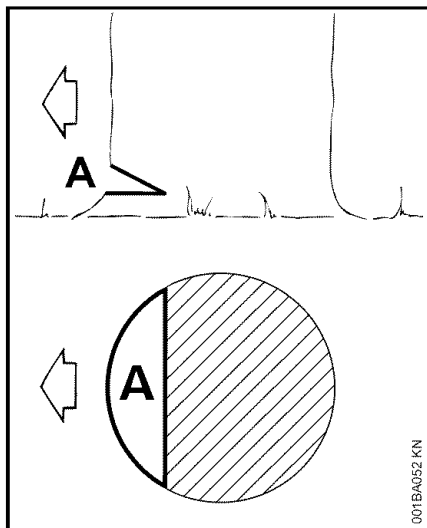
If the tree has large buttress roots, cut into the largest buttress vertically first (horizontally next) and remove the resulting piece.



### Gunning sight

When making the felling notch, use the gunning sight on the shroud and housing to check the required direction of fall:

- Position the saw so that the gunning sight points exactly in the direction you want the tree to fall.

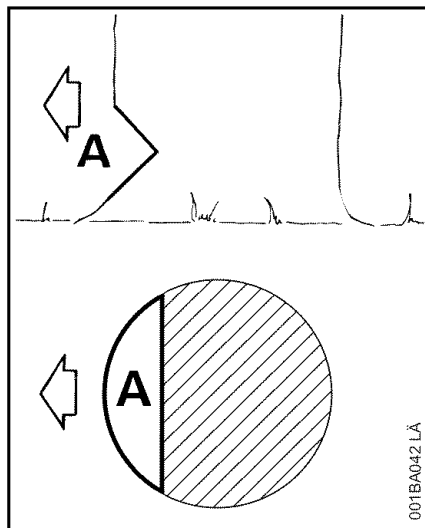


### Conventional cut

**A** = felling notch - determines the direction of the fall

For a conventional cut:

- Properly place felling notch perpendicular to the line of fall, close to the ground
- Cut down at app. 45-degree angle to a depth of about 1/5 to 1/4 of the trunk diameter
- Make second cut horizontal
- Remove resulting 45-degree piece

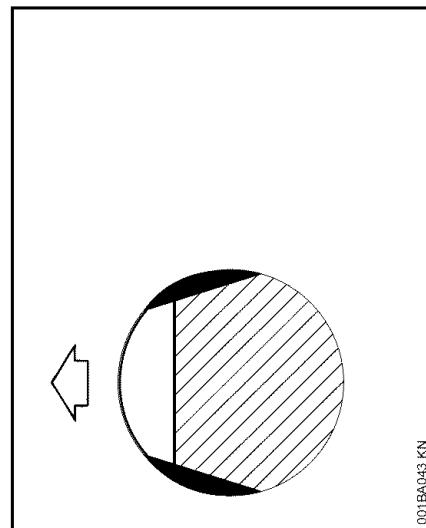


### Open-face technique

**A** = felling notch - determines the direction of the fall

For an open-face cut:

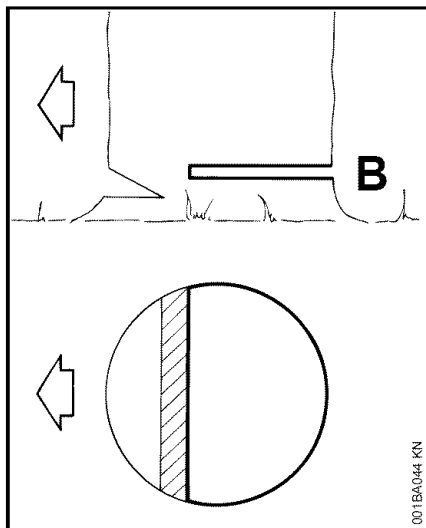
- Properly place felling notch perpendicular to the line of fall, close to the ground
- Cut down at app. 50-degree angle to a depth of app. 1/5 to 1/4 of the trunk diameter
- Make second cut from below at app. 40 degree angle
- Remove resulting 90-degree piece



### Making sapwood cuts

- For medium sized or larger trees make cuts at both sides of the trunk, at same height as subsequent felling cut.
- Cut to no more than width of guide bar.

This is especially important in softwood in summer - it helps prevent sapwood splintering when the tree falls.



### B = Felling cut

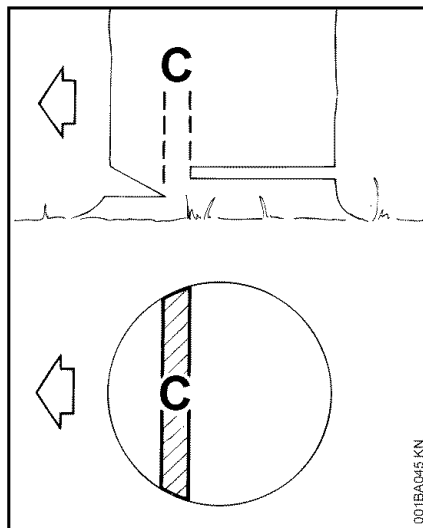
Conventional and open-face technique:

- Begin 1 to 2 inches (2,5 to 5 cm) higher than centre of felling notch
- Cut horizontally towards the felling notch
- Leave approx. 1/10 of diameter uncut. This is the hinge
- Do not cut through the hinge - you could lose control of the direction of the fall

Drive wedges into the felling cut where necessary to control the fall.

#### ⚠ Warning!

If the tip of the bar contacts a wedge, it may cause kickback. Wedges should be of wood or plastic - never steel, which can damage the chain.

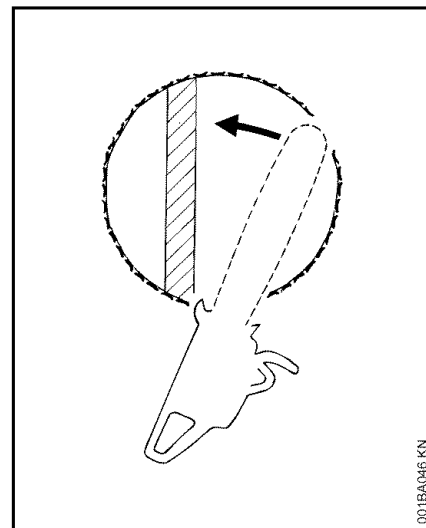


### C = Hinge

- Helps control the falling tree
- Do not cut through the hinge - you could lose control of the direction of the fall

#### ⚠ Warning!

In order to reduce the risk of personal injury, never stand directly behind the tree when it is about to fall, since part of the trunk may split and come back towards the operator (barber-chairing), or the tree may jump backwards off the stump. Always keep to the side of the falling tree. When the tree starts to fall, withdraw the bar, shut off the engine and walk away on the preplanned escape path. Watch out for falling limbs.

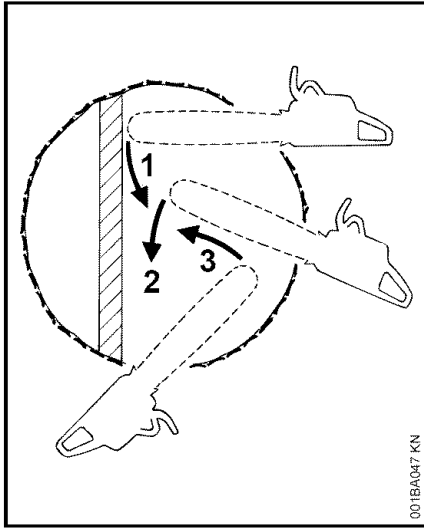


#### ⚠ Warning!

Be extremely careful with partially fallen trees which are poorly supported. When the tree hangs or for some other reason does not fall completely, set the saw aside and pull the tree down with a cable winch, block and tackle or tractor. If you try to cut it down with your saw, you may be injured.

### Felling cut for small diameter trees: simple fan cut

Engage the bumper spikes of the chainsaw directly behind the location of the intended hinge and pivot the saw around this point only as far as the hinge. The bumper spike rolls against the trunk.



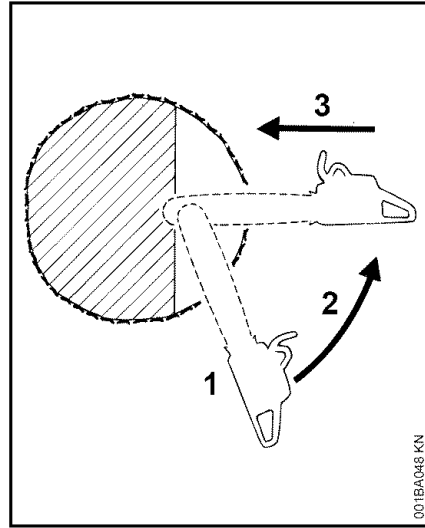
### Felling cut for large diameter trees:

#### **⚠ Warning!**

Felling a tree that has a diameter greater than the length of the guide bar requires use of either the sectioning felling cut or plunge-cut method. These methods are extremely dangerous because they involve the use of the nose of the guide bar and can result in kickback. Only properly trained professionals should attempt these techniques.

#### **Sectioning method**

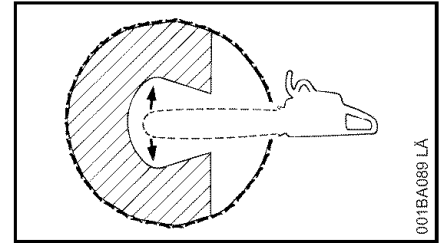
For the sectioning method make the first part of the felling cut with the guide bar fanning in toward the hinge. Then, using the bumper spike as a pivot, reposition the saw for the next cut.



Avoid repositioning the saw more than necessary. When repositioning for the next cut, keep the guide bar fully engaged in the kerf to keep the felling cut straight. If the saw begins to pinch, insert a wedge to open the cut. On the last cut, do not cut the hinge.

#### **Plunge-cut method**

Timber having a diameter more than twice the length of the guide bar requires the use of the plunge-cut method before making the felling cut.



First, cut a large, wide felling notch. Make a plunge cut in the centre of the notch.

The plunge cut is made with the guide bar nose. Begin the plunge cut by applying the lower portion of the guide bar nose to the tree at an angle. Cut until the depth of the kerf is about the same as the width of the guide bar. Next, align the saw in the direction in which the recess is to be cut.

With the saw at full throttle, insert the guide bar in the trunk.

Enlarge the plunge cut as shown in the illustration.

#### **⚠ Warning!**

There is an extreme danger of kickback at this point. Extra caution must be taken to maintain control of the saw. To make the felling cut, follow the sectioning method described previously.



If you are inexperienced with a chainsaw, plunge-cutting should not be attempted. Seek the help of a professional.

### Limbing

Limbing is removing the branches from a fallen tree.

#### **Warning!**

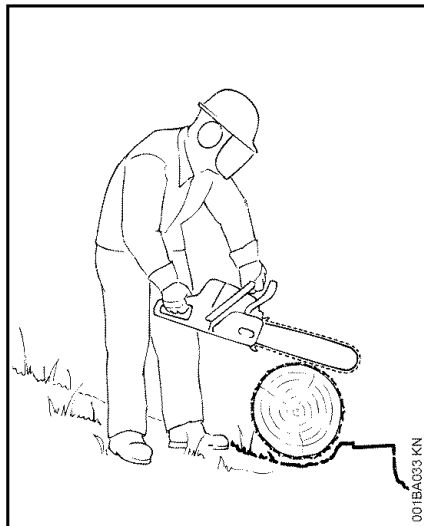
There is an extreme danger of kickback during the limbing operation. Do not work with the nose of the bar. Be extremely cautious and avoid contacting the log or other limbs with the nose of the guide bar.

Do not stand on a log while limbing it - you may slip or the log may roll.

Start limbing by leaving the lower limbs to support the log off the ground. When underbucking freely hanging limbs, a pinch may result or the limb may fall, causing loss of control. If a pinch occurs, stop the engine and remove the saw, by lifting the limb.

#### **Warning!**

Be extremely cautious when cutting limbs or logs under tension (spring poles). The limbs or logs could spring back toward the operator and cause loss of control of the saw and severe or fatal injury to the operator.

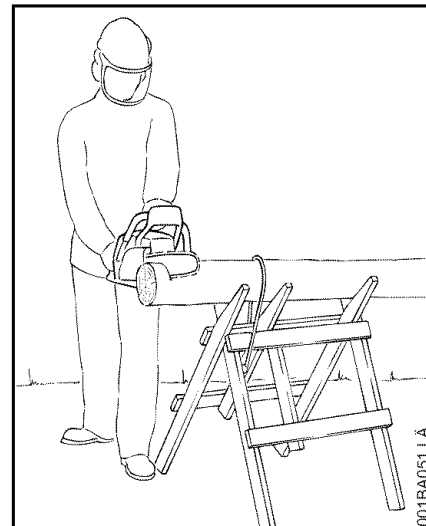


### Bucking

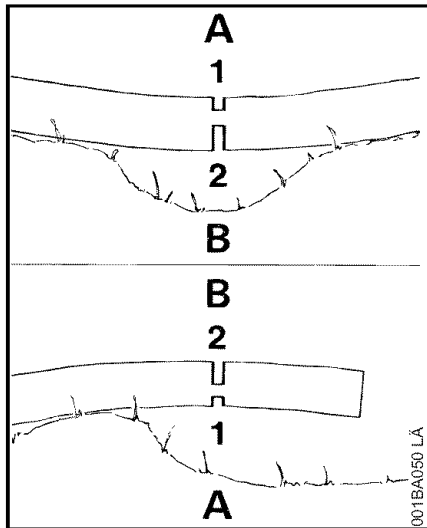
Bucking is cutting a log into sections.

#### **Warning!**

1. When bucking, do not stand on the log. Make sure the log will not roll downhill. If on a slope, stand on the uphill side of the log. Watch out for rolling logs.



2. Cut only one log at a time.
3. Shattered wood should be cut very carefully. Sharp splinters of wood may be caught and flung in the direction of the operator of the saw.
4. When cutting small logs, place log through "V" - shaped supports on top of a sawhorse. Never permit another person to hold the log. Never hold the log with your leg or foot.



5. Logs under strain: Risk of pinching! Always start relieving cut (1) at compression side (A). Then make bucking cut (2) at tension side (B). If the saw pinches, stop the engine and remove it from the log.
6. Only properly trained professionals should work in an area where the logs, limbs and roots are tangled. Working in blow down areas is extremely hazardous.
7. Drag the logs into a clear area before cutting. Pull out exposed and cleared logs first.

## MAINTENANCE, REPAIR AND STORING

**Maintenance, replacement, or repair of the emission control devices and systems may be performed by any nonroad engine repair establishment or individual. However if you claim warranty for a component which has not been serviced or maintained properly or if nonapproved replacement parts were used, STIHL may deny warranty.**

Never operate a chainsaw that is damaged, improperly adjusted or not completely or securely assembled. Follow the maintenance and repair instructions in the appropriate section of your Owner's Manual, especially those in the chapters "Mounting the Bar and Chain", "Maintaining and Sharpening" and "Chain Brake".

### **Warning!**

Use only STIHL replacement parts for maintenance and repair. Use of parts manufactured by others may cause serious or fatal injury.

### **Warning!**

Always stop the engine and ensure that the chain is stopped before making any adjustments, maintenance or repair work,

changing the saw chain or cleaning the saw. Do not attempt any maintenance or repair work not described in your Owner's Manual. Have such work performed at your STIHL service shop only.

### **Warning!**

Never test the ignition system with ignition wire terminal removed from sparkplug or with unseated spark plug, since uncontained sparking may cause a fire.

### **Warning!**

To reduce the risk of fire and burn injury, use only spark plugs authorized by STIHL. Always press spark plug boot snugly onto spark plug terminal of the proper size. (Note: If terminal has detachable SAE adapter nut, it must be attached.) A loose connection between spark plug terminal and ignition wire connector in the boot may create arcing that could ignite combustible fumes and cause a fire. Keep spark plug clean, and make sure ignition lead is in good condition.

### **Warning!**

Do not operate your chainsaw if the muffler is damaged, missing or modified. An improperly maintained muffler will increase the risk of fire and hearing loss. Never touch a hot muffler or burn will

result. If your muffler was equipped with a spark-arresting screen to reduce the risk of fire (e. g. in the USA, Canada and Australia), never operate your saw if the screen is missing or damaged.

Remember that the risk of forest fires is greater in hot or dry weather.

Keep the chain, bar and sprocket clean; replace worn sprockets or chains. Keep the chain sharp.

You can spot a dull chain when easy-to-cut wood becomes hard to cut and burn marks appear on the wood.

Keep the chain at proper tension.

Tighten all nuts, bolts and screws except the carburetor adjustment screws after each use.

### **Warning!**

In order for the chain brake on your STIHL chainsaw to properly perform its function of reducing the risk of kickback and other injuries, it must be properly maintained. Like an automobile brake, a chainsaw chain brake incurs wear each time it is engaged.

The amount of wear will vary depending upon usage, conditions under which the saw is used and other factors. Excessive wear will reduce the effectiveness of the chain brake and can render it inoperable.

For the proper and effective operation of the chain brake the brake band and clutch drum must be kept free of dirt, grease and other foreign matter which may reduce friction of the band on the drum.

For these reasons, each STIHL chainsaw should be returned to trained personnel such as your STIHL servicing dealer for periodic inspection and servicing of the brake system according to the following schedule:

Heavy usage - every three months,

Moderate usage - twice a year,

Occasional usage - annually.

The chainsaw should also be returned immediately for maintenance whenever the brake system cannot be thoroughly cleaned or there is a change in its operating characteristics.

For any maintenance please refer to the maintenance chart **and to the warranty statement** near the end of this manual.

Additionally, the daily maintenance schedule for your chainsaw set forth in your STIHL Owner's Manual should be strictly followed.

Store chainsaw in a dry place and away from children. Before storing for longer than a few days, always empty the fuel tank (see chapter "Storing the Machine" in this manual).

## Maintenance Chart

Please note that the following maintenance intervals apply for normal operating conditions only. If your daily working time is longer than normal or cutting conditions are difficult (very dusty work area, resin-rich wood, tropical wood etc.), shorten the specified intervals accordingly. If you only use the saw occasionally, extend the intervals accordingly.		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	every 12 months	if problem	if damaged	as required
Complete machine	Visual inspection (condition, leaks)	X		X						
	Clean		X							
Throttle trigger, trigger interlock, Master Control	Check operation	X		X						
Chain brake	Check operation	X		X						
	Check <sup>1)2)</sup>									X
Pickup body/filter in fuel tank	Check					X				
	Clean, replace filter element					X		X		
	Replace pickup body						X		X	X
Fuel tank	Clean					X				
Chain oil tank	Clean					X				
Chain lubrication	Check	X								
Saw chain	Inspect, also check sharpness	X		X						
	Check chain tension	X		X						
	Sharpen									X
Guide bar	Check (wear, damage)	X								
	Clean and turn over									X
	Deburr				X					
	Replace								X	X
Chain sprocket	Check				X					
	Clean							X		X
Air filter	Replace								X	
	Inspect							X		X
AV elements (rubber buffers, springs)	Replace <sup>1)</sup>								X	
	Inspect									
Cooling inlets	Clean		X							
Cylinder fins	Clean		X			X				

1) STIHL dealer

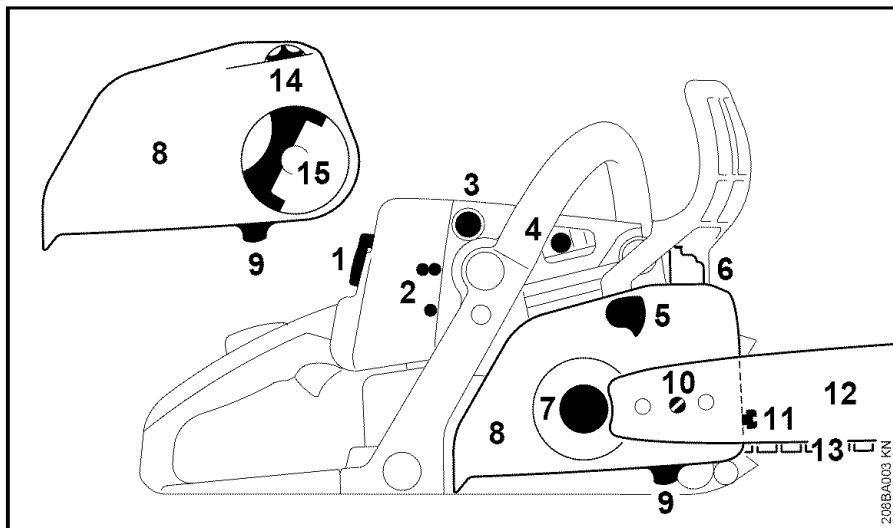
2) see "Chain brake"

Please note that the following maintenance intervals apply for normal operating conditions only. If your daily working time is longer than normal or cutting conditions are difficult (very dusty work area, resin-rich wood, tropical wood etc.), shorten the specified intervals accordingly. If you only use the saw occasionally, extend the intervals accordingly.		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	every 12 months	if problem	if damaged	as required
Carburetor	Check idle adjustment – chain must not rotate	X		X						
	Readjust idle									X
Spark plug	Readjust electrode gap						X			
All accessible screws and nuts (not adjusting screws) <sup>2)</sup>	Retighten									X
Spark arresting screen* in muffler	Inspect						X			
	Clean or replace								X	
Chain catcher	Check	X								
	Replace								X	

- 2) Firmly tighten cylinder base screws of professional saws (3.4 kW or more) after 10 to 20 hours of operation

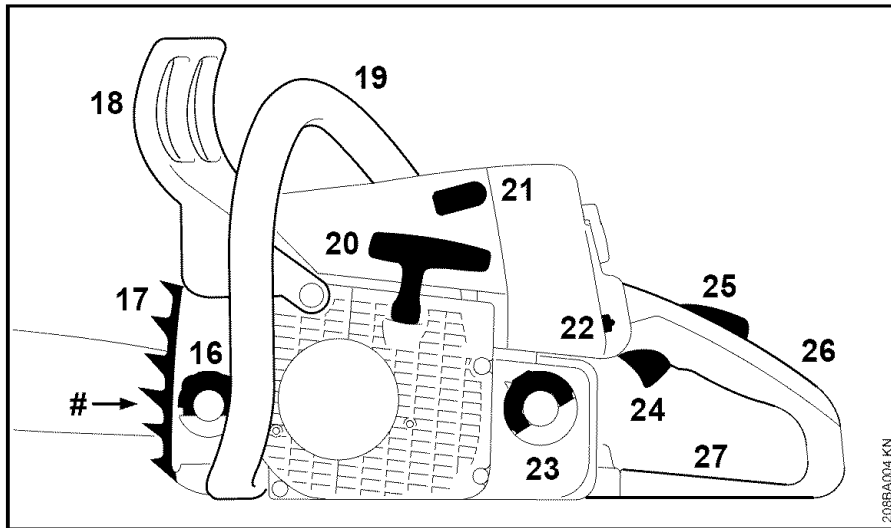
\* see “Guide to Using this Manual“

## Main Parts of the Saw



- 1 Twist lock
- 2 Carburetor adjusting screws
- 3 Fuel pump (easy start\*)
- 4 Decompression valve\*
- 5 Chain brake
- 6 Muffler
- 7 Chain sprocket
- 8 Chain sprocket cover
- 9 Chain catcher
- 10 Chain tensioner (side)
- 11 Chain tensioner (front)
- 12 Guide bar
- 13 Oilomatic saw chain
- 14 Adjusting wheel of quick tensioner\*
- 15 Handle of wingnut\* (quick chain tensioner)

\* see "Guide to Using this Manual"



- 16 Oil filler cap
- 17 Bumper spike
- 18 Front hand guard
- 19 Front handle (handelbar)
- 20 Starter grip
- 21 Spark plug boot
- 22 Master Control lever
- 23 Fuel filler cap
- 24 Throttle trigger
- 25 Throttle trigger interlock
- 26 Rear handle
- 27 Rear hand guard
- # Serial number

## Definitions

- 1 Twist Lock**  
Lock for carburetor box cover.
- 2 Carburetor Adjusting Screws**  
For fine tuning the carburetor.
- 3 Fuel Pump**  
Fills carburetor with fuel to simplify starting.
- 4 Decompression Valve**  
Releases compression pressure to make starting easier.
- 5 Chain Brake**  
A device to stop the rotation of the chain if activated in a kickback situation by the operator's hand or by inertia.
- 6 Muffler**  
Reduces engine exhaust noise and directs the exhaust gases.
- 7 Chain Sprocket**  
The toothed wheel that drives the saw chain.
- 8 Chain Sprocket Cover**  
Covers the clutch and the sprocket.
- 9 Chain Catcher**  
Helps to reduce the risk of operator contact by a chain if it breaks or comes off the bar.
- 10 Chain Tensioner**  
Permits precise adjustment of chain tension.
- 11 Chain Tensioner**  
Permits precise adjustment of chain tension.
- 12 Guide Bar**  
Supports and guides the saw chain.
- 13 Oilomatic Saw Chain**  
A loop consisting of cutters, tie straps and drive links.
- 14 Adjusting Wheel**  
Permits precise adjustment of chain tension.
- 15 Handle of Wingnut**  
Must be released to allow chain to be tensioned with adjusting wheel.
- 16 Oil Filler Cap**  
For closing the oil tank.
- 17 Bumper Spike**  
Toothed stop for holding saw steady against wood.
- 18 Front Hand Guard**  
Provides protection against projecting branches and helps prevent left hand from touching the chain if it slips off the handlebar. It also serves as the lever for chain brake activation.
- 19 Front Handle (Handlebar)**  
Handlebar for the left hand at the front of the saw.
- 20 Starter Grip**  
The grip of the starter, for starting the engine.
- 21 Spark Plug Boot**  
Connects the spark plug with the ignition wire.
- 22 Master Control Lever**  
Lever for choke control, starting throttle, run and stop positions.
- 23 Fuel Filler Cap**  
For closing the fuel tank.
- 24 Throttle Trigger**  
Controls the speed of the engine.
- 25 Throttle Trigger Interlock**  
Must be depressed before the throttle trigger can be activated.



**26 Rear Handle**

The support handle for the right hand, located at the rear of the saw.

**27 Rear Hand Guard**

Gives added protection to operator's right hand.

**Guide Bar Nose**

The exposed end of the guide bar.  
(not illustrated, see chapter "Tensioning the Saw Chain")

**Clutch**

Couples engine to chain sprocket when engine is accelerated beyond idle speed (not illustrated).

**Anti-Vibration System**

The anti-vibration system includes a number of buffers designed to reduce the transmission of vibrations created by the engine and cutting attachment to the operator's hands (not illustrated).



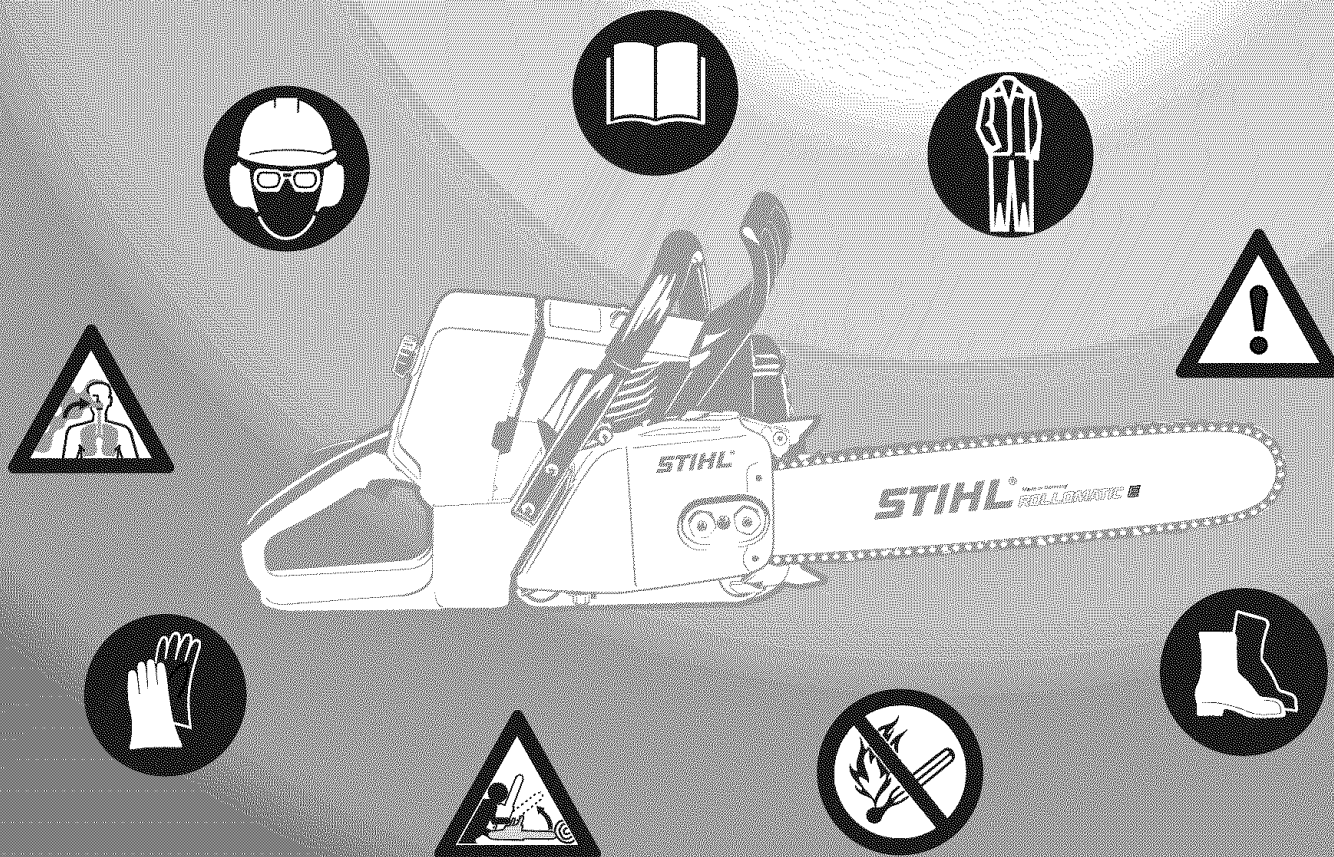
 **WARNING!**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**0457 184 3021**

**englisch / English USA**

## Chainsaw Safety Manual



## Contents

Some Important Safety Precautions for Chain Saw Users .....	2
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This manual contains the safety precautions and recommended cutting techniques outlined in STIHL chainsaw Owner's Manuals. Even if you are an experienced chainsaw user, it is in your own interests to familiarize yourself with the latest rules and regulations regarding safe use of your chainsaw.

Please note that the illustrations on pages 28 and 29 show the chainsaws STIHL MS 210, 230, 250.

Other chainsaw models may have different parts and controls. You should therefore always refer to the Owner's Manual of your particular saw model.

### **Warning!**

Because a chainsaw is a high-speed wood-cutting tool, some special safety precautions must be observed as with any other power saw to reduce the risk of personal injury. Careless or improper use may cause serious or even fatal injury. Read and follow all safety precautions in current Owner's Manual or Safety Manual. Always use two hands to operate the chainsaw.

### **Warning!**

Avoid contact of bar tip with any object. This can cause the guide bar to kick suddenly up and back, which may result in serious or fatal injury. To reduce the risk of kickback injury STIHL recommends the use of STIHL green labeled reduced kickback bars and low kickback chains and a STIHL Quickstop chain brake. Contact your STIHL dealer or the STIHL distributor for your area if you do not understand any of the instructions in this manual.

## Some Important Safety Precautions for Chain Saw Users

### A. A Summary of Warnings on kickback and other Selected Risks – Taken Primarily from ANSI B 175.1 (See also “Safety Precautions“ section of this Owner’s Manual)

#### Warning!

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 towards the operator. Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back towards the operator. Either of these reactions may cause you to lose control of the saw which could result in serious personal injury.

Section 5.11 of ANSI B 175.1-2000 sets certain performance and design criteria related to chainsaw kickback. STIHL has developed a color code system using green and yellow to help you select a powerhead, bar and chain combination that complies with the kickback requirements of the ANSI Standard. See the sections entitled "Safety Precautions" and "Specifications" of this manual.

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

1. With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents.
2. Keep a good firm grip on the saw with both hands, the right hand on the rear handle, and the left hand on the front handle, when the engine is running. Use a firm grip with thumbs and fingers encircling the chainsaw handles. A firm grip will help you reduce kickback and maintain control of the saw. Don't let go.
3. Make sure the area in which you are cutting is free from obstructions. Do not let the nose of the guide bar contact a log, branch, or any other obstruction that could be hit while you are operating the saw.
4. Cut at high engine speeds.
5. Do not overreach or cut above shoulder height.

6. Follow manufacturer's sharpening and maintenance instructions for the saw chain.
7. Only use replacement bars and chains specified by the manufacturer or the equivalent.
8. Reduced kickback bars and low kickback chains are designed to reduce the risk of kickback injury. Ask your STIHL dealer about these devices.

### B. Other Safety Precautions

#### Warning!

1. Do **not** operate a chainsaw with one hand! Serious injury to the operator, helpers, bystanders, or any combination of these persons may result from one-handed operation. A chainsaw is intended to be used with two hands.
2. Do not operate a chainsaw when you are fatigued.
3. Use safety footwear; snug-fitting clothing; protective gloves; and eye, hearing, and head protection devices.

4. Use caution when handling fuel. Move the chainsaw at least 10 feet (3 m) from the fueling point before starting the engine.
  5. Do not allow other persons to be near the chainsaw when starting or cutting with the chainsaw. Keep bystanders and animals out of the work area.
  6. Do not start cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree.
  7. Keep all parts of your body away from the saw chain when the engine is running.
  8. Before you start the engine, make sure that the saw chain is not contacting anything.
  9. Carry the chainsaw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
  10. Do not operate a chainsaw that is damaged, improperly adjusted, or not completely and securely assembled. Be sure that the saw chain stops moving when the throttle trigger is released.
  11. Shut off the engine before setting the chainsaw down.
  12. 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.
  13. When cutting a limb that is under tension be alert for springback so that you will not be struck when the tension in the wood fibers is released.
  14. Keep the handles dry, clean, and free of oil or fuel mixture.
  15. Operate the chainsaw only in well-ventilated areas.
  16. Do not operate a chainsaw in a tree unless you have been specifically trained to do so.
  17. All chainsaw service, other than the items listed in the Owner's Manual maintenance instructions, should be performed by competent chainsaw service personnel. (For example, if improper tools are used to remove the flywheel or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and could subsequently cause the flywheel to burst).
  18. When transporting your chainsaw, use the appropriate chain guard (scabbard).
- Other important safety precautions are contained in the body of the Owner's Manual especially in the General Safety Precautions.
- Note:**
- When using a chainsaw for logging purposes, refer to the Code of Federal Regulations, Parts 1910 and 1928.

## Safety Precautions



The use of any chainsaw may be hazardous. The saw chain has many sharp cutters. If the cutters contact your flesh, they will cut you, even if the chain is not moving. At full throttle, the chain speed can reach 45 mph (20 m/s). It is important that you read, fully understand and observe the following safety precautions and warnings. Read the Owner's Manual and the Safety Precautions periodically. Pay special attention to the section on reactive forces.



**Warning!**  
Reactive forces, including kickback, can be dangerous. Careless or improper use of any chainsaw may cause serious or fatal injury.

All safety precautions that are generally observed when working with an axe or a hand saw also apply to the operation of chainsaws. However, because a chainsaw is a high-speed, fast-cutting power tool, special safety precautions must be observed to reduce the risk of personal injury.

Have your STIHL dealer show you how to operate your chainsaw. Observe all applicable local safety regulations, standards and ordinances.



**Warning!**  
Minors should never be allowed to use a chainsaw. Bystanders, especially children, and animals should not be allowed in the area where a chainsaw is in use. Never let the saw run unattended. Store it in a locked place away from children and empty the fuel tank before storing for longer than a few days.



Do not lend or rent your chainsaw without the Owner's Manual. Be sure that anyone using your saw reads and understands the information contained in this manual.

These safety precautions and warnings apply to the use of all STIHL chainsaws. Different models may have different parts and controls. See the appropriate section of your Owner's Manual for a description of the controls and function of the parts of your model saw.

Safe use of a chainsaw involves

1. the operator
2. the saw
3. the use of the saw.

## THE OPERATOR

### Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgement.

Do not operate a chainsaw when you are fatigued. Be alert - If you get tired while operating your chainsaw, take a break. Tiredness may result in loss of control. Working with any chainsaw can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating a chainsaw.



**Warning!**  
Prolonged use of chainsaws (or other machines) exposing the operator to vibrations may produce whitefinger disease (Raynaud's phenomenon) or carpal tunnel syndrome.



These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.

All factors which contribute to whitefinger disease are not known, but cold weather, smoking and diseases or physical conditions that affect blood vessels and blood transport, as well as high vibration levels and long periods of exposure to vibration are mentioned as factors in the development of whitefinger disease. In order to reduce the risk of whitefinger disease and carpal tunnel syndrome, please note the following:

- Many STIHL models are available with an anti-vibration (AV) system designed to reduce the transmission of vibrations created by the engine and cutting attachment to the operator's hands. An AV system is recommended for those persons using chainsaws on a regular or sustained basis.
- Wear gloves and keep your hands warm. Heated handles, which are available on most STIHL powerheads, are recommended for cold weather use.

- Keep the saw chain sharp and the saw, including the AV system, well maintained. A dull chain will increase cutting time, and pressing a dull chain through wood will increase the vibrations transmitted to your hands. A saw with loose components or with damaged or worn AV buffers will also tend to have higher vibration levels.
- Maintain a firm grip at all times, but do not squeeze the handles with constant, excessive pressures. Take frequent breaks.

All the above mentioned precautions do not guarantee that you will not sustain whitefinger disease or carpal tunnel syndrome. Therefore, continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice immediately.

### **Warning!**

The ignition system of your unit produces an electromagnetic field of a very low intensity. This field may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemaker should consult their physician and the pacemaker manufacturer before operating this tool.

## **Proper Clothing**

### **Warning!**

To reduce the risk of injury, the operator should wear proper protective apparel.



Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loose-fitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become entangled with the saw or brush. Wear overalls or jeans with a reinforced cut retardant insert or cut retardant chaps.



Protect your hands with gloves when handling saw and saw chain. Heavy-duty, nonslip gloves improve your grip and protect your hands.



Good footing is most important in chainsaw work. Wear sturdy boots with nonslip soles. Steel-toed safety boots are recommended.

Never operate a chainsaw unless wearing goggles or properly fitted safety glasses with adequate top and side protection complying with your national standard.



Wear an approved safety hard hat to protect your head. Chainsaw noise may damage your hearing. Always wear sound barriers (ear plugs or ear muffers) to protect your hearing. Continual and regular users should have their hearing checked regularly.

## THE SAW

Parts of the chainsaw; for illustrations and definitions of the parts see the chapter on "Main Parts of Saw".



**Warning!**  
Never modify a chainsaw in any way. Only attachments and parts supplied by STIHL or expressly approved by STIHL for use with the specific STIHL saw models are authorized. Although certain unauthorized attachments are usable with the STIHL powerhead, their use may, in fact, be extremely dangerous.

## THE USE OF THE SAW

### Transporting the chainsaw

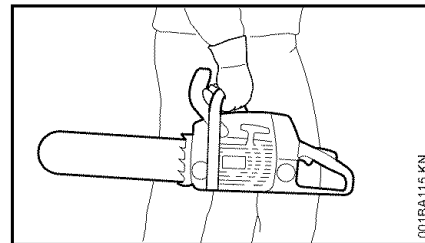


**Warning!**  
Always stop the engine before putting a chainsaw down or carrying it. Carrying a chainsaw with the engine running is extremely dangerous.

Accidental acceleration of the engine can cause the chain to rotate. During operation, the powerhead muffler and the material around it reach extremely high temperatures. Avoid touching the hot muffler, you could receive serious burns.

**By hand:** When carrying your saw by hand, the engine must be stopped and the saw must be in the proper position.

Grip the front handle and place the muffler away from the body.



The chain guard (scabbard) should be over the chain and the guide bar, which should point backwards. When carrying your saw, the bar should be behind you.

**By vehicle:** When transporting in a vehicle, keep chain and bar covered with the chain guard. Properly secure your saw to prevent turnover, fuel spillage and damage to the saw or vehicle.

### Preparation for the use of the saw

Take off the chain guard and inspect for safety in operation. For assembly, follow the procedure described in the chapter "Mounting the Bar and Chain" of your Owner's Manual.

STIHL Oilomatic chain, guide bar and sprocket must match each other in gauge and pitch.

Before replacing any bar and chain, see the sections on "Specifications", "Kickback" and the "ANSI B 175.1-2000 chainsaw kickback standard" in this manual.

**⚠ Warning!**

Proper tension of the chain is extremely important. In order to avoid improper setting, the tensioning procedure must be followed as described in your manual. Always make sure the hexagonal nut(s) for the sprocket cover is (are) tightened securely after tensioning the chain. Never start the saw with the sprocket cover loose. Check chain tension once more after having tightened the nut(s) and thereafter at regular intervals (whenever the saw is shut off). If the chain becomes loose while cutting, shut off the engine and then tighten. Never try to adjust the chain while the engine is running!

**Fueling**

Your STIHL chainsaw uses an oil-gasoline mixture for fuel (see chapter "Fuel" of your Owner's Manual).

**⚠ Warning!**

Gasoline is an extremely flammable fuel. If spilled or ignited by a spark or other ignition source, it can cause fire and serious burn injury or property damage. Use extreme caution when handling gasoline or fuel mix.



Do not smoke or bring any fire or flame near the fuel or the chainsaw. Note that combustible fuel vapors may be vented from the fuel system.

**Fueling Instructions****⚠ Warning!**

Fuel your chainsaw in well-ventilated areas, outdoors only. Always shut off the engine and allow it to cool before refueling. Gasoline vapor pressure may build up inside the gas tank depending on the fuel used, the weather conditions, and the venting system of the tank. In order to reduce the risk of burns or other personal injury from escaping gas vapor and fumes, remove the fuel filler cap on the STIHL product carefully so as to allow any pressure build-up in the tank to release slowly. Never remove fuel filler cap while engine is running.

Select bare ground for fueling and move at least 10 feet (3 m) from fueling spot before starting the engine. Wipe off any spilled fuel before starting your saw, and check for leakage.

**⚠ Warning!**

Check for fuel leakage while refueling and during operation. If fuel or oil leakage is found, do not start or run the engine until leak is fixed and spilled fuel has been wiped away. Take care not to get fuel on your clothing. If this happens, change your clothing immediately. Different models may have different fuel caps.

**Cap with Grip****⚠ Warning!**

In order to reduce the risk of fuel spillage and fire from an improperly tightened fuel cap, correctly position and tighten the fuel cap in the fuel tank opening.



To do this with this STIHL cap, raise the grip on the top of the cap until it is upright at a 90° angle. Insert the cap in the fuel tank opening with the triangular marks on the grip of the cap and on the fuel tank opening lining up. Using the grip, turn the cap firmly clockwise as far as it will go (approx. a quarter turn).



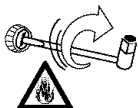
Fold the grip flush with the top of the cap. If the grip does not lie completely flush with the cap and the detent on the grip does not fit in the

corresponding recess in the filler neck, the cap is not properly seated and tightened and you must repeat the above steps.

### Slotted Cap

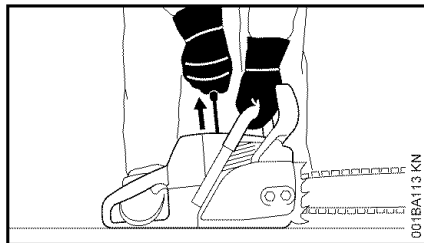


Unit vibrations can cause an improperly tightened fuel filler cap to loosen or come off and spill quantities of fuel. In order to reduce the risk of fuel spillage and fire, tighten fuel filler cap by hand with as much force as possible.



The screwdriver end of the STIHL combination wrench or other similar tool can be used as an aid in tightening slotted fuel filler caps.

See "Fueling" chapter in your Owner's Manual.



### Starting

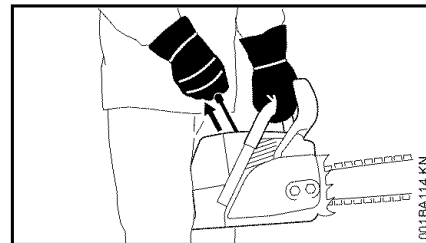
The chain brake must be engaged when starting the saw.



Your chainsaw is a one-person saw. Do not allow other persons to be near the running chainsaw. Start and operate your saw without assistance. For specific starting instructions, see the appropriate section of the Owner's Manual. Proper starting methods reduce the risk of injury. Do not drop start. This method is very dangerous because you may lose control of the saw.

There are two recommended methods for starting your chainsaw.

With the **first** recommended **method**, the chainsaw is started on the ground. Make sure the chain brake is engaged (see "Chain Brake" chapter in your Owner's Manual) and place the chainsaw on firm ground or other solid surface in an open area. Maintain good balance and secure footing.



Grip the front handlebar of the saw firmly with your left hand and press down. For saws with a rear handle level with the ground, put the toe of your right foot into the rear handle and press down. With your right hand pull out the starter grip slowly until you feel a definite resistance and then give it a brisk, strong pull.

The **second** recommended **method** for starting your chainsaw allows you to start the saw without placing it on the ground. Make sure the chain brake is engaged, grip the front handle of the chainsaw firmly with your left hand. Keep your arm on the front handle in a locked (straight) position. Hold the rear handle of the saw tightly between your legs just above the knees. Maintain good balance and secure footing. Pull the starting grip slowly with your right hand until you feel a definite resistance and then give it a brisk, strong pull.

**⚠ Warning!**

Be sure that the guide bar and chain are clear of you and all other obstructions and objects, including the ground. When the engine is started, the engine speed with the starting throttle lock engaged will be fast enough for the clutch to engage the sprocket and, if the chain brake is not activated, turn the chain. If the upper quadrant of the tip of the bar touches any object, it may cause kick-back to occur (see section on reactive forces). To reduce this risk, always engage the chain brake before starting. Never attempt to start the chainsaw when the guide bar is in a cut or kerf.

**⚠ Warning!**

When you pull the starter grip, do not wrap the starting rope around your hands. Do not allow the grip to snap back, but guide the starter rope slowly back to permit the rope to rewind properly. Failure to follow this procedure may result in injury to hand or fingers and may damage the starter mechanism.

**Important adjustments****⚠ Warning!**

To reduce the risk of personal injury from loss of control or contact with the running chain, do not use a saw with incorrect idle adjustment. At correct idle speed, the chain should not rotate. For directions to adjust idle speed, see the appropriate section of your Owner's Manual. If you cannot set the correct idle speed, have your STIHL dealer check your saw and make proper adjustments or repairs. After adjusting a chain, start the saw, let the engine run for a while, then switch engine off and recheck chain tension. Proper chain tension is very important at all times.

**Catalytic converter****⚠ Warning!**

Some STIHL chainsaw models are equipped with a catalytic converter, which is designed to reduce the exhaust emissions of the engine by a chemical process in the muffler. Due to this process, the muffler does not cool down as rapidly as conventional mufflers when the engine returns to idle or is shut off. To reduce the risk of fire and burn injuries, specific safety precautions must be observed.

**⚠ Warning!**

Since a muffler with a catalytic converter cools down less rapidly than conventional mufflers, never set your chainsaw down on or near dry

brush, grass, wood chips or other combustible materials while it is still hot. Let the engine cool down sitting on concrete, metal, bare ground or solid wood (e.g. the trunk of a felled tree) away from any combustible substances.

**⚠ Warning!**

To reduce the risk of fire or burn injury, let the unit cool down before refueling your chainsaw after use.

**⚠ Warning!**

Never disassemble or modify your muffler. The muffler could be damaged and cause an increase in heat radiation or sparks, thereby increasing the risk of fire or burn injury. You may also permanently damage the engine. Have your muffler serviced and repaired by your STIHL Servicing Dealer only.

**⚠ Warning!**

To reduce the risk of fire or burn injury, keep the area around the muffler clean. Remove all debris such as pine needles, branches or leaves.

**⚠ Warning!**

An improperly mounted or damaged cylinder housing or a damaged/ deformed muffler shell may interfere with the cooling effect of the catalytic converter. To reduce the risk of fire or burn injury, do not continue work with a damaged or improperly mounted cylinder housing or a damaged/ deformed muffler shell. Your catalytic converter is furnished with screens designed to reduce the risk of fire from the emission of hot particles. Due to the heat from the catalytic reaction, these screens will normally stay clean and need no service or maintenance. If you experience loss of performance and you suspect a clogged screen, have your muffler maintained by a STIHL Servicing Dealer.

**Working Conditions**

Operate the chainsaw under good visibility and daylight conditions only.

**⚠ Warning!**



Your chainsaw produces poisonous exhaust fumes as soon as the combustible engine is running. These gases (e.g. carbon monoxide) may be colorless and odorless. To reduce the risk of serious or fatal injury from breathing toxic fumes, never run the chainsaw indoors or in poorly ventilated locations. Ensure proper ventilation when working in trenches or other confined areas.

**⚠ Warning!**

Use of this product (including sharpening the saw chain) can generate dust, mists and fumes containing chemicals known to cause respiratory disease, cancer, birth defects, or other reproductive harm. If you are unfamiliar with the risks associated with the particular dust, mist or fume at issue, consult your employer, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, etc. Control dust (such as sawdust), mists (such as oil mist from chain lubrication) and fumes at the source where possible.

In this regard use good work practices and follow the recommendations of OSHA / NIOSH and occupational and trade associations. When the inhalation of toxic dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH / MSHA for the type substance at issue.

**⚠ Warning!**

Breathing asbestos dust is dangerous and can cause severe or fatal injury, respiratory illness or cancer. The use and disposal of asbestos containing products have been strictly regulated by OSHA and the Environmental Protection Agency. Do not cut or disturb asbestos, asbestos containing products (e.g. asbestos containing drywall or other construction products), or products such as pipes which are wrapped or covered with asbestos insulation. If you have any reason to believe that you might be cutting asbestos, immediately contact your employer or a local OSHA representative.

The muffler and other parts of the engine (e.g. fins of the cylinder, spark plug) become hot during operation and remain hot for a while after stopping the engine. To reduce risk of burns do not touch the muffler and other parts while they are hot. Don't work alone. Keep within calling distance of others in case help is needed.

Your chainsaw is equipped with a chain catcher. It is designed to reduce the risk of personal injury in the event of a thrown or broken chain. From time to time the catcher may be damaged or removed.

To reduce the risk of personal injury, do not operate a chainsaw with a damaged or missing catcher.

Inspect buffers periodically. Replace damaged, broken or excessively worn buffers immediately, since they may result in loss of control of the saw.

A "sponginess" in the feel of the saw, increased vibration or increased "bottoming" during normal operation may indicate damage, breakage or excessive wear. Buffers should always be replaced in sets. If you have any questions as to whether the buffers should be replaced, consult your STIHL servicing dealer.

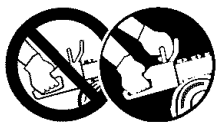
### **Warning!**

Take extreme care in wet and freezing weather (rain, snow, ice). Put off the work when the weather is windy, stormy or rainfall is heavy.

### **Warning!**

Avoid stumbling on obstacles such as stumps, roots or rocks and watch out for holes or ditches. Clear the area where you are working. Be extremely cautious when working on slopes or uneven ground. There is increased danger of slipping on freshly debarked logs.

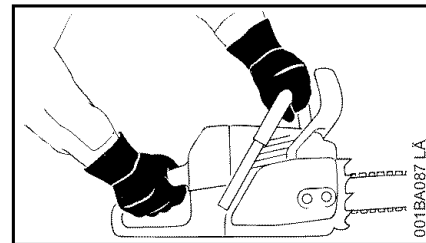
### **Warning!**



To reduce the risk of serious or fatal injury to the operator or bystanders, never use the saw with one hand.

You cannot control reactive forces and you may lose control of the saw, which can result in the skating or bouncing of the bar and chain along the limb or log.

Even for those compact saws designed for use in confined spaces, one-handed operation is dangerous because the operator may lose control.



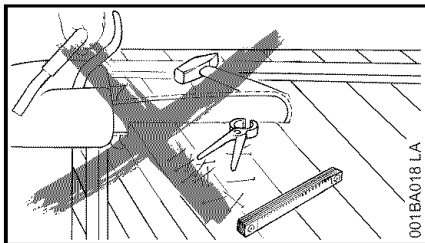
## **Cutting Instructions**

**Grip:** Always hold the saw firmly with both hands when the engine is running. Place your left hand on front handle bar and your right hand on rear handle and throttle trigger. Left-handers should follow these instructions too.

Wrap your fingers tightly around the handles, keeping the handles cradled between your thumb and forefinger. With your hands in this position, you can best oppose and absorb the push, pull and kickback forces of your saw without losing control (see section on reactive forces). Make sure your chainsaw handles and grip are in good condition and free of moisture, pitch, oil or grease.

### **Warning!**

Do not operate your chainsaw with the starting throttle lock engaged. Cutting with the starting throttle lock engaged does not permit the operator proper control of the saw or chain speed.



**⚠ Warning!**

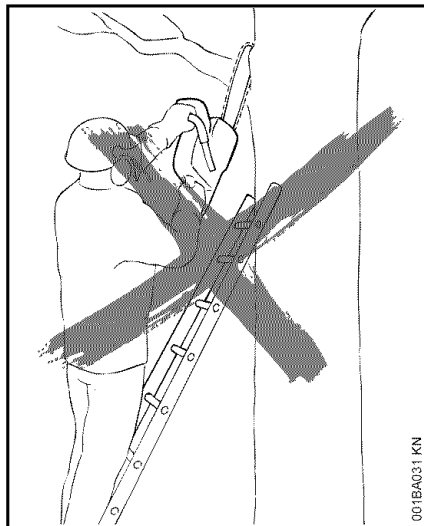
Never touch a chain with your hand or any part of your body when the engine is running, even when the chain is not rotating. The chain continues to rotate for a short period after the throttle trigger is released.

**⚠ Warning!**

Do not cut any material other than wood or wooden objects. Use your saw for chainsawing only. It is not designed for prying or shoveling away limbs, roots or other objects. When sawing, make sure that the saw chain does not touch any foreign materials such as rocks, fences, nails and the like. Such objects may be flung off, damage the saw chain or cause the saw to kickback.

**⚠ Warning!**

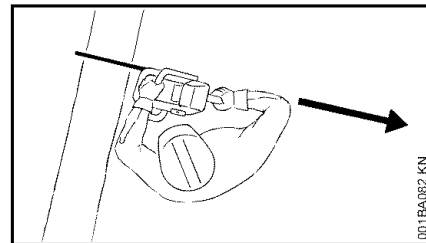
In order to keep control of your saw, always maintain a firm foothold.



Never work on a ladder, or on any other insecure support. Never use the saw above shoulder height.

**⚠ Warning!**

Never work in a tree unless you have received specific, professional training for such work, are properly secured (such as tackle and harness system or a lift bucket), have both hands free for operating the chainsaw in a cramped environment and have taken proper precautions to avoid injury from falling limbs or branches.



Position the chainsaw in such a way that your body is clear of the cutting attachment whenever the engine is running. Stand to the left of cut while bucking.

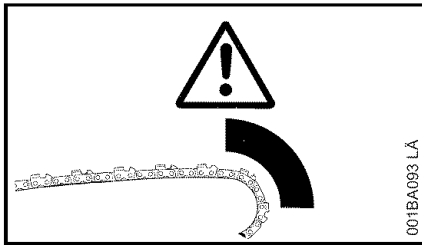
Don't put pressure on the saw when reaching the end of a cut. The pressure may cause the bar and rotating chain to pop out of the cut or kerf, go out of control and strike the operator or some other object. If the rotating chain strikes some other object, a reactive force may cause the moving chain to strike the operator.

**Reactive forces including kickback**

**⚠ Warning!**

Reactive forces may occur any time the chain is rotating. Reactive forces can be dangerous! In any chainsaw,





the powerful force used to cut wood can be reversed (and work against the operator). If the rotating chain is suddenly stopped by contact with any solid object like a log or branch or is pinched, there active forces may occur instantly. These reactive forces may result in loss of control which may, in turn, cause serious or fatal injury. An understanding of the causes of these reactive forces may help you avoid loss of control.

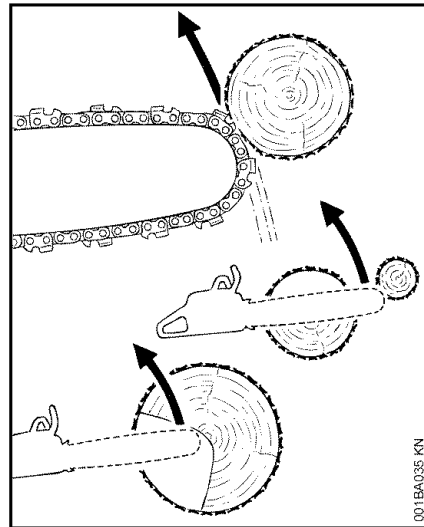
The most common reactive forces are

- kickback,
- pushback,
- pull-in.

#### Kickback:



Kickback may occur when the moving saw chain near the upper quadrant of the bar nose contacts a solid object or is pinched.



The reaction of the cutting force of the chain causes a rotational force on the chainsaw in the direction opposite to the chain movement. This may fling the bar up and back in an uncontrolled arc mainly in the plane of the bar. Under some cutting circumstances the bar moves towards the operator, who may suffer severe or fatal injury.

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

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

The type of bar and saw chain you use is an important factor in the occurrence and force of the kickback reaction. Some STIHL bar and chain types are designed to reduce kickback forces. STIHL recommends the use of reduced kickback bars and low kickback chains.

#### ANSI B 175.1-2000 chainsaw kickback standard

Section 5.11 of ANSI standard B 175.1-2000, sets certain performance and design criteria related to chainsaw kickback.

To comply with section 5.11 of ANSI B 175.1-2000:

- a) saws with a displacement of less than 3.8 cubic inches (62 cm<sup>3</sup>).
  - must, in their original condition, meet a 45° computer derived kickback angle when equipped with certain cutting attachments.
  - and must be equipped with at least two devices to reduce the risk of kickback injury, such as a chain brake, low kickback chain, reduced kickback bar, etc.
  
- b) saws with a displacement of 3.8 cubic inches (62 cm<sup>3</sup>) and above
  - must be equipped with at least one device designed to reduce the risk of kickback injury such as a chain brake, low kickback chain, reduced kickback bar, etc.

The computer derived angles for saws below 3.8 cubic inch (62 cm<sup>3</sup>) displacement are measured by applying a computer program to test results from a kickback test machine.

### **Warning!**

The computer derived angles of § 5.11 of ANSI B 175.1-2000 may bear no relationship to actual kickback bar rotation angles that may occur in real life cutting situations.

In addition, features designed to reduce kickback injuries may lose some of their effectiveness when they are no longer in their original condition, especially if they have been improperly maintained. Compliance with § 5.11 of ANSI B 175.1-2000 does not automatically mean that in a real life kickback the bar and chain will rotate at most 45°.

### **Warning!**

In order for powerheads below 3.8 cubic inch (62 cm<sup>3</sup>) displacement to comply with the computed kickback angle requirements of § 5.11 of ANSI B 175.1-2000 use only the following cutting attachments:

- bar and chain combinations listed as complying in the "Specifications" section of the Owner's Manual or
- other replacement bar and chain combinations marked in accordance with the standard for use on the powerhead or
- replacement chain designated "low kickback saw chain".

See the section on "Low kickback saw chain and reduced kickback bars"

### **Devices for reducing the risk of kickback injury**

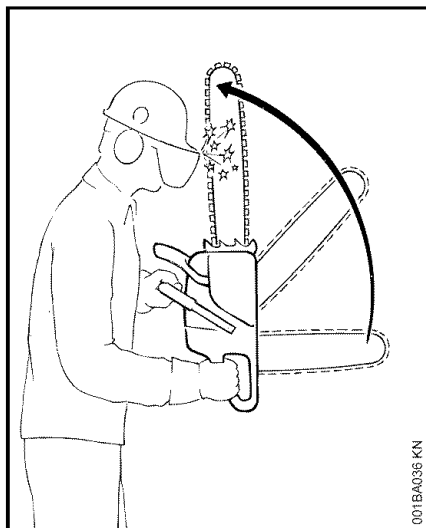
STIHL recommends the use of the STIHL Quickstop chain brake on your power-head with green labeled reduced kickback bars and low kickback chains.

### **Warning!**

To reduce the risk of injury, stop using the saw immediately if the chain brake does not function properly. Take the saw to your local STIHL Service Center! Do not use the saw until the problem has been rectified (see the section "Chain Brake").

### **Quickstop chain brake**

STIHL has developed a chain stopping system designed to reduce the risk of injury in certain kickback situations. It is called a Quickstop chain brake. The Quickstop is available as standard equipment on your STIHL chainsaw and is available for installation on most older STIHL saws. Ask your dealer to retrofit your older model saw with a chain brake.



When a kickback occurs, the guide bar may rotate around the front handle. If the cutting position is such that the operator's left hand is gripping the front handle behind the hand guard, and if the left hand rotates around the front handle and makes a sufficiently forceful contact with the front hand guard, which is the Quickstop activating lever, this contact will activate the Quickstop. The chain brake on most new model STIHL chainsaws can also be activated by inertia. See the chapter entitled "Chain Brake" of your Owner's Manual.

### **⚠ Warning!**

Never operate your chainsaw without a front hand guard. In a kickback situation this guard helps protect your left hand or other parts of your body. In addition, removal of the hand guard on a saw equipped with a chain brake will deactivate the chain brake.

### **⚠ Warning!**

No Quickstop or other chain brake device prevents kickback. These devices are designed to reduce the risk of kickback injury, if activated, in certain kickback situations. In order for the Quickstop to reduce the risk of kickback injury, it must be properly maintained and in good working order. See the chapter entitled "Chain Brake" and "Maintenance, Repair and Storing" of your Owner's Manual. In addition, there must be enough distance between the bar and the operator to ensure that the Quickstop has sufficient time to activate and stop the chain before potential contact with the operator.

### **⚠ Warning!**

An improperly maintained chain brake may increase the time needed to stop the chain after activation, or may not activate at all.

### **⚠ Warning!**

Never run the chainsaw above idle speed for more than 3 seconds when the chain brake is engaged or the chain is pinched or otherwise caught in the cut. Clutch slippage can cause excessive heat, leading to severe damage of the motor housing, clutch and oiler component and may interfere with the operation of the chain brake. If clutch slippage in excess of 3 seconds has occurred, allow the motor housing to cool before proceeding and check the operation of your chain brake as described in the chapter entitled "Chain Brake". Also make sure that the chain is not turning at idle speed (see above "Important Adjustments").

### **Low kickback saw chain and reduced kickback bars**

STIHL offers a variety of bars and chains. STIHL reduced kickback bars and low kickback chains are designed to

reduce the risk of kickback injury. Other chains are designed to obtain higher cutting efficiency or sharpening ease but may result in higher kickback tendency.

STIHL has developed a color codesystem to help you identify the STIHL reduced kickback bars and low kickback chains. Cutting attachments with green warning decals or green labels on the packaging are designed to reduce the risk of kickback injury. The matching of green decaled powerheads under 3.8 cubic inch (62 cm<sup>3</sup>) displacement with green labeled bars and green labeled chains gives compliance with the computed kickback angle requirements of ANSI B 175.1-2000 when the products are in their original condition. Products with yellow decals or labels are for users with extraordinary cutting needs and experience and specialized training for dealing with kickback.

**STIHL recommends the use of its green labeled reduced kickback bars, green labeled low kickback chains and a STIHL Quickstop chain brake for both experienced and inexperienced chainsaw users.**

Please ask your STIHL dealer to properly match your powerhead with the appropriate bar/chain combinations to reduce the risk of kickback injury. Green labeled bars and chains are recommended for all powerheads. See your "STIHL Bar and Chain Information" leaflet for details.

#### **Warning!**

Use of other, non-listed bar/chain combinations may increase kickback forces and increase the risk of kickback injury. New bar/chain combinations may be developed after publication of this literature, which will, in combination with certain powerheads, comply with § 5.11 of ANSI B 175.1-2000. Check with your STIHL dealer for such combinations.

#### **Warning!**

Reduced kickback bars and low kickback chains do not prevent kickback, but they are designed to reduce the risk of kickback injury. They are available from your STIHL dealer.

#### **Warning!**

Even if your saw is equipped with a Quickstop, a reduced kickback bar and/or low kickback chain, this does not eliminate the risk of injury by kickback. Therefore, always observe all safety precautions to avoid kickback situations.

### **Low kickback chain**

Some types of saw chain have specially designed components to reduce the force of nose contact kickback. STIHL has developed low kickback chain for your powerhead.

"Low kickback saw chain" is a chain which has met the kickback performance requirements of § 5.11.2.4 of ANSI B 175.1-2000 (Safety Requirements for Gasoline-Powered ChainSaws) when tested in its original condition on a selected representative sample of chainsaws below 3.8 cubic inch (62 cm<sup>3</sup>) displacement specified in ANSI B 175.1-2000.

#### **Warning!**

There are potential powerhead and bar combinations with which low kickback saw chains can be used which have not been specifically certified to comply with the 45° computer derived kickback angle of § 5.11 of ANSI B 175.1-2000. Some low kickback chains have not been tested with all powerhead and bar combinations.

#### **Warning!**

A dull or improperly sharpened chain may reduce or negate the effects of the design features intended to reduce

kickback energy. Improper lowering or sharpening of the depth gauges or shaping of the cutters may increase the chance and the potential energy of a kickback. Always cut with a properly sharpened chain.

### Reduced kickback bar

STIHL green labeled reduced kickback bars are designed to reduce the risk of kickback injury when used with STIHL green labeled low kickback chains.

#### **Warning!**

When used with other, more aggressive chains, these bars may be less effective in reducing kickback, and may result in higher kickback forces.

### Bow Guides

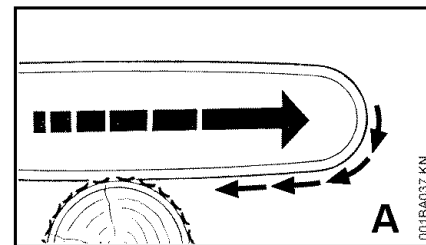
#### **Warning!**

Do not mount a bow guide on any STIHL chainsaw. Any chainsaw equipped with a bowguide is potentially very dangerous. The risk of kickback is increased with a bow guide because of the increased kickback contact area. Low kickback chain will not significantly reduce the risk of kickback injury when used on a bow guide.

### To avoid kickback

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

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



#### **A = Pull-in:**

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

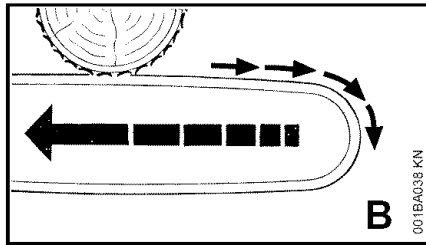
Pull-in frequently occurs when the bumper spike of the saw is not held securely against the tree or limb and when the chain is not rotating at full speed before it contacts the wood.

#### **Warning!**

Use extreme caution when cutting small size brush and saplings which may easily catch the chain and pull you off balance.

### To avoid pull-in

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



### B = Pushback:

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

### To avoid pushback

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

## Cutting Techniques

### Felling

Felling is cutting down a tree.

Before felling a tree, consider carefully all conditions which may affect the direction of fall, including:

The intended direction of the fall.

The natural lean of the tree.

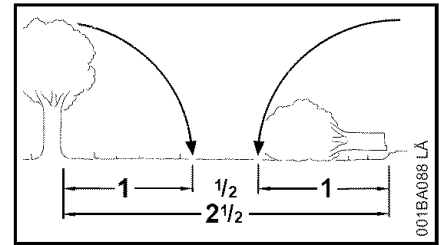
Any unusually heavy limb structure.

Surrounding trees and obstacles.

The wind direction and speed.

### Warning!

Always observe the general condition of the tree. Inexperienced users should never attempt to cut trees which are decayed or rotted inside or which are leaning or otherwise under tension. There is an increased risk that such trees could snap or split while being cut and cause serious or fatal injury to the operator or bystanders. Also look for broken or dead branches which could vibrate loose and fall on the operator. When felling on a slope, the operator should stand on the uphill side if possible.



### Felling Instructions:

When felling, maintain a distance of at least 2 1/2 tree lengths from the nearest person.

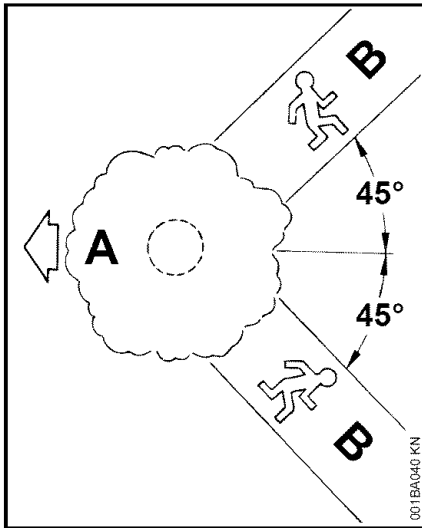
When felling in the vicinity of roads, railways and power lines, etc., take extra precautions. Inform the police, utility company or railway authority before beginning to cut.

### Warning!

The noise of your engine may drown any warning call.

### Warning!

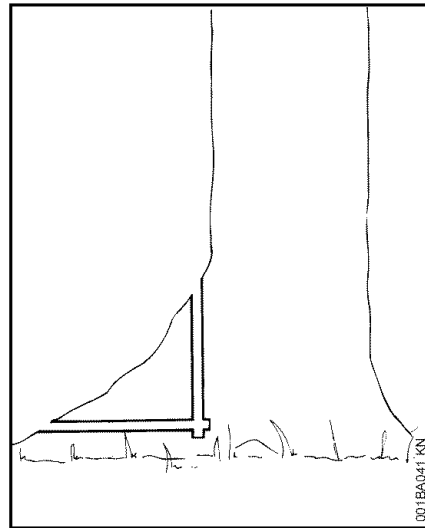
There are a number of factors that may affect and change the intended direction of fall, e.g. wind, lean of tree, sloping ground, one-sided limb structure, wood structure, decay, snow load, etc. To reduce the risk of severe or fatal injury to yourself or others, look for these conditions prior to beginning the cut, and be alert for a change in direction while the tree is falling.



### Escape path

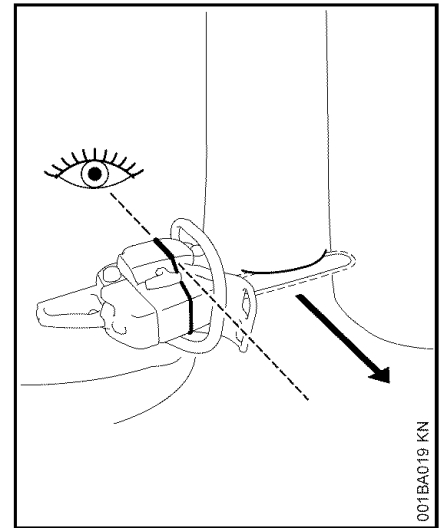
First clear the tree base and work area from interfering limbs and brush and clean its lower portion with an ax.

Then, establish two paths of escape (B) and remove all obstacles. These paths should be generally opposite to the planned direction of the fall of the tree (A) and about at a 45° angle. Place all tools and equipment a safe distance away from the tree, but not on the escape paths.



### Buttress roots

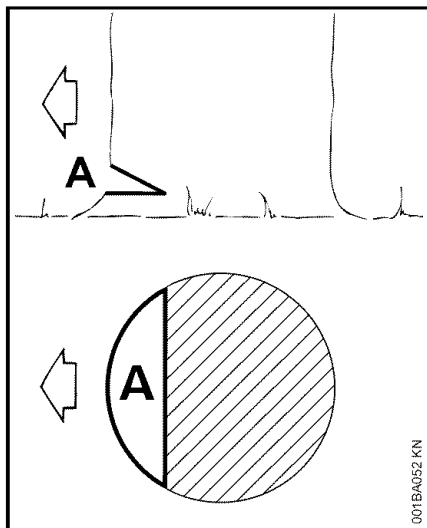
If the tree has large buttress roots, cut into the largest buttress vertically first (horizontally next) and remove the resulting piece.



### Gunning sight

When making the felling notch, use the gunning sight on the shroud and housing to check the required direction of fall:

- Position the saw so that the gunning sight points exactly in the direction you want the tree to fall.

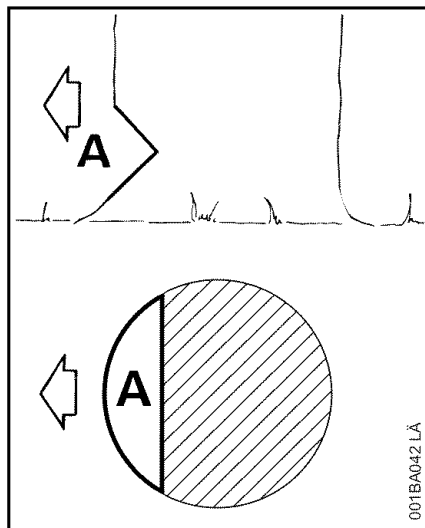


### Conventional cut

**A** = felling notch - determines the direction of the fall

For a conventional cut:

- Properly place felling notch perpendicular to the line of fall, close to the ground
- Cut down at app. 45-degree angle to a depth of about 1/5 to 1/4 of the trunk diameter
- Make second cut horizontal
- Remove resulting 45-degree piece

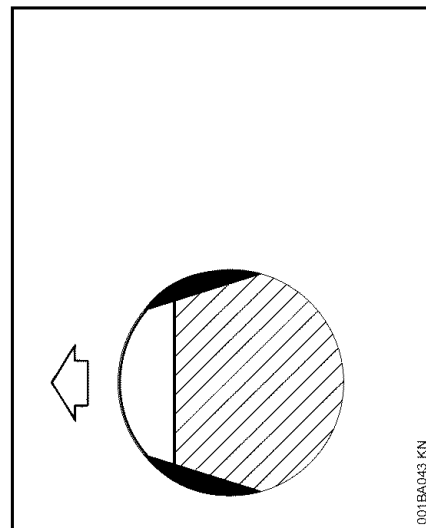


### Open-face technique

**A** = felling notch - determines the direction of the fall

For an open-face cut:

- Properly place felling notch perpendicular to the line of fall, close to the ground
- Cut down at app. 50-degree angle to a depth of app. 1/5 to 1/4 of the trunk diameter
- Make second cut from below at app. 40 degree angle
- Remove resulting 90-degree piece

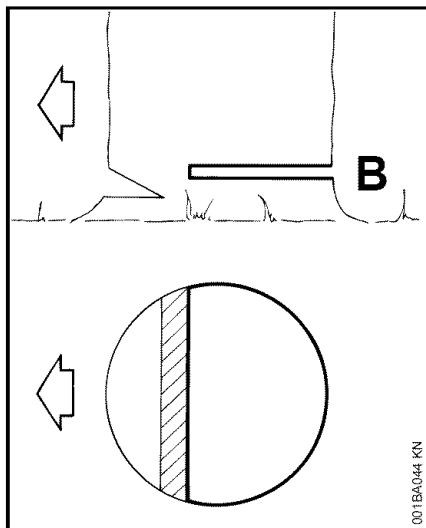


### Making sapwood cuts

- For medium sized or larger trees make cuts at both sides of the trunk, at same height as subsequent felling cut.
- Cut to no more than width of guide bar.

This is especially important in softwood in summer - it helps prevent sapwood splintering when the tree falls.



**B = Felling cut**

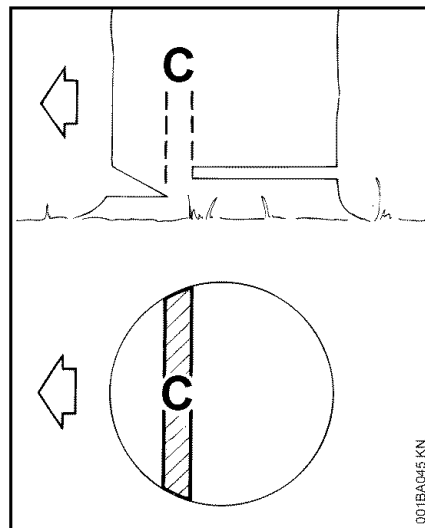
Conventional and open-face technique:

- Begin 1 to 2 inches (2,5 to 5 cm) higher than centre of felling notch
- Cut horizontally towards the felling notch
- Leave approx. 1/10 of diameter uncut. This is the hinge
- Do not cut through the hinge - you could lose control of the direction of the fall

Drive wedges into the felling cut where necessary to control the fall.

**⚠ Warning!**

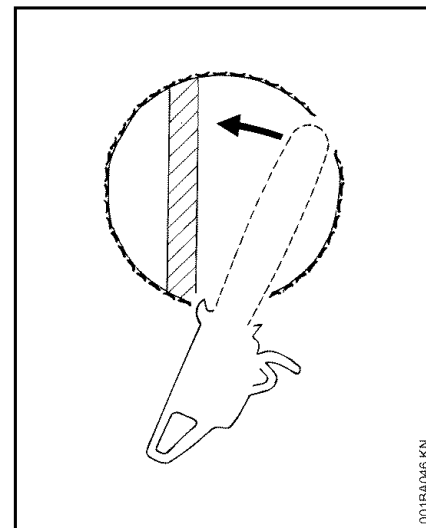
If the tip of the bar contacts a wedge, it may cause kickback. Wedges should be of wood or plastic - never steel, which can damage the chain.

**C = Hinge**

- Helps control the falling tree
- Do not cut through the hinge - you could lose control of the direction of the fall

**⚠ Warning!**

In order to reduce the risk of personal injury, never stand directly behind the tree when it is about to fall, since part of the trunk may split and come back towards the operator (barber-chairing), or the tree may jump backwards off the stump. Always keep to the side of the falling tree. When the tree starts to fall, withdraw the bar, shut off the engine and walk away on the preplanned escape path. Watch out for falling limbs.

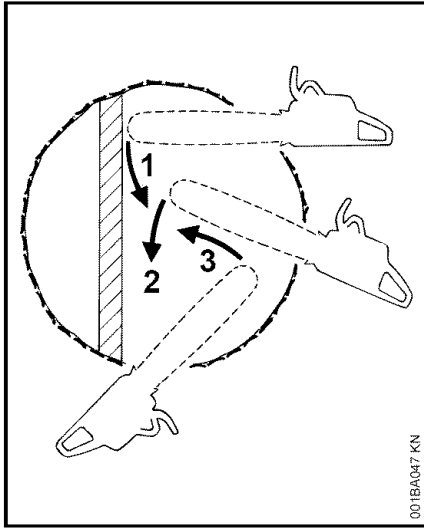


**⚠ Warning!**

Be extremely careful with partially fallen trees which are poorly supported. When the tree hangs or for some other reason does not fall completely, set the saw aside and pull the tree down with a cable winch, block and tackle or tractor. If you try to cut it down with your saw, you may be injured.

**Felling cut for small diameter trees: simple fan cut**

Engage the bumper spikes of the chainsaw directly behind the location of the intended hinge and pivot the saw around this point only as far as the hinge. The bumper spike rolls against the trunk.



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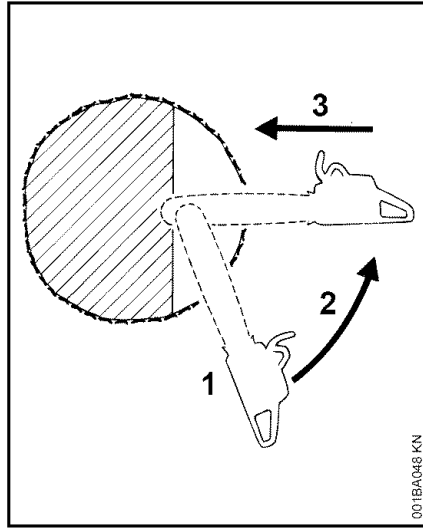
### Felling cut for large diameter trees:

#### **⚠ Warning!**

Felling a tree that has a diameter greater than the length of the guide bar requires use of either the sectioning felling cut or plunge-cut method. These methods are extremely dangerous because they involve the use of the nose of the guide bar and can result in kickback. Only properly trained professionals should attempt these techniques.

#### **Sectioning method**

For the sectioning method make the first part of the felling cut with the guide bar fanning in toward the hinge. Then, using the bumper spike as a pivot, reposition the saw for the next cut.

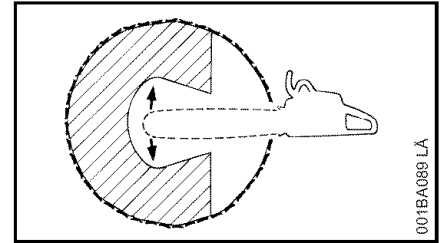


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Avoid repositioning the saw more than necessary. When repositioning for the next cut, keep the guide bar fully engaged in the kerf to keep the felling cut straight. If the saw begins to pinch, insert a wedge to open the cut. On the last cut, do not cut the hinge.

#### **Plunge-cut method**

Timber having a diameter more than twice the length of the guide bar requires the use of the plunge-cut method before making the felling cut.



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First, cut a large, wide felling notch. Make a plunge cut in the centre of the notch.

The plunge cut is made with the guide bar nose. Begin the plunge cut by applying the lower portion of the guide bar nose to the tree at an angle. Cut until the depth of the kerf is about the same as the width of the guide bar. Next, align the saw in the direction in which the recess is to be cut.

With the saw at full throttle, insert the guide bar in the trunk.

Enlarge the plunge cut as shown in the illustration.

#### **⚠ Warning!**

There is an extreme danger of kickback at this point. Extra caution must be taken to maintain control of the saw. To make the felling cut, follow the sectioning method described previously.

If you are inexperienced with a chainsaw, plunge-cutting should not be attempted. Seek the help of a professional.

### Limbing

Limbing is removing the branches from a fallen tree.

#### Warning!

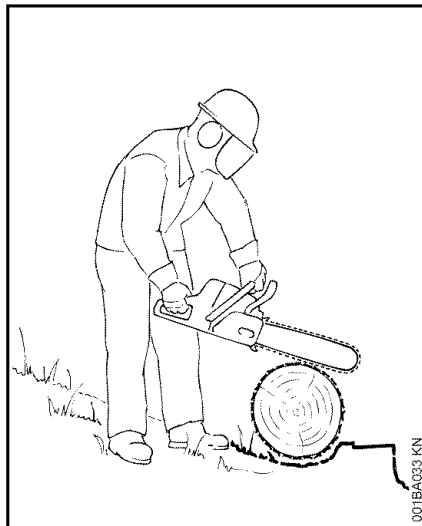
There is an extreme danger of kickback during the limbing operation. Do not work with the nose of the bar. Be extremely cautious and avoid contacting the log or other limbs with the nose of the guide bar.

Do not stand on a log while limbing it - you may slip or the log may roll.

Start limbing by leaving the lower limbs to support the log off the ground. When underbucking freely hanging limbs, a pinch may result or the limb may fall, causing loss of control. If a pinch occurs, stop the engine and remove the saw, by lifting the limb.

#### Warning!

Be extremely cautious when cutting limbs or logs under tension (spring poles). The limbs or logs could spring back toward the operator and cause loss of control of the saw and severe or fatal injury to the operator.

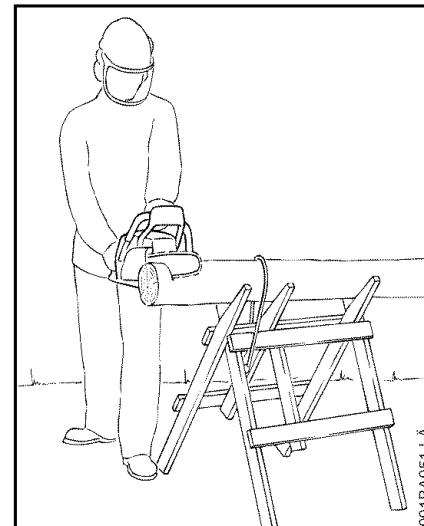


### Bucking

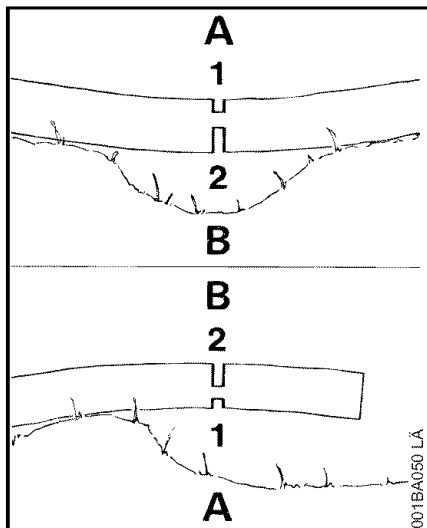
Bucking is cutting a log into sections.

#### Warning!

1. When bucking, do not stand on the log. Make sure the log will not roll downhill. If on a slope, stand on the uphill side of the log. Watch out for rolling logs.



2. Cut only one log at a time.
3. Shattered wood should be cut very carefully. Sharp splinters of wood may be caught and flung in the direction of the operator of the saw.
4. When cutting small logs, place log through "V" - shaped supports on top of a sawhorse. Never permit another person to hold the log. Never hold the log with your leg or foot.



5. Logs under strain: Risk of pinching!  
Always start relieving cut (1) at compression side (A). Then make bucking cut (2) at tension side (B). If the saw pinches, stop the engine and remove it from the log.
6. Only properly trained professionals should work in an area where the logs, limbs and roots are tangled. Working in blow down areas is extremely hazardous.
7. Drag the logs into a clear area before cutting. Pull out exposed and cleared logs first.

## MAINTENANCE, REPAIR AND STORING

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any nonroad engine repair establishment or individual. However if you claim warranty for a component which has not been serviced or maintained properly or if nonapproved replacement parts were used, STIHL may deny warranty.

Never operate a chainsaw that is damaged, improperly adjusted or not completely or securely assembled. Follow the maintenance and repair instructions in the appropriate section of your Owner's Manual, especially those in the chapters "Mounting the Bar and Chain", "Maintaining and Sharpening" and "Chain Brake".

### ⚠ Warning!

Use only STIHL replacement parts for maintenance and repair. Use of parts manufactured by others may cause serious or fatal injury.

### ⚠ Warning!

Always stop the engine and ensure that the chain is stopped before making any adjustments, maintenance or repair work,

changing the saw chain or cleaning the saw. Do not attempt any maintenance or repair work not described in your Owner's Manual. Have such work performed at your STIHL service shop only.

### ⚠ Warning!

Never test the ignition system with ignition wire terminal removed from sparkplug or with unseated spark plug, since uncontained sparking may cause a fire.

### ⚠ Warning!

To reduce the risk of fire and burn injury, use only spark plugs authorized by STIHL. Always press spark plug boot snugly onto spark plug terminal of the proper size. (Note: If terminal has detachable SAE adapter nut, it must be attached.) A loose connection between spark plug terminal and ignition wire connector in the boot may create arcing that could ignite combustible fumes and cause a fire. Keep spark plug clean, and make sure ignition lead is in good condition.

### ⚠ Warning!

Do not operate your chainsaw if the muffler is damaged, missing or modified. An improperly maintained muffler will increase the risk of fire and hearing loss. Never touch a hot muffler or burn will

result. If your muffler was equipped with a spark-arresting screen to reduce the risk of fire (e. g. in the USA, Canada and Australia), never operate your saw if the screen is missing or damaged.

Remember that the risk of forest fires is greater in hot or dry weather.

Keep the chain, bar and sprocket clean; replace worn sprockets or chains. Keep the chain sharp.

You can spot a dull chain when easy-to-cut wood becomes hard to cut and burn marks appear on the wood.

Keep the chain at proper tension.

Tighten all nuts, bolts and screws except the carburetor adjustment screws after each use.

### **Warning!**

In order for the chain brake on your STIHL chainsaw to properly perform its function of reducing the risk of kickback and other injuries, it must be properly maintained. Like an automobile brake, a chainsaw chain brake incurs wear each time it is engaged.

The amount of wear will vary depending upon usage, conditions under which the saw is used and other factors. Excessive wear will reduce the effectiveness of the chain brake and can render it inoperable.

For the proper and effective operation of the chain brake the brake band and clutch drum must be kept free of dirt, grease and other foreign matter which may reduce friction of the band on the drum.

For these reasons, each STIHL chainsaw should be returned to trained personnel such as your STIHL servicing dealer for periodic inspection and servicing of the brake system according to the following schedule:

Heavy usage - every three months,

Moderate usage - twice a year,

Occasional usage - annually.

The chainsaw should also be returned immediately for maintenance whenever the brake system cannot be thoroughly cleaned or there is a change in its operating characteristics.

For any maintenance please refer to the maintenance chart **and to the warranty statement** near the end of this manual.

Additionally, the daily maintenance schedule for your chainsaw set forth in your STIHL Owner's Manual should be strictly followed.

Store chainsaw in a dry place and away from children. Before storing for longer than a few days, always empty the fuel tank (see chapter "Storing the Machine" in this manual).

## Maintenance Chart

Please note that the following maintenance intervals apply for normal operating conditions only. If your daily working time is longer than normal or cutting conditions are difficult (very dusty work area, resin-rich wood, tropical wood etc.), shorten the specified intervals accordingly. If you only use the saw occasionally, extend the intervals accordingly.		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	every 12 months	if problem	if damaged	as required
Complete machine	Visual inspection (condition, leaks)	X		X						
	Clean		X							
Throttle trigger, trigger interlock, Master Control	Check operation	X		X						
Chain brake	Check operation	X		X						
	Check <sup>1)2)</sup>									X
Pickup body/filter in fuel tank	Check					X				
	Clean, replace filter element					X		X		
	Replace pickup body						X		X	X
Fuel tank	Clean					X				
Chain oil tank	Clean					X				
Chain lubrication	Check	X								
Saw chain	Inspect, also check sharpness	X		X						
	Check chain tension	X		X						
	Sharpen									X
Guide bar	Check (wear, damage)	X								
	Clean and turn over									X
	Deburr				X					
	Replace								X	X
Chain sprocket	Check				X					
	Clean							X		X
Air filter	Replace								X	
	Inspect							X		X
AV elements (rubber buffers, springs)	Replace <sup>1)</sup>								X	
	Inspect									
Cooling inlets	Clean		X							
Cylinder fins	Clean		X			X				

1) STIHL dealer

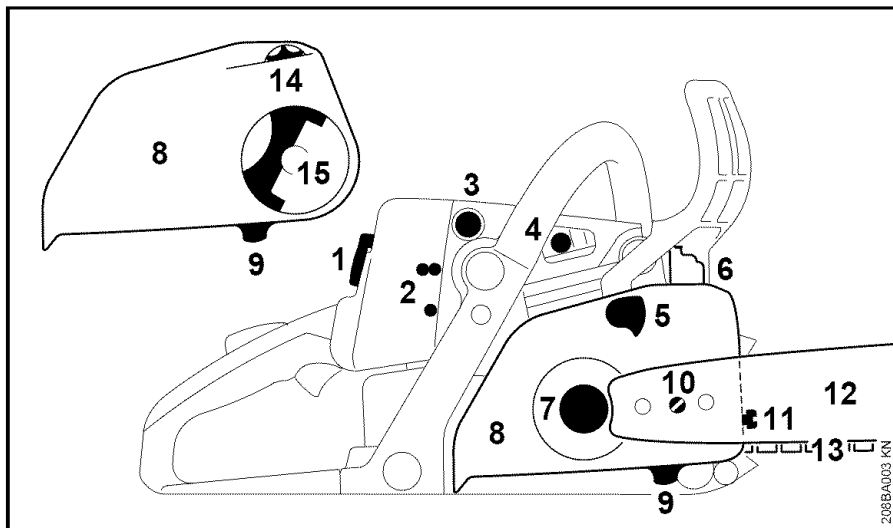
2) see "Chain brake"

Please note that the following maintenance intervals apply for normal operating conditions only. If your daily working time is longer than normal or cutting conditions are difficult (very dusty work area, resin-rich wood, tropical wood etc.), shorten the specified intervals accordingly. If you only use the saw occasionally, extend the intervals accordingly.		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	every 12 months	if problem	if damaged	as required
Carburetor	Check idle adjustment – chain must not rotate	X		X						
	Readjust idle									X
Spark plug	Readjust electrode gap						X			
All accessible screws and nuts (not adjusting screws) <sup>2)</sup>	Retighten									X
Spark arresting screen* in muffler	Inspect						X			
	Clean or replace								X	
Chain catcher	Check	X								
	Replace								X	

- 2) Firmly tighten cylinder base screws of professional saws (3.4 kW or more) after 10 to 20 hours of operation

\* see “Guide to Using this Manual“

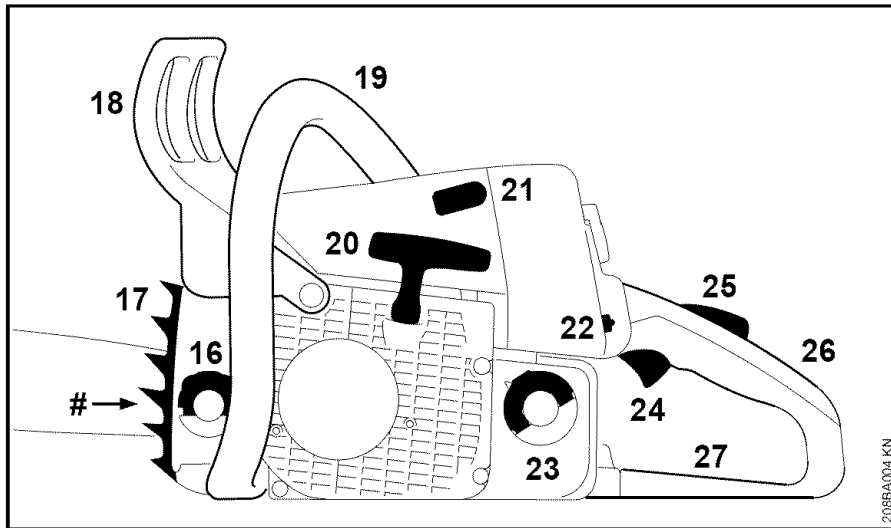
## Main Parts of the Saw



- 1 Twist lock
- 2 Carburetor adjusting screws
- 3 Fuel pump (easy start\*)
- 4 Decompression valve\*
- 5 Chain brake
- 6 Muffler
- 7 Chain sprocket
- 8 Chain sprocket cover
- 9 Chain catcher
- 10 Chain tensioner (side)
- 11 Chain tensioner (front)
- 12 Guide bar
- 13 Oilomatic saw chain
- 14 Adjusting wheel of quick tensioner\*
- 15 Handle of wingnut\* (quick chain tensioner)

\* see "Guide to Using this Manual"





- 16 Oil filler cap
- 17 Bumper spike
- 18 Front hand guard
- 19 Front handle (handelbar)
- 20 Starter grip
- 21 Spark plug boot
- 22 Master Control lever
- 23 Fuel filler cap
- 24 Throttle trigger
- 25 Throttle trigger interlock
- 26 Rear handle
- 27 Rear hand guard
- # Serial number

## Definitions

- 1 Twist Lock**  
Lock for carburetor box cover.
- 2 Carburetor Adjusting Screws**  
For fine tuning the carburetor.
- 3 Fuel Pump**  
Fills carburetor with fuel to simplify starting.
- 4 Decompression Valve**  
Releases compression pressure to make starting easier.
- 5 Chain Brake**  
A device to stop the rotation of the chain if activated in a kickback situation by the operator's hand or by inertia.
- 6 Muffler**  
Reduces engine exhaust noise and directs the exhaust gases.
- 7 Chain Sprocket**  
The toothed wheel that drives the saw chain.
- 8 Chain Sprocket Cover**  
Covers the clutch and the sprocket.
- 9 Chain Catcher**  
Helps to reduce the risk of operator contact by a chain if it breaks or comes off the bar.
- 10 Chain Tensioner**  
Permits precise adjustment of chain tension.
- 11 Chain Tensioner**  
Permits precise adjustment of chain tension.
- 12 Guide Bar**  
Supports and guides the saw chain.
- 13 Oilomatic Saw Chain**  
A loop consisting of cutters, tie straps and drive links.
- 14 Adjusting Wheel**  
Permits precise adjustment of chain tension.
- 15 Handle of Wingnut**  
Must be released to allow chain to be tensioned with adjusting wheel.
- 16 Oil Filler Cap**  
For closing the oil tank.
- 17 Bumper Spike**  
Toothed stop for holding saw steady against wood.
- 18 Front Hand Guard**  
Provides protection against projecting branches and helps prevent left hand from touching the chain if it slips off the handlebar. It also serves as the lever for chain brake activation.
- 19 Front Handle (Handlebar)**  
Handlebar for the left hand at the front of the saw.
- 20 Starter Grip**  
The grip of the starter, for starting the engine.
- 21 Spark Plug Boot**  
Connects the spark plug with the ignition wire.
- 22 Master Control Lever**  
Lever for choke control, starting throttle, run and stop positions.
- 23 Fuel Filler Cap**  
For closing the fuel tank.
- 24 Throttle Trigger**  
Controls the speed of the engine.
- 25 Throttle Trigger Interlock**  
Must be depressed before the throttle trigger can be activated.

**26 Rear Handle**

The support handle for the right hand, located at the rear of the saw.

**27 Rear Hand Guard**

Gives added protection to operator's right hand.

**Guide Bar Nose**

The exposed end of the guide bar.  
(not illustrated, see chapter "Tensioning the Saw Chain")

**Clutch**

Couples engine to chain sprocket when engine is accelerated beyond idle speed (not illustrated).

**Anti-Vibration System**

The anti-vibration system includes a number of buffers designed to reduce the transmission of vibrations created by the engine and cutting attachment to the operator's hands (not illustrated).



 **WARNING!**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**0457 184 3021**

**englisch / English USA**