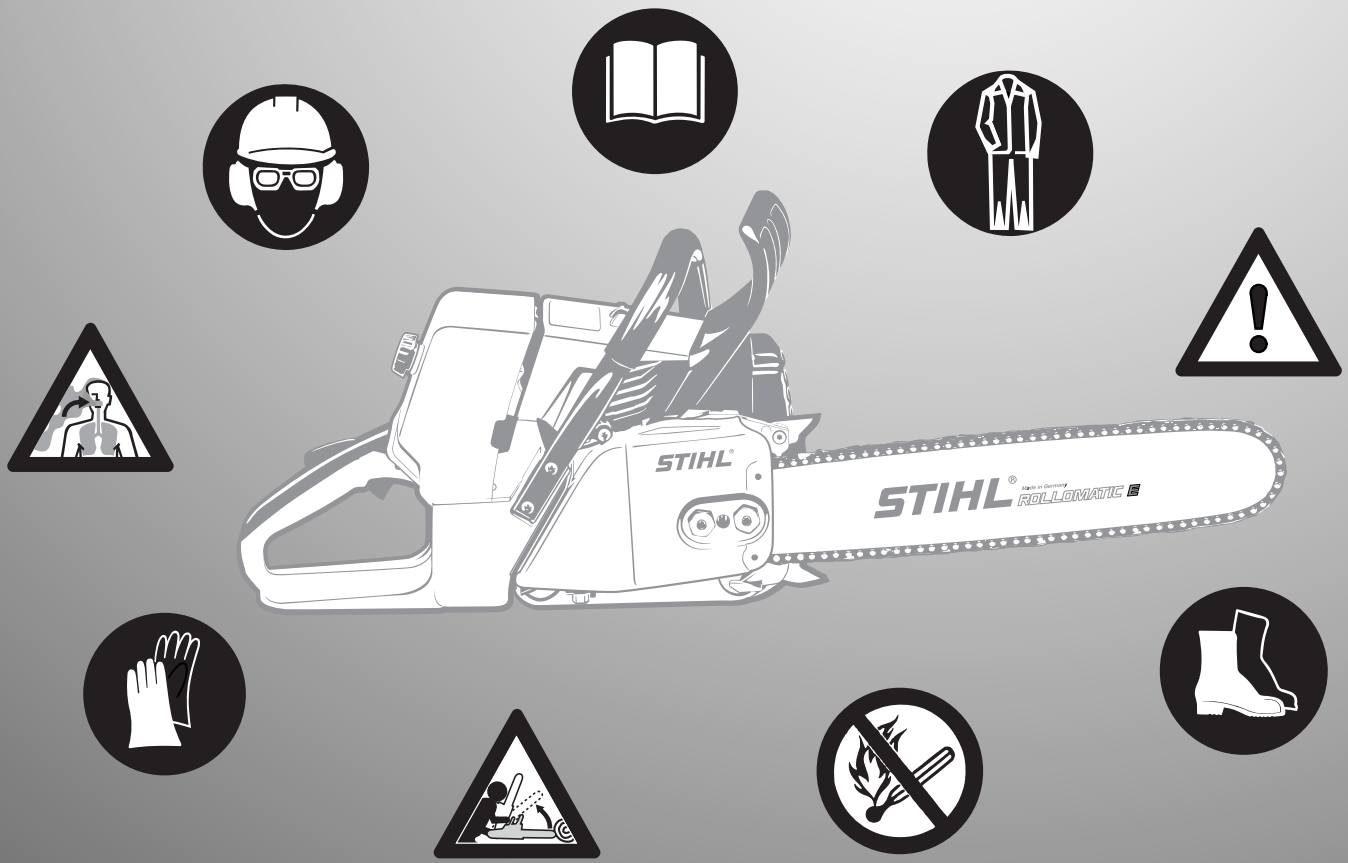
Chain Saw
Safety Manual



Contents

This manual contains the safety precautions and recommended cutting techniques outlined in STIHL chainsaw instruction manuals.

Please note, that the illustrations in the chapter on "Main Parts of the Machine" show the MS 210.

Other chainsaw models may have different parts and controls.

This manual contains references to various chapters in the instruction manuals of specific machines.

You should therefore always refer to the instruction manual of your particular saw model.

Please contact your STIHL dealer if you have any queries after reading this manual.

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Safety Precautions and Working Techniques

Because a chainsaw is a high-speed wood-cutting tool with sharp cutters, some special safety precautions must be observed in addition to those that generally apply when working with an axe or hand saw.

It is important that you read and understand the instruction manual before using your chainsaw for the first time and keep it in a safe place for future reference. Non-observance of the safety precautions may result in serious or even fatal injury.

Always observe local safety regulations, standards and ordinances.

If you have never used this chainsaw model before:
Have your STIHL dealer show you how to operate your chainsaw or attend a special course of training in chainsaw operation.

Minors should never be allowed to use a chainsaw. Children, bystanders and animals should not be allowed in the area where a chainsaw is in use.

When the machine is not in use (work break), shut it off so that it does not endanger others and secure it against unauthorized use.

The chainsaw user is responsible for accidents or risks involving third parties or their property.

Do not lend or rent your chainsaw without the instruction manual. Be sure that anyone using your saw understands the information contained in this manual.

You must be rested, healthy and in good physical condition to operate a power tool.

Persons with pacemakers only:
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.

Do not operate this power tool while under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgment.

To **reduce the risk of accidents or injury,** put off the work in poor weather conditions (rain, snow, ice, wind).

Use your saw for cutting wood or wooden objects only.

Do not use your chainsaw for any other purpose since this may result in accidents or damage to the machine. Never attempt to modify your chainsaw in any way since this can be extremely dangerous and may also result in accidents or damage to the machine.

Only use tools, guide bars, chains, chain sprockets and accessories that are explicitly approved for this chainsaw model by STIHL or are technically identical. If you have any questions in this respect, consult a specialist dealer. Use only high quality replacement parts since there is otherwise a risk of accidents or damage to the machine.

STIHL recommends the use of STIHL original tools, guide bars, chains, chain sprockets and accessories. The characteristics of these components are specifically designed to match your chainsaw model and meet your performance requirements.

Clothing and Equipment

Wear proper protective clothing and equipment.

Clothing must be sturdy but allow complete freedom of movement. Wear snug-fitting clothing with **cut retardant inserts** – a safety combination, not a coat.

Do not wear loose-fitting garments, scarves, jewelery or anything that could restrict movement or become entangled with the saw, wood or brush. Tie up and confine long hair (e.g. with a hair net, cap, hard hat, etc.).

Wear steel-toed **safety boots** with non-slip soles.

Wear a **safety hard hat** where there is a danger of head injuries from falling objects.

Wear **safety glasses** or a **face shield** and hearing protection, e.g. ear plugs or ear muffs.

Wear **heavy-duty gloves,** preferably made of leather.

STIHL offers a comprehensive range of safety clothing and equipment.

Transporting the Chainsaw

Always engage the chain brake and fit the chain guard (scabbard) before carrying the saw short distances. Also stop the engine before carrying the saw longer distances (more than about 50 m).

Always carry the saw by the front handle (handlebar) – with the hot muffler away from your body – the guide bar must point to the rear. To avoid serious burn injuries, avoid touching hot parts of the machine, especially the surface of the muffler.

Transporting by vehicle: When transporting in a vehicle, properly secure your saw to prevent turnover, fuel spillage and damage.

Fueling

Gasoline is an extremely flammable fuel. Keep clear of naked flames and fire. Do not spill any fuel – do not smoke.

Stop the engine before refueling.

Do not refuel while the engine is still hot since fuel may overflow and catch fire.

Open the fuel cap carefully to allow any pressure build-up in the tank to release slowly.

Fuel your chainsaw in a well-ventilated area, outdoors only. If you spill fuel, wipe the saw immediately – if fuel gets on your clothing, change immediately.

Different models may be equipped with different fuel caps.

After fueling, tighten down the screw-type fuel cap as securely as possible.

Insert the fuel cap with hinged grip (bayonet type cap) correctly in the opening, turn it clockwise as far as stop and fold the grip down.

This reduces the risk of unit vibrations causing the fuel cap to loosen or come off and spill quantities of fuel.

Before Starting

Check that saw is properly assembled and in good condition – refer to appropriate chapters in the instruction manual:

- Check operation of chain brake, front hand guard
- Correctly mounted guide bar
- Correctly tensioned chain
- Smooth action of throttle trigger and throttle trigger interlock – throttle trigger must return automatically to idle position
- Master control/stop switch must move easily to **STOP** or **0**
- Check that spark plug boot is secure – a loose boot may cause arcing that could ignite combustible fumes and cause a fire
- Never attempt to modify the controls or safety devices
- Keep the handles dry and clean – free from oil and pitch – for safe control.

To reduce risk of personal injury, do not operate your saw if it is damaged or not properly assembled.

Starting the Engine

Start the engine at least 3 meters from the fueling spot, outdoors only.

Your chain saw is a one-person saw. Do not allow other persons near the running chainsaw. Start and operate your saw without assistance.

To reduce risk of chain rotation and personal injury, lock the chain with the chain brake before starting.

Do not drop start the chainsaw.
The correct starting procedure is described in your instruction manual.

Do not attempt to start the saw when the saw chain is in a cut.

During Operation

In the event of impending danger or in an emergency, switch off the engine immediately by moving the Master Control / stop switch to ▮ or STOP.

Never allow the chainsaw to run unattended.

When the engine is running:
Note that the chain continues to rotate for a short period after you let go of the throttle trigger – flywheel effect.

Take special care in slippery conditions – damp, snow, ice, on slopes, uneven ground and freshly debarked logs.

Avoid stumbling on stumps, roots, rocks or in ditches.

Ensure you always have a firm and safe footing.

Do not work alone – keep within calling distance of others in case help is needed.

Be particularly alert and cautious when wearing hearing protection because your ability to hear warnings (shouts, alarms, etc.) is restricted.

To reduce the risk of accidents, take a break in good time to avoid tiredness or exhaustion.

To reduce risk of fire, keep hot exhaust gases and hot muffler away from easily combustible materials (e.g. wood chips, bark, dry grass, fuel).
Mufflers with a catalytic converter can become particularly hot.

Your chainsaw produces toxic exhaust fumes as soon as the engine is running. These fumes may be colorless and odorless. Never run the engine indoors or in poorly ventilated locations, even if your model is equipped with a catalytic converter.

To reduce the risk of serious or fatal injury from breathing toxic fumes, ensure proper ventilation when working in trenches, hollows or other confined locations.

The dusts (e.g. sawdust) produced during cutting may be dangerous to health. If the work area is very dusty, wear a respirator.

To reduce risk of fire, **do not smoke** while operating or standing near your chainsaw. Note that combustible fuel vapor may escape from the fuel system.

If your chainsaw is subjected to unusually high loads for which it was not designed (e.g. heavy impact or a fall), always check that it is in good condition before continuing cutting work – see also “Before Starting”.

Check the fuel system for leaks and make sure the safety devices are working properly. Do not continue operating your saw if it is damaged. In case of doubt, have saw checked by your servicing dealer.

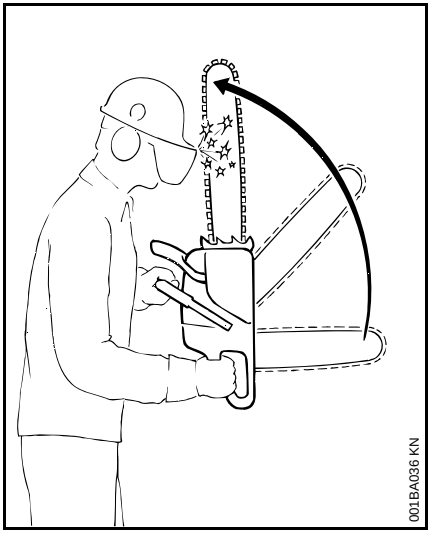
Make sure the chain does not rotate while the engine is idling. If necessary, adjust idle speed properly. If the chain still rotates, have the saw checked by your servicing dealer.

Reactive Forces

The most common reactive forces that occur during cutting are: kickback, pushback and pull-in.

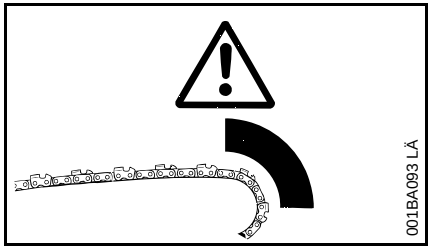
Dangers of kickback

Kickback can result in serious or fatal injury.



Kickback occurs when the saw is suddenly thrown up and back in an uncontrolled arc towards the operator.

Kickback occurs, e.g.



- when the upper quadrant of the bar nose unintentionally contacts wood or another solid object, e.g. when another limb is touched accidentally during limbing
- when the chain at the nose of the guide bar is pinched in the cut.

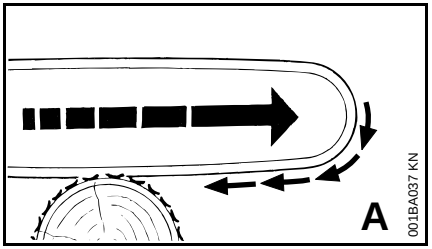
Quickstop chain brake:

This device reduces the risk of injury in certain situations - it cannot prevent kickback. If activated, the brake stops the saw chain within a fraction of a second – for a description of this device refer to chapter on "Chain brake" in this manual.

To reduce the risk of kickback:

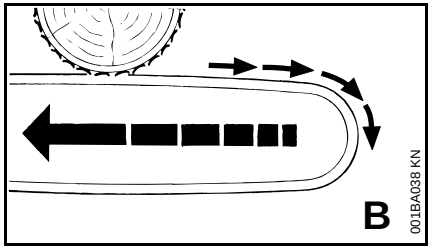
- Work cautiously and avoid situations which could cause kickback.
- Hold the chainsaw firmly with both hands and maintain a secure grip.
- Always cut at full throttle.
- Be aware of the location of the guide bar nose at all times.
- Do not cut with the bar nose.
- Take special care with small, tough limbs, they may catch the chain.
- Never cut several limbs at once.
- Do not overreach.
- Never cut above shoulder height.
- Use extreme caution when re-entering a previous cut.
- Do not attempt plunge cuts if you are not experience in this cutting technique
- Be alert for shifting of the log or other forces that may cause the cut to close and pinch the chain.
- Always cut with a correctly sharpened, properly tensioned chain – the depth gauge setting must not be too large.
- Use a low kickback chain and a narrow radius guide bar.

A = Pull-in



Pull-in occurs when the chain on the bottom of the bar is suddenly pinched, caught or encounters a foreign object in the wood. The reaction of the chain pulls the saw forward.
Always hold the spiked bumper securely against the tree or limb.

B = Pushback



Pushback occurs when the chain on the top of the bar is suddenly pinched, caught or encounters a foreign object in the wood. The reaction of the chain drives the saw straight back toward the operator.

To avoid pushback:

– Be alert to situations that may cause the top of the guide bar to be pinched.
– Do not twist the guide bar in the cut.

Exercise extreme caution:

– with leaners
– with trees that have fallen unfavorably between other trees and are under strain
– when working in blowdown areas.

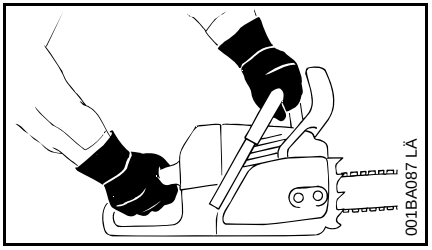
Do not work with the chainsaw in such circumstances. Use block and tackle, cable winch or tractor.

Pull out exposed and cleared logs. Select clear area for cutting.

Deadwood (dry, decayed or rotted wood) represents a considerable risk that is difficult to assess. Identifying the extent of the dangers is complicated, if not impossible. Use aids such as a cable winch or tractor in such cases.

When felling in the vicinity of roads, railways, power lines, etc., take extra precautions. If necessary, inform the police, utility company or railway authority

Holding and Controlling the Saw



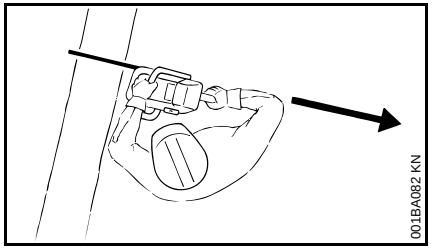
Always **hold your saw firmly with both hands** – right hand on the rear handle, even if you are left-handed. To ensure safe control, wrap your fingers tightly around the front handle and control handle.

Cutting

Do not operate your chainsaw with the starting throttle lock engaged. Engine speed cannot be controlled with the throttle trigger in this position.

Work calmly and carefully – in daylight conditions and only when visibility is good – ensure you do not endanger others – stay alert at all times.

Use the shortest possible guide bar: The chain, guide bar and chain sprocket must match each other and your saw.



Position the saw so that your body is clear of the cutting attachment.

Always pull the saw out of the cut with the chain running.

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

Do not underbuck freely hanging limbs.

To reduce the risk of injury, take special care when cutting shattered wood – sharp slivers of wood may be caught and flung in your direction.

Make sure your saw does not touch any foreign materials:
Stones, nails, etc. may be flung off, damage the saw chain or cause the saw to kick back unexpectedly.

If on a slope, stand on the uphill side of the log. Watch out for rolling logs.

When working at heights:

- Always use a lift bucket
- Never work on a ladder
- Never work in a tree
- Never work on any other insecure support
- Do not work above shoulder height
- Never operate the saw with one hand

Begin cutting with the saw at full throttle and engage the spiked bumper firmly in the wood, and then continue cutting.

Never work without the spiked bumper because the saw may pull you forwards and off balance. **Always hold the spiked bumper securely against the tree or limb.**

Note when reaching the end of a cut that the saw is no longer supported in the kerf. You have to take the full weight of the saw since it might otherwise go out of control.

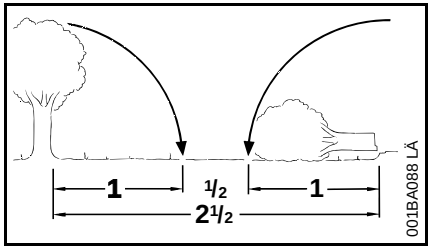
Felling and Limbing

To reduce the risk of accidents and injury, do not attempt felling or limbing unless you have been trained in the necessary techniques.

Observe all country-specific regulations on felling techniques.

Check that there are no other persons in the felling area – other than helpers.

Make sure no-one is endangered by falling tree – the noise of your engine may drown any warning calls.



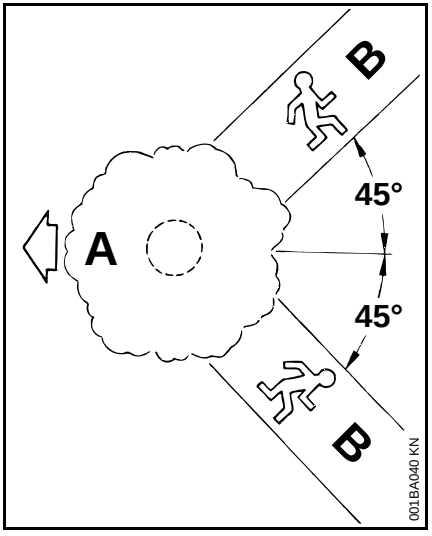
Maintain a distance of at least $2^1/_2$ tree lengths from next felling site.

Determine direction of fall and escape paths

Select gap in stand into which you want the tree to fall.

Pay special attention to the following points:

- The natural lean of the tree
- Any unusually heavy limb structure, damage
- The wind direction and speed – do not fell in high winds
- Sloping ground
- Neighboring trees
- Snow load
- Soundness of tree – take special care if trunk is damaged or in case of deadwood (dry, decayed or rotted wood)



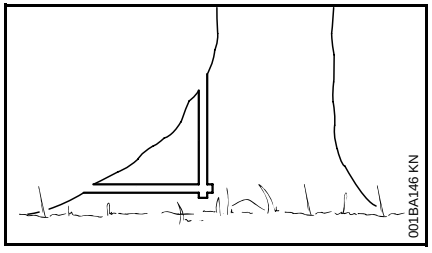
A = Direction of fall

B = Escape paths

– Establish paths of escape for everyone concerned – opposite to direction of fall at about 45°.
– Remove all obstacles from escape paths.
– Place all tools and equipment a safe distance away from the tree, but not on the escape paths.
– Always keep to the side of the falling tree and only walk away along the preplanned escape path.
– On steep slopes, plan escape routes parallel to the slope.
– When walking away along the escape path, watch out for falling limbs and watch the top of the tree.

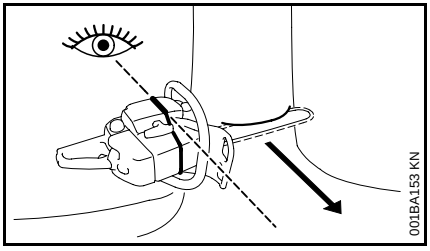
Preparing work area at base of tree

– First clear the tree base and work area from interfering limbs and brush to provide a secure footing.
– Clean lower portion of tree base with an axe. Sand, stones and other foreign objects will dull the saw chain.



– Remove large buttress roots: Make vertical cut first, then horizontal – but only if wood is sound.

Felling notch

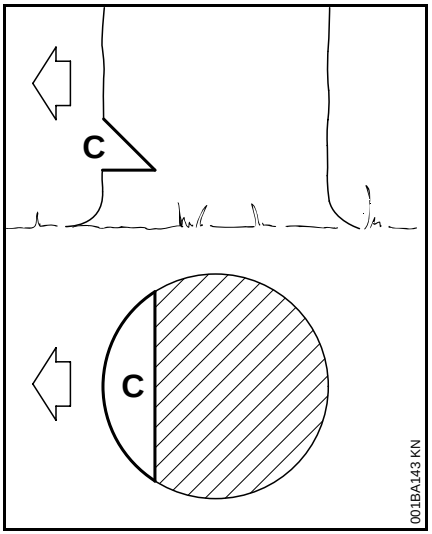


When making the felling notch, make use of the gunning sight on the shroud and housing to check the planned direction of fall.

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

There are several approved methods for making the felling notch – observe country-specific regulations on felling techniques.

STIHL recommends the following method:

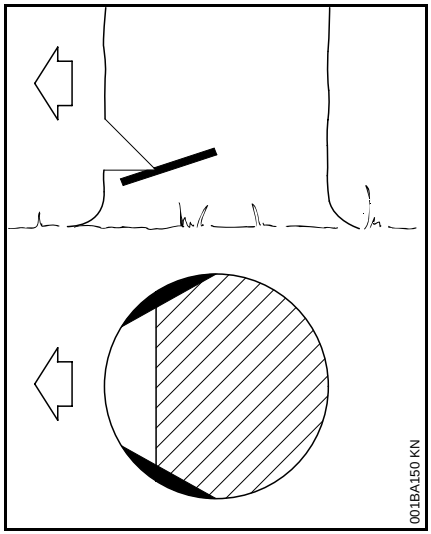


The felling notch **(C)** determines the direction of fall.

- Make the horizontal cut – check the direction of fall with the gunning sight.
- Make angle cut at about 45°.
- Check the felling notch and correct it if necessary.

Important:

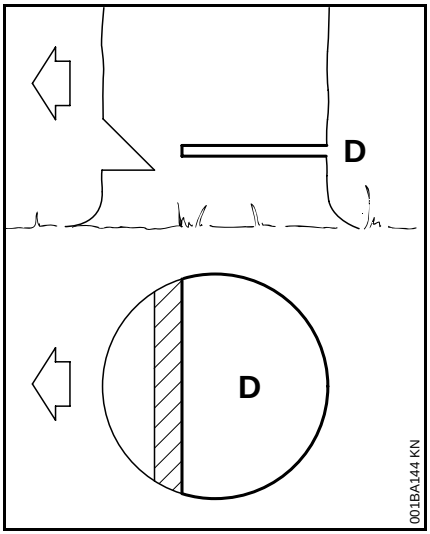
– Felling notch at a right angle to the planned direction of fall.
– As close to ground as possible.
– Cut to a depth of about $^1/_5$ to $^1/_3$ of the trunk diameter.



Sapwood cuts

Sapwood cuts in long-fibered softwood help prevent sapwood splintering when the tree falls. Make cuts at both sides of the trunk at same height as bottom of felling notch to a depth of about $^1/_{10}$ of trunk diameter. On large diameter trees, cut to no more than width of guide bar.

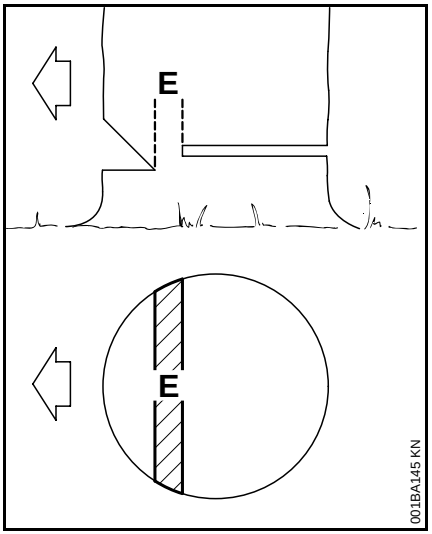
Do not make sapwood cuts if wood is diseased.

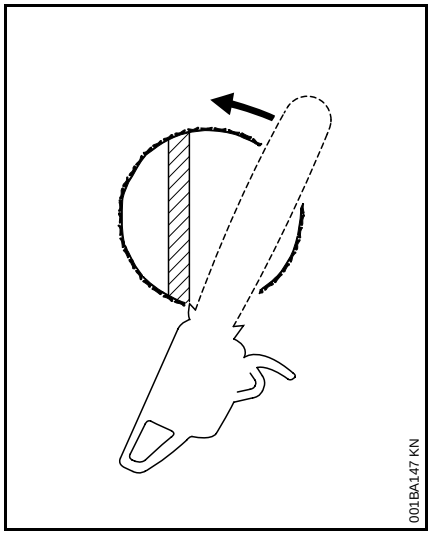


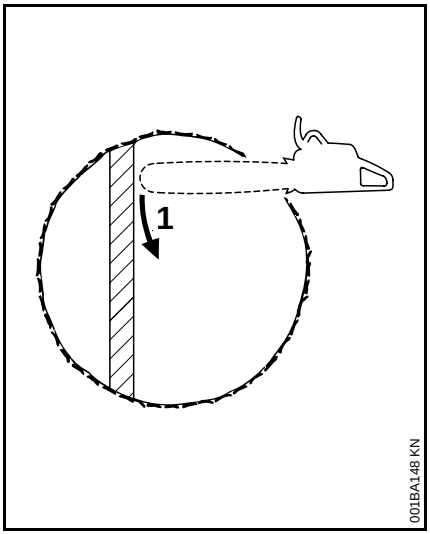
Felling

Shout a warning before starting the felling cut.

– Make the felling cut (**D**) slightly higher than bottom of felling notch.
– Cut horizontally.
– Leave approx. $^1/_{10}$ of tree diameter uncut between felling cut and felling notch. This is the hinge.







– Drive wedges into the felling cut in good time. Use only wooden, aluminum or plastic wedges. Never steel, which can damage the chain and cause kickback.
– The hinge **(E)** helps control the falling tree.
– Do not cut through the hinge **–** you could lose control of the direction of fall **–** this could result in an accident.
– Leave a broader hinge on rotten trees.

Shout a second warning immediately before the tree falls.

Small diameter trees: simple fan cut

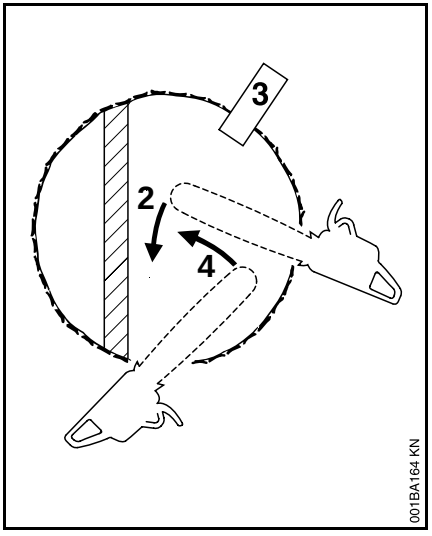
Apply the spiked bumper behind the hinge – pivot the saw around this point - only as far as the hinge. The spiked bumper rolls against the trunk.

Large diameter trees: sectioning method

If the diameter of the tree is greater than the length of the guide bar, use the sectioning method.

Use the spiked bumper as a pivot – avoid repositioning the saw more than necessary.

First cut (1):
Nose of guide bar should enter wood just behind the hinge – hold the saw horizontally and swing it as far as possible.



When repositioning for the **next cut (2),** keep the guide bar fully engaged in the kerf to keep the felling cut straight – apply the spiked bumper again.

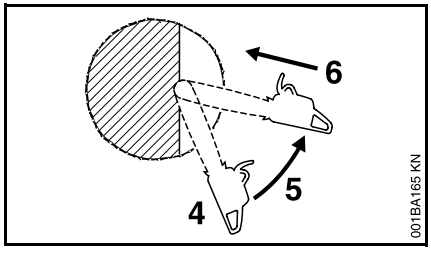
Insert a wedge **(3)** in the cut.

Last cut (4):
Apply the spiked bumper as for the simple fan cut – do not cut through the hinge!

Plunge cutting

Do not attempt plunge cuts if you are not experience in this cutting technique.

- Use a low kickback chain and exercise particular caution
- For heartwood cut
- For felling leaners
- For relieving cuts during bucking
- For DIY projects



Begin cut **(4)** by applying lower portion of the guide bar nose – do not use upper portion because of risk of kickback. Cut until depth of kerf is twice the width of the guide bar.

Swing saw slowly **(5)** into plunge-cutting position. Take care because of the risk of kickback or pushback.

Make the plunge cut **(6)** very carefully. Danger of pushback.

Heartwood cut

Enlarge the plunge cut to both sides as shown

- if tree diameter is more than twice the length of the guide bar.
- if a large portion of heartwood remains uncut on large diameter trees.
- on trees that are difficult to fell (oak, beech), to prevent heartwood splintering and maintain planned direction of fall.
- on soft deciduous trees to relieve tension in lying log and prevent slivers in the center of the hinge being torn out of the log.
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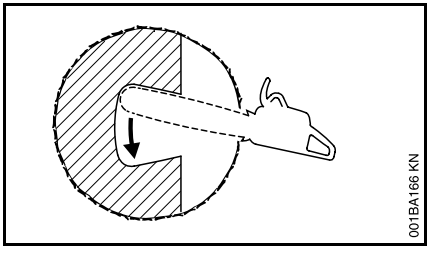


- Carefully make the plunge cut in the center of the felling notch – **there is a danger of pushback at this point** – then swing the bar in the direction of the arrow.

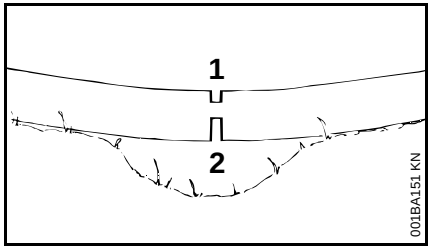
Limbing

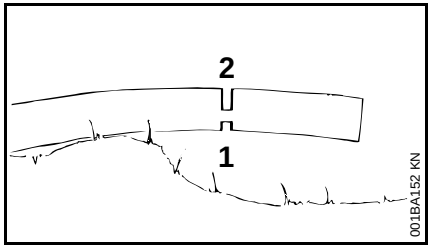
– Use a low kickback chain.
– Work with the saw supported wherever possible.
– Do not work with the bar nose.
– Watch for limbs which are under tension.
– Never attempt to cut several limbs at once.

When cutting small logs

– Use a sturdy and stable support – sawhorse.
– Never hold the log with your leg or foot.
– Never allow another person to hold the log or help in any other way.

Lying or standing logs under tension: Risk of pinching!





Always start relieving cut at the compression side **(1)**.

Make relieving cut and then perform bucking cut at the tension side **(2)** – the saw will otherwise pinch or kick back.

If not otherwise possible, make the bucking cut from the bottom upwards (underbuck) – be wary of pushback.

Do not cut a lying log at a point where it is touching the ground because the saw chain will otherwise be damaged.

Vibrations

Prolonged use of the unit may result in vibration-induced circulation problems in the hands (whitefinger disease).

No general recommendation can be given for the length of usage because it depends on several factors.

The period of usage is prolonged by:

– Hand protection (wearing warm gloves)
– breaks

The period of usage is shortened by:

– Any personal tendency to suffer from poor circulation (symptoms: frequently cold fingers, itching).
– Low outside temperatures.
– Gripping force (a tight grip hinders circulation).

Continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice.

Maintenance and Repairs

Service the machine regularly. Do not attempt any maintenance or repair work not described in the instruction manual. Have all other work performed by a specialist dealer.

STIHL recommends that you have servicing and repair work carried out exclusively by an authorized STIHL servicing dealer. STIHL dealers are regularly given the opportunity to attend training courses and receive technical information bulletins on engineering changes.

Use only high quality replacement parts since there is otherwise a risk of accidents or damage to the machine. If you have any questions in this respect, consult a specialist dealer.

STIHL recommends you use only original STIHL replacement parts. The characteristics of these parts are specifically designed to match your chainsaw model and meet your performance requirements.

To reduce **the risk of injury** from unintentional engine startup and chain rotation, **always shut off the engine and disconnect the spark plug boot** before performing any repairs, maintenance or cleaning work. – Exception: Carburetor and idle speed adjustments.

To reduce the **risk of fire**, do not service or store your machine near open flames.

Check the fuel filler cap for leaks at regular intervals.

Use only a spark plug of the type approved by STIHL and make sure it is in good condition – see "Specifications".

Inspect ignition lead (insulation in good condition, secure connection).

Do not turn the engine over on the starter with the spark plug boot or spark plug removed unless the slide control / stop switch is on **STOP** or **0** since there is otherwise a risk of fire from uncontained sparking.

Check condition of the muffler at regular intervals to reduce the risk of fires and damage to hearing. Do not operate your machine if the muffler is damaged or missing.

Do not touch a hot muffler since burn injury will result.

Vibration behavior is influenced by the condition of the AV elements – check the AV elements at regular intervals.

Check the chain catcher – and replace it if damaged.

Shut off the engine

– before checking chain tension.
– before retensioning the chain.
– before replacing the chain.
– before rectifying problems.

Observe sharpening instructions for safe and correct handling of saw chain and guide bar.
Keep the chain in good condition at all times. It must be properly sharpened, tensioned and well lubricated.

Always change the chain, guide bar and sprocket in good time.

Check condition of clutch drum periodically.

Store fuel and chain lubricant in properly labelled, safety-type canisters only. Take care when handling gasoline. Avoid direct contact with the skin and avoid inhaling fuel vapour.

To **reduce the risk of injury**, stop using your saw immediately if the chain brake does not function properly.
Take your saw to your local dealer. Do not use the chainsaw until the problem has been rectified (see chapter on "Chain Brake").

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						
	Have checked by servicing dealer[1)2)]									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					
Air filter	Clean							X		X
	Replace								X	
AV elements (rubber buffers, springs)	Inspect	X						X		
	Have replaced by servicing dealer[1)]								X	
Cooling inlets	Clean		X							
Cylinder fins	Clean		X			X				

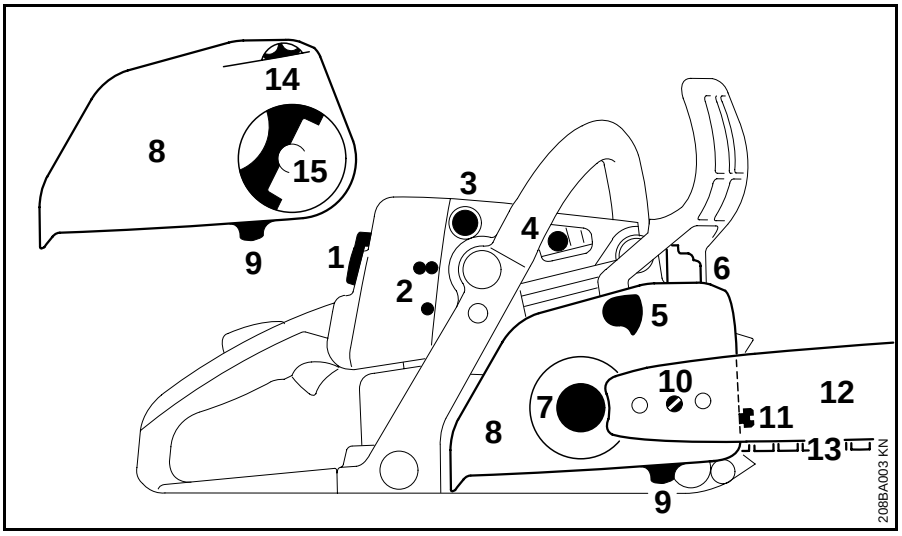
1) STIHL recommends that this work be done by a STIHL servicing dealer
2) see "Chain brake"

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		
	Replace after about 100 operating hours									
All accessible screws and nuts (not adjusting screws) [2]	Retighten									X
Spark arresting screen* in muffler	Inspect							X		
	Clean or replace								X	
Chain catcher	Check	X								
	Replace								X	
Safety label	Replace								X	

1) STIHL recommends that this work be done by a STIHL servicing dealer
2) Firmly tighten cylinder base screws of professional saws (3.4 kW or more) after 10 to 20 hours of operation

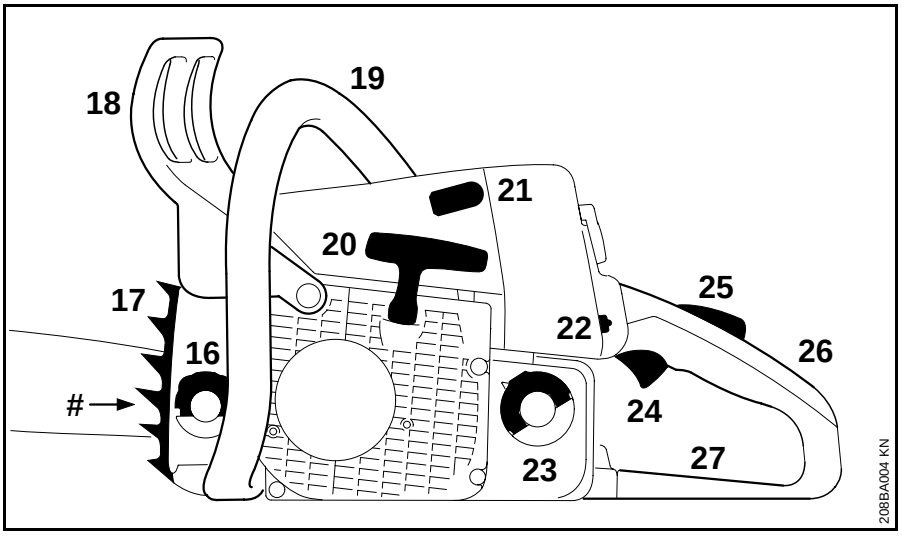
* see “Guide to Using this Manual“

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 (handlebar)
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

0457 184 0121

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