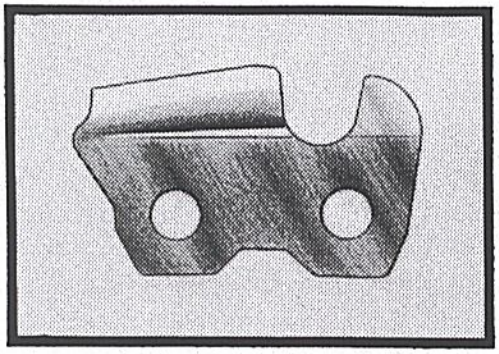


CHAIN SHARPENING

McCULLOCH CORPORATION
6101 West Century Boulevard,
Los Angeles 45, California

#ADV 1111

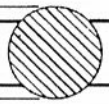
INTRODUCTION

This booklet contains three speeches to accompany the filmstrip on chain sharpening. The speeches may either be read aloud during the showing of the filmstrip or memorized beforehand and recited during the filmstrip presentation, or be used simply as a guide when preparing your own speech. If you are going to read aloud from the booklet, we recommend that you read the particular speech several times before you start your meeting. This will help you to do a much better job without having to concentrate on the pronunciation or phrasing of the sentences.

Each page of this booklet is headed by a drawing similar to the frame to which it applies. You start your filmstrip on the title frame of the filmstrip. Then you turn to the second frame and read one of the three texts which accompany the drawing in the booklet. When you finish reading the particular text, advance the filmstrip one frame and read the text which accompanies the picture similar to the second frame. Continue in this manner until you come to the end of the filmstrip.

There are three texts under each picture in this booklet. The first text is very short and is designed as a review of the essential points to remember when sharpening saw chain. Text number Two is more detailed while text number Three is the longest of all. Text Three can be read if the filmstrip is being shown without the accompanying 16mm colored motion picture on chain sharpening. For some frames the text is the same in all three speeches. Speech (or text) number One can be read in from seven to twelve minutes. Speech number Two should take between ten and fifteen minutes and speech number Three will probably take longer than fifteen minutes. The exact time it takes to read each speech depends on the speed at which you read. Speech number One can be read in five minutes or less, but it may not be understood or remembered. The principal thing to understand when you are giving your speech, either reading, reciting, or making it up from notes, is that what you say should be remembered and understood. If it is, then you will have given a very successful presentation and you can be proud of the job you've done.

CHAIN	FILE DIAM.
SP9	9/32 INCH
SP8, SL8, P8N	1/4 INCH
SP65, SL65, SP7, SL7	7/32 INCH

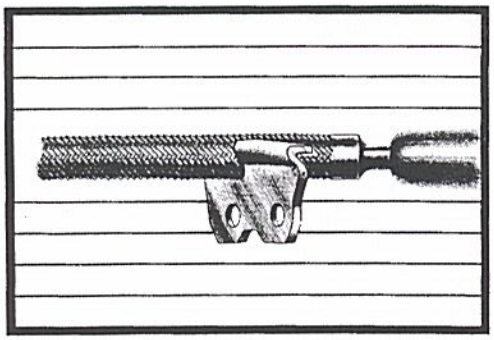


File Diameter

1 This chart shows the diameter file required for each McCulloch SP and SL chain. While SP chains are designed to be filed by one file all the way back, SL chains can be sharpened with a file of the next smaller diameter after they've been filed halfway back. The smaller diameter file will help to maintain a vertical edge without cutting down into the side links. And be sure that your file is sharp.

2 This chart shows the diameter file required for each SP and SL chain. If your file has too small a diameter and you don't hold it correctly, you're liable to put a hook in the tooth. If you use a file with too large a diameter, you'll put a blunt, slow-cutting edge on the top plate. While SP chains are designed to be filed by one file all the way back, SL chains can be sharpened with a file of the next smaller diameter after they've been filed halfway back. The smaller diameter file will help to maintain a vertical edge without cutting down into the side links. Knock or brush the filings out of the file occasionally. And be sure that your file is sharp for you can't do a good job of sharpening with a dull file or with a file clogged with filings.

3 McCulloch SP and SL chains are designed to be sharpened with round files of particular diameters. This chart shows the diameter file required for each SP and SL chain. If your file has too small a diameter and you don't hold it correctly, you're liable to put a thin cutting edge on the top plate. Your chain will cut fine for about five minutes or so and then it'll get dull fast. If you use a file with too large a diameter, you'll put a blunt, slow-cutting edge on the top plate and you'll end up with a backslope shape on the side cutting edge that will cause your chain to feed slow and you'll have to push down on the saw to make it cut. While SP chains are designed to be sharpened by one file all the way back, SL chains can be sharpened with a file of the next smaller diameter after they've been filed halfway back. The smaller diameter file will help to maintain a vertical edge without cutting down into the side links. Always use the correct file recommended by the manufacturer of your chain. Knock or brush the filings out of the file occasionally. And be sure that your file is sharp, for you can't do a good job of sharpening with a dull file or a file clogged with filings.

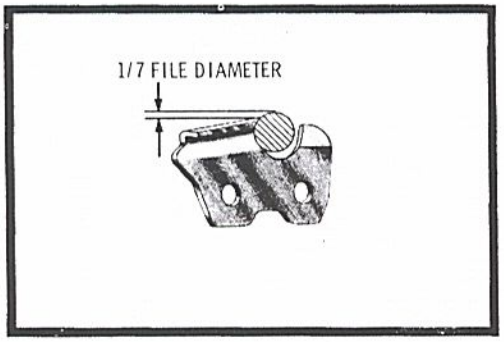


Hold File Level

1 Most saw chains are designed to be filed with the file held level. If you hold the file so that the handle is up and the nose of the file slants down, you'll make the top plate edge blunt and you will have to force the saw into the cut. If you hold the file with the handle way down and the nose high, your chain will not cut efficiently. In addition, you're liable to file into side and center links and weaken your chain.

2 Most saw chains are designed to be filed with the file held level. This is true of McCulloch SP and SL chains. If you hold the file so that the handle is up and the nose of the file slants down, you'll make the top plate edge blunt and you will have to force the chain into the cut. This can cause extremely rapid wear and lead to chain breakage. Now, if you hold the file with the handle way down and the nose high, your chain will not cut efficiently. In addition, you're liable to file into side and center links and weaken your chain.

3 Most saw chains are designed to be filed with the file held level. This is true of McCulloch SP and SL chains. If you hold the file so that the handle is up and the nose of the file slants down, you'll make the top plate edge blunt and you will have to force the chain into the cut. This can cause extremely rapid wear and lead to chain breakage. Now, if you hold the file with the handle way down and the nose high, your chain will not cut efficiently. In addition, you're liable to file into side and center links and weaken your chain. There are special times when it's all right to hold your file with the handle just a few degrees above or below level, but the amount should never be excessive. For example, if you consistently end up with a hook on your SP chain when you use the right file and hold it level, you can correct the hook holding the handle down just a few degrees. But for the most cutting uses, the file should always be held level, since that is the way the chain was designed to be sharpened.

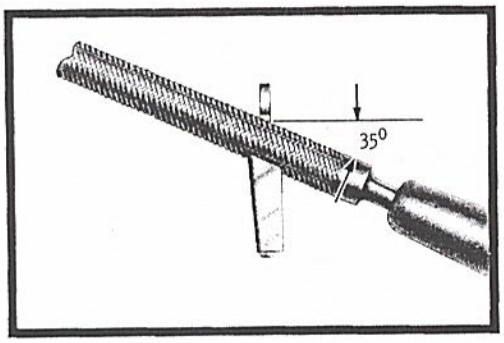


1/7th File Diameter Above Top Plate

1 Hold your file so that about one-seventh of the file diameter is above the top plate. If you use the right diameter file, hold it level and with one-seventh of its diameter above the top plate, you'll put the correct cutting shape on the top plate edge and -- when you have the correct depth gauge setting -- you'll get a chain that is self feeding.

2 Hold your file so that about one-seventh of the file diameter is above the top plate. If you use the right diameter file, hold it level and with one-seventh of its diameter above the top plate, you'll put the correct cutting shape on the top plate edge and -- when you have the correct depth gauge setting -- you'll get a chain that is self feeding. If you hold your file with more than one-seventh above the top plate, the top plate edge will be blunt. If you hold the file too low, you'll get a hooked cutting edge that will wear very quickly. A good way to determine how much of the file should be held above the top plate is to place your file into a new tooth and note how much of the file goes above the new tooth's top plate.

3 Hold your file so that about one-seventh of the file diameter is above the top plate. If you use the right diameter file, hold it level and with one-seventh of its diameter above the top plate, you'll put the correct cutting shape on the top plate edge and -- when you have the correct depth gauge setting -- you'll get a chain that is self feeding. If you hold your file with more than one-seventh above the top plate, the top plate edge will be blunt. On the other hand, if you hold the file too low, that is, with less than one-seventh above the top plate, you'll get a hooked cutting edge that will wear very quickly and the chain will run very rough. McCulloch SP and SL chains are designed so that when one-seventh of the diameter of the correct file is above the top plate, you'll get a smooth fast-cutting edge on the cutter teeth. A good way to determine how much of the file should be held above the top plate is to place your file into a new tooth and note how much of the file goes above the new tooth's top plate.



35° Top Filing Angle

1 McCulloch SP and SL chains are designed to perform best with a top filing angle of thirty-five degrees. The top filing angle affects the side cutting edge and helps to determine the width of the kerf your chain makes. The thirty-five degree angle provides a wide-enough kerf so that your chain won't bind in the cut and is the most efficient angle for all purpose cutting.

2 McCulloch SP and SL chains are designed to perform best with a top filing angle of thirty-five degrees. The top filing angle affects the side cutting edge and helps to determine the width of the kerf your chain makes. The thirty-five degree angle provides a wide-enough kerf so that your chain won't bind in the cut and is the most efficient angle for all purpose cutting. Drop below the thirty-five degree angle and the side cutting edge will begin to skim or scoop the wood rather than slice into it and the kerf will be too narrow. Go above the thirty-five degree angle and your side cutting edge will begin to dip into the wood too far and pull the chain wide. This will result in a wobbling and wild cutting chain. The ideal top filing angle is the one at which your chain cuts the narrowest kerf without binding. And for all general average cutting, this angle is thirty-five degrees.

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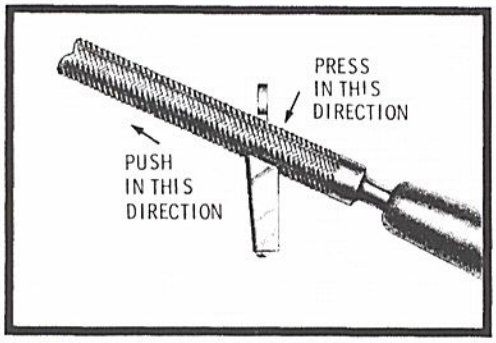
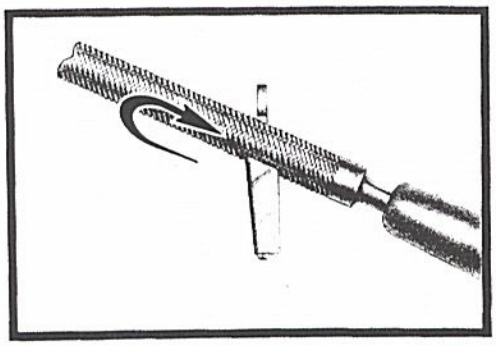


Push Toward Outside - Press Toward Tail

1 Always file from inside the tooth toward the outside. Press toward the tail of the tooth and not down toward the gullet. Use a long slow stroke. Always file left and right hand cutter teeth exactly alike to keep your chain from pulling to one side. Hold your file correctly throughout the filing stroke. Always file away all of the dulled area on the tooth. If you don't the chain will only cut properly for a few minutes before you'll have to file again.

2 Always file from inside the tooth toward the outside. Press toward the tail of the tooth and not down toward the gullet. Use a long slow stroke. Rapid filing will not only dull the file but will make the cutting edges of the tooth hard and brittle. Do not "rock" the file during the filing stroke. "Rocking" leaves a rounded edge instead of a sharp edge. File from the inside of the tooth toward the outside. Always file left and right hand cutter teeth exactly alike to keep your chain from pulling to one side. Hold your file correctly throughout the filing stroke. Always file away all of the dulled area on the tooth. If you don't the chain will only cut properly for a few minutes before you'll have to file again.

3 Always file from inside the tooth toward the outside. While filing, press gently but firmly toward the tail of the tooth and not down toward the gullet. Use a long slow stroke. Rapid filing will not only dull the file but will make the cutting edges of the tooth hard and brittle. If the cutting edges become brittle, they can be dressed back with a stone or grinder or by carefully using a file to remove the brittle edge. The file should be turned between strokes; turning it during the filing stroke can result in a "rocking" motion. Do not "rock" the file during the stroke. "Rocking" leaves a rounded edge instead of a sharp edge. It's just another way to put a blunt edge on your cutter teeth. File from the inside of the tooth toward the outside. The filings will fall harmlessly away from your chain and you'll get longer service life. Always file left and right hand cutter teeth exactly alike to keep your chain from pulling to one side. Hold your file correctly throughout the filing stroke. Always file away all of the dulled area on the tooth. If you don't the chain will only cut properly for a few minutes before you'll have to file again.



Move File Forward on Return Stroke

1 Move the file forward and lift it out of the gullet or take the file completely away from the cutting edge on the return stroke so that the file doesn't touch or rasp across the cutting edges of the tooth. If the file touches the cutting edges it will dull them. Be especially careful when positioning your file for a new stroke that you don't drag the file across the top plate edge. Dragging the file also dulls the file quickly, breaking down its cutting edges.

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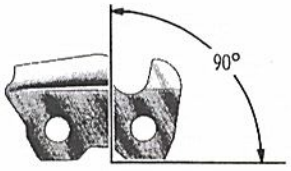

CORRECT VERTICAL CUTTING EDGE

Vertical Cutting Edge

1 The correct vertical cutting edge is ninety degrees from the bottom of the cutter. If you use the correct diameter file, hold it level and at the thirty-five degree top filing angle, you'll automatically get a vertical cutting edge that will be ninety degrees from the bottom of the cutter. McCulloch cutter teeth are designed so that you can check your filing by means of the ninety degree vertical cutting edge after you're done. If you have the ninety degree vertical cutting edge, chances are that you've done all your filing correctly.

2 The correct vertical cutting edge is ninety degrees from the bottom of the cutter. If you use the correct diameter file, hold it level and at the thirty-five degree top filing angle, you'll automatically get a vertical cutting edge that will be ninety degrees from the bottom of the cutter. If you hold the file too high or with the handle down, the vertical cutting edge will slant toward the rear of the tooth. If you hold the file too low or with the handle up, the vertical cutting edge will not be straight and you'll get a hook in the tooth. McCulloch cutter teeth are designed so that you can check your filing by means of the ninety degree vertical cutting edge after you're done. If you have the ninety degree vertical cutting edge, chances are that you've done all your filing correctly.

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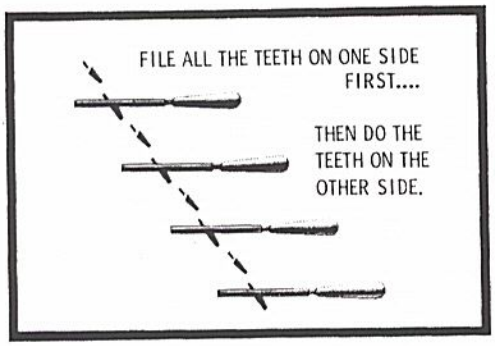

File All the Teeth on One Side First

1 File all the teeth on one side of your chain before you start to file the teeth on the other side. If you file the teeth alternately, that is, file a right, then a left and then another right, it's almost impossible to do an accurate job of filing. If the teeth on one side of your chain have a greater top filing angle, your chain will pull toward the side with the greatest angle and your chain will not cut straight and may bind in the cut. So for the greatest accuracy, do all the teeth on one side of your chain before you start to do the teeth on the other side.

2 File all the teeth on one side of your chain before you start to file the teeth on the other side. If you file the teeth alternately, that is, file a right, then a left and then another right and so on, you not only waste time in shifting from side to side of your chain, but it's almost impossible to do an accurate job of filing and you'll end up with a rough-cutting, wobbling chain. If you do all the teeth on one side before you do any of the teeth on the other side, you can do them without having to shift back and forth. If the teeth on one side of your chain have a greater top filing angle, your chain will pull toward the side with the greatest angle and your chain will not cut straight and may bind in the cut. So for the greatest accuracy and to save time and get the greatest life from your chain, do all the teeth on one side before you start to do the teeth on the other side.

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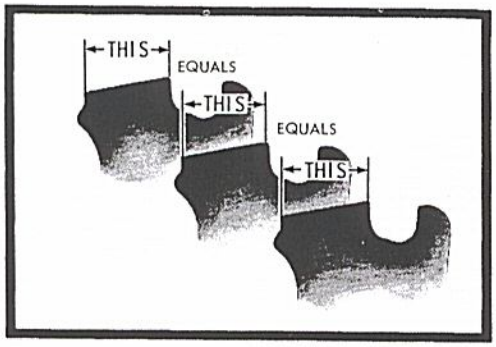

All Teeth the Same Length

1 Make sure that all the teeth are the same length after sharpening. One way to help make all the teeth the same length is to give all the teeth the same number of filing strokes. If all the teeth are given the same number of strokes each time you sharpen them, you'll find that you will have to do very little adjusting of their length with extra filing.

2 Make sure that all the teeth are the same length after sharpening. If some teeth are shorter than others, they can't do their full share of the work and the longer teeth will have to do more than their share. This results in a rough cutting chain and puts an additional strain on the rivets and chain links. If all the teeth are the same length the chain will cut smoothly. One way to help make all the teeth the same length when you're filing, is to give all the teeth the same number of filing strokes. If all the teeth are given the same number of strokes each time you sharpen them, you'll find that you'll have to do very little adjusting of their length by extra filing. The best way to make sure all the teeth are the same length is to measure the length of each tooth with a ruler or a McCulloch depth gauge tool.

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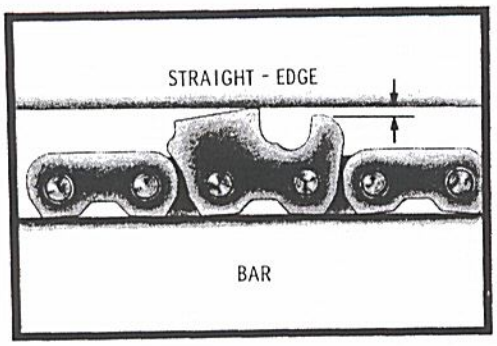

Depth Gauge Setting

1 The depth gauges determine how deep a cut the teeth make as they pass through the wood. The depth gauge setting is the vertical distance between the top of the tooth and the top of the depth gauge. You can determine the setting by laying a straight edge across the top of the teeth and measuring the distance between the bottom of the straight edge and the top of the depth gauge with a set of feeler gauges. The quickest way to determine the depth gauge setting is by using a McCulloch depth gauge tool. The depth gauge tool saves a great deal of time. Always measure the gauges at the same place on the bar.

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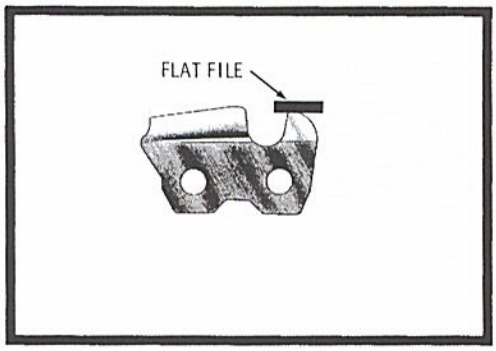

Lower Depth Gauges

1 Use a flat file to lower the depth gauges. Hold the file level and file straight across the depth gauge. Never sharpen the gauges to a point and do not slant the top of the depth gauge either from side to side or from front to rear. Measure your depth gauge setting frequently and set all the depth gauges at the same setting. A properly used depth gauge tool will set all your depth gauges quickly and accurately.

2 Use a flat file to lower the depth gauges. Hold the file level and file straight across the depth gauge. Never sharpen the gauges to a point and do not slant the top of the depth gauge either from side to side or from front to rear. File toward the outside of the chain to prevent the filings from falling into the chain. Measure your depth gauge setting frequently and set all the depth gauges at the same setting. If the depth gauges have different settings, you'll have a rough-cutting chain because the teeth won't be able to cut the same amount of wood fibers as they pass through the wood. A depth gauge tool can be laid across the chain with the depth gauge to be filed projecting through the slot with the desired setting. Run the file across the tool to lower the depth gauge. A depth gauge tool takes all the guesswork and measuring out of setting depth gauges. A properly used depth gauge tool will set all your depth gauges quickly and accurately.

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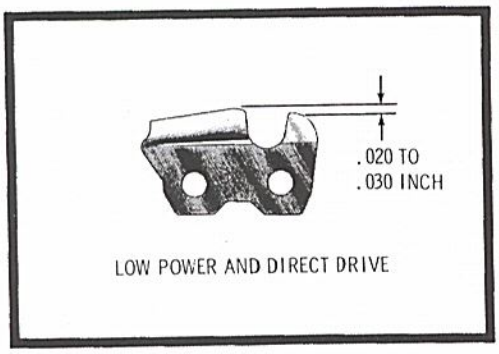

LOW POWER AND DIRECT DRIVE

Low Power and Direct Drive Saws

1 Low power and direct drive saws cut more easily when the depth gauges are set between twenty and thirty thousandths of an inch. If the setting is greater than this, you'll begin to lose engine power and in extreme cases, your engine may lug and die. Even though your engine stays running, if its speed is slowed by too low a setting, you cannot cut as fast or as economically as when the depth gauges are set at twenty to thirty thousandths of an inch. The best setting is where the chain self feeds and the engine works smoothly without lugging down.

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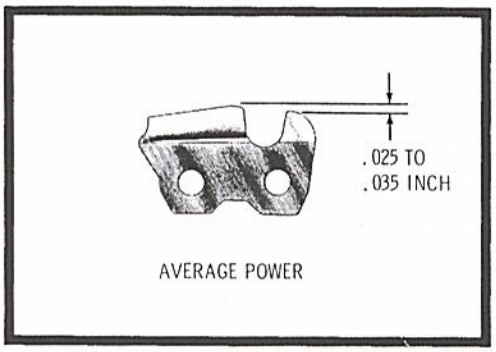

Average Power Saws

1 Average powered saws cut best with the depth gauges set between twenty-five and thirty-five thousandths of an inch. To determine the setting within this range which will be best for you, adjust the setting to give you the easiest feeding chain. Measure the depth gauge setting and use that setting on your depth gauge tool thereafter. Lower the gauges only five thousandths of an inch at a time until the desired setting is obtained. If you take off too much the chain will cut rough.

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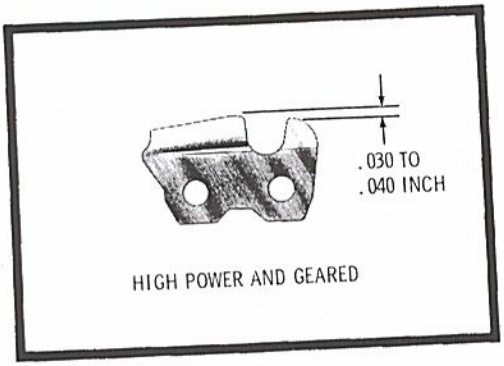


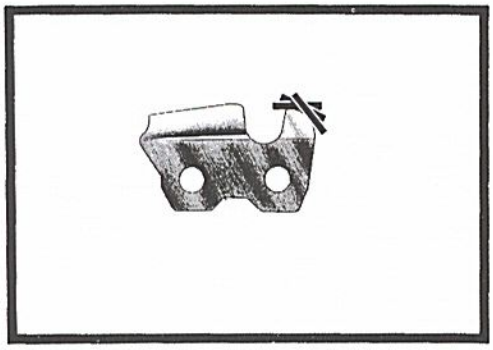
HIGH POWER AND GEARED

High Power and Geared Saws

1 High-powered and geared saws can use the lowest depth gauge settings. High-powered and geared saws operate most efficiently when the depth gauges are set between thirty and forty thousandths of an inch. The type of wood being cut also affects depth gauge settings. If the wood is soft, the depth gauges can be set lower than forty-five thousandths. But if the wood is hard or frozen, even thirty-five thousandths may be too much. Always use the setting at which your chain cuts best.

2 High-powered and geared saws can use the lowest depth gauge settings. High-powered and geared saws operate most efficiently when the depth gauges are set between thirty and forty thousandths of an inch. The type of wood being cut also affects depth gauge settings. If the wood is soft, the depth gauges can be set lower than forty-five thousandths. But if the wood is hard or frozen, even thirty-five thousandths may be too much. Remember that the correct depth gauge setting for you is the setting at which your chain cuts best. This setting of depth gauges according to the way the chain cuts, also applies to low-powered and average-powered chain saws.

3 High-powered and geared saws can use the lowest depth gauge settings. High-powered and geared saws operate most efficiently when the depth gauges are set between thirty and forty thousandths of an inch. The type of wood being cut also affects depth gauge settings. If the wood is soft, the depth gauges can be set lower than forty-five thousandths. But if the wood is hard or frozen, even thirty-five thousandths may be too much. Remember that the correct depth gauge setting for you is the setting at which your chain cuts best. This setting of depth gauges according to the way the chain cuts, also applies to low-powered and average-powered chain saws.



Round Off Leading Edges

1 Round off the leading edges of the depth gauges on all McCulloch SP and SL chains except SP65. SP65 depth gauges are designed with a built-in leading edge angle. The leading edge of other SP and SL depth gauges must be rounded over to make the chain feed smoothly. Use a flat file to round over the leading edges of all SP and SL chains except SP65.

2 Round off the leading edges of the depth gauges on all McCulloch SP and SL chains except SP65. SP65 depth gauges are designed with a built-in leading edge angle. The leading edges of other SP and SL depth gauges must be rounded over to make the chain feed smoothly. Do not file a slant on the forward edge of the depth gauge or the gauge may plow a furrow in the kerf and interfere with the cutting done by the tooth. Use a flat file to round over the leading edges of the depth gauges of all SP and SL chains except SP65. Leave about one-half of the top of the gauge flat, round off the rest.

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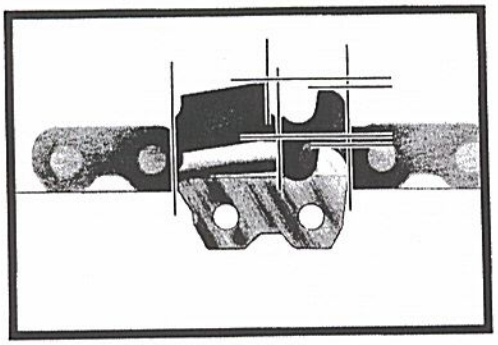

Compare Your Filing with a New Cutter

1 Compare your filing job with a new cutter. Do you have the same vertical edge? Have you rounded off the leading edge of the depth gauge so it matches the edge of a new cutter? Is your top filing angle the same? Always have a new cutter when you file your chain and check your filing job against it. For a new cutter has the best angles, shapes, and cutting edges built into it by the chain manufacturer and if you follow his directions you can't go wrong.

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MAKE SURE YOUR
SPROCKET & BAR
ARE IN GOOD SHAPE!

Sprocket and Bar in Good Shape

1 Now for some helpful hints. Make sure your sprocket and bar are in good condition. The surest way to wreck a new chain is to install it on an out-of-pitch or worn sprocket. Your bar is important too. A twisted or bent bar will make your chain wear rapidly. A cracked bar may break while you're cutting. The bar groove should be deep enough so the center link tangs can't ride on the bottom of the groove, and the rails should be square.

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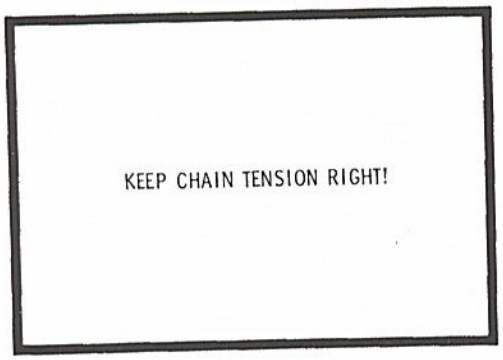
3 Now for some helpful hints. Make sure your sprocket and bar are in good condition. The surest way to wreck a new chain is to install it on an out-of-pitch or worn sprocket because a bad sprocket can shorten the life of a brand new chain by sixty-five percent. Nobody can afford to throw away sixty-five percent of the cost of a new chain. That's almost twelve dollars out of a chain that costs eighteen dollars. The best way to get the most life out of a chain is to install a new sprocket when you install your new chain. A new sprocket costs a little money but you can save more than the cost just by the added life it'll give your new chain. Your bar is important too. A twisted or bent bar will make your chain wear rapidly. A cracked bar may break while you're cutting. The bar groove should be deep enough so the center link tangs can't ride on the bottom of the groove and the rails should be square. The bar funnel should be properly shaped and you shouldn't use so small a sprocket that it prevents the chain from coming onto the bar properly. If you use a Speed Tip or other roller nose bar, make sure the roller at the bar nose is in good condition. If it needs repair see that it gets it. These things mean money to you, so make sure your sprocket and bar are in good shape.



Keep Chain Tension Right

1 Keep your chain tension right. Always follow the directions of the manufacturer of your chain when you adjust your chain tension. Remember that too tight a chain will damage your bar and chain while a chain that's too loose can jump off your bar and ruin itself. When using a Speed Tip Bar or other bar with a roller or wheeled nose, follow the instructions of the bar manufacturer. Keep your chain tension right, just the way the directions say.

2 Keep your chain tension right. Always follow the directions of the manufacturer of your chain when you adjust your chain tension. Correct tension of SP and SL chain is between three-eighths and one-half inch distance from the bottom of the side link and cutter to the bar rail when the chain is pulled down at the bottom center of the bar. The chief thing to remember is that too tight a chain will damage your bar and chain while a chain that's too loose can jump off your bar and ruin itself. When using a Speed Tip Bar or other bar with a roller or wheeled nose, follow the instructions of the bar manufacturer. Keep your chain tension right, just the way the directions say.

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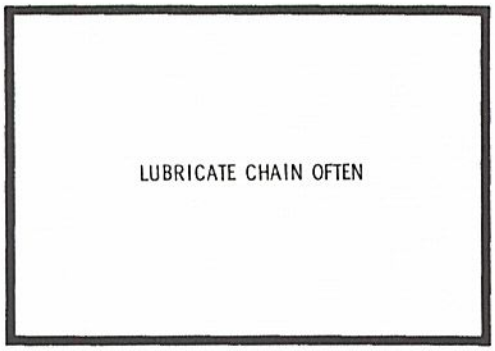

Lubricate Chain Often

1 Lubricate your chain often. Get into the habit of pumping your oiler every ten to fifteen seconds. Refill your oiler tank every time you refill the fuel tank of your chain saw. Use only clean oil; don't risk ruining your chain or clogging your chain oiler with dirty oil. And whenever you sharpen your chain, clean it in solvent and soak it in 30-weight oil before you reinstall it, to give you the best and longest cutting life.

2 Lubricate your chain often. Get into the habit of pumping your oiler every ten to fifteen seconds. Oil is much cheaper than chain. Use plenty of oil when cutting. Refill your oiler tank every time you refill the fuel tank of your chain saw. Use a 30-weight motor oil when temperatures are above forty degrees. When temperatures drop below forty degrees, use a 10-weight oil. Use clean oil only; don't risk ruining your chain or clogging your chain oiler with dirty oil. And whenever you sharpen your chain, clean it in solvent and soak it in 30-weight oil for a little while before you reinstall it to give you the best and longest cutting life.

3 Lubricate your chain often. Get into the habit of pumping your oiler every ten to fifteen seconds. Oil is much cheaper than chain. Use plenty of oil when cutting. If you're cutting in sandy areas or areas where the trees are filled with pitch or sand, flood your chain with oil. Add a little kerosene to your oil to help keep the pitch from your bar and chain. Refill your oiler tank every time you refill the fuel tank of your chain saw. Use a 30-weight motor oil when temperatures are above forty degrees. When temperatures drop below forty degrees, use a 10-weight oil. If temperatures go down below ten degrees, you can thin the 10-weight oil with an equal amount of kerosene. Shake the oil and kerosene together to make sure that they are thoroughly mixed. Use clean oil only; don't risk ruining your chain or clogging your chain oiler with dirty oil. If you use a reclaimed oil, use a screen to remove any impurities when you pour the oil into your oiler tank. And whenever you sharpen your chain, clean it in solvent and soak it in 30-weight oil for a little while before you reinstall it to give you the best and longest cutting life.

Keep Your Chain Sharp and It will Last Longer

1 Keep your chain sharp and it'll last longer. And not only will it last longer but you'll be able to cut faster and you'll have a smoother-cutting chain. It's just as easy to sharpen a chain correctly as it is to do it the wrong way. But the properly sharpened chain means more money in your pocket with less effort and less vibration and less time-out for touching-up. So take a few minutes after you've finished work for the day and do a good job. Follow the instructions we've given you and you'll have a chain that will out-cut anything — a chain you'll be proud to say you sharpened!

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