

Break it down: Making your own chainsaw chains in the workshop can save significant money if you use a chainsaw regularly. The equipment is relatively cheap and chainsaw chain can be purchased in lengths of 7.6 or 30.4m rolls. Photos: Ben White



DIY chainsaw chains

By Josh Giumelli

Chainsaws have been one of the most popular *Workshop* topics over the years, especially sharpening chainsaw chains.

We have covered sharpening chainsaws several times, and back in October 2018 we examined chainsaw chains in detail (see *Farming Ahead* 321).

This month we take things one step further, showing how chainsaw chains can be easily made to length in the farm workshop. Chainsaw chains can be purchased in rolls in long lengths and

cut and joined to suit different length chainsaw bars.

While chainsaw chains can be purchased in pre-made lengths, many service outlets will also custom-make chains for customers as it reduces inventory. There is no reason this can't be done at home, but it does suit regular chainsaw users who are likely to replace chains frequently, or those who run several chains at the same time, rotating them as they become blunt.

The saving from making up your own chains is considerable, but there are other

advantages in gearing up to make chains. A chainsaw breaker/spinner can be used to replace damaged links on an otherwise good chain. And sometimes chain can stretch to the point where there is no longer sufficient adjustment on the bar to take up the tension. The breaker/spinner tool can be used to remove a drive link, shortening the chain slightly and giving more adjustment on the bar.

Acknowledgments: Wes McGrath, Donnybrook, Western Australia.

WARNING: An incorrectly joined chainsaw chain poses a significant risk to the operator if it fails in use. Use quality chain and joining links of the correct size for your saw. If you are not confident with the joining process then it is a good idea to continue to use commercial chains.

MEASURING YOUR CHAIN



Before you lash out some serious cash on a roll of chain, you need to make sure you are buying the right size. There are two important measurements: chain pitch and drive link gauge. Pitch is defined as the distance between three rivets, divided by two, and is measured in imperial. As the rivets are not equally spaced, pitch cannot simply be specified as the distance between two rivets as with normal drive chains.



Chainsaw chain is available in pitches of 1/4", 0.325", 3/8", 0.404", 1/2" and 3/4" (smallest to largest) although the majority of chains are 0.325", 3/8" and 0.404". Sizes 1/2" and 3/4" are rare and used on timber harvesting machines. Note some pitches are expressed as fractions, while some are decimals of an inch (eg 0.325") as they cannot be expressed as a neat fraction. The chain above measures 3/4" between three rivets. Divided by two this equals 3/8" pitch.



3 The tang on the bottom of the drive link rides in the groove in the bar and is a specific thickness or gauge; most often 0.050", 0.058" or 0.063", but sometimes you will find 0.043" on battery saws (eg Stihl Pico, Micro or Mini chain). The gauge of the chain must match the gauge of the bar. You can easily measure the gauge using vernier callipers as shown, set to imperial.



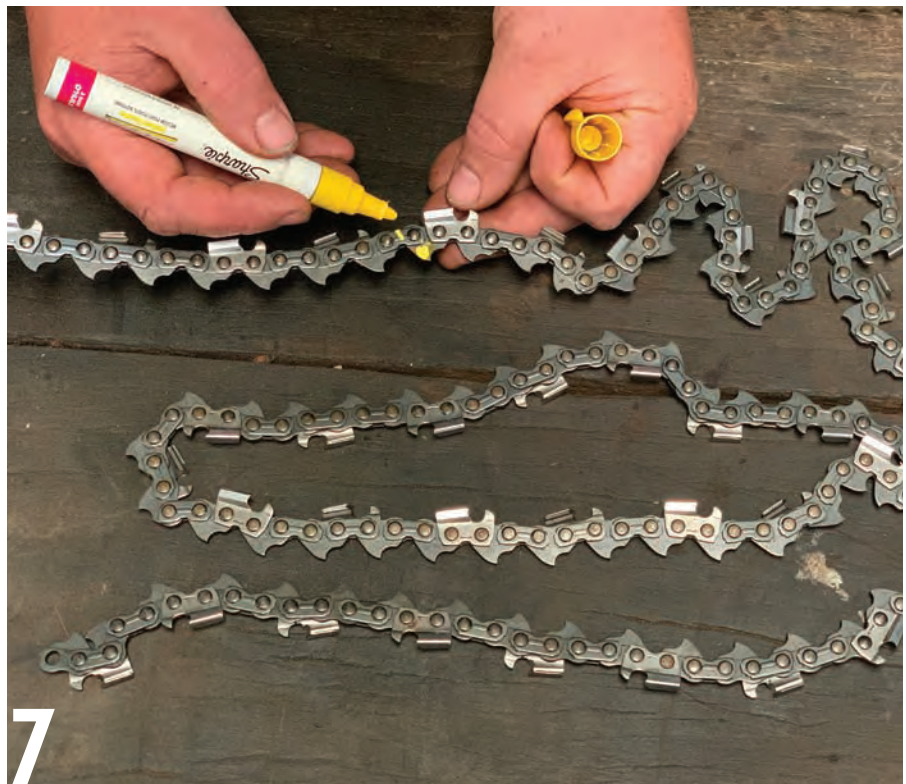
4 Chainsaw chain is sold in 25 or 100 foot rolls (7.6 or 30.4m), and price varies widely depending on size and quality. Online retailers sell 25 foot rolls for less than \$100, although it can cost double this for a quality brand. For the larger 100 foot rolls, the chain will invariably be better value for money, but can cost over \$500 for a roll.



5 Don't forget to factor in the cost of the chain joiners. They are easily sourced online for different chain pitches and cost around \$1 per set. They come in two parts: the tie strap (left) fits over the rear plate with the rivets (right) which is called a preset. You cannot recycle broken links that have been removed from a chain. While the tie strap could potentially be reused, it is often damaged from the breaking process. In the interests of safety only use new tie straps and presets when joining chain.



6 The main requirement for making your own chainsaw chains is a breaker and spinner tool. There are several styles available, and the unit pictured is one of the cheaper ones available (purchased online for around \$120). While it is nothing fancy, the fabricated steel construction is certainly strong enough. As the name implies, it has dual functions of firstly breaking the chain, and then 'spinning' the preset rivets to join the chain. Rather than bolt it to the workshop bench, we have screwed it to a block of wood so it can be easily clamped in the vice.



7 To make up a chain, start by counting out the correct number of drive links. If you have an existing chain, simply count the number of drive links to determine how long it should be. Mark the tie strap after the last drive link as this will be where the chain will be broken. It pays to count the links twice just to make sure you are not breaking it at the wrong link.

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BREAKING THE CHAIN



1 On smaller chains, the breaker can be used to pop the rivets out. This chain is a .404 pitch, and is pretty large, meaning a fair amount of force is required to drive out the rivets. To make life a little easier we have carefully ground the rivet heads down on the tie strap to be removed.



2 The last drive link of our new chain is marked on the right, with the following tie strap marked for removal. Note the ground rivet heads. Only the joining tie strap is removed, never a link with a tooth attached.



3 The chain breaker uses an anvil featuring different sized slots matching the different chain pitches available. The chain is placed into the appropriate slot when breaking out the rivets.



4 Place the anvil and chain under the breaker making sure the punch is centred over the rivet head. The chain should sit down in the anvil so the adjacent drive links rest against the anvil shoulders as shown.



5 Wearing safety glasses, pull down on the handle. The rivet should let go with a snapping sound.



6 Now reposition the chain and anvil under the punch and drive out the second rivet.

JOINING THE CHAIN



1 Bring the ends of the new section of chain together and fit the preset, making sure the scalloped edge is facing down, in the same direction as the drive links. The tie strap should fit over the top with the scalloped edge facing the same direction. Make sure the chain loop is not inverted, i.e. with the teeth facing inwards instead of the drive links.



2 Place a small drop of oil on the spinner die. If the unit hasn't been lubricated in general, then apply oil to both the spinner shaft and thrust bearings, as well as the thrust handle thread.



3 The spinner handle (left) is rotated to swage and form the rivet head, and the thrust handle (right) is used to apply pressure on the rivet and die. As the spinner handle is rotated, the thrust handle is gradually tightened to maintain pressure as the rivet head is formed.

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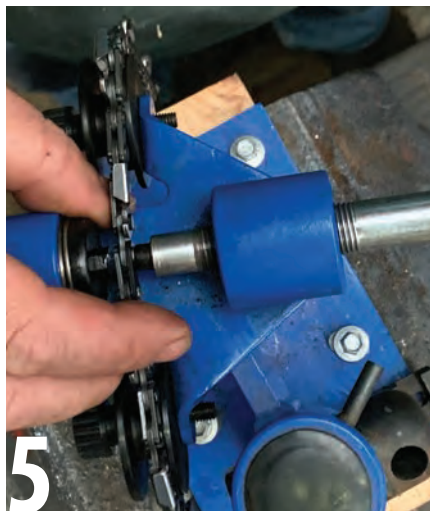


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4

Place the loop of chain over the guide wheels, which may require adjustment to hold the chain level with the die. The open or unformed side of the rivet must be in line with the spinner die.



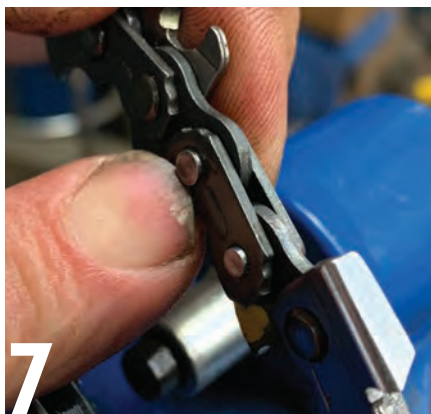
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Tighten the thrust handle until it comes into contact with the back of the rivet on the preset strap. The unformed end of the rivet should be touching the spinner die.



6

Now rotate the spinner handle clockwise, while gradually increasing the pressure on the thrust handle. The spinner handle can be spun reasonably quickly, but don't adjust the thrust handle too quickly until you have had some experience.



7

It is best to part-form the first rivet as shown above, then remove the chain and set up for spinning the second rivet. The second rivet can then be fully formed, before finishing off the first rivet. This is the safest method to get tension on both rivets correct.



8

Here we have finished spinning the second rivet and are finishing off the first rivet. If you are unsure of the progress of the job, it doesn't hurt to periodically remove the chain and inspect the rivet head, as it is hard to see when placed in the spinner. If you can slip a fingernail between the tie strap and the rivet head then it hasn't been spun down enough.



9

Here is the completed job. Note the flattened rivet heads. The small cracks around the edge of the rivets are not an issue. The link should be free to move by hand without undue slop. If it is slightly stiff, add some penetrating fluid and allow it to soak in.



10

A chain with an overly stiff link should not be placed on a chainsaw bar in the hope it loosens up, as it may cause damage, or even breakage in a worst-case scenario. It is far safer to punch out the link and replace with a new one.



11

It saves quite a lot of time to make several chains up at once, especially if they are the same size. Here we have stored each chain in plastic Ziploc bags with a squirt of lanolin spray to protect against rust.



12

If you are replacing a damaged tooth in a chain with a new one, prepare a replacement by breaking the rivets on the drive links either side, leaving two drive links attached to the tooth link as shown. Also, make sure you replace a link with a cutter of the same side (for example a left-cutting link with another left link). If you are replacing a link in a partly worn chain, you will need to file the cutting edge and the depth gauge down so that it matches the rest of the chain.