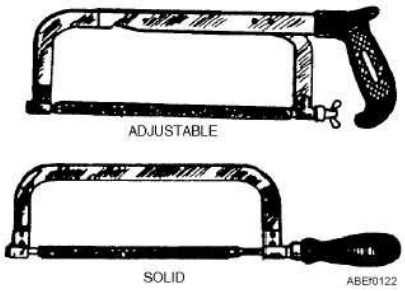
TECHNICAL DATA SHEET

Created July 21, 2006 ajc
Revised August 24, 2009 ajc

Phone 08 9446 6333 Fax 08 9446 8865 Email: hardware@galvins.com.au Web: www.galvins.com.au

Hacksaw - Set-up and Use.

HACKSAWS Hacksaws are used to cut metal that is too heavy for snips or bolt cutters. Thus, metal bar stock can be cut readily with hacksaws.



There are two parts to a hacksaw: the frame and the blade.
Common hacksaws have either an adjustable or a solid frame.

Most hacksaws found in the workplace are of the solid frames style designed to take only the length blade for which they are made.
This length is the distance between the two pins that hold the blade in place.
Hacksaw blades are made of high-grade tool steel, hardened and tempered.

There are two types, the all-hard and the flexible.
All-hard blades are hardened throughout, whereas only the teeth of the flexible blades are hardened.

Hacksaw blades are about 1/2-inch wide, have from 14 to 32 teeth per inch, and are from 8 to 16 inches long.
The blades have a hole at each end, which hooks to a pin in the frame.

All hacksaw frames, which hold the blades either parallel or at right angles to the frame, are provided with a wing-nut or screw to permit tightening or removing the blade.

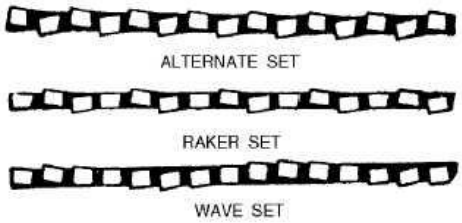
The SET in a saw refers to how much the teeth are pushed out in opposite directions from the sides of the blade.
The four different kinds of set are the

ALTERNATE set,

DOUBLE ALTERNATE set,

RAKER set,

and WAVE set.



Three of these are shown here.

The teeth in the alternate set are staggered, one to the left and one to the right throughout the length of the blade.
On the double alternate set blade, two adjoining teeth are staggered to the right, two to the left, and so on.
On the raker set blade, every third tooth remains straight and the other two are set alternately.
On the wave (undulated) set blade, short sections of teeth are bent in opposite directions.

Using Hacksaws …. See page 2

Osborne Park: 39 Howe Street. Ph 08 9446 6333 Fax 08 9446 8865
Bunbury: 12 Sylvan Way Ph 08 9725 4812 Fax 08 9725 4809
O'Connor: 11 Zeta Cres Ph 08 9331 3688 Fax 08 9331 1503
Wangara: U-2 6 Ismail Street Ph 08 9309 6333 Fax 08 9309 6899
Thebarton: 14 Murray Street Ph 08 8352 1888 Fax 08 8352 1666
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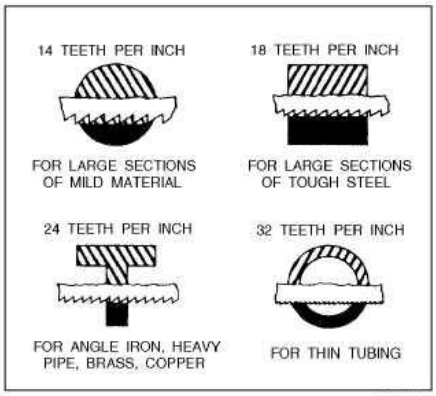
Using Hacksaws

The hacksaw is often used improperly.
Although it can be used with limited success by an inexperienced person,
a little thought and study given to its proper use will result in faster and better work and in less dulling and breaking of blades.

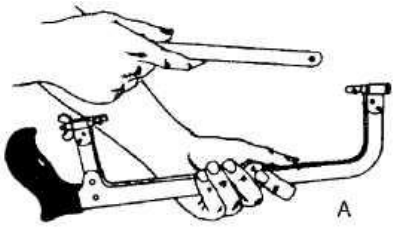
Blade Selection

Good work with a hacksaw depends not only upon the proper use of the saw but also upon the proper selection of the blades for the work to be done.
The diagram will help you select the proper blade to use when sawing metal with a hacksaw.
Coarse blades, with fewer teeth per inch, cut faster and are less likely to choke up with chips.
However, finer blades, with more teeth per inch, are necessary when thin sections are being cut.
The selection should be made so that, as each tooth starts its cut, the tooth ahead of it will still be cutting.



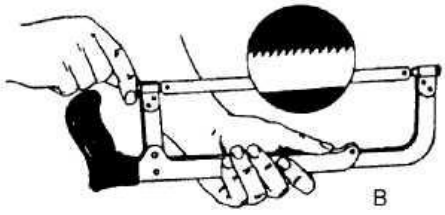
Cutting

To make the cut, first install the blade in the hacksaw frame as shown, so the teeth point away from the handle of the hacksaw.
(Hand hacksaws cut on the push stroke.)

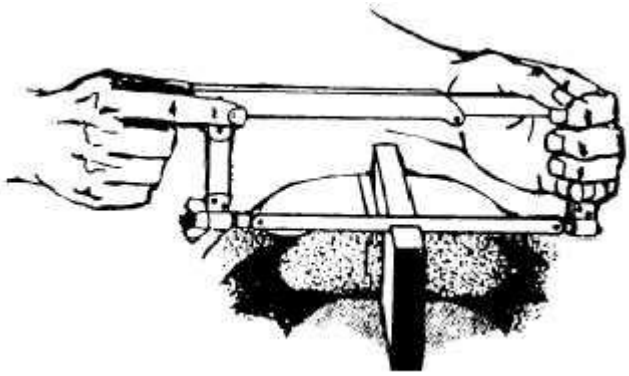


Tighten the wing-nut until the blade is definitely under tension.
This helps make straight cuts.

Place the material to be cut in a vice.
A minimum of overhang will reduce vibration, give a better cut, and lengthen the life of the blade.
Have the layout line outside of the vise jaw so that the line is visible while you work.



The proper method of holding the hacksaw is depicted in the diagram
See how the index finger of the right hand, pointed forward, aids in guiding the frame. When cutting, let your body sway ahead and back with each stroke.
Apply pressure on the forward stroke, which is the cutting stroke, but not on the return stroke.
From 40 to 50 strokes per minute is the usual speed. Long, slow, steady strokes are preferred.
For long cuts, rotate the blade in the frame so that the length of the cut is not limited by the depth of the frame. Hold the work with the layout line close to the vice jaws, raising the work in the vice as the sawing proceeds.



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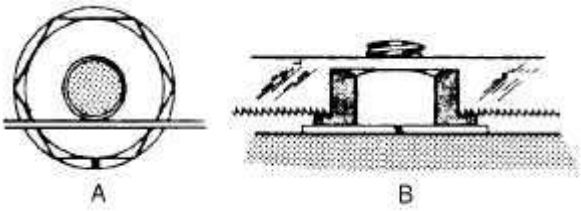
TIP

Removing a frozen nut.

To remove a frozen nut with a hacksaw, saw into the nut, as shown here, starting the blade close to the threads on the bolt or stud and parallel to one face of the nut, as shown in view A. Saw parallel to the bolt until the teeth of the blade almost reach the lock-washer. Lock-washers are hard and will ruin hacksaw blades, so do not try to saw them.



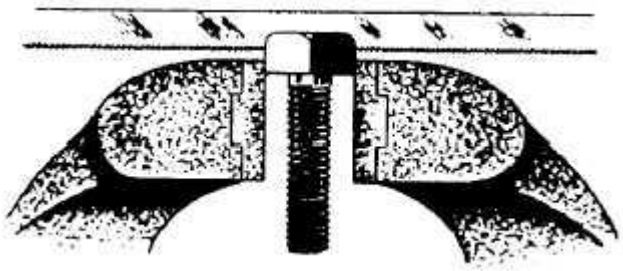
View B shows when to stop sawing.

Then, with a cold chisel and hammer, remove this one side of the nut completely by opening the saw cut. Put an adjustable wrench across this new flat and the one opposite, and again try to remove the frozen nut. Since very little original metal remains on this one side of the nut, the nut will either give or break away entirely and permit its removal.

TIP

Screw Removal

To saw a wide cut in the head of a cap screw or machine bolt, fit the hand hacksaw frame with two blades side by side, and with teeth lined up in the same direction.



With slow, steady strokes, saw the slot approximately one-third the thickness of the head of the cap screw, as shown here.

Such a slot will permit subsequent holding or turning with a screwdriver when it is impossible, due to close quarters, to use a wrench.

Hacksaw Safety

The main danger in using hacksaws, is injury to your hand if the blade breaks.
The blade will break if

A) too much pressure is applied,
B) when the saw is twisted,
C) when the cutting speed is too fast,
D) or when the blade becomes loose in the frame.

Additionally, if the work is not tight in the vice, it will sometimes slip, twisting the blade enough to break it.

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