

Circular-Saw Basics

A sidewinder is the most important tool on the job site, but did anybody ever teach you how to use one safely and effectively?

by John Spier

As a professional carpenter who has built houses from Arizona to New England, I've probably run more kilowatts through portable circular saws than through all my other power tools combined. This article will serve as a primer for novice carpenters and as a refresher course for veterans. There's much more to learn about circular saws than will fit here, but I urge you to learn the basics first. Get comfortable with the

tool and its dangers before you climb a ladder and start cutting rafter tails 20 ft. in the air.

Buy a good saw and use a good blade—I own both sidewinders and worm drives, but here I'm going to focus on the 7¼-in. sidewinder. (In an upcoming issue, Larry Haun will discuss the basics of using a worm-drive saw.) These saws can cost anywhere from \$50 to \$200.

But with a dozen good-quality professional saws on the market for under \$150, I recommend spending a little more for a professional saw.

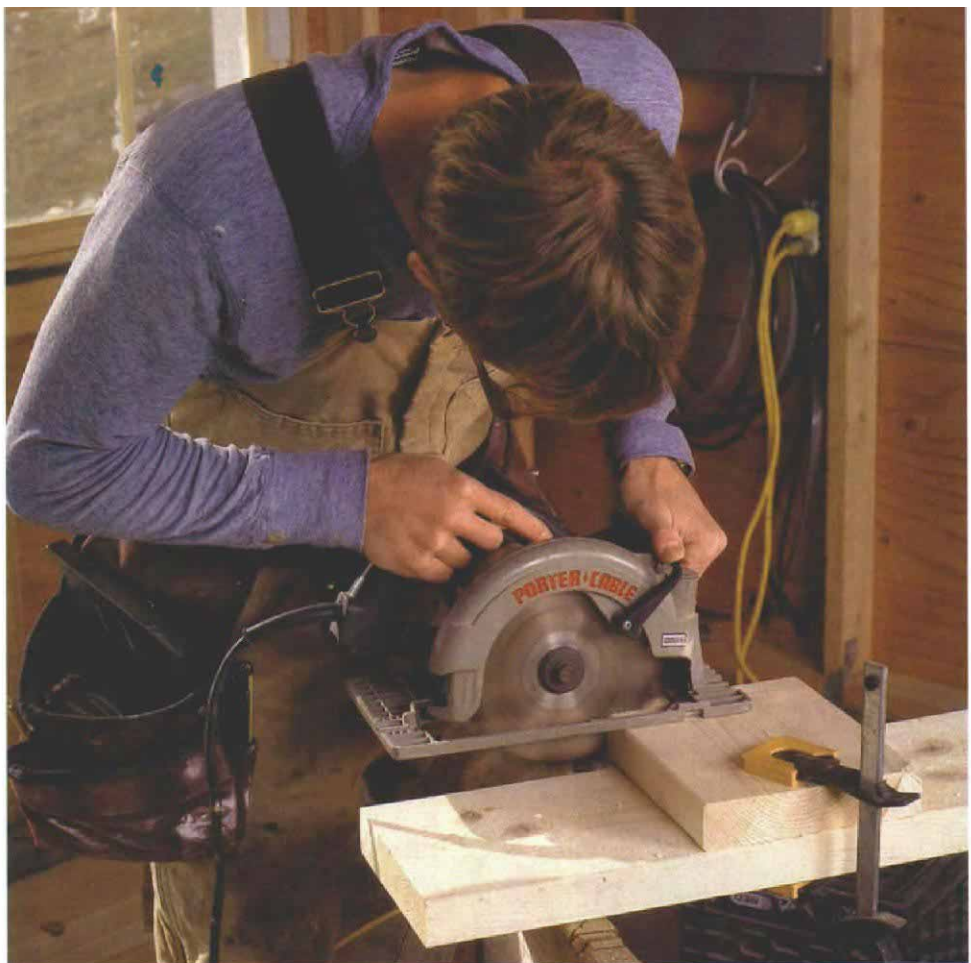
The biggest factor that affects the performance of a circular saw is choice of blade. The newer thin-kerf carbide-tipped combination blades are excellent all-around blades that cut quickly and stay sharp a long time, and I buy whatever brand is on sale.

CIRCULAR-SAW SAFETY

Kickback happens to even the best and most careful carpenters, but it can be minimized by setting the blade depth, standing in the right position and keeping the work held securely.



Blade depth is set $\frac{1}{8}$ in. beyond work



Clamping short work lets two hands hold the saw.

Protect your eyes—Before you start cutting, let's talk about safety. Circular saws can cause serious damage with eye injuries and cuts being the most common. On my job sites, eye protection is a must (photo facing page). My employees all wear good-quality safety glasses whenever they're using a circular saw.

Proper blade depth minimizes kickback—

Most injuries from circular saws occur when the sawblade binds in the cut and the saw kicks back toward the operator. Adjusting the cutting depth so that the blade extends no more than $\frac{1}{8}$ in. beyond the bottom of the material (photo left) is an important first step in avoiding kickback. Having the blade at the proper depth limits the area of the blade that's in the kerf. It also exposes less of the blade if the saw kicks back.

A number of situations can cause a saw to bind and kick back. The first is when the piece being cut off is not allowed to fall down and away from the saw properly. The board should be positioned so that the weight of the cutoff keeps the saw kerf open as the cut is being made. If you're working off the end of a sawhorse or some other working platform, make sure you're not cutting uphill. Cutting on the slightest incline can cause the saw to bind. Instead, lift the back edge of the board as you finish the cut so that the saw runs downhill.

If someone is holding or catching the cutoff, he or she should support the piece gently but with a firm grip while applying slight forward pressure on the end of the cutoff to keep the saw kerf open. If your "catcher" is a novice, make sure that he or she understands the procedure before you start cutting.

Binding and kickback probably occur most often when you're making a cut between two sawhorses. In this case both sides of the cut are supported, and either the weight of the saw or its forward motion can cause the saw kerf to close and the blade to bind. Binding can be avoided in this situation by lifting the piece being cut off up and toward you as the cut progresses.

To prevent the blade from binding, the saw must also move in a straight line. If the blade wanders from its straight path, the rear of the blade will bind against the side of the kerf.

Kickback happens to even the best and most careful carpenters, so it's important to keep all parts of your body out of the line of potential kickback. A saw can also wrench the arm, wrist or hand holding the saw when it kicks back. A firm grip and awareness of that potential will help, but the best defense is avoiding kickback in the first place. Finally, if I have to turn the saw off in the middle of a cut (if I'm repositioning myself for a long diagonal cut through a sheet of plywood, for instance), I make sure the blade

has stopped spinning before taking my hand off the saw.

Hold the saw with two hands whenever possible—

Most saws have two handles. Any time I'm cutting something that doesn't have to be held, I use both handles. It's easy to cut long lengths of stock with both hands on the saw. If the weight of the work is not enough to keep it from moving, it can be clamped, blocked, screwed or nailed to keep it in place. However, the safest way to handle cutting short pieces is to clamp them securely in place (photo right).

Malfunctioning guards are another common cause of injury. An accumulation of wood chips or sawdust can keep the guard from closing properly, as will a broken spring or a lack of maintenance. When a saw is set down with the guard stuck open, it usually spins in a tight circle on the floor, often cutting its own cord and sometimes your toes. If the floor happens to be newly finished with zebra wood inlays, missing toes might be the least of your problems.

Here, some other safety considerations: A dust mask or respirator should be used when cutting materials that generate fine or toxic dust. Always unplug the saw to service it or to change blades. Try not to cut into live wiring, including the saw's power cord. Never use a circular saw or any other power tool in or around water.



Start with the blade and the saw-base notch on the line.

CROSSCUTTING

With practice, starting a cut with the saw properly aligned becomes second nature, but for the beginner, here are some crosscutting hints that you can apply to both framing and finish.



Register the saw against the square to guide the cut.



Your thumb can also serve as a saw guide.

Crosscutting begins with lining up the cut—To crosscut in a straight line, the saw needs to enter the material lined up with the line you intend to follow. Saws don't like to start out crooked and make a turn to follow the line.

Start by lining up the guide mark on the front of the saw table and the front edge of the blade with the cutline (photo left). (Be sure that the blade is not actually in contact with the material when the saw is started.) The line can then be followed either by using the guide mark or by watching the blade.

A square guides the cut—Many carpenters use a cutting guide, usually a triangular rafter square, to keep the saw on the line for a square

cut (photo top right). The lip of the square is held against the far side of the board, and the saw table rides along the square. This technique works only if your sawblade is perfectly parallel with the edge of the table. If table alignment is off, this technique will cause the blade to bind.

Hand as saw guide—I frequently place my left thumb or fingers beside the saw base as a guide when I'm starting a cut (photo bottom right). With experience, I've found this method to be the easiest and most efficient. Once the cut is started, I guide the saw by watching the leading edge of the blade as it cuts along the line.

Better saws have the inside of the blade guard cut away so that watching the line from the nor-

mal operating position is not a problem. Because the saw tends to travel in a relatively straight line as it cuts, the line doesn't have to be watched that carefully for most framing cuts. However, for more precise cuts, especially when the blade is cutting on the left side of the line, I lean over the saw for an unencumbered view of the blade and the line.

One problem that you'll run into while crosscutting is having a chunk of material splinter off the cut as the cutoff piece falls away. When I'm cutting framing material, I tend to speed up my cut at the end so that the material is clear cut through before the cutoff starts to fall. However, if I'm making a slower, more careful cut, I reach over with my left hand and catch the cutoff.

A rip fence is usually in the truck when you need it—There are basically two ways to rip material (cutting stock lengthwise in the direction of the grain) with a circular saw: Either you make a line on the material and follow it, or you use something that guides the saw at a fixed distance from the edge of the stock. The accessory specifically designed for this purpose is called a rip fence and can be attached to the saw on either side (top photo). Rip fences are limited in the width they let you cut (usually 10 in. or less), and they are usually out in the truck when you need them. If you have a lot of narrow ripping to do, the rip fence is definitely worth a trip to the truck.

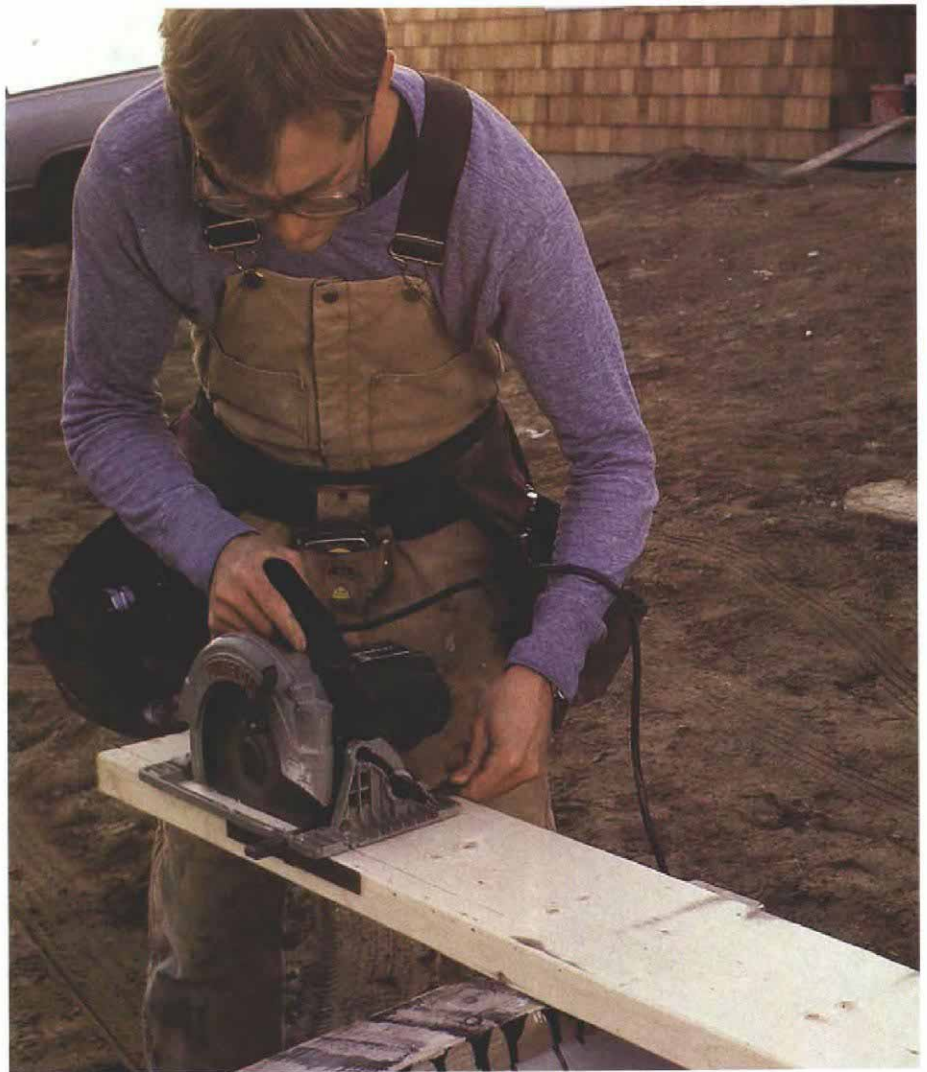
For rips up to 3 in. to 4 in., I put the fence on the right, or blade, side of the saw. For wider rips, I find that the saw and material will be steadier if the fence is on the left. The fence can be set by measuring over from the blade. But a quicker and more accurate way is to scribe a foot or so of line. Rip to the line by eye, stop the saw, and then just slide the fence over to the edge of the board. With the sawblade in the kerf, secure the fence to the saw base.

Pliers as rip guide—Many framers carry small locking pliers or stair gauges in their belts. Either of these tools can be clamped to the saw table as a quick guide for making narrow rips (photo bottom right). These little tools are much more useful to have in your belt than a rip fence.

Hand-grip guide—Another quick way to make narrow rips where accuracy is not paramount is to make a pencil mark on the saw table and follow it as your guide. Yet another way to make narrow rips is to pinch the table with your thumb and forefinger so that your hand acts as a rip fence (photo bottom left). Watch out for splinters. And finally, if you know the table dimensions of your saw on either side of the blade, certain sizes can be ripped easily just by lining the base of the saw along one side of the material. For instance, the standard 1½-in. dimension to the right of most circular-saw blades is invaluable for making a lot of framing cuts without measuring and marking.

When ripping smaller pieces of material, it is often worthwhile to clamp or nail the stock in place to keep it from sliding. You can use your left hand to hold the stock, but a rip might be 20 ft. long; it's easier and safer to use two hands. Incidentally, with care and a good rip fence, you can rip down to about ¼ in. Any less is just too inaccurate.

Most often, I use a combination blade on my circular saw for ripping because I'm usually making a variety of other cuts as well. However, blades designed for ripping are available if you're dedicating your saw to that purpose.



A factory-made rip fence makes the most accurate rips.

RIPPING

With its flat table and adjustable blade, the circular saw is essentially an upside-down, hand-held table saw. And as such, it makes a great tool for ripping. Different guides or fences make it easy to rip accurately.

A finger becomes a rip guide in a pinch.



Pliers can also be a guide.



CUTTING SHEET GOODS

The easiest way to cut sheet goods such as plywood is right from the stack using a 2x spacer to separate the sheets you want to cut from the rest of the pile.



Clamping pliers hold sheet goods together for gang-cutting.



A strip of plywood serves as a guide for cutting wide pieces.

Plywood lends itself well to gang-cutting—

Many carpenters stack three or four sheets of plywood that are to be cut to a common width or length, for instance, to finish the last course of roof or floorsheathing. A couple of nails, clamps or small locking pliers will keep the sheets from shifting while they're being cut (top photo).

Keeping your cord clear is important when cutting plywood or ripping long stock. Good saws have 9 ft. or 10 ft. of cord to allow you to rip a full sheet without catching the plug, but the best approach is to position your cord correctly in the first place. I often hang it across my left arm when making long cuts.

Straightedge guide—One way to guide the saw when cutting sheet goods is by attaching a straightedge to the stock for the saw table to slide against (bottom photo). The handiest straightedge is usually the factory edge of a piece of plywood clamped, nailed or screwed to the material you're cutting. A level also serves as a good makeshift straightedge.

When cutting sheet goods, set the blade to the proper depth to keep it from binding, which occurs when the cut edges move in relation to each other during the cut. At the right depth, the blade also exits the material at a shallower angle, which reduces splintering.

Three ways to cut at angles—When the circular-saw blade is left square (90° to the table) but the saw follows a line other than perpendicular to the edge of the material, the angle being cut is a miter. If the blade angle is changed but the saw follows a perpendicular line, the angle being cut is a bevel. If both sawblade and line are angled, then the cut is a compound miter.

The circular saw can do all three of these angled cuts well. Most saws have a guideline or notch in the base to indicate the cutline when the blade is set at a 45° angle. For lesser angles, you can start the cut and then interpolate, or make a pencil mark for the guide position. But again, I make my most-accurate cuts by watching the blade follow the line.

Holding up the guard—Cutting bevels and miters is the true test of a good blade guard; most guards have to be held up by hand when starting a cut of any substantial angle (photo top left, facing page), or the guard will jam against the edge of the board and prevent you from cutting. Some carpenters wedge their guards up with shims when they have to make a lot of angled cuts, and when I worked on production framing crews, we used to remove the guards. Now that I'm older and not in so much of a hurry, I leave the guards on where they belong.

Beyond 45° —Several of my carpenters have Skil or Bosch saws that adjust to 60° . These saws come in handy when we have to do a steeply pitched roof or an irregular valley. However, there are ways to cut greater angles with a saw that adjusts only to 45° . For example, if I set the blade to 45° and raise up the table by the thickness of my fingertips, I have a 51° cut (for a 15-in-12 pitch). If I set a piece of stock $\frac{3}{4}$ in. thick, or the wide edge of my triangular rafter square, under the saw table (photo top right, facing page), I have a 56° cut (18-in-12 pitch). That's about the limit for a $7\frac{1}{4}$ -in. sawblade.

Finish work with circular saws—After using a sliding compound-miter saw for the first time, I all but banished my circular saws from exterior-trim work. However, most trim-cutting can be done well with a basic circular saw.

The same rules apply for cutting trim as with cutting framing: Support the work, set the depth, and cut to the edge of the line. However, to get cleaner, more accurate cuts in finish lumber, I find my newest saw and make sure that my blade is sharp and straight. A finish blade will give a better cut than a combination blade.

Cutting from the backside—When I need to make a clean cut in finish lumber, I try to make cuts from the back of the stock (photo bottom left, facing page). The teeth of the circular-saw



Hold the guard up so that it won't jam on compound miters.



Lifting the saw base lets you cut angles beyond 45°.

ANGLES AND FINISH WORK

Sliding compound-miter saws may be great for cutting angles, but used carefully, a circular saw can work almost as well for cutting most angles in framing as well as finish stock.



Cutting from the backside puts the smoothest side of the cut on the finished face.



Prescoring the cut reduces splintering.

blade are traveling upward on the leading edge of the blade. This action causes wood to splinter slightly as the blade exits the kerf while leaving a smoother cut on the bottom where the blade enters the wood. Cutting from the backside puts the splintered edge where it won't be seen and also hides the initial wobble in the cut that often happens when the blade starts into the material.

Scoring the cutline—Sometimes I need to crosscut a trim board with the good side facing up. Before cutting, I score the line with a utility knife first, and then cut to the outside of the score (photo bottom right). I also keep a low-

angle block plane in my toolbelt for cleaning up the cuts when necessary.

When cutting miter angles in finish material, the side of the cut where the blade is shearing off the grain will always be smoother than the side where the blade is cutting against the grain. Make sure your stock is turned so that the piece you're using is on the smooth side of the cut.

If I'm cutting two pieces for a mitered joint, such as the corner of a door casing, I sometimes set the blade at a slight bevel to allow a tighter fit on the surface where the joint is visible. In many cases, you can cut the two pieces to be joined at the same time either by laying one atop the oth-

er and cutting through both or by butting them together and sawing through the joint.

If you are cutting something narrow, lay a piece of stock the same thickness next to it so that the saw base is well supported. To follow a line precisely, lock your arms and move the saw gently with your upper body. To start an angled cut smoothly, hold the saw guard so that it clears the edge of the stock. Finally, if you have two saws, keep the best one for finish-cutting. □

John Spier and his wife, Kerri, have a general-contracting and renovation business on Block Island, Rhode Island. Photos by Roe A. Osborn.