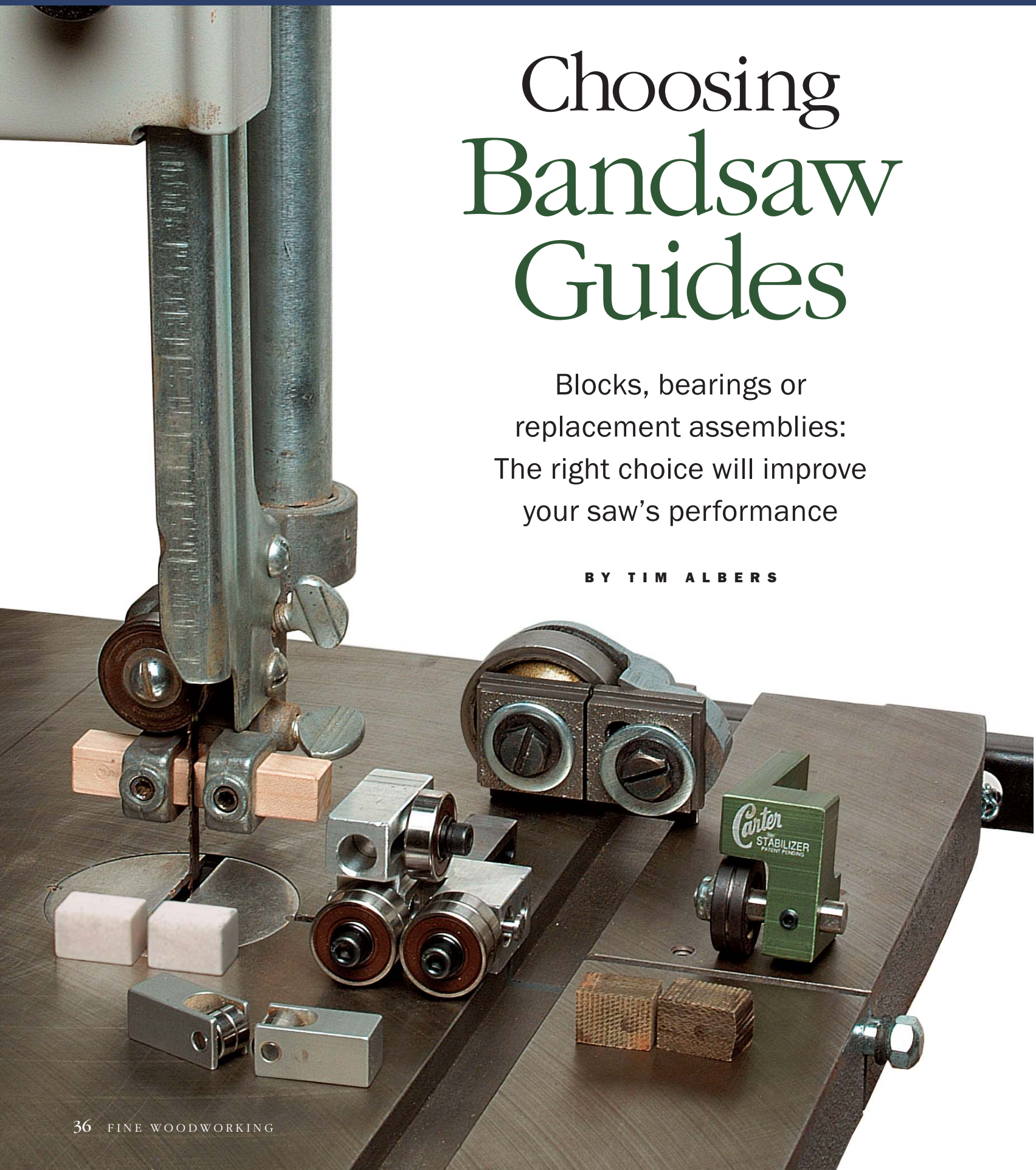
Choosing Bandsaw Guides

Blocks, bearings or replacement assemblies: The right choice will improve your saw's performance

BY TIM ALBERS



The bandsaw continues to be one of the most versatile tools in the shop, and with the increasing use of bimetal and carbide bandsaw blades, it's not uncommon for woodworkers to have several hundred dollars invested in blades. But many woodworkers don't think twice about the guides on their bandsaw.

It's important to have guides that are appropriate for your type of woodworking. Whether you are a luthier using your bandsaw for precision resawing, a toy builder making hundreds of curved cuts or a furniture maker doing some of both, there are bandsaw guides that are right for you.

Anatomy of guides

Bandsaw guides typically have one assembly above the table and one below. The bottom assembly is fixed, while the top assembly travels vertically on a guide post. Each assembly contains three support elements: two side, or lateral, supports and one rear support. The rear support element is known as the thrust bearing and limits the rearward movement of the blade while cutting.

Some guides use blocks to provide lateral support, while some use bearings. Bearing guides are further divided into American and European styles. American-style bearing guides support the blade with the curved outside surfaces of the bearings, rolling along the blade as it travels by. European-style bearing guides contact the blade on their flat side-faces, potentially offering more support area but also more friction and noise.

Replacement blocks

The stock guide assemblies that come with most small-shop bandsaws use square, adjustable blocks for lateral support. These blocks are easy to adjust and, because of their simple design, they have spawned a number of aftermarket replacement blocks.

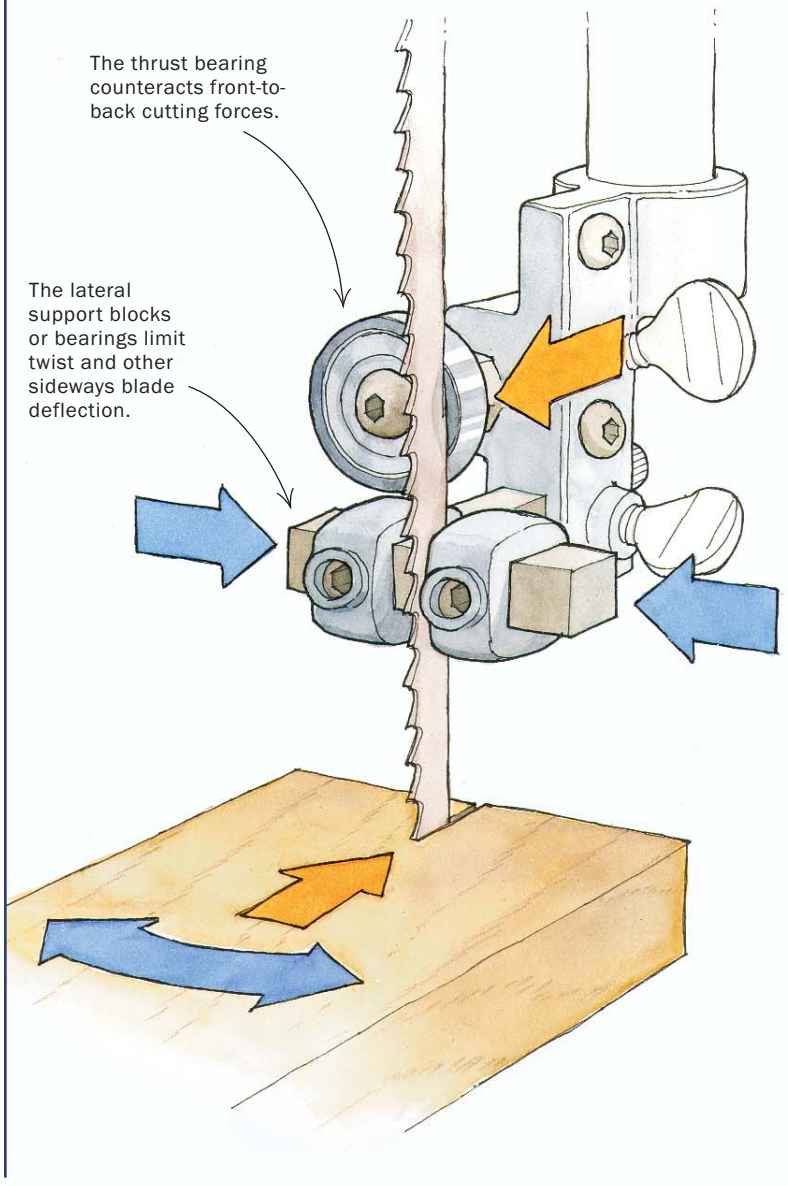
The standard blocks are usually steel and provide solid support for both resawing and curve-cutting. However, steel blocks have significant drawbacks. They generate some heat and noise. The small amount of heat generated by steel blocks isn't the problem (see the related story on p. 41). I find the most significant disadvantage to be their potential to make contact with the teeth and ruin an expensive blade. This is an unnecessary risk, considering that alternative blocks can be bought cheaply or even made for free.

Cool Blocks—With the widespread popularity of the 14-in. Delta bandsaw and its clones, many innovative alternatives to steel blocks have sprung up. Cool Blocks, manufactured in a wide range of sizes to fit most 8-in. to 16-in. bandsaws, are the most popular replacement option. Made from graphite-impregnated phenolic—a hard type of plastic—Cool Blocks are inexpensive, easy to replace and adjust, and provide good support for both resawing and curve-cutting. Adjusted to the recommended clearance of 0.004 in. (the thickness of a dollar bill) between blocks and blade and located directly behind the gullets of the teeth, my blocks have delivered excellent longevity. An added benefit is that you can push them close to the blade and teeth without the risks inherent in steel blocks. Finally, when they wear or get damaged, a quick touch on a disc sander trues them up. Watch out for knockoff versions of Cool Blocks. These melt away quickly.

Hardwood blocks—These are a good alternative to steel blocks, mostly because scrap wood is free. And anyone can make a section of hardwood guide stock in a few minutes. Like Cool Blocks, wood blocks virtually eliminate the potential for blade damage posed by steel blocks. Wood blocks are best for ⅛-in. or 1/16-in. blades, which can be completely encased in the blocks to prevent them from twisting in tight cuts. And, because these blocks are free, you don't have to fret about resurfacing them each time you

BANDSAW-GUIDE ANATOMY

Bandsaw guides work to counteract cutting forces and keep the blade aligned properly.



Drawing: Jim Richey; photo, facing page: Michael Pekovich

REPLACEMENT BLOCKS

Cool Blocks

Hardwood blocks

Iturra Bandrollers

Iturra ceramic blocks

BLOCKS	SAW SIZES	BLADE SIZES	PRICE	SOURCES	COMMENTS
Cool Blocks	For most saws up to 16 in.	⅛ in. to ¾ in.	$13	Catalogs, retail outlets	Best all-purpose replacement for stock steel guide blocks; economical; won't damage blade
Hardwood blocks	Cut to fit	All blades	Free	Shopmade	Ideal for cutting curves; can encase narrow blades but wear too quickly for resawing
Iturra Bandrollers	Fit all 14-in. saws and some other sizes	¼ in. to ¾ in.	$70	Iturra Design (888-722-7078), catalogs	Economical version of bearing guides; not recommended for very narrow blades; good for resawing
Iturra ceramic blocks	For Delta and import 14-in. saws	¼ in. to ¾ in.	$25	Iturra Design	All-purpose blocks; reduce pitch buildup on blade; must be kept clear of teeth

switch back to a larger blade. The downside of wood blocks is that they wear quickly. If you have a lot of cuts to make, you don't want to stop frequently to true your guides.

Ceramic blocks—Iturra Design recently introduced replacement blocks made of a proprietary ceramic material. These blocks have a lifetime guarantee against wear. However, like steel blocks, ceramic blocks must always be kept clear of the teeth, because they can ruin a good blade in a hurry. Iturra recommends that ceramic blocks be used for high-resin woods, so I tried them on some old pine. The blocks did a good job of scraping the resinous sawdust off the blade while not creating the heat buildup that can occur with steel blocks in the same situation. But I don't see any other advantages to them over Cool Blocks or wood blocks.

Iturra Bandrollers—Iturra Designs' other blocks (see Tools & Materials, *FWW* #136, p. 32) replace standard steel blocks, but they use small bearings to support the blade. Like Cool Blocks, Bandrollers are made in a wide range of sizes and fit all 14-in. bandsaws. It took me about two minutes to install the Bandroller Pro guides. Iturra recommends a blade clearance of 0.003 in. However, I run American-style bearing guides in light contact with the blade to obtain the most support. I decided to run these the same way and experienced no problems doing so.

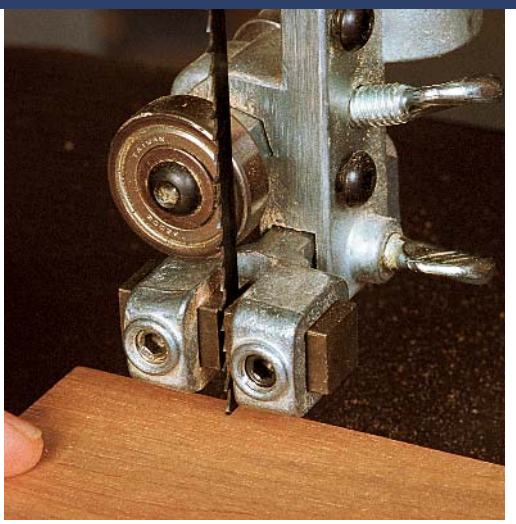
With less surface area contacting the blade, Bandrollers don't provide as much support as blocks for cutting tight curves. On the other hand, they perform well for all other tasks, especially resawing. For a relatively small investment, Bandrollers offer the benefits of bearing guides while allowing a quick changeover to blocks for smaller blades.

Replacement block assemblies

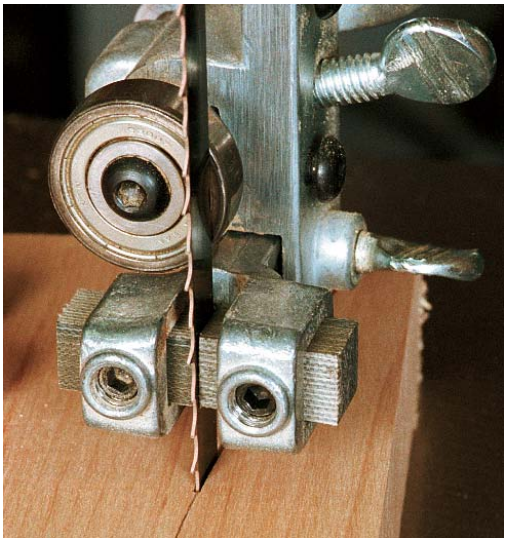
While relatively inexpensive replacement blocks are best for newer 14-in. saws, updating an older or larger saw requires a complete replacement of the guide assembly. Some of these aftermarket units use blocks to provide lateral support, and some use bearings. Let's look at the block assemblies first (see the chart on p. 40)

Carter's Micro-Precision guide—The Carter Products Micro-Precision guide, popular for larger saws, is available in three sizes,

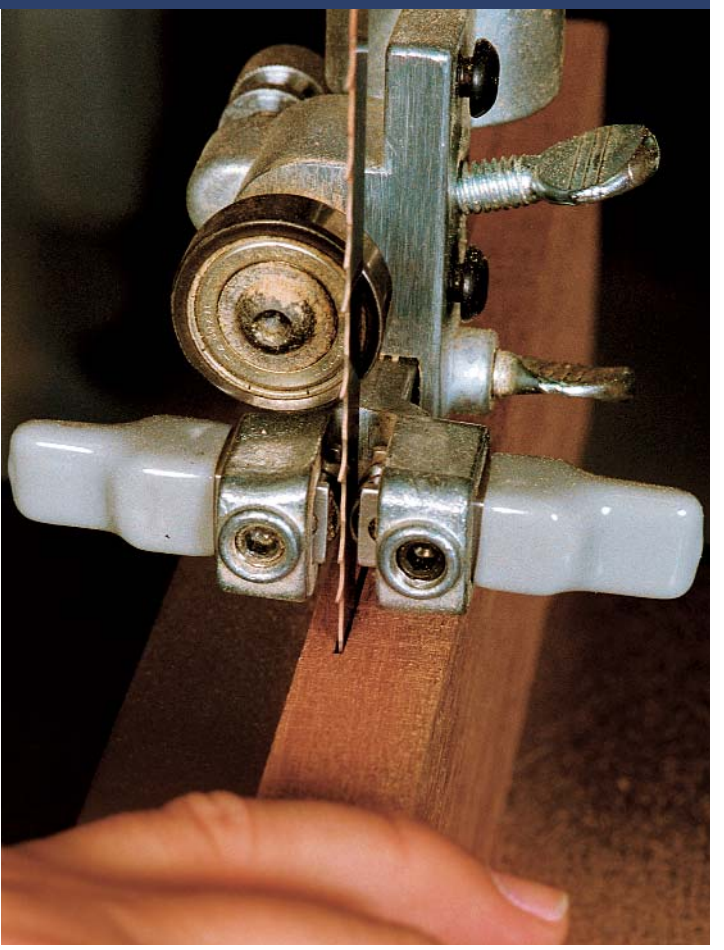
Photos, this page: Erika Marks



Steel blocks should be replaced. *With inexpensive block replacements available for many of today's guide assemblies, why risk ruining an expensive blade? Here, an improperly adjusted thrust bearing allows the teeth to contact the metal blocks.*



Cool Blocks are the author's favorite aftermarket blocks. *Available for every bandsaw on the market, they are inexpensive, easy on teeth and can be adjusted so they completely encase smaller blades.*



Iturra Bandrollers offer smaller saws the benefits of bearing guides for much less cost than a complete replacement guide assembly. *Like all bearing guides, Bandrollers can be run against the blade without creating excess friction, making them a good choice for resawing, where blade tracking is so important.*

from #00 to #1 (for more on choosing the right size guide assembly for your saw, see the chart below). However, the company does not recommend this guides for 14-in. bandsaws or smaller. The Micro-Precision guide functions essentially like standard block guides, but Carter's blocks are larger and made of a material called Tefloy, a Teflon-impregnated metal alloy that produces less friction and wear than steel blocks, according to the manufacturer. The large, square blocks on this assembly, coupled with the large thrust bearing, provide excellent blade support.

Wright guide—Manufactured by Black Diamond Saw & Machine Works, the Wright guide, like the Carter guide, is available in a range of sizes from #00 to #2. In this case, however, only the #00 size is relevant because the other, larger sizes are designed for large, industrial bandsaws beyond the scope of this article.

The #00 Wright guide has a unique design. The large thrust bearing and blocks are mounted together in one compact but sturdy unit. The blocks are approximately 1 in. square by ⅜ in. thick and are mounted so that their sides support the blade.

The blocks have rabbets on three sides, each one slightly deeper than the last, offering four different contact areas for different blade sizes. By simply rotating the blocks, you can adjust for blades from ½ in. down to ⅛ in. However, each side of the block is 1 in. tall, providing excellent blade support. I experienced absolutely no problems with a ⅛-in. blade, even in very tight curves. While this assembly uses hardened-steel blocks, their easy adjustment and excellent blade support outweigh—and even reduce—their potential to damage a blade.

Both the Carter and Wright block assemblies employ a hardened-steel thrust bearing that is much more durable and resistant to grooving

SIZING GUIDE ASSEMBLIES

Most aftermarket guide assemblies are sized according to a standard numbering system, from #00, the smallest, to #2, the largest.

SIZE	BLADE SIZE	MACHINE SIZE
#00	⅛ in. to ½ in.	12 in. to 16 in.
#0	⅛ in. to 1¼ in.	16 in. to 24 in.
#1	¼ in. to 1½ in.	30 in. to 36 in.
#2	¼ in. to 2½ in.	36 in. and up

Photos, except where noted: Asa Christiana

REPLACEMENT BLOCK ASSEMBLIES

MODEL	GUIDE SIZE(S)	BLADE SIZES	PRICE	SOURCES	COMMENTS
Black Diamond Wright guide	#00 to #2 (#00 tested)	⅛ in. to ½ in. for #00	$58 for #00*	Black Diamond Saw & Machine Works (508) 653-4480	Best replacement assembly for all-around use on saws 14 in. and smaller
Carter Micro-Precision guide	#00 to #1	⅛ in. to 1¼ in. for #0	$130 for #0*	Carter Products (616) 451-2928 www.carterproducts.com	Best replacement assembly for all-around use on saws 16 in. and larger

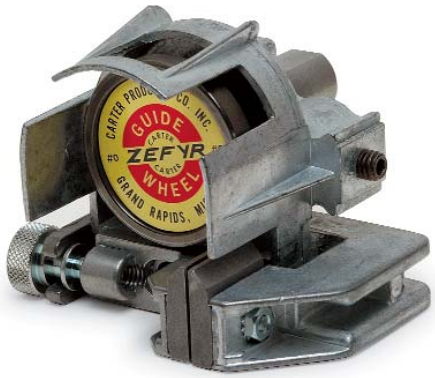
*Often requires accessory mounting bracket

than the thrust bearing on the stock guide assembly on your bandsaw.

American-style bearing assemblies

A few aftermarket guide assemblies use bearings to provide lateral support. They are available in two styles: American and European. I'll start with American-style bearing assemblies, which support the blade with the curved, outside edges of their bearings. These rolling guides are great for resawing, because they hold the blade solidly in place without generating much friction.

Black Diamond Wright guide



Carter Micro-Precision guide

Carter vs. Paddock—I evaluated two American-style bearing assemblies on a 20-in. saw: Carter Products Guidall 500 and an assembly from Paddock Tool Co.

These bearing guides take slightly longer to adjust than block guides, but both the Carter and the Paddock guides held their adjustments well (see the chart on p. 42).

I have the luxury of a large bandsaw dedicated to resawing, and I maintain an American-style bearing assembly on this saw. The downside of these bearing assemblies is that you are limited in blade width. Bearings do not provide good support for very narrow blades, which can jump out of the guides and cause blade damage or disaster. You need to make sure these bearing guides are adjusted just right for ¼-in. blades, especially when cutting tight curves. The #0-equivalent guides work best on blades ⅜ in. and wider.

Depending on the wood species being cut, pitch buildup can be a problem on bearing guides. Pitch will create extra friction and blade deflection, just the things you are trying to avoid. So, for my larger saw dedicated to resawing, I have a slight preference for the more expensive Paddock guide, because its bearings are a bit easier to adjust, and its hooded assembly seems to shed sawdust better and keep the bearings cleaner. Also, the bearings on the Paddock have a much sharper edge than those on the Guidall 500, resisting a narrow blade's tendency to roll out of the bearings when twisted.

Carter also makes a replacement bearing assembly—the Guidall 2000—for specific 14-in. and 16-in. bandsaws. The bearings on this assembly have much sharper edges and can handle blades down to 3⁄16 in.

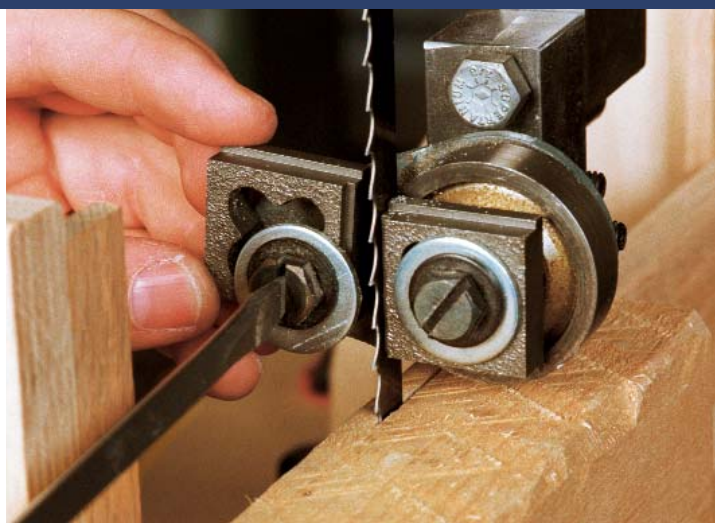
Stabilizer—The latest wrinkle in bandsaw guides is the Stabilizer from Carter Products. The Stabilizer is designed only for narrow blades, up to ¼ in., and is unlike other bearing guides. It has a single bearing mounted in the thrust-bearing position. The blade rides in a groove machined around the outside of the bearing. The Stabilizer replaces part of the upper guide assembly and is manufactured for a variety of small and midsized saws.

The manufacturer recommends that the Stabilizer be mounted so that the bearing pushes the blade forward 1⁄16 in. and the assembly sits about 4 in. to 6 in. above the tabletop. While the latter distance allows the blade to flex somewhat, a ⅛-in. or 3⁄16-in. blade, adequately tensioned, will track extremely well through even the tightest cuts. A sharp blade is a necessity, of course.

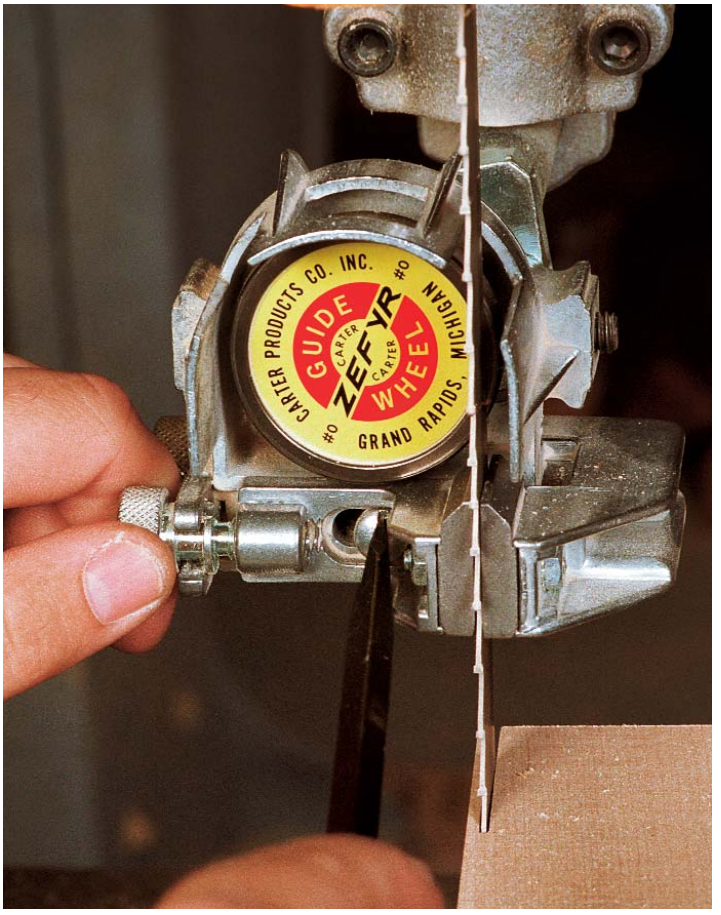
European-style bearing assemblies

European steel-framed saws have boomed in popularity the last few years. These saws generally arrive with what most of us call European-style bearing guides. On these guides the blade is sup-

Photos, this page: Erika Marks



The Wright guide's blocks and thrust bearing are mounted together in one compact, sturdy unit. *As a result the thrust bearing cannot be adjusted forward and back to accommodate different blade sizes; instead, the blocks offer four rabbeted sides of varying thicknesses. The blocks can be rotated and adjusted quickly and easily.*



Carter's Micro-Precision guide is an excellent replacement assembly for all-purpose use on a large saw. *Made of a Teflon-impregnated alloy, the large blocks can be run closer to the blade, offering better blade support without creating more friction and wear. Adjusting these blocks takes a little getting used to, because both sides are secured with the same screw.*

Don't blame the guides if your blade overheats

A common misconception is that steel blocks generate excessive heat, which in turn causes loss of tooth hardness or blade failure. In fact, guide setup and feed rate—rather than which type of guides are used—are the greater contributors to friction and heat.

As a test I set up two similar bandsaws, one with its original steel blocks and one with Cool Blocks, and I used a Raytek infrared thermometer to measure the temperature of the blades. On both saws I used a ½-in. standard carbon-steel blade. With the blade sufficiently tensioned and the guides properly adjusted, I made a series of heavy cuts. The highest blade temperature I obtained with Cool Blocks was 89°F, or 14° above the ambient temperature in the room (75°F). The highest temperature from the steel blocks was 107°F, or 32° above room temperature. Some of the cuts created cooler temperatures very close to Cool Blocks' measurements. So, the highest temperature difference I could get between the two types was 18°.

The author used a Raytek infrared thermometer to check the temperature of the blade in use or immediately thereafter. *He learned that friction and heat are more a function of feed rate and saw setup than the particular guides being used.*

For testing purposes I then moved the thrust bearing on the upper assembly back very slightly and used a faster feed rate to cut the same thick board. It wasn't difficult to achieve temperatures in excess of 150°F, and I'm sure with more aggressive cutting the blade would have gotten even hotter.

It's not hard to generate blade heat while cutting, but it's also not hard to reduce it to manageable levels. Adjust the lateral support blocks or bearings as recommended. Minimize blade flex by bringing down the upper assembly close to the workpiece, properly tensioning the blade and adjusting the thrust bearing to just a hair behind the blade when it is running freely. Then watch your feed rate, and don't try to follow curves that are too tight for your blade size.

REPLACEMENT BEARING ASSEMBLIES

Carter Guidall 500

Carter Guidall 2000

Paddock guide

Carter Stabilizer

MODEL	GUIDE SIZE(S)	BLADE SIZES	PRICE	SOURCES	COMMENTS
Carter Guidall 500	#0 equivalent	¼ in. to ¾ in.	$154*	Carter Products (616) 451-2928, catalogs	Good for resawing; not good for narrow blades
Carter Guidall 2000	#00, for most 14-in. bandsaws	3⁄16 in. to ½ in.	$150-$170	Carter Products, catalogs	Not as versatile as stock guides
Paddock guide	#00 to #1 equivalents	Model 10: ¼ in. to ¾ in.	$265 for model 10	Paddock Tool Co. (913) 621-3234 www.paddocktool.com	Excellent for resawing; easier to adjust than Guidalls; less prone to pitch buildup
Carter Stabilizer	Fits most 10-in. to 14-in. saws	⅛ in. to ¼ in.	$70	Carter Products, some catalogs	Best used for cutting curves; limited in capacity but very good at supporting small blades

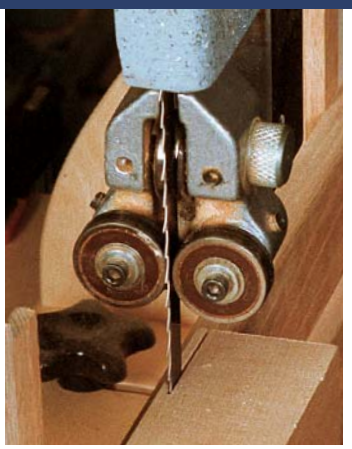
*Often requires accessory mounting bracket

ported between the flat side-faces of two bearings, rubbing rather than rolling between them.

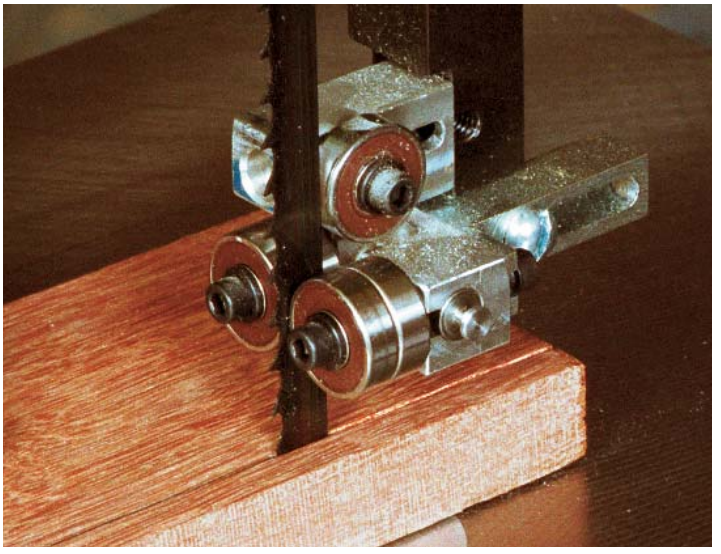
The only advantage of these guides is their ease of adjustment, with knurled locking rings replacing the usual combination of Allen wrenches. European bearing guides, however, have significant disadvantages. These guides are very large, so they eat up resaw capacity and cause the bottom assembly to be mounted farther below the table, allowing more blade flex. Also, these large guides block my line of vision, making it more difficult to follow a line on intricate cuts. The most significant problem I have found with several of these European-style saws, including the one I own, is that the side bearings are not parallel to each other and cannot be made parallel without a decent amount of filing and adjusting. Bearings that are not parallel can reduce blade support, cause more friction and make set-up procedures a headache.

Some manufacturers claim that the guides on their saws are adjusted so that the bearings are slightly toed-in, the idea being that the guides can be adjusted closer to the blade and its teeth without creating excess friction. But this setup will support the blade well only if the toe-in is minimal, 0.002 in. or less, and only if the toe-in position is directly at the front of the bearings. The greater the toe-in, the less the contact area and support. Many of the saws I have inspected have too much toe-in. Worse yet, it's located at the bottom or top of the bearings.

Photos, this page: Erika Marks



Both Carter and Paddock make bearing guides well-suited to larger saws used primarily for resawing. *The Carter Guidall 500, left, is less expensive, but its lateral-support bearings have rounded corners that don't hold smaller blades as well as the Paddock's sharper-edged bearings. Also, the Paddock has less trouble with pitch and dust buildup.*



Carter also makes a smaller bearing assembly, the Guidall 2000, as a conversion option for newer saws. *The sharper-edged, smaller bearings on this assembly do a much better job supporting narrow blades while still excelling at resawing.*

Carter's Stabilizer is in a category of its own. *The best option for guiding small blades through scrolling cuts, it consists only of a grooved thrust bearing. The existing upper thrust bearing and entire lower guide assembly are retracted when the Stabilizer is in use.*

The bottom line is that I would spend the money to replace these guides with aftermarket block guides.

Replace the guide assembly or just the blocks?

I like block guides for all-around cutting. It's hard to beat their versatility. If you have a newer 10-in. to 14-in. bandsaw, stick with the manufacturer's guide assembly and replace the steel blocks with Cool Blocks. If you do a lot of resawing, get a set of Iturra Bandrollers. It takes only a minute to switch styles. And if you do a lot of cutting with ⅛-in. blades, consider the Carter Stabilizer.

If I were replacing the assembly on an older, smaller saw (up to 14 in. or 16 in.), I'd go with the Wright block guide. However, for a newer 14-in. bandsaw, this block assembly is not enough of an improvement over stock guides to justify its expense.

On a larger saw (from 16 in. to 20 in.), I would choose Carter's Micro-Precision guide for all-around cutting. I would also use the Micro-Precision guide to replace the European-style bearing assemblies on today's larger, welded-steel-frame saws; however, replacements are not available for all saws.

If you have a larger saw dedicated to resawing or making veneer, I would install an American-style bearing assembly, with the slight edge going to the slightly pricier Paddock guide. □

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