

# Seven Joinery Fixes

Don't scrap a valuable workpiece; make an invisible repair

BY PHILIP C. LOWE

The work of cutting accurate joinery involves two basic, and contradictory, truths.

The first truth is that to hone your craft, you must learn and practice the correct skills, keep your tools sharp, and focus on your work. In short, avoid mistakes.

The second truth is that you cannot avoid mistakes.

Let's face it: No matter how skilled we become, we still slip with a chisel now and then or get too aggressive with the tablesaw. Occasionally, despite our best efforts, a router bit chips away a corner.

Sometimes it's simple enough to grab a fresh piece from the lumber rack and start again. But if you're working with a limited supply of lumber, don't want to discard a grain-matched board, or already have invested hours in shaping or carving a part, a joinery mistake poses a serious dilemma.

Fortunately, you almost always can save the part you're working on. Here are some ways to fix mistakes when cutting tenons, dovetails, and dados.

*Philip C. Lowe is a furniture maker and teacher in Beverly, Mass.*



# 1

## Shim a miscut tenon cheek



**A too-slender tenon.** A tenon that has been cut or trimmed too narrow creates a weak joint.



**Add a shim.** Make a shim from the material used for the workpiece and glue it to the tenon. Make sure that the grain runs in the same direction on both pieces.



**Trim the excess.** After the glue has set, use a shoulder plane to pare the tenon to proper size. Check your progress frequently as you plane away the excess material. Stop when you have a snug push-fit.

The critical parts of a tenon are the cheeks and shoulders, and each can be miscut in several ways. Let's start with the cheeks. Planing a tenon too thin is probably the most common mistake, but you also can create tenons that are twisted or trimmed narrower at one end than the other. The strategy for repairing any of these problems is to glue a slightly oversize shim to the offending side of the tenon and plane away the excess wood until the tenon is square and fits the mortise.

Make sure that the surface to be corrected is flat so that the added piece will have an adequate glue joint. For shim stock, I typically use a thin cutoff of the workpiece material. The grain of the shim should run in the same direction as the tenon so that it will shrink and swell in the same way.

When gluing, I use a thick block as a caul to distribute the clamping pressure evenly. If the shim is very thin, glue can seep through so I use a sheet of waxed paper to prevent the caul from sticking to the work.

Although I want to do the repair work carefully, I don't want to lose too much time in the process, so I typically use the quickest-setting glue that will hold the repair. Instant glues such as cyanoacrylate can get you working again in a few minutes, but they tend to darken the area around the repair and make it more visible. Yellow glue works fine for most repairs, but it needs to set for an hour or so. Hide glue is the slowest option; however its dark color can help some repairs disappear. It's also water soluble, so you can redo the work if needed.

## 2 Trim a damaged shoulder

Another common mistake is going too far when sawing the shoulder of a tenon, or making a bad cut with a shoulder plane when trimming the shoulder. The best correction is to scribe another line and pare the shoulder to it. Remember that the corresponding tenon shoulders on an opposite rail (or rails) should be trimmed to the same length; otherwise you will build the frame out of square. You won't always have the room to fix errors in this way because it will change the finished dimensions of the piece.



**An ugly result.** A slip with the shoulder plane can leave unattractive gaps.



**Mark out the repair.** Scribe a line for a new shoulder just behind the damaged edge (above). Don't forget corresponding parts. You'll need to trim the opposite apron to match the length of the piece you're repairing, so transfer your newly scribed line to the second piece (right).



**Cut a new shoulder and check the fit.** Use the new line as a guide to pare away the waste and create a new surface (left). Careful work with the chisel yields a clean line at the joint (above).

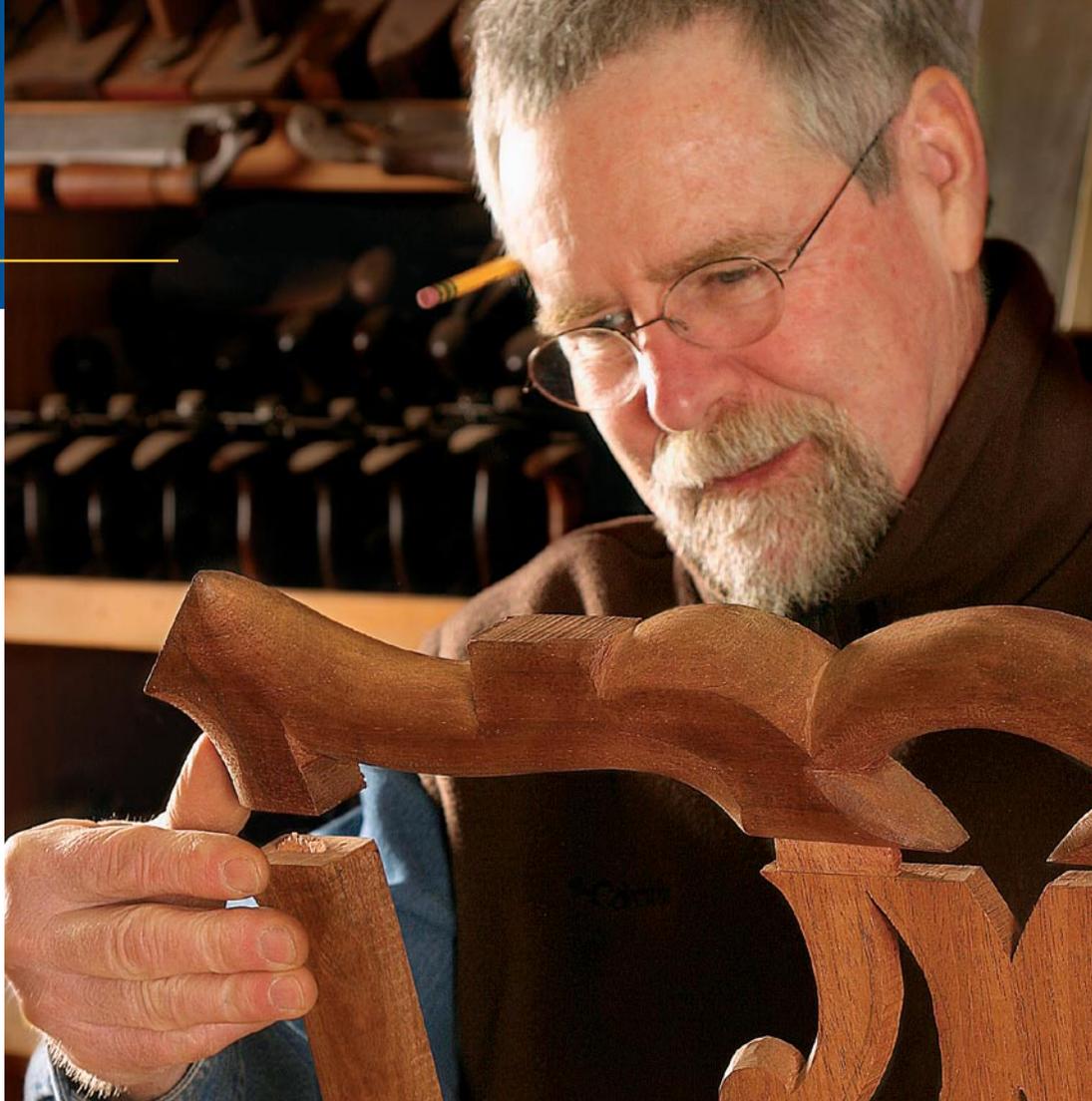
# 3 Replace a broken tenon

If the damage to a tenon is bad enough, it can compromise the tenon's strength, making it necessary to eliminate the tenon completely. In a situation like this, I cut off the damaged tenon and install a loose tenon.

A loose, or slip, tenon goes into a mortise in each mating piece. So after removing the damaged tenon, I cut a mortise where the tenon used to be.

When deciding on the size of this mortise, I make sure to leave an adequate shoulder area around the tenon. This might mean that the new mortise is smaller than the original mortise in the mating piece. If that happens, I'll make the loose tenon with different-sized ends, so that each end will fit its own mortise.

I use West System epoxy for this repair because it adds strength to the shoulders where the end grain comes in contact on each piece. The glue dries slowly, but the result is a more solid joint.



**The problem.** Through accident or rough treatment, a tenon has broken off.



**Create a mortise.** Saw and chisel away the broken remnant of the tenon for a clean surface. Use dimensions from the mating piece to locate the new opening.

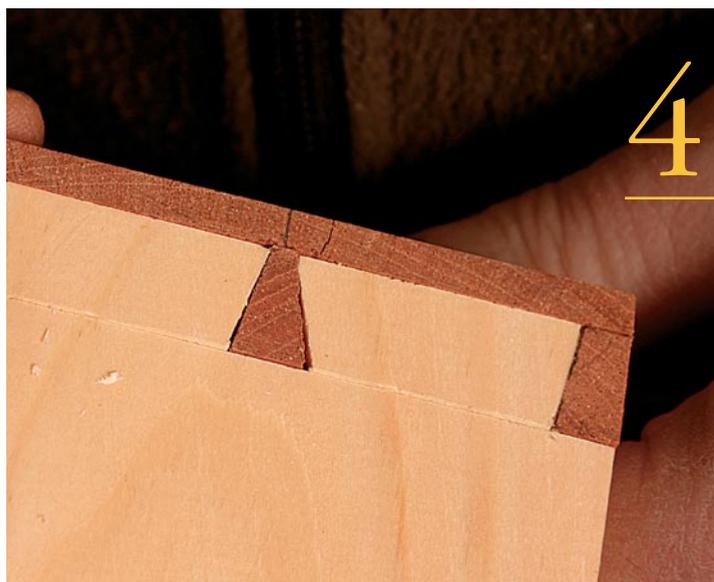


**Fit the new tenon.** Size and shape the repair piece to fit the newly created mortise. Then glue it in place.



**Trim the exposed end.** After the glue sets, trim and pare the tenon cheeks to fit the mortise in the mating piece and get the parts to line up.

# Fixing mistakes in dovetails



## 4 FILL GAPS IN DOVETAILS

**A little too roomy.** A mistake with the saw or chisel has resulted in a loose fit around one of the pins.

**A** number of mishaps can occur when cutting dovetails by hand.

If you cut the pins first, like I prefer to do, you can wind up miscutting the tails so that they don't mate snugly with the pins. It's also possible to pare a pin too aggressively, causing a poor fit or a weak joint.

When I miscut a tail, I typically will go ahead and glue up the work and then fill the gaps by gluing in wedges. I make the wedges using cutoff stock from the pin board. When choosing material for this repair, I look closely at the end grain and try to match the annual growth rings of the pins as closely as I can.

For wedge stock to repair through-dovetails, I like to use waste material that was sawn away from between the pins when I roughed out the work with a coping saw.

Be sure to set aside some of these waste pieces as you cut them. If you need them for repairs, the grain and color of the material will match perfectly.



**Fill the gap.** Use a chisel to pare a short, thin wedge from a cutoff of the drawer-front material. Orient the grain in the same direction, dab one end in glue, and tap the wedge home between the pin and tail (left). Cut the wedge flush with the surface of the drawer side. After planing the surface, the finished repair disappears (above).

## 5 REPLACE A BROKEN PIN

If you find that you've pared a pin at an angle, you can repair the mistake with a shim. Glue a piece of small, thin stock to the side of the pin, then trim it flush to the inside face of the board and to the end. Pare the restored pin carefully with a chisel for a tight fit.

It's also possible to salvage a pin that you've broken off or weakened by paring it too small. To do this, I begin by chiseling away the broken pin altogether. Continuing with the chisel, I then cut an open-ended mortise immediately behind the pin location. This mortise will accept an oversize, rectangular replacement piece from which I'll cut a new pin.

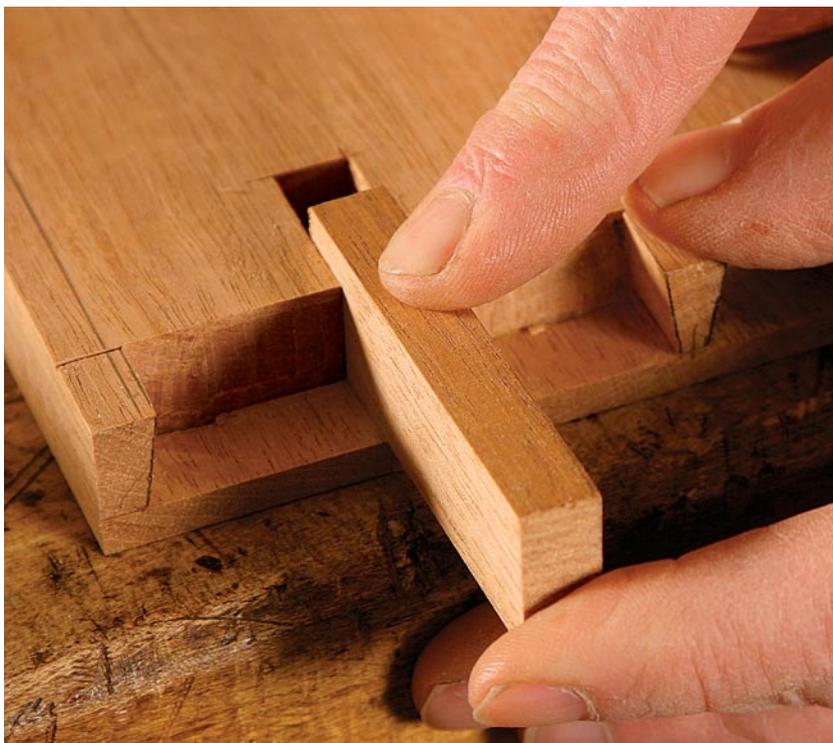
The piece, milled from cutoff stock, is glued in place and then sawn, planed, and pared to fit. Use the tail board as a template to mark out the sides of the new pin.



**This can't be shimmed.** A slip with the chisel left a broken pin.



**Mark out for pin removal.** Scribe lines to create a rectangular mortise matching the maximum width of the pin (above). Remove material by making angled chisel cuts to create a ramp to the baseline at the front of the pin. Then pare from the front (right) until the bottom is square.



**Use cutoff stock for the repair.** Fit and glue in the rectangular repair piece (left). Trim the new piece flush with a saw and handplane. Use the tail board to mark out the sides of the new pin. Be more careful this time!

# 6 Patch and recut a dado

A **dado** is cut across the grain and a groove is cut with the grain; both are set in from the edge or end of the board. A **rabbet** is a dado or groove that is open on one side, such as on the edge or end of a panel. If you cut these joints too wide or too deep, the easiest repair is to fill the cavity, plane it smooth, and cut it again.

Fill a dado with a piece that also runs across the grain so that the infill piece will shrink and swell along with the panel. To make the glueline as invisible as possible, I use the cutoff from the end of the panel as the filler. A miscut groove can be repaired in the same fashion, but the grain should run with the length of the groove instead of across it. This repair can be done with a cutoff from the edge of the panel if it is large enough; it will be far less visible because the long grain will line up with the edges of the groove. These techniques also work for repairing miscut rabbets.



**That sinking feeling.** The wrong end of the workpiece was against the fence, so the center dado is in the wrong place.



**Save your cutoffs.** A crosscut scrap from the end of the board is trimmed to fit and glued in place. Plane the repair piece flush (right) for a barely detectable repair. The dado can now be recut in the right place.

Fine  
WoodWorking.com

Visit our Web site for more joinery-repair tips. Author Philip Lowe demonstrates techniques for perfecting a lap joint.



# 7 Repair a chipped corner

Any kind of through-cut across the grain can end in a chipped corner. If the damage is minor, you might be able to soften the rough edge with sandpaper to make it disappear. But when the damaged area is large enough, you'll need to replace the missing wood. The trick is to do it without it being too obvious.

First, use a bench plane or block plane to make a nice tapering cut off the corner to create a flat surface for gluing. Next, create a repair piece by sawing a corner from a cutoff piece. Be sure to cut the repair piece at an angle that matches the flat surface on your workpiece; this way the grain will run in the same direction as the grain on the part. It's important that the surfaces mate as closely as possible so that the glueline is invisible.

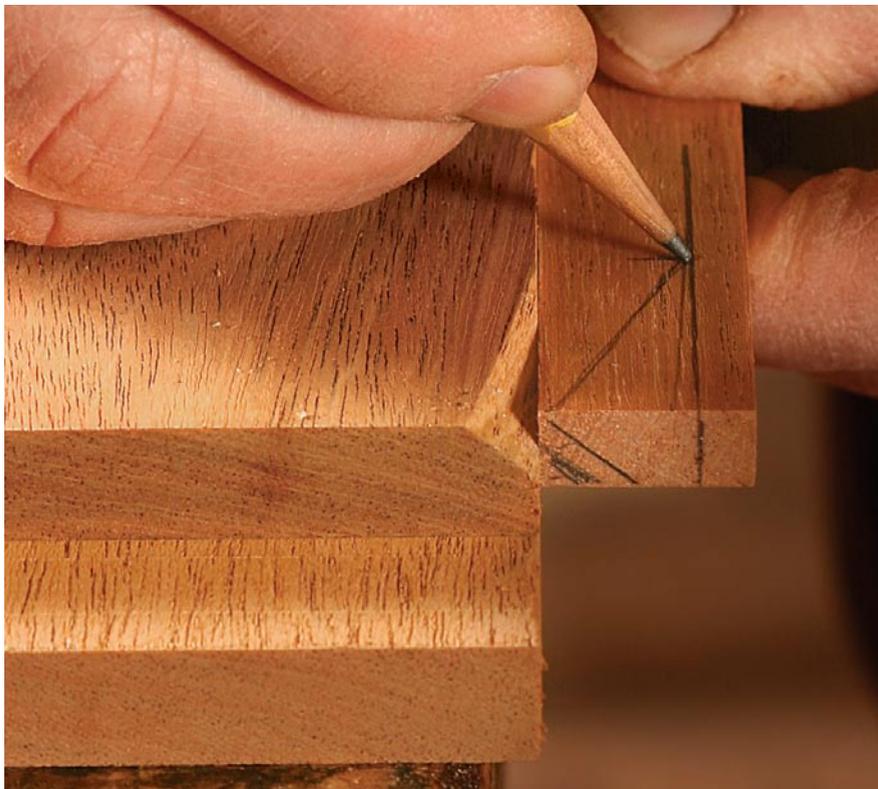
Attach the repair piece with a rub joint and hold it in place with a spring clamp if necessary. Once the glue sets, carefully plane the proud surfaces of the repair piece flat to the surrounding surfaces of the workpiece, and use a chisel to pare the overhang flat to the shoulder.



**A chipped-out corner.** An otherwise clean rabbet cut is marred by a triangular chip torn from the edge.



**Create a clean surface for the repair.** Use a bench plane or block plane to make a flat base on which to glue the repair piece. This will minimize the glueline and help make for an invisible repair.



**Custom-fit a repair piece.** Mark out and saw the repair piece to fit the missing corner (left). Take care to ensure that the grain direction matches the workpiece as closely as possible. Glue the repair piece in place, leaving the outside surfaces proud of the workpiece. Once the glue has dried, carefully saw, pare, and plane it flush to the workpiece (above).