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## Introduction

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Obviously not all mistakes are fixable. Nor can I give you cookbook solutions for all of them. What I'll do here is present a series of ideas or solutions to fix some common problems. You will have to adapt or combine these as necessary for particular situations. You must realize that often the fix takes more time than making a new pen... for the cost of a couple of replacement brass tubes. Many times you can even turn off the wood and reuse the tubes. It's always a decision you have to make. Sometimes the blank is special and starting over is not an option. And at times the fix makes the pen come out better! Lastly, fixing mistakes is educational. Not only in the sense that you'll learn not to make the mistake again from analyzing what went wrong, but often the fix means stepping slightly out of the box, trying something new. Soon you may find you're incorporating some of the techniques routinely. But enough philosophy, let's get started!

### Adjusting slimline mechanisms

Everyone making 7mm pens, at one point, has pressed a transmission in too far. The result is a tip that does not fully retract, or extends a little too far in the writing position. I am aware of 2 ways to fix this. One method I learned from Jim Lane, a member of the penturners group on yahoo. Grab the mechanism in a simple wooden vise, and pry up the body using 2 screwdrivers.



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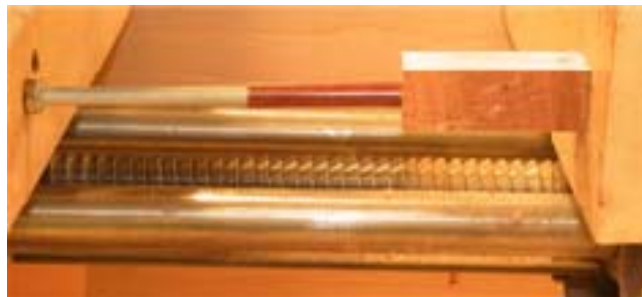
To protect the pen barrel from the prying screwdriver a bushing and a washer are used (see picture 1). The refill

can stay in place, so you can see exactly when the length is correct

The other method uses the commercially available 7mm disassembly kit sold by virtually all pen kit retailers, or a home made variation of the same. The kit contains a 1/8" steel rod which is inserted through the



transmission. The pen barrel is held by hand, and the rod is struck with a hammer, knocking out the tip. Now the transmission can be pushed back in one of several ways: You can grab the pen barrel again and use the thicker rod to knock out the transmission. A size D drill blank can be used for that, or even a 1/4" bolt – if it were truly 1/4" it would not fit, but the way the tolerances work out most will actually fit nicely. The 7mm disassembly kit contains a large barrel which lets you do this job in a gentler way: You insert the transmission into the cylinder, the D rod into the open end, and press the transmission back the amount needed. You can then leave the cylinder on, and press on the tip again to complete the pen.



A home-made variation of that is a size D (0.246") or even 1/4" hole dilled in a piece of hardwood. The hole just fits the transmission, but catches the barrel. A 1/4" bolt can serve as push rod. Picture 2 shows the home-made 'kit', and picture 3 shows it being used in a bench vise.

After you have fixed a couple of pens like that, you'll probably make a gauge to get it right in the first place. A simple block that prevents your assembly press's jaws from closing too far does the trick (picture 4). The block is about 3 31/32",

but it is best to assemble a pen and measure the distance from the tip to the end of the transmission. There are minor differences depending on the refill, so when you switch to another manufacturer or rather refill it's good to go slowly on the first pen and check.



## Disassembling

The theory of disassembling is quite easy. At least one side of any pen barrel is open. You insert a metal rod through the hole, and punch out the fitting at the other side. If there are 2 holes, you start at the larger hole so your punch does not go straight through. Suitable punches are old drill bit, e.g. I have an incredibly bad Chinese bradpoint drill set that goes to ½" in 1/64<sup>th</sup>s, bought at some surplus place for a few bucks. They are no good for drilling, but they make good disassembly punches. An excellent option is a set of transfer punches that goes up in 1/64<sup>th</sup>s (see sources). Of course you have to see what it is that the punch bottoms against at the far end, sometimes you may shatter some plastic, or simply disassemble a pressed-in part you didn't mean to. I'll discuss a few specific pens to demonstrate some of the problems and fixes. Of course, you don't have to spend money - in a pinch bolts, dowels, anything you may have laying around might fit. My friend Greg Wilson routinely uses concrete nails, with the head ground to the right diameter.

### ***El Grande***

Berea's El Grande is one of my favorite pens. But the main barrel is not easy to disassemble. The holes at both ends are about the same. If you leave the

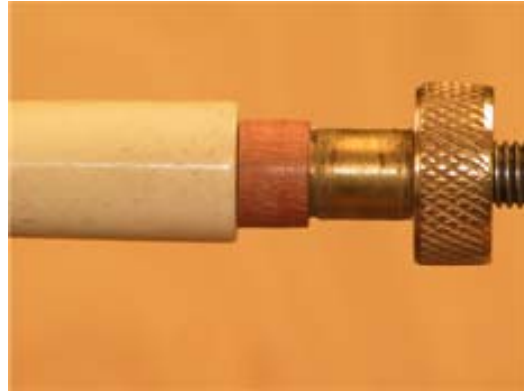
receiver barrel on the pen and try to punch out receiver barrel and fitting as one unit, chances are you'll shatter the receiver barrel. What you can do, though, is use bolt screwed into the fitting. Unfortunately, this thread is an uncommon metric thread, M10x0.75. So I turned a small plug on my Chinese 7x12 metal lathe. (These lathes are relatively inexpensive, and a great addition to a shop, if just for odds and end jobs). You can see the plug in picture 5. Now the punch has something solid to drive out. The plug and fitting come out as one piece and are unscrewed, and the fitting is totally re-usable. Of course, if you can find a metric bolt with the right thread you can use that. But if it's a loose fit, you may damage the thread and preclude re-use. If you don't have a metal lathe, maybe you can find a friend that has one that'll be happy to show his expertise off and make you one. My lathe does not cut metric threads perfectly, but with the right gears the error can be minimized.



### ***Glued-on/pressed-on centerbands***

The Havana pen from Craft Supplies USA has a decorative ring that is pressed onto an exposed piece of brass tube. Before you press on that ring, you have to remember to insert the plastic threads into the tube. Especially the first few times I made that pen I forgot the threads... There is no internal protrusion to grab, so the knock-out method does not work. I have been somewhat successful with using a leather liner or 2 layers of bicycle tire for protection, grabbing it with a pair of pliers, and rocking and twisting it off. That same technique is useful with Parker style and Euro style pens, for the centerband, whether it is on a wood tenon or an exposed piece of brass tube. I have always been able to get these centerbands loose. At worst, I have marred them to render them unusable, but kit manufacturers will generally replace a part, often at no charge, if you screw up.

Sometimes, if the centerband was on a real tenon, the tenon twists off with it... In that case, you can clean up the square shoulder on the lathe, glue on a short piece of wood, and turn a new tenon. The tenon does not even have to be the same material: picture 6 shows a pink ivory tenon breathing new life into an antler pen.



### ***American Flattop***

Here is a problem one of my friends had with a Berea American Flattop pen. This pen has a solid connection between transmission and finial adapter.

Somehow the transmission was ruined, she could not unscrew the cap and knock out the transmission/finial adapter assembly. The disassembly trick used here is to drive the assembly out the other end, all the way through the tube. Drill a hole in a piece of wood to let the lower body slide through, but catch the centerband. A 13/32" bit was right for this



pen. Now insert the pen, and start tapping the fitting straight through, from the clip end. See picture 7. This is the sort of esoteric problem you might think nobody will ever have again, but this trick has helped other friends of mine. It's useful to remember the technique to maybe apply in a different situation.

### **Blowouts, cracks and tearouts**

Blowouts during turning can have many causes, like dull tools, wild grain as in a burl, too aggressive a cut, poor glue bond between brass tube and blank, and more. I call a smaller defect that happens often with wild grain where the defect

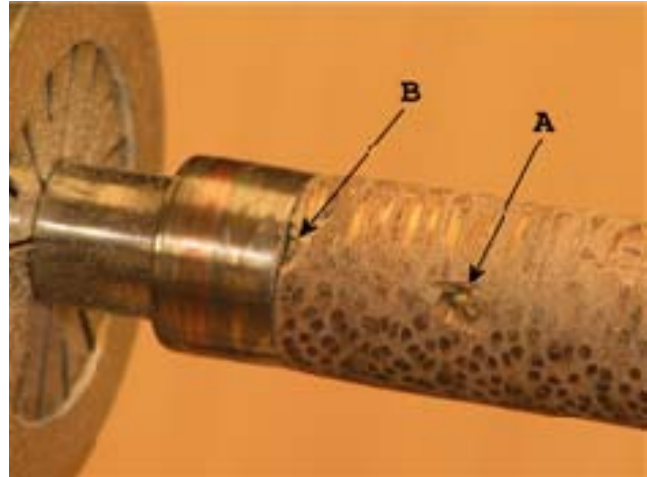


does not go all the way through to the brass tube a tearout.

Occasionally you will have wood that has cracks or small defects that were not visible from the surface and only reveal themselves as you are close to the final shape. All of these can be dealt with in similar ways: You can fill the damaged area with a

mixture of wood dust and glue, or some contrasting filler like colored epoxy, or crushed stone bonded with glue. It really depends on the wood, and the size of the hole. I find that it is very hard to match the color of the wood using wood dust, the mixture with glue darkens it a lot. Of course you can keep some lighter colored wood dust around, but don't expect to make an invisible repair. Still, many times, for a small hole or tearout, especially in a burl, wood dust and glue are an excellent option. In many cases repairs of small defects will be very hard to detect.

Picture 8 shows such a small defect (A). It's quick to generate some dust using sand paper if you don't have an accumulation on or under your lathe already. Make a small pile of sawdust right on the defect (picture 9). You can also use a small tool like a dental pick to pack the dust into the defect. Then add a drop of thin CA (picture 10). I like thin



CA, because it wicks in best. I immediately follow it with a drop of medium CA to fill some of the gaps better. It's best to allow this to air dry and not hit it with accelerator to avoid frothing. The accelerator starts a reaction that heats up the CA, and because of the large local concentration it generates enough

heat to boil the CA and froth up. When it's dry, you can continue turning. Picture 11 shows the finished repair after it's been turned back down to size.



Larger areas where the darkened wood dust would look objectionable can be filled with colored epoxy.

There are lots of ways to color epoxy, you can use carbon powder or artist's paint, or buy dry pigments in artists' supply store. You can even buy specific epoxy colorant. I have read that one should use only oil based paints to color epoxy, but I have used acrylic latex paint successfully also. Mix up the epoxy, add the colorant and pack it into the defect. After it is dry, continue turning.

With many woods I like using crushed stone.

Picture 12 shows a pen made from desert ironwood heartwood with sapwood that had several cracks in the sapwood. I use a Dremel tool to enlarge the cracks slightly, after the barrel is turned to just about final shape. Here I use crushed turquoise stone grade Fine to fill the cracks. I have used tools from screwdriver tips to McDonalds coffee stirrers to handle the stone, nothing worked terribly well. Then I started using a 7mm tube, mostly because I could always find one. That worked fairly well. Bouncing the idea back and forth with my friend Jay Pickens, after a few iterations, resulted in the tool I am using today, shown in picture 13. It allows precise





positioning and dosage, with minimal spilling. The space behind the open front holds enough stone to do a whole pen's worth. Again I use a dental pick to position the stone to fill the cracks. Then I use thin CA, applied with a micro-tip, to let CA wick into the stone. Key is not to use too much CA, just enough to wick in and fill the space between the stone granules. I spray it with accelerator and proceed to the next area. Because the stone is high in the cracks, it must be brought down to the level of the wood. Most stone is very hard, and doing this with a HSS tool is a real challenge, so I use a carbide tipped tool. The tool I use is no longer available, but it is not hard to even make your own, or have a friend with basic metal working abilities help you make one (see sources). After the stone is leveled, the barrel can be sanded, polished and finished as usual.

## Carving inlay

You don't have to preserve the natural outlines of a defect. Some people are very good with carving tools like the turbo-carver, or a Dremel, and manage to turn defects into attractive designs. An example where I used a turbo-carver to widen a series of sapwood cracks in desert ironwood is shown in picture 14. The widened cracks were then filled with crushed turquoise.



## Decorative rings

Another variation on that same theme is turning a ring to hide a defect. Use a parting tool to cut a groove, or grooves, and fill them with stone. The groove can be all the way down to the brass, but it does not have to. If it is too shallow, though, it's harder to fill completely and not see through to the bottom. I learned to fill the grooves from my friend Bill Baumbeck: With the lathe stopped, first you make a little pile of stones in the groove, and wick thin CA into it. Be careful not to apply too much CA! First, a large drop can wash away the stone. Secondly,

extra CA can run down and fill the groove. This will prevent you from applying stone there. So use just enough to bind the stone, then spritz a little mild accelerator on it. If you didn't use too much CA and don't overdo the accelerator it won't bubble. Some people put a small tray on the lathe bed to catch spilled stone. Of course, it's also not a bad idea to protect the lathe bed from spilled CA. I have to admit I don't bother with either. I'm just careful... famous last words, I know! But using my stone applicator tool, stone spillage is really minimal. And CA scrapes off easily when it's dry. (Scraping works much better than attempting to dissolve it with acetone!)

After that first little pile of stone is locked in place, rotate the pen away from you, and put on a new pile. The initial stone serves to hold the new pile in place. Again, a little CA and accelerator will hold it. Work your way around the whole pen that way. If you find you filled part of the groove with CA and can't put in stone, use your parting tool to recut the groove and start over.

Now it's time to level the stone again. The carbide-tipped tool comes in hand again. I turn the stone so it is just a tad below the surface. I use a magnifying glass and dental probe to inspect the stone carefully, sometimes you discover small voids where larger stone pieces prevent complete filling, or where a stone tore out during turning. Some extra-fine stone can be worked into such holes with the dental pick and locked with CA. With the lathe turning very slowly I now apply thin CA in a small bead just over the filled groove. The CA flows into the small cracks that may still be there and fills them completely. If you can't do that, they may fill with sanding dust can later. Now you can re-level the CA/stone and finish the pen as usual.

## **Oops bands**

It happens I the best of families... you are just about done, and tear out a piece at the end of a barrel. It happens especially easily with burls and diagonally cut woods. Or you take too aggressive a cut earlier in the turning and a chuck comes off the end. Or you crack then end during assembly. Lots of thing can

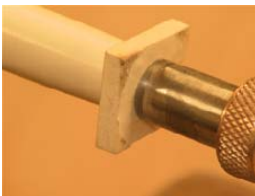
happen at the ends! Fortunately, this is really easy to fix: add an 'oops band!' You can even plan on using oops bands up front, as I do in the style of pen shown here.



Picture 15 shows a crack that developed after assembly in a piece of mammoth ivory, because I was careless and did not file out the brass tube sufficiently to let the fitting slip in. In this case I added a piece of ivory, and hid the joint under a ring of crushed stone.



I start by parting off enough of the damaged area to have a clean face (picture 16). The shoulder of the face should be square or have a small undercut so a piece can be added without gap. I have a box of cut-offs from pen blanks and can usually find something suitable. Here I use the same material as the original.



Drill a hole of the right size, square the end, and crosscut to a little longer than what you need. Glue it on with thick CA (picture 17). When that's dry, square and trim to the right length. Because I used the same material I have to hide the glue joint. Here I did this by inlaying a stone ring. Cut the groove (picture 18), fill with stone (picture 19), turn and finish as needed. The fixed ivory pen is shown in picture 20.

A more standard oops band that has become a design element can be seen in the next sequence. Notice that in picture 8 there was another defect, at B.



Some wood had broken out at the end. Again I cut a tenon and add a piece of contrasting material, trustone in this case (picture 21) After turned it to size and



blended it in with the wood, another chunk of wood came out, right next to the previous repair! See picture 22. Again I simply filled with sawdust and CA (picture 23). The final repair is nearly invisible (picture 24). Often you can also orient the clip to hide a repair that does not blend in quite as well.

Sometimes you have the choice at which end of the barrel you want to do the oops band. Other times, if you have a shape with strong curvature at one end of the barrel, and the diameter is already correct, you don't have the choice: if you add it at the end with the strong taper, and try to extend the shape smoothly, the end will end up too small, or you may have a rather awkward shape. I once cut 10 upper barrels for Parker-style pens at 1 11/16" instead of 1 13/16". They were all different and expensive blanks, I did not want to take a \$50 loss! I tend to put accents at the ends of a pen, but sometimes you have a choice (depending on the pen design) These pens, American flat-top style, already have a black centerband between two gold rings, so I added



the additional blackwood band at the centerband – you'd never know they weren't designed that way! (See picture 25)

## Shorten a refill

All twist ballpoint pens using a Parker-type refill and a center fitting into which a transmission is screwed are rather sensitive to front tube length. This includes many Parker and Euro style pens, as well as cigar pens. If the barrel is trimmed too far, the transmission ends up too close to the tip, and the tip will not fully retract. Picture 26 shows such a problem, the refill here is in the retracted position! If it's a pen you use yourself or in your family, you can shorten the refill slightly. Just grind off as much of the black plastic at the end of the refill as necessary! See picture 27. This



should be the first line of defense because it's the simplest. Similarly, on a Cross-type refill, you can pull off the black cap and shorten the metal tube, if for some reason you can't or don't want to adjust the mechanism.

## Lengthening tubes

The more permanent way to fix too short a barrel – you guessed it – is to lengthen it. You can underlay a ring under the center fitting, I prefer to add an



oops band at the tip. Picture 28 shows a tenon to accept the extension piece.

The tenon has to be long enough to solidly anchor the extension. When you trim it, just don't trim back to the brass tube – use a brass tube from an unmade kit to



measure the length it should be and trim to that (picture 29). Now you can turn and finish the barrel. The joint between the 2 pieces can be hidden in a number of ways – here I hide it by emphasizing it with a few wire-burned rings. Picture 30 shows the complete barrel, you can clearly see the extension beyond the brass tube.



When you press in the tip, use epoxy to fill the gap to give the tip mechanical strength. The end result does not look too shabby (picture 31), even though I was not careful enough with the diameter, and this pen, because of the epoxy to wood joint, is not a good candidate for disassembly.

## **Cigar lengthening**

The cigar pen gives you another option to lengthen the front barrel, without disassembly. Since the tip unscrews, you can underlay a small disk you turn out of a suitable material like plastic or corian. Either add to the existing plastic ring, or replace it with a thicker one. Because of work holding, this is not terribly easy, but I have done it successfully.

## **In summery...**

I have shown you some techniques for dealing with the most common mistakes during penturning. This is a large topic, and there are plenty of variations on these problems as well as the techniques, and plenty additional ones. The main message is treat mistakes as design opportunities! Sometimes it pays to put a pen aside and give it a fresh look a few days later. Of course, many of us have a box with problem pens that we'll get to some day. That's OK – I generally deal with the ones I need to right away, and those others – didn't I say it's sometimes more trouble than it's worth? Well, there is always hope, some day I'll get to all the patients ☺