Making fast wind-up tuning pegs for a double bass

A step-by-step guide to creating an efficient tuning system for bassists

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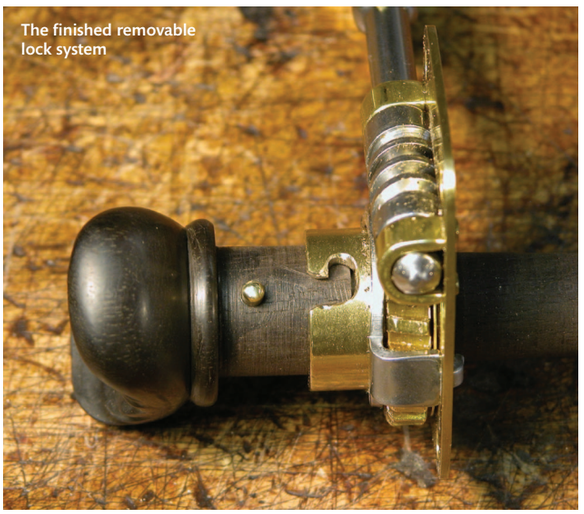
WOODEN PEGS – often made from ebony and boxwood – have long been part of the geared tuning machines used on double basses. You cannot usually remove these pegs from the machines, because they are secured with screws or nails to the collar of the cog that turns the peg. To change a string, bassists have to use fine-tuning metal keys to turn the cog and collar, and unwind and rewind a string around the peg. This can be quite time-consuming because of the cog's slow-turning worm drive.

When I made my second bass, I realised that a simple modification could give players access to their pegs and the chance to change their strings more quickly – an advantage for those who play both classical music and jazz. Instead of using screws or nails to secure the peg, I installed a removable lock system that allows the peg to slot in and out of the collar. In my experience, once bassists have tried this kind of tuning machine, they don't want to return to their old systems.



The finished removable lock system

1 The shape of the lock marked in felt-tip pen

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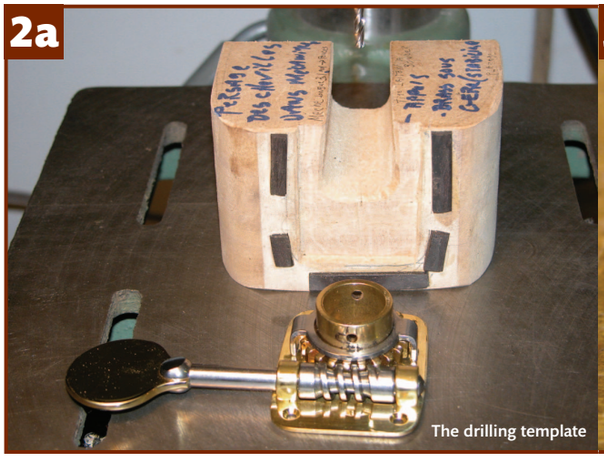
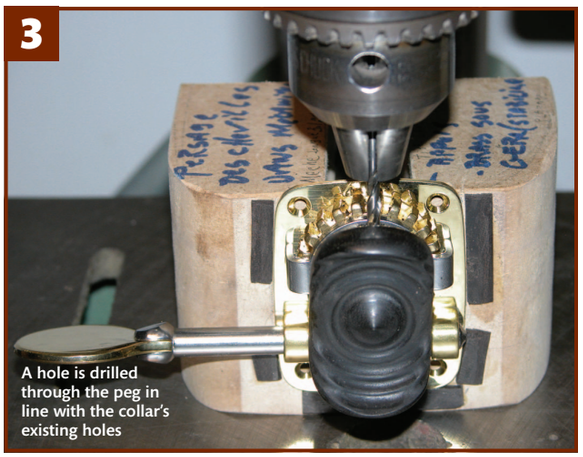
1 Before I start making a new lock system, I decide which bass machines will be used for each of the four strings. This is because the rotary motion of the bass machines that will be used for the G and D strings (on the right-hand side of the pegbox), must be the inverse of that used for the E and A strings (on the left). Planning this in advance allows all four metal fine tune-pegs to turn in the same direction when the lock system is in place.

Once this is done, I mark the shape of the lock on the collar of the cog with a fine felt-tip pen. I make sure the lock is positioned so that the peg cannot slip out of the cog's collar when the string is tuned with the metal fine-tuner key. (The cog, collar and peg all turn as one in the same direction.)


The drilling template


The riveted underside of the tuning machine

2 I set up a drill press so that later I can drill downwards. I use a 1/8-inch bit that corresponds to the diameter of the collar's existing holes, made by the manufacturer. Then I make a drilling template to stabilise the bass tuning machine when it's held in the drill (**figure 2a**). I attach five pieces of ebony to hold the tuning machine's brass plate, and I cut grooves into the template to hold the rivets on the underside of the machine (**figure 2b**). I also carve grooves into the template so that the wooden peg can be inserted into the collar while the tuning machine is in the drill.


A hole is drilled through the peg in line with the collar's existing holes

3 I position a bass machine (without its wooden peg) on the template, and turn the fine tuning key slowly until the collar's two existing holes are in line with the drill. I drill through the holes, and then, without changing the drill setting, I insert the wooden peg into the collar. Holding the peg firmly with my fingers, I drill through it. (It's possible to use standard manufactured pegs as well as your own homemade ones.)

Once I've drilled through a peg, it's important to keep it with its corresponding bass machine. Each machine varies and the manufactured collar holes are not always in the same place or identically centred.


The rod should fit tightly inside the peg

4 To make the metal catch running through the peg, I take a standard 1/8-inch brass rod and cut it to a length 4mm longer than the collar's diameter. I then round off both ends of the rod with a lathe or drill press, and polish them. I insert the rod into the peg, leaving 2mm showing on either side of the collar. The rod should fit tightly inside the peg, but if it doesn't, make small notches on it with pincers, then secure the rod with cyanoacrylate (commonly known as Super Glue). ▹


The lock's shape is cut out with a metal milling cutter

5 Holding the bass machine in a vice, I use a rotary tool with a spiral metal milling cutter to cut out my earlier felt-tip pen guidelines on the collar. I then level off and round the edges of the cut brass.


A file is used for final adjustments to the collar

6 I make any final adjustments to the collar locks with a rough-cut file with a rat's tail 1/8 inch in diameter – regularly testing the peg in the collar lock. If the existing holes in the collar are not centred correctly, a peg may occasionally only lock on one side. But usually the process works well and locks securely on both.


The finished lock system with the peg locked in place

7 After the peg is locked in place, the bass machine is ready to be installed on the pegbox.

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