

## TIP 33 — A CNC-Machined Spindle Drawbar Remover/Colin Dyckes

Colin didn't send any written explanation when he attached these photos to his email, but the photos pretty much speak for themselves. This part offers another take on the best way to remove a collet or chuck from the spindle without hammering on the drawbolt. Any method that uses slow, constant pressure to push the arbor out of the #1 Morse taper in the spindle helps keep your machine in alignment and saves the Z-axis from developing excess backlash from the handwheel set screw having to support the force of pounding on the headstock.

To use the puller, a split collar is attached to the spindle shaft leaving enough space underneath to insert the base of the puller. To remove the item from the spindle taper, the drawbolt is first loosened. Then the puller is inserted under the collar and the socket head screw tightened against the head of the drawbolt. Tightening the screw pushes down on the bolt, removing the tapered collet or arbor from the spindle.

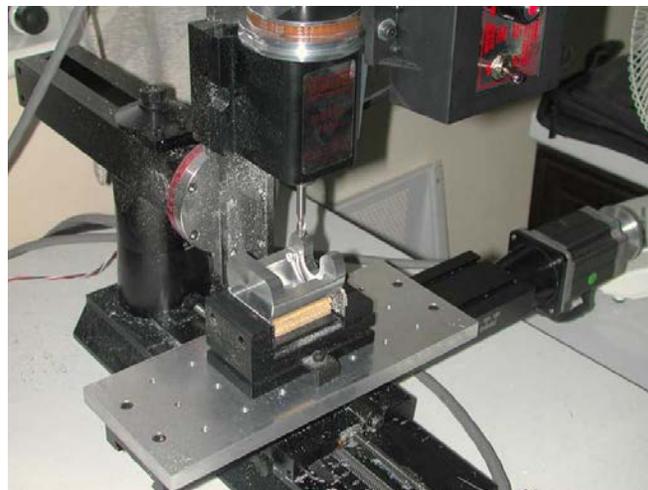
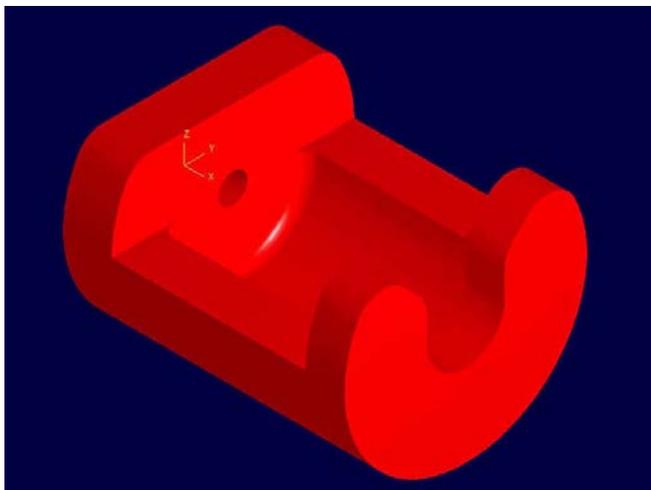
After seeing this write-up, Colin mentioned that after trying his first prototype he ended up filing a groove in the spindle shaft while it was spinning. It doesn't show in the photos, but the set screw in the split collar goes into this groove. This helps keep the collar from slipping up on the spindle shaft when the screw is tightened against the drawbolt head. He says this is optional.

For those who would like 3D and CNC files for the puller, Colin's drawings are included as links below (both are supplied in a single .zip archive):

[.STL file or .IGS file](#)

Colin adds: "The IGES file (.igs) and the STereo Lithography file (.stl) should be readable by just about any CAM program (VisualMill, SurfCam, Solidcam, etc.). I supplied those files rather than the original Solidworks file because they are pretty much universally readable. The STL or IGES files will need to be rotated within the CAM package to get the correct orientation for milling."

*The 3D CAD drawing and the three photos below help explain how the puller is made.*



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