



Workholding aids & chucking – part 1

In the first part of this new series on workshop aids and chucking, **Kurt Hertzog** looks at the range of drive centres and holding methods available to the turner

Workholding is one leg of the proverbial three-legged stools in woodturning. Skill in sharpening, turning technique, and workholding all are key to being successful. Through this series, we'll explore the array of workholding methods available to today's woodturner. Some are purchased, some adapted, and some made.

Most workholding methods fall into one category of the four Ss: squeezing, sticking, screwing, and sucking pretty much encompasses them all. For interest among the varied experience levels of our readers, we'll hop around

rather than start at the beginning and progressively build.

I believe anything can be mounted securely and turned safely. I can't speak for the integrity of each piece of material; you'll need to be the judge of its integrity. Use good judgement on the safety of using it, and the appropriate speeds and feeds.

Some workmounting is straightforward and easy; others are a bit more challenging requiring some ingenuity and perhaps special fixing. This article will show you that everything can be mounted securely and turned safely.

“I believe anything can be mounted securely and turned safely”

KURT HERTZOG



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LEFT: Squeezing the work between the headstock drive centre and the tailstock revolving centre is about as secure as any workholding method can be

'SQUEEZING'

We begin the workholding series with one aspect of 'squeezing'. That is, squeezing the work between the headstock drive centre and the revolving tailcentre. Arguably the most secure workholding method there is – between centres – is used for almost every project if only to get things prepared for subsequent mounting. With the headstock providing the rotational drive, two things need to happen. That rotational drive needs to be coupled to the work somehow and something needs to hold the work onto that coupling mechanism. That holding function is provided by the tailstock and revolving tailcentre. Traditionally, a four-spur drive centre has been used in the headstock. It has a great advantage in that it will drive nicely both in end and face grain. It provides superb repeatability on remounting, if required. Available in different sizes depending on the work, it provides positive drive with the tailcentre keeping the work engaged. Its downfall is in wet wood and minor repositioning. Regardless of grain orientation, a four spur will usually tear the fibres and then spin uselessly in the pocket that it creates. Having a large point that buries makes small adjustments difficult.



BELOW: The general purpose four-spur drive centre – taper or chuck mounted – is available in a variety of sizes

MORE DRIVE CENTRES

For wet wood, a two-spur drive centre works much better than the four-spur. It tends to bury better and twist loose less often. Various sizes are available. The two-spur should be your first choice for wet wood. The orientation of the spur blades certainly should be considered. On end grain, orientation is unimportant. On face grain, you should orient splitting the fibres rather than across them. It buries the blades deeper thus providing better engagement.

There are many special purpose drive centres but three are particularly useful. For green woodturners, especially when using barked blanks, the Elio drive is advantageous. It has two adjustable screws on each side of the centre pin that can poke right through the bark rather than requiring removal. Acting like a two-spur, the screws can be individually adjusted to compensate for uneven distance between the wood surface and the face of the drive. The safety centre has a centre point and no spurs. Drive is provided only by the friction of the ring contact in the wood fibre.

ABOVE: Two spur centres, more useful for wet wood, come in different sizes and different mounts as well



ABOVE: Two very useful special purpose drive centres. The Elio drive centre (left) and the 'safety' drive centre (right)

It works better in dry than wet wood but will work in either. As the name implies, it is 'safer' since any catch allows the work to stop with drive centre spinning after overcoming the ring friction. This has three great applications. It is helpful for the newcomer because errors are more gently dealt with. Also useful for learning light touch. You can relax the amount of tailcentre pressure and reduce the drive force letting you develop a lighter touch cutting technique. Probably the most valuable application is for mastering the skew chisel. Rather than having a terrifying catch each time you err, the safety centre adjusted for proper friction will provide a less nerve wracking handling of your mistakes.



ABOVE: The steb drive centre is available in different sizes and mounts as well as a steb revolving tailcentre

STEB CENTRES

Another valuable special drive is the steb centre. It has a spring loaded point so you can relax the tailcentre pressure and the teeth will disengage yet the work is still mounted between each centre's points. The work can be stopped and gauged or examined without turning off the motor. This is valuable for the turner doing repetitive spindle work. Reducing frequent stops and starts puts less stress on motors and lowers power consumption. Not necessarily

for beginners, using a steb centre allows mounting and dismounting spindle work with the motor running. It does not work well with delicate spindle work as the pin spring load force is always present with any engagement. A steb centre does allow for finer adjustment in repositioning the headstock centre position when needed because it doesn't bury the point.



ABOVE: Ball bearing revolving tailcentres have uses both with the centre pin and with the centre pin removed



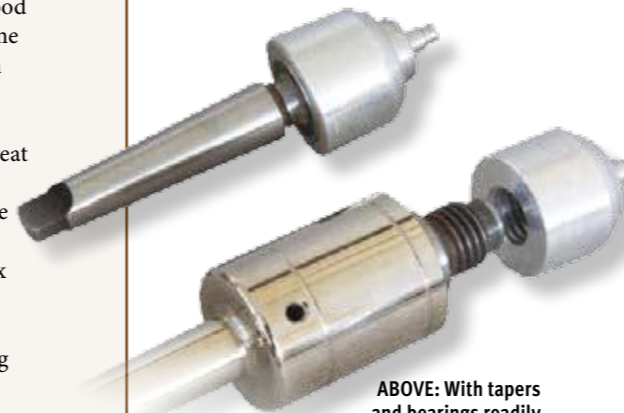
ABOVE: Some examples of the different revolving tailcentres available at the different price points and flexibility extremes



ABOVE: Different accessories available to adapt the tailcentre to the specific work needs with large points or inside/outside tapers



ABOVE: This tailcentre's threaded nose and knock out pin offer tremendous flexibility in making custom tapers, forms, bushings, and shafted accessory holders



ABOVE: With tapers and bearings readily available, the shop-handy turner can make thread-on or permanent speciality tailcentres



ABOVE: The finer resolution in repositioning without the pin in the tailcentre (left top) vs with the pin (left bottom). Similar advantage with the steb drive centre (right top) vs the standard four-spur (right bottom)



ABOVE: Even work destined for a faceplate, chuck, or vacuum mount usually begins with the heavy work and mounting prep done between centres

TAILCENTRE FUNCTION

The tailcentre function is to support the other end of the work and hold it up against the drive centre engagement. Regardless of the workholding method, using the tailcentre until it MUST be removed is good practice. Most modern tailcentres are a revolving, ball bearing centre with many having a removable centre point. This allows for replacement should the point become damaged as well as changing points with different included angles. Included angle is unimportant when burying it in wood but very important when being used with a mandrel or other metal interface.

The point serves two important purposes providing for accurate re-mounting of work and burying well into material to provide

a secure rotational point. Tailcentres are available with various sizes and shapes of points. Depending on the size of the work, selecting the proper size and shape of tailcentre cone or point will help secure things safely. Using the tailcentre to support work needing special attention is easily done using available accessories. Inside and outside tapered cones are available as are larger points. With a threaded tailcentre – or removing the point – the shop-handy turner can craft a host of special tailcentre 'noses' from wood or metal. Not only can threaded custom endpoints be crafted but also dedicated tailcentres as well.

Removing the tailcentre point for certain applications provides the advantage of finer

adjustment on repositioning. Whether correcting for grain misalignment on a spindle or fine tuning the orientation of a bowl blank, the ring engagement without the pin can be repositioned without the trouble of the pin pocket collapsing or shifting. This is also an advantage of using a steb drive centre. Because the pin rarely indents deeply into the workpiece, you can make finer adjustments in repositioning the headstock end of the work should you choose to do so.

Whether you use between centres methods for all of your woodturning or only to prepare your blank for a subsequent workholding method, hopefully you can see that it is a versatile, secure, and safe method of workmounting. ●