Kurt Hertzog puts this piece of Woodpecker kit to the test

Woodpeckers Ultra-Shear Pen Mandrel System

Shortcomings

I have some very critical opinions about the design, manufacture, and inherent shortcomings of pen turning equipment. Nearly every pen turning product offered is designed and manufactured to sell at the lowest price possible. Several very key features suffer with this approach.

By design, the use of the tailcentre point to support the end of the mandrel shaft is troublesome. This fit, or often misfit, of the point can be a source of wobble, vibration, shaft bending, and drives using excessive headstock clamp pressure. Fixing this fundamental physics problem requires a mandrel saver. A mandrel saver is a tailcentre that 'swallows' the mandrel shaft end. By pushing on the stack of bushings and pen blanks with its face, the needed compression is accomplished. The mandrel shaft is properly supported inside the mandrel saver with zero end force on the mandrel shaft itself. The mandrel savers that are available usually suffer the same 'lowest cost' approach. Their bearings are inexpensive, noisy, and have a limited lifetime.

Other shortcomings pertain to pen turning bushings. I recommend using bushings only to hold things in place to turn and the crudest of sizing. Actual measurement is used for the proper finished size. Most pen turners still use the bushings to size their completed turned blanks. Even if bushings are initially accurate, repeated sanding reduces the diameter of the bushings. Smaller bushings produce smaller parts until fits are lousy. Another bushing shortcoming is the lack of identification. Unless you have a great organisation system, you'll wind up with confusion among various bushings.

A pen mandrel system that solved problems

The Ultra Shear Pen Mandrel System from Woodpeckers is just that – a system. This is a complete system with a specially designed headstock and mandrel saver tailstock to complement Woodpeckers' mandrel shaft and user-friendly designed and marked bushings. All of the system is machine tool grade materials and manufacture. Uniquely driven by solving problems and providing the highest quality rather than lowest price point, I feel it solves the shortcomings of the current pen turning mandrel systems.

The Woodpeckers Ultra-Shear Pen Mandrel System is a headstock morse taper clamp, a ball bearing, mandrel saver function revolving tailcenter, and ground mandrel shaft

Revolving tailstock mandrel saver

In my opinion, an absolute key to quality pen turning is using a high-quality mandrel saver. The Woodpeckers mandrel system includes a cleverly designed mandrel saver tailcentre as part of its system. Their tailcentre uses the same 12-jaw collet clamp design as its headstock clamp, although the tailcentre uses a nose cone providing collet clamp compression. The shaft of the mandrel is centred by the collet fingers with the collet closure controlled by a fixed compression provided by the tailcentre nose cone. The face of the tailstock nose cone functions as the mandrel saver face to push on the pen bushing. Quality bearings are used in the mandrel saver tailcentre, being precise, durable and virtually noiseless. The problem of tailcentre point to mandrel shaft end and usual need to overtighten the headstock clamp solved.

Headstock clamp and mandrel shaft

Other pen mandrels use a four-jaw design collet in the headstock clamp, usually with limited mandrel contact area. Their soft mandrel shaft materials are easily scored with overtightening. The mandrel saver tailcentre of the Woodpeckers Ultra-Shear system eliminates the need for large headstock clamp force. The headstock 12-jaw collet clamp design provides excellent clamping force without needing to be excessive or digging into the mandrel shaft. The shaft is accurately centred on the lathe centrline axis every time with minimal clamp force required, since all of the bushing and blank compression force is totally eliminated from the mandrel shaft. I tighten my headstock mandrel clamp lightly finger tight.

The headstock clamp, a CNC machined 303 stainless steel with a No.2 Morse taper, a 12-jaw collet clamp and a threaded knurled compression nut with wrench flats

The No.2 MT mandrel saving function revolving tailcentre uses ABEC1 bearings, is CNC machined 303 stainless steel with a 12-jaw collet clamp compression controlled by a mandrel saving nose piece

User-friendly bushing system

The Woodpeckers mandrel system will work with any bushings of the proper diameter that you already own. That said, I suggest you skip using anyone else's bushings and purchase the Woodpeckers bushings. Buy them one set at a time or the complete set package. All I.D. bearing surfaces are 50% longer than usual. This extra length provides better support and guidance for the tube of the pen blank. While not a critical function, it is certainly a directionally correct change to the traditional bushing design. Two features illustrate their attention to problem solving. Each bushing is marked with a number, indicating which pen kit it works with. The family of 11 pen bushing sets – numbered one to 12, leaving the number six unused for obvious reasons – covers every kit I'm aware of. A provided chart indicates which number bushings belong to which kit. No more mystery bushings in the shop. With differing diameters, the U(pper) and L(ower) or C(ap) and B(arrel) is also marked on appropriate bushings. You'll immediately know the correct orientation. Another clever feature of the Ultra-Shear bushings is the integrated minimum diameter wear indicator. A groove in every bushing indicates the minimum diameter for that barrel end. If the groove cut into your bushing shows, you are still proud of the minimum dimension. When you've sanded the bushing so much that wear indicator grove disappears, replace the bushing or you'll make undersized parts.

Each package of bushings indicates the kits that the bushings are designed for. Notice the C(ap) and B(arrel) markings added to the bushing numbers to indicate orientation

Conclusions

Woodpeckers' Ultra-Shear Pen Mandrel System is top shelf throughout; a total system that solves the existing products' shortcomings as I see them. Using 4140 ChroMoly steel, 303 stainless steel, and ABEC1 bearings and fabricated on CNC machining and grinding equipment, Woodpeckers provides a machine tool grade pen turning product. You may eventually wear down its 4140 bushings, but they will last far longer and provide better service than others.

While it certainly isn't the most inexpensive pen turning mandrel system available on the market, the Woodpeckers mandrel system is a once-in-a-lifetime purchase. Much like buying a woodturning chuck, you get what you pay for. You can enjoy many years of using a well-built, high-quality tool or forever curse the shortcomings of a lowest-cost, bargain purchase. I highly recommend you investigate and consider the Woodpeckers Ultra-Shear Pen Mandrel System. You can find more information, helpful videos, and ordering information on the Woodpeckers website at **www.woodpeck.com.**