

# Midi Lathes

Two classes of machines  
put to the test

BY ANDREW FINNIGAN

**M**idi lathes span the gap between mini lathes and full-size machines. A midi is generally more capable and easier to use than a mini, while remaining more affordable, smaller, and more portable than a full-size lathe. Often the introductory machine for those just beginning turning, the midi can also be the perfect professional machine for any number of makers: those looking to turn relatively small items or furniture components, or those with small workspaces.

As a professional turner and furniture maker, my focus is primarily spindle and architectural based work, and most of my days are spent entirely at the lathe. An inherently simple piece of machinery, it holds and spins a piece of wood around a central axis. It has a headstock, bed, tailstock, and centers to hold the spinning work. The banjo and tool rest are moved around and locked to the bed to support the turning tools and allow for the work of turning. How well a lathe does its job depends upon how substantially and how well the stress-bearing components are made and how positively and easily they're secured and adjusted. Power and power distribution have important roles: An appropriately powered electric motor and properly sized belts and pulleys are critical. Lastly, a reasonable degree of accuracy in machining is necessary. Centers should align and there should not be excessive play in any part of the system. As I examined the lathes in this review, I was considering all of these factors.

## 7 performance tests

To evaluate the various testing criteria, Finnigan chose seven pieces to turn per machine. Each piece tests the lathe in a different way or in a different capacity. All of the turning tests were performed on straight-grained hard maple with the exception of the very rough bowl blanks, which were seasoned ash. Spindle blanks measured approximately 2 in. square by 12 in. long. Face work blanks were approximately 8 in. dia. by 2 in. thick. The rough square ash bowl blanks were approximately 7 in. square by 3 in. thick. Finnigan performed all the testing in the same order for each machine.

## SPINDLE TURNING

**1** **Roughing out a cylinder.** Finnigan began the testing on each lathe by quickly and aggressively roughing out a cylinder between centers. By doing so, he placed stresses directly against the lathe's working axis, attempting to deflect it.



**2** **Turn a simple taper.** Most any machine can turn a taper. The value of this test was to see how well the machine tolerated aggression against its axis and toward the tail stock. While headstocks are often built to handle this sort of stress, the tailstock is sometimes overlooked in the design of the machine and can be underbuilt or weak.



**3** **Turn a bell shape.** Turning a spindle thin at the center tests the entire machine for high frequency vibrations. All lathes will have some vibration at small diameters and may require a hand or steady rest for support. But a machine should not create excessive high-frequency vibration with a sharp tool and gentle cut.



**4** **Turn a pad foot.** With the final spindle blank, Finnigan turned a pad-foot leg to test the machine's ability to tolerate off-center and out-of-balance work. Pad feet, as non-parallel offset turnings, will by their nature always be very unbalanced.

## FACE WORK



**5** **Rough out a bandsawn disk.** This test consisted of wasting down a disk as rapidly as possible, to about the size of the small face plate. Finnigan put his entire body weight behind approximately 1 in. of cutting edge on a side-swept bowl gouge. This aggressive test, which stresses the belt, pulleys, and motor, shows how powerful the lathe is and how that power is distributed.



**6** **Turn a small stool top.** Turning a stool seat that's dished underneath is largely an ergonomics and access test. It shows how comfortable and/or easy it is to work at various positions around the lathe and whether or not the machine's design gets in the way of routine turning tasks.



**7** **Roughing an irregular square bowl blank.** This test reveals how the lathe responds to intermittent and irregular abusive cuts in a difficult, out-of-round material.

# Under \$1300

The \$1300 and under group of lathes are, in my view, appropriate for an introduction to woodturning and/or intermittent professional use. These lathes are generally lighter, more portable, and more accessible for the average turner. While still providing a solid foundation for turning, overall these machines lack the range of features, options, and quality of build found on the more expensive midis.



**AUTHOR'S  
BEST OVERALL  
CHOICE**

## DELTA 46-460, STAND 46462

Lathe price	\$895
Stand included	No
Stand price	\$180
Weight	97 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 12.375 Over banjo: 9.5 Bet. centers: 16.5
Faceplate included	Yes

One of the first things I noticed about this lathe is its simplicity, and I intend that as a compliment. It doesn't have a lot of bells and whistles or a digital speed readout. It feels a bit boxy and narrow in its castings and stand. This may not sound positive, but it allowed for a lot of maneuverability around the machine.

The Delta proved to be powerful, easy to use, intuitive, and ergonomic. It performed all turning tasks well with minimal vibration with the exception of the very rough bowl blank test. While the machine certainly has the power for rough work, there was a good deal of wobble in the lathe with the provided stand during this specific test. Unless weighted down, I don't think this lathe would be the best choice for those primarily interested in rough bowl, hollow form, or complex multi-axis work.

While the tailstock worked well and held its position under stress, I was able to get the banjo to creep. I had to bear this in mind during use and keep my tool fairly centered over the tool rest post. Going toward the ends of the rest and away from support, particularly with aggressive cuts, invited substantial vibration and minor movement in the tool rest and banjo.



**Streamlined design.** The sparse design of the Delta allows the user a lot of maneuverability around it. Here Finnigan can rest against the machine to get right in line with the work.



**Speedy change.** The controls were intuitive and changing belts was simple with the use of a side compartment and lever. Finnigan particularly liked the spindle lock design.



**Give your tools a rest.** The tool rest on the Delta is very easy to access to insert and remove your tools.



## RIKON 70-1420VSR

Lathe price	\$1300
Stand included	No
Stand price	\$200
Weight	137 lb.
Extension available	Yes
Motor size	1½ hp
Tested dimensions	Over bed: 13.875 Over banjo: 10.5 Bet. centers: 19.375
Faceplate included	Yes

This lathe performed all turning work fairly well. Vibration was well dispersed even with heavier cuts. Working felt comfortable and the lathe's relatively narrow profile helped access. While I could be very aggressive in the spindle testing, I could not be as aggressive with face work. The machine is somewhat underpowered, but not enough to stall the machine often or otherwise be a nuisance. I was able to stall the machine with a full effort in the waste block test.

The provided hardware was of high quality with the exception of the centers. I believe that their points protrude too far.

This lathe has my favorite of all the mechanisms in this test for changing speeds. The entire process occurs in two intuitive motions with a single lever.

Acceleration happens slowly on this lathe, leaving the user waiting for it to get up to speed before engaging a tool. It's not a huge deal, but I might find it annoying in the course of a full workday.

### The testing criteria

For this review, we divided the field of midis in two by price: those under \$1,300 and those over \$2,000. I tested 10 lathes overall and assessed them by looking at issues in the following categories.

**Ergonomics**—How much effort was put into the design with regard to extended use and overall functionality.

**Actual working dimensions**—A lathe's listed swing and length dimensions are rarely accurate. I'm interested in the actual swing over the bed, over the banjo, and what's safely possible between centers.

**Ease of operation**—Overall ease of use of the controls and ease of adjustment of the headstock (if applicable), tailstock, banjo, and tool rest.

**Quality of stock hardware**—Does the machine come with a high-quality, well-designed tool rest, live center, and other hardware? Would the machine immediately benefit from aftermarket upgrades?

**Stability**—I checked the ability for cams and locking mechanisms to remain solid and stationary during use and to take abuse without failing or creeping. I also examined quality of construction as it pertains to the machine's ability to tolerate heavy cuts and unbalanced work without excessive vibration.

**Power**—More important than horsepower, what is the power delivery like? Can the belt and pulley handle heavy cuts without slipping? This would be of particular interest for bowl turners.

**Expandability**—While the midi is a perfect fit for many woodworkers, it's also a first lathe for many woodturners due to its general affordability. Speaking from experience, some turners may want to expand the capacities of their machines after a time. Are bed extensions or other aftermarket add-ons compatible with the lathe or offered by the manufacturer?



**Change speeds in a jiffy.** Three speed ranges power the machine with an adequately sized belt, with access through two hinged panels.



**Impressive tool rest and banjo.** Both the tool rest and banjo were solid, well made, and highly ergonomic.



**Movable on/off controls.** This is typically a feature found on full-size, higher-end lathes. The control panel itself was well made, intuitive, and stayed where it was placed. It felt durable and like it would survive a good number of drops.

# Under \$1300 continued



## GRIZZLY G0844

Lathe price	\$780
Stand included	No
Stand price	\$230
Weight	110 lb.
Extension available	Yes
Motor size	¾ hp
Tested dimensions	Over bed: 13.875 Over banjo: 10.125 Bet. centers: 19.875
Faceplate included	Yes

The Grizzly benchtop lathe, which has levelers with rubbery feet that help stabilize it on the bench, carried out the work of testing fairly well. Even simply clamped to the bench, this midi tolerated vibration and aggressive cuts well. The banjo, though lightweight, was solid and held its positions throughout, as did the tailstock. Adjustments were easy and there was no creeping or movement during testing.

This lathe easily out-powers even some of the higher-priced lathes. While I did slow the lathe down with intentionally heavy sustained cuts in face work, I could not stop it. Changing between the three speed ranges was simple: just loosen and lift a lever. Upper and lower panels allow access to the pulleys. The controls and readout are logically placed near the user's right hand within the bed.



**Actual working dimensions.** The listed swing and length dimensions of a lathe are rarely truly accurate. The Grizzly came within ¾ in. of its marketed specs, which is good.



## JET 1221

Lathe price	\$1000
Stand included	No
Stand price	\$310
Weight	121.25 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 12.375 Over banjo: 9.375 Bet. centers: 18
Faceplate included	Yes

I was not able to be aggressive in testing the Jet midi. The machine did turn the small spindle work adequately, but it did not have the power required to drive larger face work or spindle work. Vibration and wobble were issues. The lathe itself is adequately built in terms of castings for its capacities, but the stand is too light-duty for the task and moves during use. I'd recommend an aftermarket banjo and tool rest for improved performance.

The electronics were intuitive and worked well. Changing speeds on this lathe was also intuitive, with a process that was one of the easiest in the group: With the lift of a lever, a simple toothed ratcheting plate holds the motor up until the adjustment is made, then the plate is released, lowering the motor.



**Safety mechanism.** The Jet has a feature that, for user safety, senses too much load and cuts power. Minimal aggression stops the lathe and an error message displays. Turn the lathe off and on to reset it.



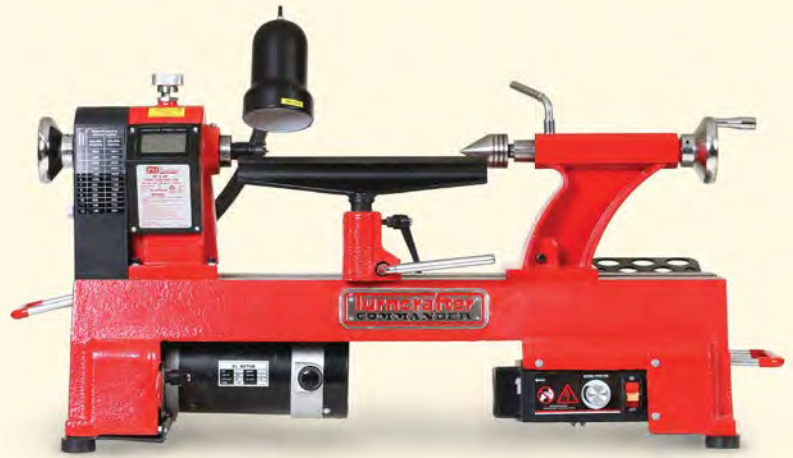
## LAGUNA REVO 12/16

Lathe price	\$1000
Stand included	No
Stand price	\$350
Weight	118 lb.
Extension Available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 12.25 Over banjo: 9.25 Bet. centers: 13.25
Faceplate included	Yes

Despite its small size, this lathe is built heavy in its castings. The wide bedways and footprint and weight make it stable, tolerating aggression and vibration very well. The machine held all of its adjustments well through abuse. This lathe was also intuitive and easy to operate. Electronics were simple and worked well. The tool rest design lends itself to comfortable use and is well constructed. While the Laguna performed very well with regard to stability and tolerating aggression structurally, it falls short in power. It did manage its way through the testing, however, and had more torque at the low end than expected. The drive and live centers had points that protruded too far to be generally useful. The banjo design is very good and comfortable.

### Speed things up, or down.

The Laguna's belt change mechanism is very nice, allowing the motor to be raised by pushing a lever sideways, without the user actually needing to lift the weight of the motor. Access to the belts and pulleys is gained through easy-to-access panels.



## PSI TURNCRAFTER COMMANDER

Lathe price	\$570
Stand included	NA
Stand price	NA
Weight	106 lb.
Extension Available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 12 Over banjo: 9.25 Bet. centers: 16.125
Faceplate included	Yes

This lathe had the smallest feel of the machines I tested. Despite that, it was adequately built and felt solid beyond its size. I like the lathe's simplicity. While it does have a digital readout and electronic controls, it's lacking in premium features.

The Turncrafter performed all turning work fairly well. It dispersed stress and vibration without substantially losing stability. All adjustments were easy to make and they held under stress.

Regarding power, I was able to stop this machine with aggressive cuts in face work, but it performed capably in the rough bowl blank test with minimal need to take light cuts. This lathe, like the Grizzly, outperforms the Jet, Laguna, and Harvey in terms of power. Two speeds drive this machine with an adequate belt and pulleys. Access to the pulleys is simple via the removal of a plastic cover in the headstock, and the motor is raised with the turn of a lever and a lift.

### Portability prevails.

While the PSI does not have an available stand, it is a solid benchtop machine. The integral carrying handles make it easy to move from storage to benchtop.



# Over \$2000

The \$2000 and above class is made up of machines that could easily be run professionally. They're built heavier and stronger, manufactured to be intuitive, comfortable, functional, high-quality machines capable of years of consistent hard work. While it's tempting to believe spending more is better, I should note that I've been running a professional turning business for over 10 years using a full-size equivalent to a machine from group 1.



ONEWAY 1224	
Lathe price	\$2863
Stand included	Yes
Weight	300 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 12.375 Over banjo: 9.25 Bet. centers: 19.25
Faceplate included	Yes

There was minimal setup required with this machine. It came almost entirely assembled and bolted to what looked like a custom-made pallet. The only real work was lifting it off the pallet and assembling and installing the control panel, which ships within the stand. All supplied hardware came in a well-packaged kit.

On this lathe every adjustment is made easily and intuitively. The supplied centers, tool rest, banjo, faceplate, tailstock, and clamping mechanisms, like those that come with the Robust, are among the best commercially available, in my opinion, and are often what turners will purchase aftermarket to modify or replace on their machines.

This was a very easy lathe to use. Its high-speed idle is very quiet and stable. The supplied stand's design coupled with the offset bed allow the user to get very close to the work without obstruction. While most every lathe has some aspect or hot spot where it feels like it gets in its own way, I did not notice any of that with this lathe. Even the levelers on the stand are substantial, and they are accessible from above, allowing for easy adjustment.

The Oneway performed all turning tasks very well. Aggression and vibration were well tolerated and dispersed. The lathe is very, very solid and allowed for clean, smooth cuts even at small diameters. I was able to bring this machine to a stop during the waste block test, but it was a workout on my end as I had to try very hard. The Oneway has ample power for its size and is bested in power only by the Robust.



**Prime parts.** The Oneway's tool rest and banjo, like the Robust Scout's, are among the best commercially available.



**Live center.** The Oneway's live center has an ergonomic design, is solidly built, and runs very accurately. A threaded, rotating, cup center can accept accessory centers.



**Easy change.** The motor, which is located beneath the headstock, within the stand, has two speeds that are easily changed.



ROBUST SCOUT	
Lathe price	\$5695
Stand included	No
Stand price	\$995
Weight	150 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 14 Over banjo: 10.25 Bet. centers: 24.625
Faceplate included	Yes

Everything about this lathe was clean and neat. The welds were clean and tight and there was no sign of slag, dents, scratches, etc. from manufacturing. Even the paint job was beautiful. Intuitive, simple controls are located just below the headstock and bedways where the user's hand frequently is when at rest. The supplied centers, tool rest, banjo, faceplate, tailstock, and clamping mechanisms are, like the Oneway's, among the best commercially available.

Sustained heavy cuts in out-of-balance face work failed to slow the lathe at all and the process produced no unacceptable vibration. There was no unexpected movement or creep of the tailstock/banjo/tool rest. Vibration was dispersed well. Standard spindle and face work was performed quietly, efficiently, and without vibration even during heavy cuts. This was the only lathe in the group that I was unable to stop in the waste block test. I wasn't even able to slow the machine down with the heaviest of cuts.

As tested, the lathe was mounted on the Robust Universal Stand, which is well built and very solid. It's also unique among lathe stands, as it can be adjusted for height and tilted substantially toward the user, allowing people with mobility issues to comfortably and safely use a lathe.

**Full length stop.** The stop bar running the length of the bed is adjustable and easily engaged to stop the lathe with light pressure, allowing the user to turn the machine off easily in the case of an emergency without the use of their hands/arms.



## Stands and setup

Most of the lathes I tested were mounted on stands that came from the manufacturer. There were a few exceptions. In the cases where there was no stand available at all, or at the time of testing, the lathes were clamped in the same manner to the same solid workbench for testing.

There is an irreducible amount of work in unpacking and setting up a lathe. All machines should come with a light coat of oil, grease, or other rust inhibitor on at least the milled or untreated metal surfaces, and they all did. That coating needs to be removed with solvents prior to use. Additionally, we sanded and smoothed all the tool rests prior to use. Any burrs or slag that may have posed an issue were removed or sanded flat as well. In my assessments I did not make specific mention of any of these standard measures unless there was something unusual about a particular lathe.

## A word about features

For some of these machines there are additional features available such as indexers, tool caddies, accessory holders, multiple drive centers, and overload shutoffs. The value of such features depends on the work that you do. There is a wide variety of aftermarket products that can add many of these same features to any given machine. I didn't highlight the extra available features, because I felt it was more important to focus on the machines themselves, their performance, and actual construction, as opposed to bells, whistles, or fancy electronics. The latter can be added to any quality machine at minimal expense.

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**Adjustable height stand.** The Robust could easily be a general use lathe for people with mobility impairments because the Universal Stand can raise the lathe up for a tall standing turner or be dropped down and tipped forward to accommodate a seated turner.



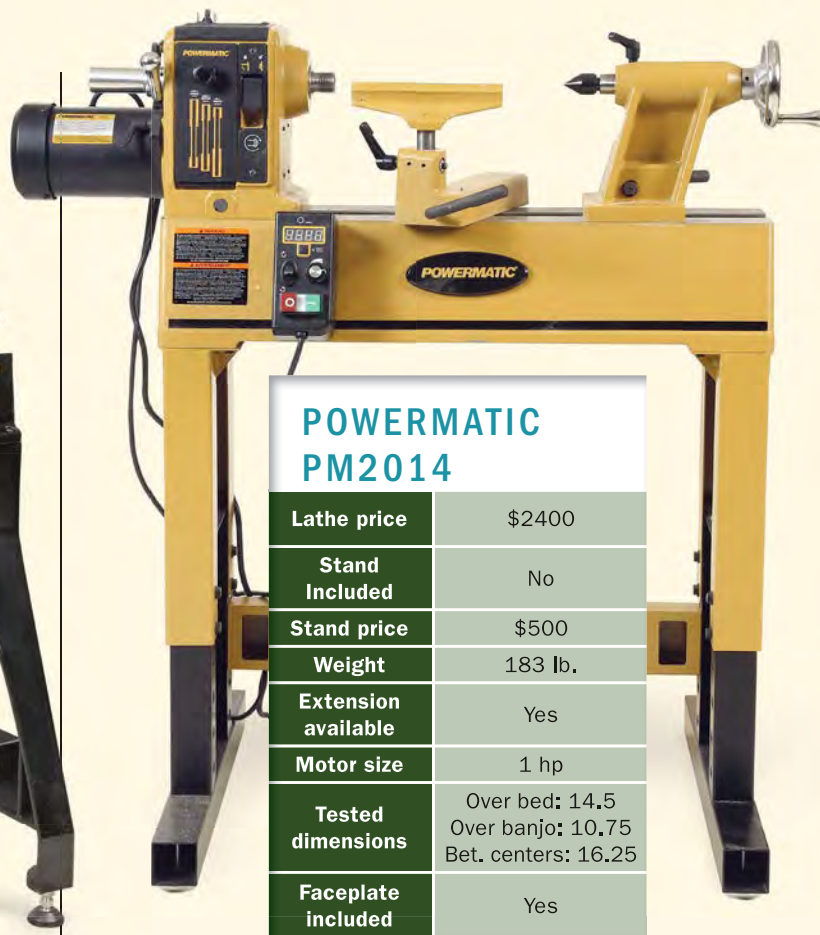
Over \$2000 *continued*



HARVEY TURBO T-40	
Lathe price	\$2000
Stand included	No
Stand price	\$360
Weight	176 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 14.125 Over banjo: 10.25 Bet. centers: 22
Faceplate included	Yes

The Harvey Turbo, the only lathe in the group to come wired 220 instead of 110 and supplied with a 6-20p plug, is fairly well built. The bed, headstock, and tailstock are substantial and the extra weight keeps the lathe stable and helps to absorb vibration. The provided tool rest is of reasonable quality and ergonomic. There was no creeping or excessive vibration during use. The motor on this lathe is much smaller in size than the other lathes in this review, which can hinder performance. The electronics and controls take up a lot of room behind the headstock and get in the way during use. They are also among the most complex I've seen on a commercial lathe. Out of the crate, all the components were coated in thick grease. Many applications of solvent were needed to remove it.

**Excels at spindle work.** The Harvey was able to rough out and turn spindles quite well at high speeds without loss of torque. This would be a good machine for doing lots of spindle work.



POWERMATIC PM2014	
Lathe price	\$2400
Stand included	No
Stand price	\$500
Weight	183 lb.
Extension available	Yes
Motor size	1 hp
Tested dimensions	Over bed: 14.5 Over banjo: 10.75 Bet. centers: 16.25
Faceplate included	Yes

The heaviest built lathe in the group, the PM2014 is modeled after Powermatic's 3520 series, a professional, heavy-duty workhorse. The castings are substantial. The thin stand, though, is not on par with the lathe. This lathe is unique in the group for its sliding headstock. The Powermatic performed all turning work very well. There was little vibration present within the lathe itself even during aggressive cuts. The headstock, banjo, and tailstock moved easily along the bedways and held their placements well. It has a great deal of power and I struggled to slow or stop the machine in the waste block test. Three speed ranges power the machine with wide belts and pulleys. Changing speeds was quick, easy, and intuitive with a magnetic door and levers to unlock and lift the motor. I also really liked the lathe's spindle lock and tool rest locking mechanism. The banjo's locking mechanism is particularly well-designed.



**Movable magnetic controls.** Like the Rikon's, Powermatic's control panel was well made, intuitive, and stayed wherever it was placed.



**A nice spindle lock mechanism.** The spindle lock is easily engaged by lifting a lever. It stays engaged until the lever is pushed down by the user.