

WELL-ROUNDED MACHINES

These full-size lathes let you turn spindles up to 42 in. long and bowls up to 16 in. or 20 in. dia. Hefty headstocks and beefy components control vibration, and variable speed makes them more versatile than older or less-expensive lathes.

TOOL TEST

Heavy-Duty Lathes

There are two clear winners in this group of smooth operators

BY ANDY BARNUM

FineWoodworking.com

Watch as Andy Barnum puts his two top picks to work.

Interest in wood turning has exploded in the last decade, with artisans producing bowls, vases, and sculpture in every shape and size imaginable. Manufacturers have steadily upgraded their lathes to meet the demands of contemporary turners.

The latest crop of heavy-duty lathes typically comes with electronic speed control, a 16-in. or 20-in. swing (the largest bowl blank the machine can accommodate), a bed measuring 42 in. between centers, plus beefier spindles and the torque needed to turn large workpieces. Prices range from \$1,200 to \$3,200.

These machines hit the bull's-eye in the world of lathes. Above this class, you get machines sized and priced strictly for the pros; below, you get much less lathe—one with less horsepower, a smaller spindle, or a smaller swing.

These lathes have enough power and capacity to satisfy the bowl-turning enthusiast. At the same time, they probably aren't too beefy or expensive for the woodworker who uses a lathe to make legs, stretchers, and balusters. These lathes are good choices if you're a first-time buyer or are looking to upgrade.

I tested seven lathes, including new models from Nova and Rikon (we outfitted the Nova models and the Powermatic with bed extensions to give them the same capacity as the others). Oneway wasn't represented because it doesn't make a lathe comparable in size and price with the others I tested. Delta wasn't able to provide its 46-755X lathe for testing. All seven models tested served well for spindle turning, but some performed better than others when it came to turning large bowls, platters, and hollow vessels.

Measuring performance

The lathe is a unique woodworking machine. You don't push the workpiece into the path of a spinning bit or blade. Instead, you manipulate a handheld cutting tool as the wood spins, so your skill largely determines the final quality of the work.

However, a lathe that's prone to vibration or that has other drawbacks will frustrate even the most skilled user. For my main trials, I tried to isolate the lathe's performance with the wood turner out

CHANGING SPEED

Dialing it in. Most of these lathes have an electronic speed control that lets you adjust the speed while the lathe is running. It also permits very low speeds, especially convenient for large turnings.



Stepping it up. The Nova 1624-44 has eight speeds, set by shifting the drive belt between pairs of pulleys with the lathe stopped. But for many turners, this is all the speed control they will need.





POWERMATIC 3520B

Built like a tank, with the stoutest tailstock and the beefiest tool-rest base, this lathe also has plenty of power. The headstock slides to the far right for outboard turning, where it's used with an optional bed and tool-rest extensions (\$400). It comes with a high-quality live center.

NOVA 1624-44 (AND NOVA DVR-XP) These two are identical except for the headstock and drive mechanism. The 1624-44 is an excellent basic lathe and the author's choice for best value. The DVR (inset) has an excellent electronic speed control. Both lathes are light and will benefit from having a base with plenty of ballast.

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TOOL-REST DIFFERENCES





Comfy. The two Nova lathes have a substantial locking lever for the tool rest that's easy on the hands.



Versatile. The locking lever on the Powermatic and the Jet fits in one of three holes. You can move it to keep it clear of the tools.

Skimpy. The Rikon's tool rest is nicely designed, but it is held in place with a small locking lever that's uncomfortable to hold.

of the picture, using objective tests devised with the help of John White, *Fine Woodworking's* shop manager. Those tests assessed stability, torque, and tool-rest rigidity. I then put myself back in the picture, using each lathe to turn large bowl blanks.

All the lathes are well-machined, with perfectly concentric Morse tapers and headstocks that could be aligned precisely with the tailstocks. And all are quiet. That's important because turners need to listen to the cutting tool to know if it's behaving properly.

Making the lathes walk—I put a large, out-of-balance bowl blank on each lathe, gradually increasing the speed until the machine began rocking. A dial indicator mounted on a separate stand let me measure exact amounts of movement.

The Powermatic and the Rikon moved no more than 0.005 in. until I raised the speed past 500 rpm. That's impressive. It means the lathes won't move when you begin turning a large bowl and take a series of interrupted cuts to make the blank round. As delivered, none of the other lathes could match that. Weighting the less-stable lathes with 200 to 250 lb. of sand helped. The Nova 1624-44, for example, became nearly as stable as the Powermatic.

Most lathes have a shelf on the base to hold sand, or lugs cast into the legs for a ballast shelf. The four-legged Nova base can't accept ballast, but Nova provides plans for a bench that does.

Trying to make them stall—A simple brake-and-lever setup let me measure each lathe's power at 100, 200, and 300 rpm. Ample low-speed power is important when roughing out large bowls or spindles. The Nova DVR, the Powermatic, and the Rikon had no significant speed loss even with the maximum 40 lb. of weight on the brake lever. At the other extreme, the Grizzly could handle only 22 lb. before stopping.

Hammering the tool rest—A well-designed tool rest will stay locked in position, allowing you to make heavy cuts safely when



GENERAL 25-650

This lathe has less real power than others this size. The narrow base hampers stability. The headstock slides and swivels for outboard turning. Although the headstock spindle has 1^{-1} -in. threads, the shaft itself is thinner and prone to flex under heavy loads.



GRIZZLY G0456

Big on the outside, this lathe lacks the guts of other lathes with a 20-in. swing. It has a skinny drive belt and an automatic shutoff that stopped the lathe frequently and annoyingly when turning large bowls. The toolrest base is too short for large turnings. turning a bowl. In extreme cases, a shifting tool rest could cause you to lose control of the tool.

I locked the rest tightly, then let a length of ipé on an MDF stand swing freely to strike one end of the rest. The rests on the Nova models and the Grizzly showed no measurable movement; the Jet, Powermatic, and General rests moved 1/8 in. or less. The Rikon's moved ¹/₄ in. It needs a beefier locking lever.

A close look at the headstock

Most lathes have electronic speed control that allows a range of speeds not available with the older steppedpulley designs.

All but one lathe could run at about 200 rpm and still deliver adequate power to handle a large bowl blank. The Grizzly was the exception. It stalled whenever I took a heavy cut. It has a 1/2-in.-wide drive belt-more appropriate for a mini-lathe than for one with a 20-in. swing. The others use a ³/₄-in. or 1-in.-wide belt.

These lathes have a headstock spindle of at least 11/4 in. dia. (It's 1¹/₂ in. on the Grizzly.) The fatter spindle adds rigidity, so you can expect less vibration and chatter. That wasn't the case with the General. Although the threaded part of its spindle measures a full 11/4 in., the shaft is only 1 in. dia.

By contrast, the unique Nova DVR integrates the motor and headstock; it has no drive pulleys. This makes for an extremely rigid spindle and very smooth, quiet operation.

Some move for outboard turning-Years ago, nearly all lathes had a fixed headstock, which limited the type and size of work that could be turned. Some lathes could do outboard turning with the work threaded on a spindle at the outside end of the headstock. But that was an awkward arrangement at best.

Many of these lathes have a rotating or sliding headstock, a more practical design for outboard turning. Best in this regard are the two Nova models and the Powermatic. The Nova lathes and the Rikon offer a beefy bolt-on outrigger to hold the tool



A substantial outrigger. The Nova models come with a hefty, well-made accessory to hold the tool rest for outboard turning.

A questionable outrigger. An extension bar for the General tool rest is designed for outboard turning. But it flexes considerably and is a weak spot.



Slider. The Powermatic headstock slides the length of the bed. A bed extension and an accessory for the tool rest give it very useful outboard-turning capability.





JET JWL-1642-EVS-2

A solid performer, the Jet is similar in many ways to its beefier sibling, the Powermatic. It has plenty of power. The headstock slides for outboard turning. The spindle lock is spring-loaded, so it can't be left locked by accident. The Jet comes with a high-quality live center for the tailstock.



RIKON WOODFAST SERIES 70-500

A strong but expensive performer, it has 20-in. capacity, no shortage of power, and a very stable design. The five-step drive pulley and speed control gives a wide range of speeds. The Rikon has a nicely designed tool rest, but it's mated with an undersize locking lever.

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Testing

How stable?

Barnum mounted a large out-of-round blank on each lathe, then stepped up the speed until the lathe began to "walk" across the floor. The best held steady up to 500 rpm; the worst, about 300 rpm.





	MODEL	SOURCE	STREET PRICE	SWING OVER BED
	General 25-650	www.general.ca 514-326-1161	\$1,770	16 in.
	Grizzly G0456	www.grizzly.com 800-523-4777	\$1,600	20 in.
	Jet JWL-1642-EVS-2	www.jettools.com 800-274-6848	\$2,100	16 in.
	Nova DVR-XP	www.teknatool.com 866-748-3025	\$2,100	16 in.
B	بریانه Nova ST VALUE ۲۰۰۵ 1624-44	www.teknatool.com 866-748-3025	\$1,200	16 in.
BES	پ ^{۲۴۵} ۹۵ Powermatic T OVERALL 3520B ۹۰۵۱۵۶	www.powermatic.com 800-274-6848	\$3,200	20 in.
	Rikon Woodfast Series 70-500	www.rikontools.com 877-884-5167	\$3,000	20 in.

How powerful? A lever pressing against a disk became a brake that let Barnum gauge torque at 100 to 300 rpm. The best hardly slowed even when he piled on 40 lb. The worst stalled under 22 lb.

How rigid? In this test, a length of hardwood was allowed to swing, striking one end of each tool rest. Some didn't budge, but the Rikon's tool rest shifted ¼ in.



rest. To set up the Powermatic for outboard turning, you slide off the tailstock and tool rest, move the headstock down to the tail end of the main bed, and bolt on a bed extension. You reattach the tool rest on the bed extension, using an extension tube to bring the rest to the proper height. It works beautifully.

The General's headstock can be pivoted at an angle to turn bowls larger than 16 in. Trouble is, the extension needed for the tool rest is a very flexible casting. I was reluctant to use it because I was afraid that it would crack if I pushed down too hard.

Taking stock of tool rests

Of all the parts on a lathe, the tool rest probably gets the most rigorous workout. Any shortcomings in tool-rest design will quickly become major points of frustration.

On all these lathes, the tool-rest base slid easily along the bed and locked in place securely. However, the Grizzly's base is too short to use when turning a large-diameter bowl. Although the lathe has a 20-in. swing, the tool rest limits bowls to 14 in. dia.

I also found significant differences in the ergonomics of the locking levers that hold the tool rest in position. The Rikon has a

	SPEED	HP/	OUTBOARD	TOPOULE	STABILITY	TOOL	COMMENTS
CENTERS	RANGE (RPM)	VOLTAGE	TURNING	TONQUE	STADIETT	REST	COMMENTS
43 in.	Variable in three ranges: 0 to 1,100; 0 to 2,000; 0 to 3,750	1.5/220	Yes (headstock slides and swivels)	Good	Fair	Very good	Headstock spindle shaft only 1 in. dia.; flexed under heavy load. Tool-rest extension flexed under heavy load.
43 in.	Continuously variable: 300 to 3,000	2/220	No	Fair	Good	Fair	1½-india. spindle, but undersize drive belt. Auxiliary disk sander on headstock means you can't use a knockout bar to free drive center. Tool-rest base too short to allow large bowl turning.
42 in.	Variable in two ranges: 0 to 1,200; 0 to 3,200	2/220	Yes (headstock slides)	Excellent	Good	Very good	Tool rest slipped slightly in hammer test.
24 in.	Continuously variable: 100 to 3,500	1.75/120	Yes (headstock swivels)	Excellent	Fair	Excellent	Stability improves to very good when weighted with sand. 20-in. bed extension, \$200; stand, \$245; outboard tool-rest holder, \$270. Street price includes bed extension.
24 in.	Eight-step pulley: 215 to 3,600	1.5/120	Yes (headstock swivels)	Very good	Fair	Excellent	Stability improves to very good when weighted with sand. 20-in. bed extension, \$200; stand, \$245; outboard tool-rest holder, \$270. Street price includes bed extension.
34½ in.	Variable in two ranges: 50 to 1,200; 125 to 3,200	2/220	Yes (headstock slides)	Excellent	Excellent	Very good	Tool rest slipped slightly in hammer test. 18-in. bed extension and tool-rest extension for outboard turning, \$400; Street price includes bed extension.
36 in.	Variable in five ranges: 50 to 510; 90 to 910; 170 to 1,740; 290 to 2,900; 390 to 3,890	2/220	Yes (headstock has outboard spindle)	Excellent	Excellent	Good	Tool rest moved more than most in hammer test, has undersize locking lever. Outboard tool-rest holder, \$200.

short, skimpy lever with acorn nuts on the ends that dig into your palm. (The tool rest itself was my favorite; it has softened edges and a polished surface.) The Nova models use a thick rod capped with comfortable plastic balls; it was easy on my hands.

Checking the tailstocks

The Jet and the Powermatic have the best live centers—large, plated cones that turn smoothly and are similar to the best aftermarket live centers. The Rikon's live center is nearly as good. All the others have a small but serviceable basic live center.

Quill diameters range from 1 in. on the Grizzly to 1¹/₂ in. on the Nova models. As with headstock spindles, a larger tailstock quill means more rigidity and less vibration transmitted to the work. However, even the Grizzly's smaller quill seemed solid enough. Tailstock travel was adequate for all the lathes.

Most of these lathes have a handwheel on the tailstock and a selfejecting center. As you turn the handwheel counterclockwise, the quill retracts into the tailstock and the center pops free. The Nova models and the Rikon have a hollow quill and use a knockout bar to free the center. Many turners prefer the self-ejecting center. However, the hollow-quill design lets you thread a long auger bit into a turning, for drilling lamp bases and the like.

Two lathes to consider

These lathes easily handle spindle turning and most faceplate work. Most have the size and power needed for large-scale pieces, and using them was a pleasure. However, the Grizzly stalled when turning heavy bowls, and the General needs a beefier spindle to be truly competitive.

The Powermatic 3520B is my choice for best overall. Originally designed with the help of a legendary wood turner, the late Rude Osolnik, the 3520A was a good lathe with a few faults. The 3520B, designed with the help of Ernie Conover, did everything right.

The Nova 1624-44 is the best value at \$1,200, which includes a bed extension. Its simple step-pulley design should deliver years of trouble-free operation. The runners-up are the Jet JWL-1642-EVS-2, the Nova DVR, and the Rikon. Both Nova models need plenty of ballast. The Rikon needs a better tool-rest handle.

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