

A fundamental machine for cabinetmaking. Six-in. jointers like this Powermatic are a mainstay of many smaller woodshops, but the capabilities and price tags of machines in this size category vary widely. All of the jointers reviewed by the author can cut rabbets.

I f you have trouble getting tight joints, square corners and flat surfaces, chances are you're either having a jointer problem or you're without a jointer. A jointer establishes the reference surfaces from which all other machining is done. And in addition to truing edges and removing cup, bow and twist, jointers can taper, bevel, chamfer and rabbet (see the photo above).

These attributes help make the jointer one of the most useful tools in the workshop and one worth choosing very carefully. Jointers are sized by the length of their knives, which translates into the widest board they can face joint. Generally, the bigger the machine, both in length and width, the easier your woodworking will be. With a wider machine, you won't have to rip boards as often for face-jointing and, consequently, you will have fewer gluelines in panels and tabletops. Longer jointer tables (also called beds) provide better support for boards entering and exiting the cutterhead, resulting in straighter stock.

The trade-offs with a big machine are the amount of floor space it takes up and its cost. There are many other factors to consider, too, such as design, availability of parts and service, and ease of use. Some of the imported jointers are a lot alike (see the three jointers stacked up on p. 84). After you examine the castings and motors on several machines, you'll be convinced that they were

Essential parts of a jointer

How well a jointer performs depends on the design and construction of its key parts: fence, infeed and outfeed tables, and cutterhead.



made at the same plant, and you'll probably be right. However, similar-looking jointers can have some subtle differences besides different brand labels. If you look closely, you'll see that fences, knobs, levers and cranks distinguish one machine from another.

Picking a field for comparison

Most shops end up with 4-, 6-, or 8-in. jointers. I decided to look at 6-in. jointers because they're large enough for most jobs yet are reasonably priced, especially the imported tools. The small capacity of 4-in. jointers makes them impractical for many furniture-makers; 8-in. jointers are larger, so they take up more shop space

and are more expensive. From the field of 6-in. jointers, I picked 10 of the most popular brands, including Powermatic, Delta, General and a generous sampling of Taiwanese models. I chose machines that are stand-mounted with an overall table length of at least 40 in. (less than that, I think, makes it difficult to get accurate results). List prices ranged from \$329 to \$1,593. Many companies offer more than one 6-in. jointer, so I asked each for its best

model. Bridgewood (sold by Wilke Machinery) has two models. Because the better machine was out of stock, I included the less expensive one. The only differences are in the stand and in the fence.

I'm aware of a half-dozen other companies that also carry 6-in. jointers. They include AMT (800-435-8665); CP Tools (800-654-7702); Enco Manufacturing Co. (800-873-3626); Harbor Freight Tools (800-423-2567); Lobo Power Tools (800-786-5626); and Sears/ Craftsman (800-377-1565). AMT could not ship a jointer in time for this review. The Sears jointer has 36-in.-long tables. The other companies offer Taiwanese machines that are virtually indistinguishable from several I already had on my list. The 10 machines reviewed in this article are an excellent representation of what's available.

Jointers aren't difficult to understand

Jointers are pretty basic. The principal parts are infeed and outfeed tables, a cutterhead with knives, a knife guard and an adjustable fence (see the photo at left). This main assembly sits on a stand, which houses the motor (see the top photo at right). Most stands have built-in dust chutes to help evacuate the chips (see the bottom photo at right). Adjusting the height of the

Look in the cabinet to inspect motor mounts and belt tensioning. The General is compact, and belt-tightening is simple because of a pivoting motor base. The motor comes with rubber isolation bushings and a big, balanced pulley.



Chip removal: Designs vary widely and include (from left) open dust chutes on the Enlon and General machines, a dustcollection hose adapter on the Wood-Tek jointer and no chute at all on the outfeed end of the Bridgewood machine.

infeed table determines how much stock is removed from a board as it is moved over the cutterhead. The knives in the cutterhead, which should be set level with the outfeed table, do the work. And because knives get dull, they must be removed from the machine, re-sharpened and reinstalled periodically. The quality of cut depends on these and other factors: flatness of the tables and fence, adjustments of tables, knives and fence, and performance of the motor and drive train.

Assembly: what the owner's manual doesn't tell you

None of these jointers could be used right out of the box. I had to set up the base, bolt on the jointer (you'll need help lifting the cast-iron machines onto the bases), align the pulleys and install the belts. On some machines, I had to wire the switches. After I installed the fences and guards and cleaned off the cosmoline (a protective coating applied at the factory), I was ready to adjust the tables.

Most of the jointers took about $1\frac{1}{2}$ to 2 hours to unpack and put together; some of them took longer. With a few exceptions, the job was about what I had expected. The Enlon was coated



Two types of center-mounted fences—Both the Reliant (left) and Enlon jointers have centermounted fences. Enlon's fence is fixed by three points, so it's stable. Reliant's fence, fixed by a sliding dovetail, isn't easy to position and can't be set acutely.



Hand cranks are better. The author prefers a hand crank (left) over a lever for adjusting table beds because hand cranks make precise adjustments easier. The fence on the General jointer (left) is mounted at the end of the infeed table.

end, but that should not adversely affect most jointing jobs. I would be reluctant to accept a machine that is out-of-flat by much more than .005 in., but none of these jointers had that problem.

All of the tables ride on sliding dovetail ways, except those on the Delta, which use parallelogram supports (I'll talk more about that later). All the jointers have adjustable infeed as well as outfeed tables—a handy feature for leveling the table to the knives.

Table adjustments are easier with hand cranks—Table adjustments are made by either a lever or a hand crank, as shown in the bottom left photo above. Some machines have two hand



Checking and adjusting the tables

To get flat, true tops on their jointer tables, manufacturers grind them, usually after assembly. Of the tables I compared, a few are ground to a smoother finish than others. But with a coat of wax on all the tables, I didn't notice any difference in performance between the tables that are highly polished and those that aren't.

I checked the tables for flatness with feeler gauges and a 6-ft.-long Starrett straightedge. I looked for drooping in the tables near the cutterhead and at the ends. A few of the machines had perfectly flat tops. Others had dips of a few thousandths of an inch. The Enlon table drooped .04 in. at the outfeed



Comments: Fence is difficult to adjust and use. Fence stops don't always repeat exact tilt settings. The table height-adjustment cranks are easy to get to (on front).

Jet JJ-6CS

List price: \$629Tables: $7\% \times 45\%$ Infeed: crank Outfeed: crank Knives: $1\% \times 11/16 \times 6$ Setup: springs Fence: $37\% \times 277\%$ Mount: center, sliding dovetail Tilt: 90° -135° Stops: 90° , 135° Motor: 12 amps, 110v Manual: good Pages: 23



Comments: Fence is difficult to adjust, set and use. Stand and castings are virtually identical to Jet and Sunhill jointers but Reliant has a slightly different fence mount.



Comments: Fence comes unassembled. It was difficult to set its positive stop to 90°. Fence works okay after tweaking. Bolt-on extension wings add 7 in. to table length.

Reliant DD39C

List price: \$370 Tables: $7\% \times 45\%$ Infeed: crank Outfeed: crank Knives: $1\% \times 1^{1}/_{16} \times 6^{1}/_{16}$ Setup: springs Fence: $3\% \times 27\%$ Mount: center, sliding dovetail Tilt: 90° -135° Stops: 90° , 135° Motor: 14 amps, 110v Manual: fair Pages: 13

Sunhill CT-60L

List price: \$389 Tables: $7\% \times 52$ Infeed: crank Outfeed: crank Knives: $1\% \times 11/16 \times 61/16$ Setup: springs Fence: $4 \times 281\%$ Mount: center, parallel arm Tilt: 45° -135 $^{\circ}$ Stops: 90 $^{\circ}$, 135 $^{\circ}$ Motor: 14 amps, 110 $^{\circ}$ Manual: fair Pages: 15 cranks (one for each table), some two levers and some one of each. It was much easier to adjust the tables accurately with hand cranks. One revolution of the crank moved the table a precise distance, depending on the number of threads per inch on the shaft connected to the crank. With a hand crank, I could easily position the outfeed table exactly to the maximum height of the knives as I watched a dial indicator. By contrast, I found the action of the lever-adjusted tables to be stiff and imprecise. I often had to settle for a table position that wasn't quite where I wanted it. Accurate table setting is more critical on the outfeed table. So I was glad to see that when a machine has both a crank and a lever, the lever is on the infeed table where exact settings are somewhat less critical. I still prefer jointers with hand cranks on both tables.

Delta's approach is unique. The DJ-15 uses a parallelogram support system and a pair of levers to adjust the tables. Delta's levers are smooth and easy to move, probably because the heavy castiron tables are counterbalanced by springs. Delta includes minimum and maximum depth-of-cut stops on both the infeed and outfeed tables. On the infeed table, you can set the minimum to ¹/₅₂ in. for fine cleanup passes and the maximum to about ¹/₈ in. to prevent taking too deep a cut. Delta suggests using the outfeed table stops to lock the table level with the knives. This keeps the table from accidentally being lowered.

Rabbeting ledges are standard—All of the machines have rabbeting ledges as part of the infeed table (see the photo at left on p. 83). All but Delta's and Enlon's are cast in place. Enlon's is bolted on at the factory and ground flush with the infeed table. Delta's bolt-on ledge added about five minutes to the machine setup but performed as well or better than the others. Its larger size provided a little more support.

Pay attention to the cutterhead and knives

How fast you feed a board and how deep a cut you take affect the quality of a jointed surface. Cutterhead speed (in cuts per minute) also determines surface smoothness. The Powermatic (21,000 cuts/min.), the Delta (16,500 cuts/min.), the Enlon and Grizzly machines (both at 15,000 cuts/min.), and the Jet (14,400) cuts/min.) have the fastest cutterhead speeds. The rest of the jointers produce only 13,500 cuts per minute.

To make knife setting easier, manufacturers try various techniques. The system that I prefer includes a pair of jackscrews mounted in the cutterhead (see the bottom drawing on p. 83). The jackscrews make the process faster and more accurate. They catch the lower edge of a knife and raise it as an Allen screw is turned. Only the Delta and the Powermatic cutterheads come equipped with jackscrews.

Several machines include knife-setting jigs (see the bottom left photo on p. 86) that work in conjunction with springs under the knives. The springs rest in the knife-holding slots in the cutterhead. With the jig straddling a knife and resting on the cutterhead, the spring pushes the knife to the proper height above the cutterhead. The locking screws are then tightened. I don't care for this arrangement because it sets the knives relative to the cutterhead rather than the outfeed table. If the cutterhead and outfeed table are not in the same plane, the jointer won't cut evenly. It's best to set the knives to the outfeed table, preferably with a dial indicator.

Fence mechanisms and settings are critical

The one part of the machine that you'll have more contact with than any other, save possibly the infeed-table adjustment, is the fence. You'll be moving it back and forth to accommodate different-sized stock, to use different parts of the blade and to cut rab-



Comments: Fence is difficult to adjust and won't tilt to stops. Stamped-steel stand lengthens setup time. Fence bowed .021 in. over its length. No dust chute.

Delta DJ-15Final StatesSta

Comments: Guard has stiff spring and blunt front face, making stock feed difficult. Nice depth-of-cut gauge. Replaceable table inserts around cutterhead.

bets. You want a fence that's easy to slide. The fence also must tilt accurately to at least 45° and 90° . Initially, I set each fence at 90° to the outfeed table, set the stops (see the top left photo on p. 86) and then tilted each fence through its range of motion. I returned to the 90° setting to see if the fence retained its accuracy.

There are three types of fence mounts among the jointers I reviewed: two center-mounted styles and an end-mounted version. The most common is the center-mounted fence fixed to a sliding bracket, as shown in the top left photo on the facing page. This type of mount is used on the Powermatic, the Delta and several Taiwanese jointers. The bracket rides on a fence carriage fixed to the back side of the jointer. As the fence is moved across the tables, the sliding bracket covers the blade behind the fence. Fence tilt is accomplished by parallel arms, which provide a solid three-

Bridgewood BW6J

List price: \$329Tables: $65\% \times 45\%$ Infeed: crank Outfeed: crank Knives: $1\% \times 11/6 \times 61/6$ Setup: jig & springs Fence: $3\% \times 27\%$ Mount: center, sliding dovetail Tilt: 90° -135° Stops: 90° , 135° Motor: 14 amps, 110v Manual: fair Pages: 13 or two-point (Delta only) mounting system.

The second most common mounting system is used on the Jet, Reliant and Bridgewood jointers. This also is a center-mounted style with a sliding bracket and fence carriage bolted to the back of the jointer. But this mount is smaller and lighter and requires a steel guard to cover the knives when the fence is toward the rabbeting ledge. The tilt mechanism on this type of mount uses a slid-



Square the fence–Install the fence 90° to the outfeed table, and then set the stop. After you move the fence through its range of adjustments, return it to the initial position, and recheck for square.



Installing knives—A couple of jointers come with knife-setting jigs, which gauge knife height above the cutterhead. Here, the author installs a knife in the Grizzly jointer's cutterhead, which has spring-loaded slots.

ing dovetail way (see the top left photo on p. 84).

The third system is a fence mounted on the end of the infeed table, used on the Wood-Tek and General jointers (see the bottom left photo on p. 84). This mount uses a sliding socket wrench to control two locknuts. One nut holds tilt settings; the other nut is for width settings.

Almost all of the fences had a slight end-to-end bow that ranged from .004 in. to .021 in. The Grizzly was the only one with a perfectly flat fence. But as long as a fence can be adjusted to a true 90° to the table, bow really has no affect on performance.

In terms of accuracy, repeatability and ease of adjustment, I found the fences on the Powermatic, Delta and General jointers to be head and shoulders above the others. The dovetailed center-mounted fences were the most difficult to use. They were awkward to slide, and the tilt mechanisms often hung up. The stops didn't always bring these fences back to accurate settings, either. I wouldn't buy a jointer with this kind of fence.

Similar motors and drive trains

All the jointer motors are wired for 110v, single phase power, but they can be rewired for 220v. The motors are rated between ³/₄ and 1 hp

by the manufacturers. Motors on the Taiwanese jointers look identical, although some claim slightly different specifications. The Powermatic has a Baldor motor and the General has a Leeson motor. The Delta uses its own brand.

All of the jointers use pulleys and V-belts. With the exception of the Powermatic and the General machines, the jointers have sliding motor-mounted systems for adjusting belt tension. Access to the belt is generally through an easily removed rear panel. The access panels on the Delta and Grizzly machines are screwed in place, which is inconvenient.

The belt-tensioning arrangement on the Powermatic is the hard-



Comments: Excessive protective coating. Machined surfaces are highly polished. Nylon pads prevent the fence from scratching the table. Jointed very smoothly.

Enlon EN3104

List price: \$380 Tables: $6\frac{1}{2} \times 46\frac{5}{6}$ Infeed: lever Outfeed: crank Knives: $\frac{1}{6} \times 1 \times 6$ Setup: jig & springs Fence: 4×29 Mount: center, parallel arm Tilt: 55° -135° Stops: 90° , 135° Motor: 12 amps, 110v Manual: fair Pages: 24



Comments: Best fit and finish. Quietest of all machines. Blade guard for back side of fence is optional. Compact footprint. Long power cord but only 16-gauge wire.



Comments: Bolting together the stampedsteel stand and wiring switch takes longer than setting up other machines. Bracket prevents fence from tilting to full 135°.

General 1180-1

List price: \$1,295Tables: $6\frac{1}{2} \times 42\frac{1}{2}$ Infeed: crank Outfeed: crank Knives: $\frac{1}{8} \times \frac{3}{4} \times 6$ Setup: none Fence: $3\frac{7}{8} \times 34\frac{3}{4}$ Mount: end Tilt: 45° -135° Stops: 45° , 90°, 135° Motor: 10.8 amps, 110v Manual: poor Pages: 4

Grizzly G1182

List price: \$375Tables: $7\% \times 47\%$ Infeed: lever Outfeed: lever Knives: $1\% \times 1 \times 6$ Setup: jig & springs Fence: 4×29 Mount: center, parallel arm Tilt: 45° - 125° Stops: 45° , 90° Motor: 14 amps, 110v Manual: good Pages: 30 est to adjust. The motor is mounted low in the cabinet, so it's difficult to get to the four bolts under the pivoting motor platform. General has the best motor-mounting system and the easiest belt adjustment. Rubber mounting pads isolate the motor from vibration. A single bolt with nuts on either side of a pivoting platform provides positive up and down adjustments. The General jointer had the only drive pulley that showed signs of having been balanced (see the top right photo on p. 83).

How they performed overall

After checking all the knives and leveling the outfeed tables to the knives on all the machines, I face- and edge-jointed maple, oak and poplar, taking 1/16-in. passes. With factory-fresh knives in properly setup machines, I expected, and got, decent results. There were subtle differences in machine performance, such as the feel of boards that had been jointed, and some more noticeable differences, such as noise levels. Although I didn't measure

Sources of supply

Bridgewood (Wilke Machinery Co.) (717) 764-5000

Delta International Machinery Corp. (800) 438-2486

Enlon Import Corp. (800) 888-9697

General Mfg. Co. Ltd. (819) 472-1161

Grizzly Imports Inc. (800) 523-4777

Jet Equipment & Tools (800) 274-6848

Powermatic (800) 248-0144

Reliant (Trend-lines Inc.) (800) 767-9999

Sunhill Machinery (800) 929-4321

Wood-Tek (Woodworker's Supply Inc.) (800) 645-9292

decibel levels, I thought that the Powermatic generated the most objectionable noise-a loud, high-pitched whine.

The Delta jointer was the best adjusted machine out of the crate. It produced glasssmooth cuts. Following closely behind the Delta were the Powermatic and the General jointers. The Taiwanese machines all did a fairly nice job, although the Enlon jointer seemed to produce a slightly smoother surface than the others. The Grizzly caused some tearout in swirly grained white oak. Edge-jointing with the Wood-Tek and the Bridgewood units produced some chatter marks, even when I slowed the feed rate.

Big bucks buy big performance

For those who have few financial or space constraints, I'd recommend the Powermatic or the Delta jointer. Either one should provide your shop with a long-lasting, high-quality

machine. Though these are the two heaviest machines, their longer beds are an advantage. For shops with less floor space, you can't beat the General: smooth-running, quiet and a pleasure to use. It has a compact stand, and because the fence mount doesn't protrude from the back side of the machine, you can tuck it close to the wall. The only thing that prevents it from being my top choice is its shorter table length.

Though the General, Powermatic and Delta are good machines, they are more than three times the price of most of the Taiwanese models. For the woodworker on a budget who's willing to put up with less convenient fence settings, one of the Taiwanese machines with either the end-mounted fence or the center-mounted, parallel-arm fence should work just fine (you should check the fence setting with a square any time you change it, anyway). But I would get one with hand cranks instead of levers. The upscale



Comments: Large stable base and the longest tables. Castings are heavy. No power cord supplied. Small on/off switch. Machine is loud. Awkward belt tensioning.

Wood-Tek 801-589

Comments: Only machine with pick-up boot for dust-collection hose. Includes guard for back side of fence. Fence stops require trial-and-error bolt turning.

version of the Bridgewood (model BW6R, priced at \$429) meets all these criteria and, based on the performance of the BW6J, should be a good performer.

Of the Taiwanese machines I reviewed, I like the Wood-Tek with its end-mounted fence. The Sun Hill also has all the features I favor, including bolt-on extension wings that increase table length by 7 in. The Enlon and the Grizzly both perform well and have decent fences, but I don't like the fact that they use height-adjustment levers on their infeed tables. Both machines took longer to setup for jointing than the other imports. With some tweaking and tuning, though, the Enlon and Grizzly can do an acceptable job.

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Powermatic 50

List price: \$1,593 Tables: 61/4 x 561/4 Infeed: lever Outfeed: crank Knives: 1/8 x 11/16 x 6 Setup: jackscrews Fence: 4 x 36 Mount: center, parallel arm Tilt: 45°-135° Stops: 45°, 90°, 135° Motor: 9.6 amps, 110v Manual: excellent Pages: 30

List price: \$395 Tables: 65% x 421/4 Infeed: crank Outfeed: crank Knives: 1/8 x 11/16 x 6 Setup: jig & springs Fence: 3³/₄ x 35¹/₂ Mount: end Tilt: 90°-135° Stops: 45°, 90°, 135° Motor: 16 amps, 110v Manual: poor Pages: 8