

Used Machines Can Be

Learn how to avoid lemons, and you'll get serious power and capacity for less money

BY ROLAND JOHNSON

Buying used woodworking equipment is a great way to step up to machines with bigger capacity, higher horsepower, and smooth, solid performance that comes with lots of heavy cast iron.

Great deals can be had on old woodworking equipment, especially bandsaws, tablesaws, and jointers, but used machinery often requires some refurbishing. Fortunately, basic power-tool technology hasn't changed much in the last century, so it doesn't take an engineering degree to bring an old horse back into harness.

I'll show you what to look for in a used machine and what to look out for. I'll also show you what type of work you may need

to do to rehab an old machine, but you'll see the benefits, too. A bigger, better machine should help you do better work.

Finding your gem in the rough

Searching for old tools can be rewarding, but first you must educate yourself on the type of machine that fits your space and needs, and have a price limit in mind.

You can use the Internet to read about old tools, such as information on the manufacturer, performance, utility, and mechanical eccentricities. One great online source is the Old Woodworking Machinery site (OWWM.org).

a Steal



Local dealers let you kick the tires. Although you can find used machines by searching online, a better option is a local used-machinery seller, such as *Tried & True Tools in Minnesota*. These retailers often troubleshoot and repair the tools they sell. The selection will vary from week to week.

And there are lots of good sources for good-quality old tools. The key is knowing where to look.

Buy local if you can—Locally purchased tools offer a couple of real advantages: It's easy to inspect the tool, and getting it home will be less of a hassle and expense. Newspaper ads are usually great sources, but you also can find tools locally using *Craigslist.com*. And you may find a gem at a tag sale or flea market.

Long distance can work, too—Approach a long-distance purchase with care. To assure a fair deal, pay strict attention to photos and ask the seller hard questions. Long-distance purchases also

Bring a tool kit

When heading out to look at a prospective machine purchase, bring a portable tool kit with some wrenches (metric and imperial/SAE) and screwdrivers. It's also helpful to have a few special items that can help you do a more in-depth inspection.



A **dial indicator** with a magnetic base is good for checking bearing and shaft runout.

Used with **feeler gauges**, a **straightedge** is essential for checking table flatness on jointers and tablesaws and for gauging upper and lower wheel alignment on a bandsaw. A 3-ft. straightedge will suffice for checking tablesaws, but a 6-ft. one is best for checking jointers and bandsaws.



With a long **screwdriver**, you can listen to bearings.

Use a compact, bright **flashlight** and a **mechanic's mirror** to check the inner works of a machine.

A narrow, stiff-bristled **paintbrush** helps when clearing sawdust and debris off parts so you can inspect them.

ALL MACHINES

START HERE WITH ANY MACHINE

Machines share a lot of basic technology (motors, switches, pulleys, bearings) and a quick inspection can help you identify tools that you need to walk away from before you make a bad purchase.



CHECKLIST

- Do the motor and switch work?
- Will the motor work in your shop?
- Are there any damaged or missing parts?
- Are the bearings in good shape?
- Do the pulleys spin true?

will have to be shipped unless you plan to pick up the machine. Make sure the seller is willing to get the machine ready to ship and help the shipper load the machine, and get a firm bid on shipping costs. Freight charges can kill a good deal quickly.

If you're looking nationally, eBay is the best known source of used machinery. However, Fine-Woodworking.com, Woodweb, and other sites have classified sections that could help.

What to look for, and look out for

Once you've found a possible purchase, you need to know the key parts that need inspection. Here's a checklist that should help.

Do the motor and switch work?—Make sure the machine will work in your shop. First, see if the motor runs on 110 or 220 volts. Next, check whether the motor is a direct drive (cutterhead or bandsaw wheel mounted to the motor shaft) or belt drive (pulley system). Direct-drive motors typically require three-phase power, which is not typical in a home shop. If three-phase power is not available in your shop, or the motor is not easy to replace with a single-phase unit, look for another tool. To make a three-phase motor work in that situation, you'd need to install a phase converter that changes single-phase power to three-phase, and that can be an expensive option that could ruin a good deal.

Now start the motor. If it starts quickly and runs smoothly, it will most likely work fine. But if it doesn't start, plan on replacing the motor, the switch, or both. Figure that expense into the price.

On most belt-driven machines, replacing the motor is a simple task. Look at the existing motor tag and try to match the ratings as

closely as possible: the motor frame type, the service rating (continuous duty is the best), the enclosure (TEFC, totally enclosed fan cooled, is best for woodworking tools), the rated horsepower, and the rpm.

As for switches, a 220-volt machine requires a magnetic switch. It's also a good idea for 110-volt machines because in the event of a power failure, a magnetic switch prevents the tool from restarting when power is restored. You can buy replacement motors and switches at most electrical-supply stores, farm-supply stores, or woodworking machinery dealers.

Are pulleys and belts worn?—Belts and pulleys are integral to almost any machine. Bad belts or pulleys can cause

Check the motor. Make sure that the motor will work in your shop. If the motor needs to be replaced, try to match the ratings on the existing motor's tag (left). Also, turn on the motor to check the switch.



Check the bearings and pulleys. Use a long screwdriver as a stethoscope, placing the tip on the motor or pulley shaft and listening at the other end (above) as you spin the shaft or pulley. Any clicking or crunching noises are signs of trouble. A pulley that doesn't spin true will cause vibration in the machine. A simple but effective test is to mark a line on a stick and hold it over the pulley (right) as it spins.



TABLESAW

USED TABLESAW CHECKLIST

The tablesaw should exhibit very little runout and should have a flat top and smooth blade adjustments. If the fence is bad or missing, don't worry. There are plenty of good aftermarket ones.

- Is the tabletop flat and in good shape (including miter slots)?
- Does the blade tilt left or right?
- Are blade adjustments easy (height and angle)?
- Are blade angle adjustments accurate?
- Is there excessive arbor runout?
- Is the belt good?
- Is the fence serviceable?

a lot of vibration. Inspect the belt for cracks, frayed edges, or spots where it's delaminating. If it looks bad, replace it. Fortunately, belts are cheap.

If the pulley wobbles on the shaft, more than likely the machine will have lots of vibration; it could also score the shaft of the machine. Fortunately, it's easy to find a replacement for nearly every pulley style and size—farm and fleet (machine supply) stores are a good source. If you have to replace a pulley, pick a high-quality, cast-iron, machined one.

Do spindles and shafts spin true?—The accuracy of any molding, planing, or cutting machine depends to a large extent on the concentricity of the spindle or arbor shaft that holds the blade or cutter. Check spindles and arbor shafts for runout (lack of concentricity) and damage. Runout should be less than 0.005 in. for any spindle or shaft.

If the shaft exhibits a lot of runout or has visible damage, walk away from the machine. Replacement is too costly and difficult.

Are the bearings crunchy or smooth?—Modern machinery uses bronze bushings, ball bearings, and roller bearings, but years ago bearings were cast from Babbitt metal, an alloy of tin, antimony, and lead. If a prospective machine has worn-out Babbitt parts, it will be too costly and time consuming to replace them or upgrade the machine to modern bearings, so walk away from it.

Ball and roller bearings should be nearly silent. Most worn-out bearings will make obvious grinding, grumbling, or squealing noises, but sometimes they are quiet enough that it's hard to hear any malfeasance. I use a long-handled screwdriver as a stethoscope to listen to a bearing as the shaft is turned (see photo, facing page). Another method is to use a mechanics stethoscope, a lot handier if the bearing housing is hard to access.

If the bearing is kaput it's usually easy to get a replacement from a local machine shop or automotive parts store. The bearing number usually is stamped on it, but if it's not, finding a match can be a chore. Accurate Bearing (www.accuratebearing.com/quote.php) has a handy service that will find a match if you know the bore, outside diameter and width, and unit of measurement (millimeters or inches). Although the amount of work needed to replace a bearing varies based on the machine, you should have some basic mechanical knowledge and ability to take on the job, or at least know someone who does.

I don't have an arbor press or a hydraulic press, so I typically rely on a local machine shop for press-fit bearing installation. You



Eyeball the top. Use a good straightedge to see whether the top is flat. If you see major deviations (0.030 in. or more; about the thickness of 3 business cards), don't buy the machine.



Smooth blade adjustments? Raise and lower the blade, and check its tilting action. Be sure it squares up to the table, too.



Run away from runout. Use a dial indicator to measure the arbor shaft runout. A measurement of more than 0.005 in. means the machine is a no-go.

JOINTER

USED JOINTER CHECKLIST

The primary job of the jointer is to flatten surfaces, both edges and faces, so it's critical that the tables are flat and aligned, and that the fence is accurate.

- Is the tabletop flat and in good shape?
- Is there noticeable sag in the tables, and if so, can it be corrected?
- Is the cutterhead in good condition?
- Can you get replacement knives?
- Is the fence in good condition, and does it square up to the table?



Flat tables, please. Use a straightedge to check the flatness of the tables and to check for any sag. Parallelogram-style tables are easily corrected for sag, while those with dovetailed ways (right) can't be adjusted easily. However, with dovetailed ways, you can tighten the nuts to eliminate play.



Inspect the cutterhead. Unbolt the cutterhead to inspect it for damage. Also, look for any missing knife-setting screws.



It's hip to be square. Check the action of the fence and make sure it can be set 90° to the tables.

Extreme bandsaw rehab

Johnson bought an old Walker-Turner 16-in. bandsaw for \$250. It's cast-iron, with smooth bearings, a stout upper guide post, and 12 in. of resaw capacity, but it needed major TLC. After about \$675 in parts, including a new 1½ hp motor, he had a big-capacity, heavy-duty machine with a price that's hard to beat.



New base and belt. The original base was shot, so Johnson built a new one that sits on a roller base. He also installed a new link belt.



New guides. Ceramic guides (spacegceramicguideblocks.com) replaced worn roller guides.

BANDSAW

USED BANDSAW CHECKLIST

The bandsaw has lots of moving parts that all need to be in tune to get great results. Give a close inspection to the wheels, the guide post, and the guides.

- What's the cutting capacity?
- Is the upper guide post rigid?
- Are the blade guides serviceable?
- Are the trunnions in good shape?
- Are the top and bottom wheels relatively coplanar?
- Are the tires in good shape?
- Is the belt good?
- Is the table in good condition?



Wheels should line up. Start by using the blade-tracking knob to get the upper wheel parallel to the lower one. If the wheels are still $\frac{3}{8}$ in. or more out of alignment (not coplanar), it will be difficult to track the blade correctly.



Upper guide post should be stiff. Raise the post so the guides are about 9 in. above the table. You can check for flex simply by pushing on it, but for a more accurate assessment, use a dial indicator. It should deflect no more than 0.005 in. at 6 lb. pressure.

If the machine has a fence, be sure to check its action and that it can be squared up.

Can you see rust inside?—Some machine surfaces may be rusty. While a light coating of rust is easily removed on external surfaces, internal rust can be a greater problem. If it's pervasive enough to affect critical internal components such as shafts, gears, bearing surfaces, and dovetailed ways, you should walk away.

With a bit of elbow grease, you can create a winner

Once you've found the perfect machine, expect to do some work on it. If you're lucky, most of the labor will be cleaning and lubricating parts. But you may have to replace critical parts (see below), such as a motor or switch, bandsaw tires, and belts, or update the tool with better-quality aftermarket parts, such as a better fence, and even repaint the tool. But all the work will be worthwhile in the end.

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Better than a Bowflex. The tires were worn and split, so Johnson stretched on a new pair. It turned out to be a great workout.



Finally, the fence. Johnson added a new aftermarket fence and measuring tape.

Like new. After all the mechanical work was completed, the final touch was a new paint job, matched to the original color.

