

Kinetic SPLITTERS



Splitting firewood has come a long way since the late 1970s when I'd head out to the woods with a Homelite chain saw and splitting maul. I remember bouncing the maul off of a lot of wood before I finally learned to tell elm from the more splitter-friendly species. Hydraulic splitters replace the momentum of the maul head with a steady push of 20 tons or more. They require a power source, hydraulic pump, valves, hoses, and a cylinder—and gallons of hydraulic oil and a filter that needs changing on a regular basis. The hydraulic ram moves at a steady pace, whether it is splitting a 6-inch round or a 30-inch crotch.

Above: The author tries his hand at splitting a forked piece of post oak. The 1-hp electric SuperSplit kinetic splitter had no problems with it.

Kinetic log splitters use the kinetic energy (hence, the name) of a flywheel much as a splitting maul's kinetic energy forces the wood apart as it passes through it. Think of the difference between striking the wood with a maul (kinetic) and setting the maul on the wood and trying to split the wood by pressing down on it (hydraulic) and you get the idea. The flywheel approach allows the use of a smaller, more fuel-efficient motor to spin the flywheel up to speed, then uses that energy to push the wood through the splitting wedge in just a couple of seconds. The flywheel slows down as it applies its energy to the splitting process, but once the split is complete, it only takes a few seconds to spin it back to full speed while the ram retracts and the operator sets up the next piece.

According to Paul McCann, owner and CEO of SuperSplit, kinetic firewood splitters were largely unnoticed when they first hit the market back in 1978. Their compact frame and small engine didn't have the look and feel of a "serious" log splitter, but they gained a small, and still-growing, base of enthusiastic owners. "My dad bought the patent and manufacturing rights, and I took over the company in 1997 when he retired. It is basically the same product as it was in 1978," Paul explained in a recent interview. Now that the patents have expired, a number of other companies offer log splitters based on the same principle.

The engine (gas or electric) spins a pair of balanced flywheels with a total weight of 150 to 200 pounds to 350 rpm. Between the flywheels is a pinion gear. When the operator lifts a lever, a cam pushes a rack gear onto the pinion, and the teeth mesh, pushing the rack forward. The rack, in turn, pushes the

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The three-second cycle time of the SuperSplit kinetic splitter is especially useful in splitting firewood slabs, which may provide an additional source of income to small sawmills.

wood through the splitting wedge. At the end of its stroke, the rack lifts off the pinion gear and a pair of springs pulls the rack back into the housing—all in the space of about 3 seconds. All the engine needs to do is bring the flywheels back to normal speed, which means that it needs about 1/3 the power of a hydraulic splitter, which must be sized for the maximum splitting power.

“It is hard to compare a kinetic splitter to the ton rating of a hydraulic machine,” Paul noted. “On, say, a 25-ton hydraulic splitter, if it won’t go through a piece of wood, you can’t hit it again and expect it to split the way you can with a kinetic splitter. The kinetic is like swinging a maul. Eventually, you’ll get through it if you hit it enough times.” All the operator needs to do is to bump down the control handle to disengage the rack, which takes pressure off the splitter. Normally, the springs will pull it back for another try, but sometimes it takes a little bump to get it started. As an

additional safety, there is a clutch between the flywheel and the engine, so the engine won’t stall, but with a little experience, an operator learns to read the log and disengage the rack before it comes to a halt.

“Kinetic splitters have to be built like a Sherman tank, because they get a lot of rough treatment,” Paul explained. Labor is expensive, but it is the only way to build a quality machine. “We put every flywheel on the balancer and machine them to run smoothly. A couple of 75-pound flywheels spinning out of balance at 350 rpms can make your splitter walk across the floor,” he said, laughing.

Paul maintains that high-quality material machined to close tolerance will stand up to the stress of the kinetic mechanism as long as the operator keeps the track clean and occasionally puts some grease on the rack and on the main bearings. To illustrate the point, he mentioned a call from an owner. “I had an owner call a while back who said, ‘I’ve had my splitter for more than 30 years, and I’ve finally worn something out.’ I asked what he needed, he replied ‘a new hat!’” On the other hand, he says he occasionally gets calls from people looking for replacement parts for a cheap “knock-off.” “Even if we didn’t manufacture it, we’ll help them if we can,” he added.

What about safety? The 3-second cycle time with a very unforgiving ram and wedge does require the operator to pay close attention to the task at hand. According to Paul, the key to safety is for only one person to run the splitter. “Nearly all splitter (hydraulic or kinetic) accidents occur when one person splits the wood while a helper’s hand is in the wrong place,” he noted. Of course, the operator needs to be focused on the job and not get in too much of a hurry.

While SuperSplit comes in three sizes, Paul is quick to point out that they do not manufacture a “homeowner” version. Their smallest machine, the “J” model, with a 5.5-hp Honda engine and a pair of 75-pound flywheels, handles hardwoods just fine and is used by many firewood businesses. The Heavy Duty features a pair of 90-pound flywheels, a slightly wider rack and pinion, and a 6.5-hp Honda engine. Their biggest splitter is the Special Edition (SE). “The SE was designed to handle big elm logs when the Dutch elm disease was sweeping across the country,” Paul explained. “It has 100-pound flywheels and a 9-hp Honda engine with a 2:1 gear reduction.”

Paul says he doesn’t have as much time to work on new ideas as he would like, but he does listen to his customers and has incorporated several features such as guide bolts for the rack gear. “I’ve had a lot of requests for a log lifter,” he said, “and I just may have to come up with one.”

Sawmill slab firewood is an ideal source for wood heat—and possible income—for sawmill businesses. I use firewood as backup heat for my passive solar home. My recent jump from a hydraulic splitter to kinetic is nearly as dramatic as when I set aside my splitting maul in favor of a hydraulic splitter. The quick cycle time lets me split slabs as quickly as I can set them in place. In fact, the biggest problem is that I tend to split the wood into smaller pieces, and I have to dig through the firewood pile to find overnight firewood. It also works well for limbs and logs and branches from thinning and logging. I opted to go with the 1-hp, 220-volt, electric splitter. With a consistent torque at any rpm, this electric splitter has proven capable of handling anything I could split on my old 6.5-hp hydraulic splitter.

The mill and splitting yard are well beyond the reach of any conventional outlet, so I use a portable generator in the form of three solar panels capable of producing a total of 960 watts (1-1/4 hp) and enough battery storage to run the splitter and electric chain saw for 3 hours without solar input, though the panels produce some electricity

The two 75-pound flywheels have an amazing amount of splitting power, concentrating the force at the start of the split. At the end of the splitting stroke, the rack gear disengages from the pinion, and a pair of springs retracts it.

even under an overcast sky. Best of all, there are no issues with maintaining or starting a gas engine. The 120/220-volt inverter provides plenty of power to the splitter at the flick of the switch, and even at “full throttle,” the only sound is the quiet hum of an electric motor. The system is on a trailer that serves as a portable generator for the splitter and other equipment, including an arc welder, grinder, and outdoor lights. Designed by solar consultant Art Boyt (my brother and owner of SolSource Greenbuild), the portable solar generator interconnects with the 5 kW of solar panels on the roof of my house (when I’m not splitting wood) and will soon run fans and a dehumidifier for a small wood kiln—all tied into the grid. It also combines with the rooftop to provide and store electricity for the pump, lights, and appliances during power outages. The ultimate goal is to convert my Norwood sawmill to solar electric as well.

Kinetic log splitters are one of many options available for firewood production. While they won’t replace high-production firewood processors, they may be worth a closer look if you are looking for an economical way to convert sawmill slabs or logs into usable firewood. In addition to SuperSplit, some other manufacturers you might want to check out are DR products, Oregon, and GRIPO. ■



Dave Boyt has a BS degree in Forest Management and an MS in Wood Technology. He manages a tree farm (2006 Missouri Tree Farm of the Year), and operates a band saw sawmill.

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