

## Tow-Behind Mower Fitted With 2 Steering Axles

"It used to take four to six hours to mow our yard. Now I get the job done in about half the time, and trimming around trees and other obstacles is easier because of the tight turning radius," says Zach Jensen, Irene, S. Dak., who built an offset hitch to pull a Sears LT100 riding mower behind his Sears Craftsman DYT 4000 riding mower.

The front mower is equipped with a 48-in. deck and the tow-behind mower a 44-in. deck. The 2 mowers cut a 92-in. wide swath with an 8-in. overlap.

To create the staggered effect, Jensen fabricated an offset hitch and welded it to the rear mower's right front spindle. He also removed the mower's rear transaxle and replaced it with the front steering axle off another Craftsman mower. The new rear axle faces backward from the front axle, so

the rear axle's steering arm that connects to the steering box is on the mower's right side of the rear axle. The drag link for the rear steering axle was reused and lengthened in order to reach the original steering box's pitman arm.

"In effect, the rear mower has 4-wheel steering which allows it to do a better job of following behind when turning," says Jensen. "Other tow-behind riding mowers I've seen follow like a regular trailer. Depending on the situation, the driver either has to swing wide or make a loop to turn corners in order to prevent skipping grass between mowers."

As Jensen turns, the hitch tongue pulls on the right front wheel and the rest of the axle turns with it. "Because both axles are connected to the steering box, when the front axle steers it forces the rear axle to steer in



Zach Jensen replaced rear mower's rear transaxle with the front steering axle off another riding mower, facing it backward. In effect, the rear mower has 4-wheel steering which allows it to do a better job of following.

the opposite direction. This allows the rear mower to maintain its position behind the front mower when cornering without leaving any uncut grass," says Jensen.

The only limitation to the system, says Jensen, is that the offset hitch and the rear mower's all-wheel steering design makes the

rear mower difficult to back up. To see the mowers in action, go to YouTube and search for "self steerable tow behind mower".

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## Electric Tractor Handy For Many Jobs

Since converting a Massey Harris tractor from gas to solar power, Drew Gailius has modified and replaced implements and tools to take advantage of the electric power stored in the tractor's eight batteries. He uses an inverter to run an electric chainsaw to cut firewood, for example.

The Canyon, B.C., farmer and his wife, Joanne, grow organic root crops and grains including Khorasan and red fife wheat, spelt, rye and buckwheat on their 40-acre farm, and try to use environmentally friendly practices. So switching to a solar-powered tractor seemed like a natural option, especially when Gailius had the opportunity to get the old 1950's Massey Harris for free.

"The size was right for what I wanted. The engine was not an integral piece of the framework for the tractor so it could be removed, and the front axle would still be in place," Gailius explains.

Still, he had to disassemble much of the tractor and engineer some parts for the 48-volt DC motor and transmission. The motor is connected by a cog belt drive to the driveshaft and is controlled by the former gas pedal. He spent about 9 months of his spare time and \$5,000 to modify the tractor, including the eight 6-volt, deep cycle batteries, three 250-watt solar panels, and a hydraulic pump to raise and lower a new 3-point hitch.

The panels are mounted horizontally on an overhead frame and provide welcome shade

for the driver.

"On the upside, the electric tractor is super user-friendly, quiet, no smoke and maximum torque from 0 rpm's up," Gailius says. "On the downside is the range, which will be improved as battery technology advances."

It meets his needs so far, allowing him to run the tractor the better part of a day. He kept the tractor's gears so he can shift to low gear for heavy work.

"Virtually the only maintenance is the batteries, which require topping off with distilled water and keeping them clean," he adds. When not in use he has them on a trickle charger.

Gailius uses the electric tractor for an assortment of jobs: hauling manure, raking hay, pulling a 2,600-lb. roller, and using a toolbar for hilling, cultivating and weeding in a one-acre market garden.

"It has far exceeded my expectations, and I find that every year I seem to use our diesel-powered tractor less," he notes. "Electrics have a lot of advantages, and we really need to explore them. Working toward better electrics will require R&D; the only way to do that is to use them. Powering them by renewables is the thing that will get us into other forms of energy use."

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Drew Gailius converted this old Massey Harris tractor from gas to solar, replacing the engine with a 48-volt DC motor and transmission. Three 250-watt solar panels mount horizontally on an overhead frame.



Gailius uses the tractor for a variety of jobs, including raking hay and spreading manure.

## Front-Mount Tractor Receiver Hitch System

"I worked in the heavy construction industry all my life and always had to come up with labor saving ideas on the job. So since I retired I've kept making innovations on my small farm," says Wayne Moureau, Chester, Ill., who mounted a versatile receiver hitch system on front of his Kubota L3800 tractor. He credits Ernst Service of McBride, Mo., for doing most of the work.

The receiver hitch is welded to a 4-ft. long crossbar made from 2-in. tubing that bolts on across the front of the tractor and protects the tractor's tie rods from small trees, brush, and other obstacles. The crossbar bolts onto the tractor's front weight mounting brackets.

Moureau pins an L-shaped steel bracket onto the hitch and then bolts a vice on top of the bracket. The vice can be adjusted up or down about 10 in. by changing the position

of a pin.

If he wants, he can replace the bracket with a 16-in. long metal "pin" that's fitted with a chain hook on one end and a clevis on the other.

A 2 by 3-ft. expanded metal basket can also be bolted to the crossbar. The basket comes in handy for hauling chainsaws, fuel cans, and fencing material such as rolls of barbed wire and post drivers.

"I like how it turned out," says Moreau. "I use the vice for sharpening chainsaws when I'm out in the woods. I'm 87 years old and my eyesight isn't what it used to be, so I need to get closer to my work without bending over as much. If I want, I can also mount the vice-holding bracket on back of my pickup and use it that way."

He can also mount the pickup's ball hitch



Front receiver hitch can be fitted with an L-shaped bracket that supports a vice and an expanded metal basket, or various hitches can be inserted.

on front of the tractor. "I use the ball hitch to park trailers that I fill with brush and tree limbs that I cut down along fence lines," explains Moreau.

He says he spent about \$300 to put the hitch

system together.

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