



By pulling a pin on an offset hitch, Hobby Greene can shift his tractor mower 16 in. to the side.

Side-Swing Mower Hitch

Hobby Greene, Elizabethtown, N.C., built an offset hitch for his tractor mower. By pulling a pin he can shift the mower 16 in. to the side.

"It works great for mowing between rows of trees in my long leaf pine plantation," says Greene. "There used to always be a strip of unmowed weeds between the trees and the tractor's rear wheels, but now I can mow right up to the trunks."

"The switch takes only a couple minutes. Nothing changes on the original mower so it can be easily moved back to its original position."

The mower was originally 3-pt. mounted. Greene cut the 3-pt. bracket off the mower and then used 2 by 4 tubing to make an upside-down U-shaped frame that pins onto the tractor's 3-pt. hitch.

He used more 2 by 4 tubing to build a pair of 28-in. long steel arms that connect the frame to the mower via four homemade bushings and four 1-in. dia. steel pins. Two of the bushings are welded on between the frame and arms, and the other two are welded on between the arms and L-shaped, heavy-duty

angle iron brackets. The brackets are welded to a pair of 7-in. wide, 2-ft. lengths of channel iron that are welded to cross braces on top of the mower deck.

He also welded a metal tab about halfway back onto each arm, and he attached a pair of matching bushings onto the mower deck. A 1-in. dia. metal "stop pin" drops through a hole in each tab into the bushing.

"It's really easy to use. If I want to offset the mower I use the stop pin on one arm, and if I want to pull the mower straight behind the tractor I switch the stop pin to the other side," says Greene. "I thought about using hydraulic cylinders to offset the mower, but I decided that using stop pins would work just fine."

"I had to lengthen the driveshaft 2 ft. so the offset mower would clear the tractor's rear wheel. I used a lathe to make the bushings," notes Greene, who says he spent about 28 hours making the conversion.

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Revolutionary New Rotary Engine

A revolutionary rotary-style engine punches out 580 hp and 2,538 ft./lbs. of torque at only 1,200 rpm's. Yet, it weighs just 300 lbs. and takes up less than 2 cu. ft. of space.

This multi-fuel, internal combustion engine from Vengeance Power, Inc. can run on practically any fuel or no fuel at all. The design allows on-the-go switching from internal combustion to compressed air to steam pressure-powered rotation.

"The actual mechanics are perfected, and now we are perfecting the seals," explains Jesse Laba, Vengeance Power. "It will find a place first in stationary and portable power generation, even powering large scale stand-by generators, and then in transportation."

The first scale model was shown at the Society of Automotive Engineers (SAE) Congress in April of 2009. The first working prototype will be fired up at this year's SAE Congress.

"We had to do some seal redesign from last year's model," explains Laba. "After this year's Congress, we will begin dyno testing to obtain certification for power, emissions, efficiency and durability. The next step is using it in test vehicles and platforms."

If all works according to plan, Laba and his partners in design, Tony Sleiman and Andre Laba, expect the engine to be in production within a year and a half.

The Vengeance engine is a true rotary engine, a significantly improved version of the decades-old Wankel Rotary. The combustion chambers are formed by 8 vanes that slide in and out on two sets of offset roller bearings. The vanes follow the nearly oval-shaped engine block, moving in and out to drive the central shaft. The chamber shape allows

gasses to expand more slowly. The power is transmitted directly to drive shaft rotation with 8 power impulses per revolution of the engine for a smooth running engine without vibrations.

The use of roller bearings instead of sliding bearings and the elimination of pistons vastly reduces energy waste and the need for lubrication compared to traditional engines. In addition to the pistons, crankshaft, connecting rods and valve train are also eliminated.

The intake chamber is separate from the combustion chamber, allowing higher temperatures. No valves mean no restrictions in airflow and no valve timing to open and close at certain rpm's. With optimum air volume in the intake chamber, maximum torque is produced at any rpm's. This eliminates the need for a conventional transmission.

Multiple spark ignition, greater dwell time and better fuel to air ratio produce more complete combustion inside the combustion chamber. That means fewer emissions, less noise and better fuel efficiency. The company promises twice the fuel efficiency of a piston engine producing equal power.

With only 9 moving parts, the Vengeance engine is projected to cost 80 percent of an equivalent piston engine. Few moving parts also translate into very low maintenance costs and minimal repair costs.

Vengeance Power plans to license production rights to other companies.

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Jason Tower says his water tank sled is perfect for dragging behind an ATV when rotating cattle from one paddock to another.

Sled-Mounted Water Tank

Move your water tanks, mineral feeders and more with a simple wood sled. Jason Tower says his water tank sled is perfect for dragging behind an ATV when rotating cattle from one paddock to another. The sled works so well, he entered it in the American Farm Bureau Federation's Idea Exchange contest.

"Instead of setting up a tank in every paddock, it makes more sense to move tanks when you move the cattle just by hooking a chain to an ATV," says Tower

He suggests sizing the sled to fit the water tank being used. He made his sled out of three 2 by 6's running lengthwise and spaced to match the width of the tank plus 3 in. Two 2 by 6's bolted at either end of the long pieces completes the frame. A short length of chain is secured at one end with lag bolts through the double layer of 2 by 6's.

Two 2 by 2's attach to the outside long edges of the sled.



Sled is made from 2 by 6's, with a short length of chain at one end that hooks up to the ATV.

"They help hold the tank in place," says Tower. "The tank sits on the center 2 by 6, held in place by the 2 by 6's on the ends and the 2 by 6's along the side."

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