



Dave Retzlaff built this self-propelled TMR mixer from parts off a combine and cement mixer. Photo above shows front view of mixer being loaded.



Unloading auger tilts down close to bunk or feed cart so wind doesn't blow feed away.

Cement Mixer Converted To Self-Propelled TMR Mixer

Dairyman Dave Retzlaff needed a better way to produce Total Mixed Rations for his 50-cow herd. His solution was to build a self-propelled machine from parts off a combine and a cement mixer.

"It seems like everybody builds things out of combines, so I thought I would too," says Retzlaff.

One reason to go with a combine was the hydrostatic drive. Retzlaff wanted a mixer that could self-fill from the face of a silage pile and unload into feed bunks. Both tasks required the ability to creep ahead while keeping other systems under full power.

Retzlaff started out with a \$2,000 New Holland TR70 from which he salvaged both axles, the 3208 Cat engine, cab, hydraulic system and electrical harness.

"I first built a main frame out of 4 by 6-in. steel tubing cross-braced with 5-in. sq. steel tubing," says Retzlaff. "I also reinforced the frame with 12-in. I-beams from behind the front axle and extending past the rear axle and part way under the engine mounts."

He mounted the combine drive axle on the rear end and mounted the engine at the rear as well. The drive axle is far enough forward that it carries most of the weight of the mixer mounted above it. The cement mixer was lifted intact from its original truck bed and

set intact on the new framework, just ahead of the engine. The cab was mounted on the front right corner of the frame.

Retzlaff mounted a pto drive from a Uni-Harvester on the engine, giving him two drive shafts. He attached the cement mixer drive shaft to one and then ran a belt from the other shaft to the hydrostatic drive unit mounted on the axle. He also mounted a 32-gpm hydraulic pump under the engine. A four-band belt runs off the engine to the pump. A 3/4-in. valve directs flow to either the loader or the unloading auger as needed.

"It's a simple setup but I don't have reverse on either one," explains Retzlaff. "So far, I haven't needed it."

The hydraulic system from the combine provides power for steering as well as the header cylinders, which had been remounted on the loading elevator.

The loading elevator is housed inside a 12 by 12-in. square steel tube, fashioned from a gas station canopy leg. Retzlaff made the chain and flighting and had the pan the flighting runs over fabricated at a local metal shop. The top end of the elevator is hinged to two steel legs, which angle back from the main frame to the mouth of the cement mixer. When not in use, the elevator rests against the legs and the frame.

"One thing I would change is the size of the elevator," says Retzlaff. "With fluffy haylage it doesn't plug up, but the elevator flights can slide under. A wider elevator, say 20 in., would work with all kinds of feed and work faster."

Retzlaff designed and built a mechanical mouth to tear away silage at the face of silage bags and feed it into the elevator. This front unit is attached to the loading end of the elevator and pivots with the aid of a hydraulic cylinder. The pivoting action gives Retzlaff additional reach and control.

The facer itself consists of a bucket-shaped framework fitted with an auger and beater reel. Retzlaff welded flighting to a 4-in. steel pipe for the auger. It throws silage to the center and into the elevator. The beater reel is made from steel plate teeth welded on at 3-in. intervals. Each is staggered back from its neighbor by an inch. Retzlaff had a machine shop make stub shafts, which he welded to the pipe ends for mounting the beater and the auger.

The motor that drives the elevator chain also drives the auger and facer. While the elevator shaft turns at 1,000 rpm, the facer beater and auger turn slower. This helps ensure that they never overload the elevator.

To load the mixer, Retzlaff creeps up to



Home-built mechanical "mouth" tears away silage at face of silage bags and feeds it into elevator.

the face of the silage bag and slowly raises the elevator against it. The beater tears away at the face, pulling material into the auger. Corn and soybean meal are simply augered directly into the mixer.

"The toughest part was building the front unit and matching the speeds of the facer, auger and elevator," says Retzlaff. "It works great and has plenty of traction. It was pretty muddy last fall and instead of making many trips with a skid steer, I went in and out twice a day without much problem."

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Gate Opener Controlled From House 270 Ft. Away

Rural security doesn't have to be highly expensive, says a Cochrane, Alberta couple who made a remote controlled security gate from a garage door opener, doorbell, and a security light.

Peter and Carol Davidson operate a rural bed and breakfast. They wanted the ability to secure their yard and still provide selected access to visitors without having to leave the house.

In order to accomplish this, Peter trenched a four-wire telephone cable from his home, down one side of his driveway to a spot just before the hinged side of his gate – some 270 ft. away. He uses this cable to power the gate control as well as a light and buzzer.

After building a 3-ft. sq. shed that somewhat resembles a shingled dog house with a hinged access door, Davidson installed a Chamberlain brand garage door opener inside.

The opener's 10-ft. long rack extends out through a small opening cut in one end of the shed. The other end of the rack is secured to the gate post, where linkage joins the rack to the bottom of the gate. Davidson placed a piece of inverted eave trough on top of the rack to keep off the snow and rain.

"You have to adjust the travel pressure settings downward, but the garage door opener works great for opening and closing my 14-ft. farm gate," Davidson says. "As the gate

opens inward toward the property, the shed is positioned almost at the end of the gate when it is open."

According to Davidson, most modern garage door openers come with two sensors, which are normally situated on the inside bottom of the door. If the beam is broken, the door will open. He situated these sensors inside the little shed, facing each other because he didn't want winter snow build-up to cause him problems.

Davidson's gate is set at 5 in. above the ground, and he says it will push through snow up to 6 in. deep with no problems. He adds that the gate could be mounted higher.

Two of the telephone wires run from the opener to the button that controls it, which he located in his living room. From there, he can see through the window to the gateway. The other two wires run from the house's doorbell chimes to a special post on the far side of the gate, where Davidson placed the doorbell button.

"We do have a sign on the gate which says 'Electric Gate – No Entry,' but people who want to come in can see the illuminated button on a post with a sign and arrow that says, 'House Bell.' When they push that, it rings the door chime 270 ft. away in our house and lets us know that there's someone at the road wanting to come in," he says.

"It's been the best thing ever for security



Remote-controlled security gate was made from a garage door opener and doorbell.

and privacy. You don't have any salespeople come by, and you keep people 270 ft. away from your home," Davidson says. "I have a security flood light on the end of the little shed's overhanging eaves that lights up the gate when you push the gate opener button in the house. If you push it twice, it will only turn the light on and not the gate opener. Then we can see who's there and decide if we want to let them in. The light goes off automatically after 10 min."

"If I was building a setup like this again, I would have buried extra cables and put in an intercom, so you could actually ask who was at the gate."

The Davidsons also have an opener control they keep on the visor of their car, so that as they approach their gate from about 100 ft. away, they can automatically open it, drive through, and close it again.

"Everybody who comes here goes mad over our gate opener. It's been running for two years without a problem," Davidson says.

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