

## Loader Tractor Fulfilled Lifelong Dream

Melvin Putikka's big loader tractor with crab steering was built with parts from an Army truck's front axles, a Continental engine that dates back to the 1950's, a transmission from a 1947 Ford truck, and other parts he fabricated himself.

With a full metal housing and bright yellow paint, it looks too good to be homemade. "I had a guy ask what brand it was," says Putikka. "When I told him I made it myself, he said, 'Yeah, and I'm President of the United States'."

Putikka got the idea after seeing the famed deuce and a half 6 by 6 trucks in action during World War II. He figured they would make a good tractor. With no money to try building one at the time, Putikka set the idea aside. When he retired some 50 years later, his old dream came to life. After three years, he had his tractor.

The 52 hp, 225 cu. in. Continental engine was like new when he bought it for \$450. It had been the power source for a hydraulic system demo at a vo-tech school. He says similar engines were common in the old Massey Harris 44's. The engine has more than enough power to handle the 2 1/2-yard snow bucket, 1-yard dirt bucket or 2 1/2-ton fork-lift Putikka uses on the tractor. With the 16-50 16 tires, he can go where he wants, and with the 2-speed transfer case that came from a World War II army truck, he gets up to 25 mph on the road.

"It steers with both front and rear axles, but I can lock the rear steering for road travel," says Putikka.

The front axle is mounted solid to the 3 by 7-in., 3/8-in. wall, rectangular tubing frame that Putikka also built. The rear axle is mounted on a pivot point, allowing it to oscillate. The tractor can ride over an object 20 in. high before lifting both wheels on a side

off the ground.

"I built the pivot point with a stainless steel shaft and brass bushings and machined them myself so they should last longer than I will," says Putikka. "So many pivot points on machinery have grease zerks in places difficult to reach, so they don't get greased. I put hoses on mine to bring the zerk out to a conspicuous spot so they are easy to remember and service."

While the engine hooked up easily to the transmission, he needed to drop the drive 6 in. to match the power splitter. Putting in a U-joint would have taken up too much space, so Putikka made his own transfer gear box with a #60 roller chain in an oil bath.

"Roller chain will last forever if it runs in oil," explains Putikka. "I replaced the ball bearings on both the input and output shafts with needle bearings. There is a lot of load on a chain like that, and the bearings get most of the load. I knew ball bearings couldn't take it."

Putikka also had to modify the front and rear drive axles. The original axles had the differential off to the right side, so Putikka cut the housing off the left and shortened the axle to bring them to the same internal length.

The power steering came off a big 4-WD Minneapolis Moline tractor with orbit steering. Putikka modified this as well, putting a cylinder on each side for steering. He also modified the cylinders to match cylinder stroke with steering reach. He points out that manufactured cylinders are often built with a longer stroke than the steering reach, resulting in stress and breakage over time.

A Vickers hydraulic pump is direct coupled to the engine at the crankshaft. A second pump dedicated to steering runs off the cam gear on the front left side of the engine. Putikka also added Vickers spool valves to



Melvin Putikka used parts from an Army truck's front axles to build this big loader tractor.

lift, lower and tilt buckets on the Davies industrial loader. Even though it is a heavy-duty loader, he quickly found it needed to be reinforced.

"This tractor is built to put out more force than was intended for that loader, and it's one of the best I've ever seen," says Putikka. "I put 3-in. cylinders on the arms to replace the 2 1/2-in. cylinders that came with it. After watching the plate start to crack where the cylinder meets the arms, I welded 3/8-in. plate all the way down to the bucket."

Tired of years of working with equipment where play developed in clutch and brake linkages over time, he used needle bearings where they fasten to the frame and for linkage to the cab. Needle bearings were also used to connect the shift mechanism to the transmission.

"I've run it for five years now, and there is still no play," says Putikka. "I replaced the

clutch lever with a clevis on the linkage. When you shift, you don't wonder what gear you are in. It feels like it is direct out of the transmission."

The tractor carries 1,300 lbs. of cast iron weights on its rear to counterweight the front end under load. Putikka picked them up for only \$50 at an auction. With him in the cab and 600 lbs. of water and antifreeze in the tires, the entire unit weighs in at 10,650 lbs.

"I use it for snow plowing, lifting things for people and a little dirt moving," says Putikka. "Most of all, it's kind of a toy, something I wanted to build my entire life. I finally did."

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## "Tempest" Turns Waste Streams Into Profit

Run hog manure through a Tempest Air Drying System, and you get compost-type fertilizer ready to bag. Run dried distillers grain with solubles through the same machine, and you'll get a golden puffed grain product that rivals soy meal.

In the case of hog manure, all pathogens are killed, the water is pulled off, 95 to 96 percent of the nutrients are captured and the odor is gone. With the processed distillers grain, there is a shelf life in the 4 to 7-week range and a protein level of 34 to 38 percent.

The same magic seems to hold true for waste from water treatment plants, papermaking, wine making and nearly any other high moisture material that the manufacturer, Global Resource Recovery Organization (GRRO), has tried.

"We can take about any waste stream and dry it down," says Loran Balvanz, president, GRRO.

The hog manure test system has been operating on a conventional hog farm for more than a year and a half. Now a new 2,400-head unit is being built specifically to work with the new technology. GRRO has also processed grape residue for cattle feed, sludge cake (sewage) for fuel and even dairy bedding sand.

"We can take sand used for bedding in dairies, heat it to kill the pathogens, remove the water, vibrate out the waste and give back the sand," he says. "This technology creates a whole new road map when it comes to recycling. Why haul water if you can remove it."

GRRO's technology utilizes airflow to shear cell walls, which aids in releasing water. The airflow, akin to a controlled tornado, also removes the moisture to the desired level, as low as 15 percent.

The modular systems range in size from 5 to 10 wet tons per hour processing and can be designed to fit any size operation. An entire mobile system can fit on an 8 1/2 by 48-ft. semi-trailer or be skid-mounted if stationary. Pretreatment units can be used to heat materials to kill pathogens. Air scrubbers can be used to capture odors.

In the past, cyclonic drying systems relied on high temperature, which can destroy nutrient values.

An advantage to the system is the module design with volumes as low as 5 tons per hour, processing volume, adds Balvanz. If an ethanol plant needs to process 20 tons of distillers grains per hour, it can use four units.

"This gives them redundancy," he explains. "If one unit shuts down, the other three continue operating. It also allows them up to four different end product streams, taking the product off at different moisture and/or protein levels."

The system offers huge savings as well. Balvanz reports that capital costs for his system are less than half that of alternative drying systems and operating costs are 50 to 75 percent less.

GRRO is now working with a number of companies to evaluate the technology in their industries. And the company is working on recovering heat to power generators and also reducing the size of the modules. "Our goal is to get a unit no bigger than a desk," says Balvanz.

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"We can take just about any waste stream and dry it down into compost-type fertilizer that's ready to bag," says Loran Balvanz about the new Tempest Air Drying System.

## Skateboard Storage System

"Changing and storing quick-tach garden tractor implements is a lot easier with my skateboard storage system," says Richard Bergman, Chippewa Falls, Wis.

Bergman owns a Steiner tractor and has several front-mount attachments for it, including a 150-lb. bucket. In the past, after removing the bucket he had to "man handle" it over to the side of his garage. By setting the bucket on the modified skateboard, he can easily roll it around.

He started with a 2-ft. long skateboard and screwed an 18-in. wide sheet of wood on top. He attaches a couple of 6-in. wood blocks to the board to hold the bucket in place.

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By storing the bucket on his Steiner tractor on a modified skateboard, Richard Bergman can easily roll it around his shop. Contact: FARM SHOW Followup, Richard Bergman, 16201 120th Ave., Chippewa Falls, Wis. 54729 (ph 715 288-6031).