Farm Shop Made With Highway Guardrails

Richard Stephens built a 40 by 60-ft. shop using 14 and 26-ft. long sections of highway guard rails for the framework.

"A guy stopped by offering used guard rails for sale when a local highway was being rebuilt. I bought a few, thinking I would use them for cattle feeder skids," recalls Stephens. "After looking at them a while, I ordered a whole load."

He welded them together back-to-back, which created a natural set of flanges. Stood on end, they created ideal surfaces to bolt cross members before putting on siding.

Putting up the shop was not simply a matter of welding guardrails into girders, however. Stephens designed a truss system that he assembled on the ground. It consisted of guard rails, 10-in. dia. log rafters and 2 by 6's for roof braces.

To create strength in the girders and in sidewall braces, splices were always overlaid. In the case of the girders, to get the 40-ft. span, Stephens used four 26 ft. guardrails, i.e. a 26-ft. rail was welded face to face with a 14-ft. rail. Then a second 26-ft. rail was butted to the 14-ft. rail with a second 14-ft. rail butted to the first 26-ft. rail. Once butts and seams were welded, Stephens had an extremely strong 40-ft. beam. Gusset plates made from 3/16-in. steel plate were welded over the seams. They extend up to act as anchor points for vertical supports.

Six trusses were assembled on the ground. Each truss consisted of two uprights, a span, a center post, two rafters and two mid point supports. Stephens then poured cement piers for each upright with steel rebar in it and extending to the surface, where a faceplate was welded in place.

When the first truss was lifted into place, he discovered the weight of the rafters was too great. It bent the gusset plates. He then reinforced each truss where the log rafters and their supports met the guardrail girders.

As additional trusses were lifted into place, Stephens began attaching the 2 by 8-in. sidewall supports, bolting them to the facing flanges. The 2 by 8-in. boards were also spliced with a length of 2 by 8-in. board overlaid and spiked to both ends.

Framework on Richard Stephens' 40 by 60-ft. shop is made from 14 and 26-ft. long sections of highway guard rails.

Stephens trimmed 3 1/2-in. poles for roof purlins, giving them a flat top for the metal roof to be attached. These were nailed to the rafters. Before the center beam was lifted into place, it was notched to receive the ends of rafter end gusset plates.

"Once we covered the sides and roof with metal, it looked no different than a commercial steel building," says Stephens. "It has stood up well to high winds, and the trusses support a lot of weight."

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"Tumbler" Restores Rusted Gas Tanks

Anyone who needs to restore a gas tank for an antique car or tractor will be interested in this gas tank "tumbler" built by Scott Farley of Oswego, N.Y. It lets him thoroughly clean out rusted tanks.

"It rotates like a rock tumbler to scour the tank's interior. When I'm done the tank is in better than new condition," says Farley.

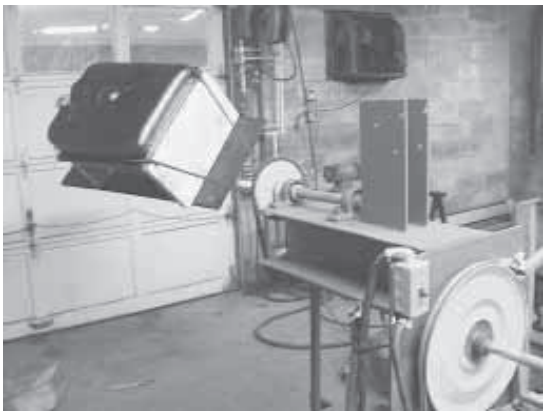
Farley owns Farley's Radiator Shop, which offers cleaning and repair of up to 35-gal. fuel tanks. His machine is powered by an industrial electric motor, which belt and chain-drives a 1 1/4-in. dia. shaft that extends about 4 ft. beyond the machine's frame. A wheel bearing is welded to the end of the shaft and a wood frame attaches to the bearing. The tank being repaired is held to the wood frame by bungee cords.

To use the machine, Farley drops a 24-in. length of heavy chain, along with fine white sandblast sand, into the tank and then rotates the tank at low speed for an hour. Then he turns the tank 45 degrees after emptying it out and refilling it with clean sand. After another hour the entire tank will be scoured clean.

"When finished, the inside of the tank resembles that of a sandblasted surface, which the rust-proof coating bonds to easily. The exterior is then sandblasted and coated with polyurethane, which preserves the outside as well," says Farley.

"This machine is quite labor intensive so it's not the answer if you can buy a replacement tank cheap. I came up with the idea because customers would come to me with tanks so full of rust they were almost unrepairable, yet they couldn't find a replacement tank. As far as I know there's nothing on the market like it.

"In the past we would drain the tank and purge the fumes, then acid dip and steam clean the tanks the best we could. That process removed loose rust and debris, but it would leave behind light rust and pitting. We then applied a coating inside the tank, which unfortunately trapped the rust. In 5 to 10 years, the tank would rust again.



"It rotates like a rock tumbler to scour the tank's interior, thoroughly cleaning it out," says inventor Scott Farley about his gas tank "tumbler".

"Every tank is different so I have to make a new wood frame for each tank, which can be time consuming. If the tank has baffles, I have to cut a hole through the side of the tank to access the area behind the baffle, then weld the baffles back shut again.

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Auger Sleeve Reinforces Deere Unloading Auger

"When the unloading auger on my Deere 9650 STS combine got a kink in it, I repaired it with a reinforcing sleeve that fits over the damaged section," says Roger Gutschmidt of Gackle, N. Dak. "I'm also installing a transport cradle for extra support."

He says he believes the area that kinked is a weak spot on Deere combines. His unit had about 1,500 separator hours on it when he had the problem, with a lot of use in corn and soybeans.

"The auger tube had worn thin in that area from all those bushels going through it, and then we had some exceptionally heavy wheat last year," he says. "The original sheet metal in that area is only 18 ga., which is thinner than the thickness of a dime. After running about 200,000 plus bu. of grain through it, it ends up being paper thin."

To solve the problem, Gutschmidt had a special 12 ga., 4-ft. long clamp made at a machine shop in Jamestown, N. Dak. While that was being done, he straightened his auger tube by first positioning his combine so the header of his shop door was just above the damaged area.

"I laid a 2 by 6-in. board on top of the tube and braced a 4 by 4 between it and the header. This gave the auger tube some support when I lifted on the far end of the auger with a hydraulic jack. I jacked up on the tube until the auger was a little past the straight position and pulled out the dents," he explains.

To remove the dents, Gutschmidt welded several flat washers to the kinked areas, and then used a slide hammer to pull them out.

"My slide hammer is a homemade device. It's a Vise-Grip pliers with a long rod and a heavy weight that slides back and forth on the rod," he points out. "I clamped it onto the washers, pulled out the dents, and then ground the washers off with my 4 1/2-in. grinder. I accidentally made some small holes, but they don't show because the clamp/sleeve covers them."

For added strength, Gutschmidt made a 6 by 24-in. reinforcement patch and welded it over the once-kinked area. The patch is 12 ga. sheet metal and wraps around the auger tube up each side of the damaged area. He drilled several holes in the patch to spot weld it to the auger tube.

Reinforcing sleeve fits over damaged section of unloading auger on Gutschmidt's Deere 9650 STS combine.

Once his new 12 ga. by 4-ft. clamp arrived, Gutschmidt removed the auger's end spout and light bracket, and then slid it on from the end, positioning it over the previously kinked area. He then tightened up the 12 bolts that snugly hold the clamp in place.

He painted his handiwork with matching paint, resulting in a professional looking finished product.

"I wanted it to look like it came from the factory that way," he says.

Gutschmidt says he can supply other farmers with this type of reinforcement kit, allowing them to install it as either a preventative measure or as an economical repair.

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