

Countershaft and gearbox pulled from combine.



## Worn Holes May Signal Countershaft Troubles

Roger Gutschmidt warns owners of Deere 9600 combines to watch for bad countershafts. Early signs include worn bolt holes in the bracket that holds the gearbox on the shaft.

"When my customer brought the combine in, the bolts on the bracket were loose, and the gearbox wiggled," says Gutschmidt. "I took it apart and pulled the shaft out about a foot. I checked the splines on the shaft and the gearbox, and everything looked fine."

After putting everything back in place, he

built up the bolt holes, assuming the loose bolts were the problem. He was wrong. When the combine returned to the field, it took about five acres before the gearbox was out of control.

"I told him I would fix it at no cost, but for parts," says Gutschmidt. "I talked to a service rep, and he suggested the shaft might be bent. He advised taking it apart completely and offered to help."

This time, Gutschmidt pulled the countershaft out completely. That meant removing

the large pulley on the opposite end of the shaft from the gearbox. It's a heavy cast-iron pulley that sits on the tapered shaft.

"I was using a 3/4 impact on it, and when I pounded it, it flew off like a rocket and just missed my head," recalls Gutschmidt. "The second time, I chained it so it wouldn't go too far."

The 16-ft. long countershaft has a 4-in. diameter at the gearbox but tapers to 3 in. at the far end. Gutschmidt figured any bend would likely be on the tapered end. Rolling it on a flat surface gave no indication of a problem. However, when he mounted it in his metal lathe with a 3 1/8 spindle bore and a large chuck, the bend was clear. As Gutschmidt turned the countershaft from slow to fast, his service technician friend looked through the spindle bore with a flashlight.

"About 10 in. of the countershaft goes through the gearbox," says Gutschmidt. "When we spun it, that end was out of round, which had put a strain on the bolts and everything else with every rotation."

Gutschmidt ordered a new shaft from A&I Parts for half the price Deere would have charged. He rebuilt the bracket and reassembled everything. When he installed new bolts through the bracket into the gearbox, he added rubber bumpers.



Bracket after countershaft failed.

"I asked my combine specialist friend what would have caused the problem," says Gutschmidt. "He said slugging the machine can do it, as can putting the separator into gear under a wide-open throttle."

Gutschmidt notes that the countershaft is really the heart of the combine.

"If it isn't working, you might as well junk the combine," he says. "But if you can find the problem, you can fix it. If you see vibration and don't have a turning lathe big enough, take it to your local machine shop and check for a bend."

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Water pump shown in use, attached to pickup receiver hitch.



## Nifty Hitch-Mounted Water Pump

Dale Freeman has water on command with his receiver-hitch-mounted water pump. He can fill an IBC tote in his truck from the local river or use the pump to spray water where it's needed.

"I don't have to set the pump on the ground when using it and worry about it turning over," says Freeman. "I also don't have to worry about forgetting it when I drive off."

Freeman set up his pump for his pickup, but notes it would work just as well on an

ATV or a side-by-side, provided it's equipped with a receiver hitch.

"I bought a 30-gpm, 4-cyl. Honda water pump and bolted the base plate to a piece of 2-in. square tubing," says Freeman. "The pipe extends 2 in. beyond the pump end of the plate. I welded a second length of 2-in. tubing at a right angle to the extension so it can slip into a 2-in. receiver hitch."

To make the pump even more versatile, Freeman slid a short length of 2 1/2-in. galvanized tubing over the 2 by 2-in. tube.

If he wants to use his pump with a vehicle equipped with the larger receiver hitch, he simply moves the sleeve to the end of the 2-in. tube, pins it in place, and adds a length of 2 1/2-in. tubing.

The pump slides straight into the 2-in. receiver hitch on his pickup without interfering with the tailgate. However, when used on his Honda Pioneer side-by-side, the receiver hitch position prevents the tailgate from dropping.

Freeman came up with a novel solution, something he calls his gooseneck hitch. He started with a standard 2-in. sq. ball hitch insert and modified it with a piece of 2 1/2-in. receiver hitch tubing. He cut a piece from one side, then slid the other sides over the ball hitch insert and welded it in place at a 45-degree angle.

His next step was to cut a 45-degree bevel on a length of 2-in. sq. tubing and weld a short length of 2 1/2-in. sq. tubing across the bevel to serve as a receiver for the water pump.

"The gooseneck extension moved the water pump back enough to clear the tailgate when it's lowered," says Freeman.

He refers to the pump and tote as his



Water pump and 2 by 2-in. receiver hitch insert.

personal rescue equipment.

"I can put the tote in my truck, slide in the pump, and run down to the river for water," says Freeman. "If we have heavy rains, I can take it to a source for potable water and bring water to those who need it. If there's a small grass fire, I can get water to it quickly."

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Gutschmidt recently built this shop hoist with subframe for his brother.



## Subframe Supports Shop Hoist

The jib-style shop hoist in Roger Gutschmidt's shop has handled heavy lifting for 38 years, thanks in part to the subframe embedded in concrete. It was only the first of many he has built for neighbors and, more recently, for his brother.

"I really like my overhead hoist for lifting motors out or other objects from a pickup bed," says Gutschmidt. "I didn't build it as strong as I should have, but it has done its job since 1988."

When he began receiving requests from

others to build shop hoists, he had an engineer review his plans. While his subframe remained essentially unchanged, the engineer recommended a stronger vertical beam. In the years since, he estimates he's made around 30 subframes for hoists.

"The subframe is a combination of rebar and vertical bolts that extend through a 1/2-in. thick skeleton top steel plate," says Gutschmidt. "To install it, we dig a 5-ft. deep, 4-ft. dia. hole and place the subframe with the skeleton plate below the surface. The skeleton plate ensures we can fill the hole to the top with concrete without concern for a void forming under the plate."

A second steel plate, set over the protruding bolts, serves as the base for the vertical post and sandwiches the skeleton plate.

When his brother installed his shop hoist, he used 1/2-in. thick, 15-in. square steel tubing for the vertical leg. A 20-ft. I-beam jib pivots in a bracket on the tubing. A tie-rod support to the jib extends to a similar pivoting bracket at the top of the leg.

"I welded the brackets and painted everything," says Gutschmidt. "My brother



Subframe showing rebar, vertical bolts and top steel plate.

and nephew installed it. It's incredibly strong. It could lift 4 tons 20 ft. out on the jib."

The leg serves double duty in the shop. Ends are sealed with 1/2-in. thick steel plates. Air couplings were installed in the tubing.

"They use the leg as a pressure tank for their air compressor," says Gutschmidt.

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