

# Propane-Powered Portable Pto

By Jim Ruen, Contributing Editor

When Larry Ristau needed a 400 rpm pto to power his grain dryer, he modified an old combine engine to run on propane and turned it into a stand-alone power source. Located close to the dryer, he didn't even need a separate fuel tank. He just plumbs it into the dryer's LP fuel system.

"The engine was from an IH 203 self-propelled combine that had been sitting in my neighbor's pasture," says Ristau. "I added an LP gas carburetor/mixer and vaporizer and parts from other salvaged equipment. It didn't cost me much, and it works great."

The 150 cu. in., 4-cylinder engine needed surprisingly little work after sitting for years. Ristau replaced the water pump, oil pan and several seals and gaskets. No internal repairs were needed. He mounted it on a trailer made from an old irrigation pump frame.

"I used a bell housing, flywheel, clutch and gearbox from a B engine on an old IH 64 pull-type combine," says Ristau. "It bolted direct to the back of the 203 engine. International didn't change the machining on their engines for about 20 years."

Ristau had to change the carburetor manifold on the 203 engine. It was too large for his LP carburetor. A salvage yard operator suggested a manifold from an older Farmall tractor.

A neighbor gave him a Century brand carburetor/mixer and a matching vaporizer from an old Super C he had converted from LP to gas. The vaporizer was shot, but a company that used multiple forklifts gave him 3 old Century vaporizers, suggesting he might be able to make one good one out of the parts.

"The carburetor and vaporizer need to be the same brand for them to work together,"

explains Ristau.

He also needed to do some work on the throttle and clutch. The IH 64 had a rod that ran from behind the operator's seat to the clutch on the B engine. When the operator pulled on the rod, it engaged the clutch and brought the engine up to speed. Ristau disconnected the throttle from the clutch linkage. He then reconnected it to a small hand throttle from an old Farmall Cub and installed it over the bell housing. He also replaced the clutch engage and release rod with a squeeze lever from an old McCormick grain drill.

Ristau admits he lucked out when he installed a pto shaft and bearings from an old Allis Chalmers. He mounted it alongside the 203 engine. When he connected a drive belt, he discovered the pulley on it and the one he had put on the engine drive shaft were sized to deliver 400 rpm's at full engine speed.

"I knew I needed to reduce the engine rpm's to what the dryer called for, and they matched up perfectly," says Ristau.

The biggest problem with using LP is that it has to be warmed in order to vaporize to a gas that will burn. To accomplish this, hot water from the engine is cycled through the vaporizer. This is fine when the engine is hot, but for a cold start, Ristau needed a source of vapor.

"I installed a small tank on the frame ahead of the radiator," he explains. "It holds enough vapor for a cold start and to warm the engine."

The tank is piped to the line coming out of the vaporizer. It fills with vapor when the engine is operating. When Ristau shuts down the engine for the day, he shuts off the line to the LP tank and to the propane vapor mini-tank. The next morning he turns on the



Larry Ristau modified an old combine engine to run on propane, turning it into a stand-alone power source that he uses to power his grain dryer. The pto shaft and bearings are from an old Allis Chalmers tractor.



valve to the mini-tank and vapor feeds into the carburetor to start the engine.

"Once it is warmed up, I open the line from the LP tank to the vaporizer, and it refills the vapor tank and fuels the engine," explains Ristau.

One added caution Ristau took was to beef up the air cleaner with multiple filters. "You don't want any restriction on air intake," he explains. "Sometimes the bees-wings from the corn blows over the engine and could plug up the air cleaner. If that happens, the engine starts sucking in extra propane, and you can

have problems."

The bees-wings were one reason Ristau also left the old cowling on the 203 radiator. It was designed to keep field chaff and dust out of the radiator, and continues to do that job.

"I've run it for 3 years, and the engine oil is as clean today as when I put it in," says Ristau.

Contact: FARM SHOW Followup, Larry Ristau, E14484 County Road HH, Osseo, Wis. 54758 (ph 715 597-6160; lristau@trivest.net).

## Clever Way To Run Older Pickups On Propane

Whether pulling a stock trailer or a camper, burning a little LP makes Larry Ristau's truck run better. The 1985 Ford F-350, naturally aspirated diesel gets better mileage with LP trickling into the air cleaner. Not only does it have more power, but the engine oil stays cleaner longer.

"Pulling my 16-ft. stock trailer used to make the truck smoke on hills," says Ristau. "Now the exhaust is either light gray or clear."

To add LP to the air flow, Ristau used a 2-stage regulator sold in the RV market. It comes with an adapter plug that fits standard LP tanks. The regulator is installed in the engine compartment where it delivers gas to a solenoid valve.

A brake light switch installed on the accelerator pedal linkage controls the solenoid valve. Ristau set the switch so that to activate it the pedal has to be depressed to a certain level (typically at a point where the truck is travelling at more than 25 mph).

A master toggle switch was installed on the dash. Unless it is turned on, no LP gas can flow. With it on and the accelerator

pedal depressed, LP flows to a 3/16-in. orifice drilled into the air cleaner cover.

"I can be driving down the road on diesel at 40 mph, but if I hit the toggle switch, the truck will accelerate to 60," says Ristau.

Ristau can't adjust the actual flow of LP on the go. Instead he sets the regulator to allow a small but steady flow of LP when the master switch is on and the light switch activated.

"I've put a lot of miles on it since I converted it, nearly 7,000, and it has worked out real well," he says. "I burn about a gallon of propane per hour when driving around 50 mph."

Ristau has previously converted other engines to LP and back. For this conversion, he fabricated brackets for an 80-lb. tank that mounts in the truck box. He refills it from the LP tank by his crop dryer.

"The liquid propane from the larger tank runs in until the fill tank in the pickup is about 40 percent," explains Ristau.

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Burning a little LP makes Larry Ristau's 1985 Ford F-350 diesel pickup run better. An 80-lb. LP tank mounts in the bed.



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A master toggle switch was installed on the dash. Unless it's turned on, no LP gas can flow. A brake light switch installed on the accelerator pedal linkage controls the solenoid valve (right).



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