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# TurboDraft Opens Up New Sources Of Water

By Ed Ballam

Rural water supply is frequently a challenge. When water is available, it seems to be just out of reach, 50 feet off the paved road or down a boat ramp not made for a 35-foot, 20-ton apparatus.

Portable pumps will work in those cases, but it takes a lot of effort to set them up and typically requires someone to stand by to keep them running. That's where a TurboDraft makes sense. It uses an internal venturi similar to an eductor to create negative pressure inside the underwater housing. To force the water through the venturi restriction, the pumper uses a 2 ½-inch line initially fed from the booster tank.

## Getting Started

Once the cycle is started by establishing the pressure differential, water flows back to the apparatus through a 5-inch large diameter hose into the steamer intake and is then pumped to the fire scene.

The 2½-inch discharge line from the apparatus to the Turbodraft is charged to about 180 psi at 200 gpm and this flow force is used to power the venturi and the negative pressure continues to draw water from the source into the 5-inch return line. (The booster tank is then shut down after being refilled.)

Once the 5-inch LDH water flow is established, the TurboDraft produces a continuous flow to the pumper of up to 670 gpm to fill shuttle tankers, relay pumpers or portable tanks. Lots of variables affect the net useable flow the TurboDraft produces, including lift angle, elevation and hose friction loss. But the TurboDraft does produce an uninterrupted water flow that's as good or better than from some hydrants. The manufacturer, Schutte & Koerting of Trevose, Pa., has a slogan; "No hydrant? No problem."

Our Haverhill Corner, N.H., Volunteer Fire Department bought a TurboDraft last fall using funds largely raised by our annual raffle. At $2,900, it was a substantial investment, but one we believe will pay off. We also spent nearly $1,000 for 150 feet of 5-inch LDH just for use with the TurboDraft. (The departments in our mutual aid compact have standardized on 4-inch LDH supply line.)

**The TurboDraft produces a continuous flow to the pumper of up to 670 gpm.**

One might think that with the Connecticut River flanking our western border, water would be the least of our worries. But access is difficult with hundreds of acres of corn and hayfields between paved roads and the river.

Before deciding to buy, we asked for a demonstration. TurboDraft representative Neil Bagdis of Brigham Industries in Paxton, Mass., met with firefighters from six area towns at a boat launch on the Connecticut River. He asked for one pumper with at least a 1,250-gpm pump, preferably a side-mount, for the demo.

## Works In Ice

We had prepared a list of questions we couldn't find answered online or in brochures. Critical for us was how the device would work on an ice-covered pond and how large an access hole was needed. Bagdis said any hole slightly larger than the TurboDraft itself would work, leaving just a little bit of wiggle room.

A TurboDraft is ready to be charged at a boat ramp on the Connecticut River. The attached pail provides buoyancy. Tank water from the apparatus is sent through the 2½-inch hose at about 180 psi to create suction in the 5-inch return line, providing a useable flow of up to 670 gpm.

Using a 1,500-gpm pumper, about 150 feet of 5-inch LDH and an equal amount of 2½-inch pressurized line for power, we placed a TurboDraft at the water's edge. Bagdis said the operating line flow would push the unit into the hole. We attached a sealed empty 5-gallon foam pail for buoyancy to keep the 53-pound TurboDraft upright, out the muck and silt.

Bagdis said when using the TurboDraft on a pumper with an electronic pressure governor, it should be set to control the engine rpms rather than the discharge pressure. Initially the 2½-inch

booster tank supplied priming line needs to be quickly brought to at least 180 psi to activate the venturi and start a flow into the 5-inch LDH return line.

## Raising Pressure

But there's only a certain amount of tank water available. Taking too long to raise pressure in the 2½ priming/operating power line results in losing water fast. During the demo, our first pump operator blew through 1,000 gallons without establishing a water supply through the LDH. We learned a hard lesson.

According to Bagdis, a well-practiced operator should get the TurboDraft into operation by only taking a few hundred gallons of tank water. The main trick is to get 180 psi in the 2½-inch line quickly.

With some practice, within seconds of achieving 180 psi in the priming and power line, water was flowing into the 5-inch LDH. As the water initially traveled through the LDH the air in front of it had to be released by opening the ball intake valve bleeder. As soon as the line was hard we opened the steamer's intake valve and were ready for operations.

For the demo, we fed a ground monitor because it was easy to staff and watch its performance. We estimated we were pumping about 600-gpm. "And it will do that all day long, as long as you have diesel fuel," Bagdis said.

He added, however, that if a water source can be reached with flexible hard suction, that method would be preferable to using the TurboDraft as more water will always be available using straight suction hose.

## Testing The Lift

While we were impressed by our first evolution – a 10-foot lift over about 150 feet – we were more impressed when we moved to a boat ramp that was so steep you wouldn't want to put an apparatus down to the water's edge.

We did the same drill, laid LDH and the 2 ½-inch line for operating pressure at a location that would require least a 20 foot lift. A conventional centrifugal pump has a theoretical lift of about 33 feet at sea level. Priming a pump with a lift of 20 feet or more is difficult at best. It was a challenging site, but one that Bagdis was confident the TurboDraft would be able to handle. And it did.

A lift of about 20 feet through 150 feet of hose was no challenge for the TurboDraft, which produced about 300 gpm of useable flow in this evolution.

When water started coming up the 5-inch LDH toward the intake, a pump operator from a neighboring town remarked, "I've been a firefighter here for more than 30 years and I've never seen anyone get water out of there."

Granted, there wasn't enough to sustain a significant fire flow, but at about 300 gpm it was enough to fill tankers and perform as a supplemental water source. And, it was a lot easier to set up the TurboDraft than to lug a 200-pound portable pump down the bank.

Friction loss is a big deal with the TurboDraft, so keeping the hoses short, straight and kink-free produces the best water flow. We also found the TurboDraft can be deployed vertically in shallow sources like brooks as long as there's a constant stream of water into it. The screen doesn't have to be completely covered, but there does have to be a substantial current to keep the TurboDraft supplied.

In doing a bit of research, we learned some departments have their TurboDrafts set up in a preconnected format, with the LDH and the discharge hose all set to go. One firefighter can grab the handle and pull the attached hoses to the source. And we now know the TurboDraft will open a bunch of water sources previously unavailable to us.

*Editor's Note: Ed Ballam, a former managing editor of Fire Apparatus & Emergency Equipment magazine, is a firefighter with the Haverhill Corner (N.H.) Fire Department and holds certifications in pump operations, SCBAs and emergency vehicle driving. He is also a nationally certified emergency medical technician.*