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ON THE COVER // KP Panchal grew up around the construction trade, so he went to college to earn a degree in construction engineering and management technology, aspiring to become a general contractor. After college he started his career working for construction companies as an estimator and came to notice something: the increasing use of hydroexcavation on job sites. So he and two college classmates decided to form US Hydrovac in Indianapolis. That was five years ago, and today the company is going strong. "When you start a business, you make projections," Panchal says. "Our projection was we would have five trucks after five years. We have 15-plus vac trucks and four camera units. That blows my mind." (Photography by Marc Lebryk)



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

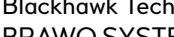







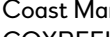




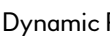

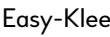
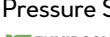
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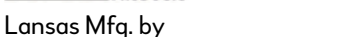


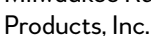








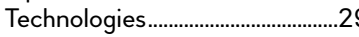



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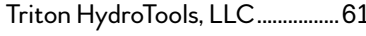


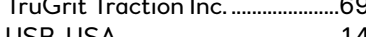

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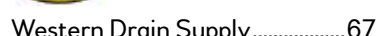
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Published monthly by COLE Publishing, Inc.
PO Box 220, Three Lakes, WI 54562

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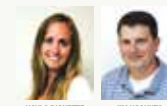
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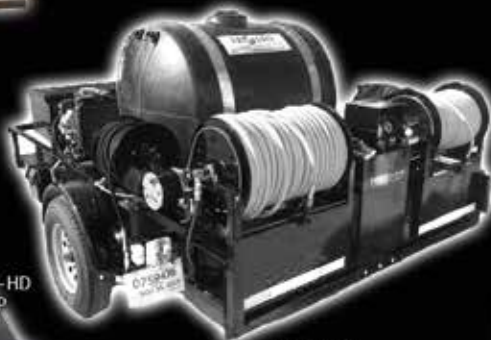
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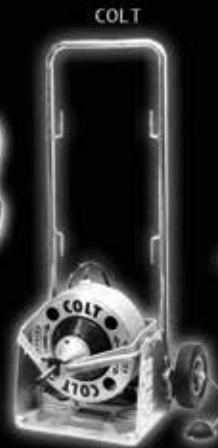
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GETTING OUTSIDE THE BOX

Injecting new ideas into your business requires confronting the fact that your past experience and knowledge is both an asset and a hindrance

EXPERIENCE IS GENERALLY considered a good thing. But it can also hold you back. The curse of knowledge, as it is referred to in this month's Better Business feature by Susan Robertson.

The basic idea is that our natural human tendency is to rely on past knowledge and experience when coming up with solutions to whatever challenges we face. This is indeed useful, but there is a limit to how useful. This experience can also be a barrier to our ability to produce truly new and innovative ideas. As Robertson explains, it can limit our thinking to nothing but slight variations of what already

exists. If you have a specific problem you've been trying and struggling to solve, a "slight variation" of what you already know is probably not going to get the job done.

This also ties into one of this month's featured contractors, Lovett Services out of Portland, Oregon. The company is a good example of overcoming the curse of knowledge.

"We don't do much at Lovett that's the usual," says Aaron Sawyer, Lovett's corporate communications manager.

For example, the company puts a strong emphasis on the Japanese concept of kata for all aspects of its operations. Rooted in martial arts and meaning "way of doing," it is an approach to improving efficiency by mastering processes through doing things deliberately and repetitively. The ultimate goal is continuous improvement and innovation. Logical when you hear it explained no doubt, but how many company owners in this industry are out there saying, "You know what we need to kick-start business growth? Martial arts principles."

For Lovett Services, this concept was brought to the company in 2018 with the arrival of a new co-owner from the private-equity industry. That's a key part of defeating the curse of knowledge: some outside perspective. You only know what you know. If that is also hindering your creative problem-solving, you're going to have to seek out some alternative sources. It's not easy, but the first step is consciously challenging the fact that your experience — while valuable — also carries limiting hidden assumptions.

This got me thinking about my own personal experiences. My journey in the sport of running came to mind. I started in middle school and am a satisfied runner to this day, but there was a period when I wasn't enjoying it and couldn't keep it up consistently. I eventually came to realize that the problem was that I remained too wrapped up in the past experience of my middle and high school running career. I let go of what wasn't working, opened myself up to some new ideas (in some cases the exact opposite of what I was coached in school), and rediscovered my joy of running.

I encourage you to do the same and think about how this "curse of knowledge" may be holding you back, in either your personal life or with your business. What can you do to circumvent it, think more creatively and get some new ideas and solutions flowing?

Enjoy this month's issue. **c**



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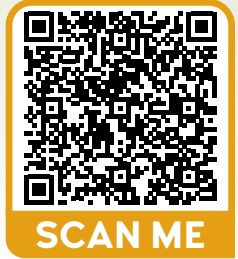
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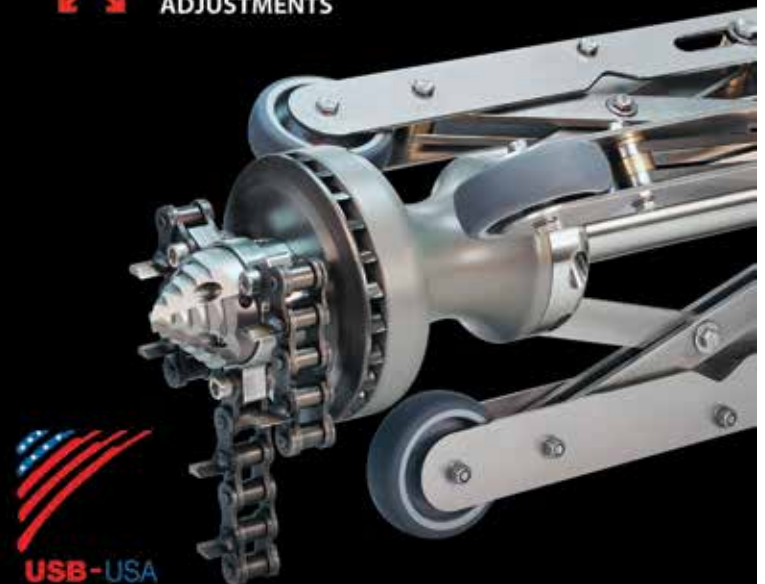
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OREGON'S LOVETT SERVICES BUILDS A STERLING REPUTATION BY
TAKING AN ALTERNATIVE APPROACH TO DOING BUSINESS

// By Ken Wysocky



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LOVETT SERVICES IS NOT A TYPICAL CONSTRUCTION-SERVICES COMPANY.

From performance reviews for field workers and reading assignments for all employees to guerilla marketing tactics and an on-site bookstore to a corporate culture that emphasizes continuous learning and improvement, the Portland, Oregon-based company aims to take a different approach from the norm.

Established by co-owner Dale Lovett, the company also differentiates itself through diverse service offerings that include hydroexcavation, directional drilling, conventional excavation, plumbing, drain cleaning and vacuum truck and mitigation services, says Aaron Sawyer, corporate communications manager.

“We don’t do much at Lovett that’s the usual,” Sawyer says. “I know we operate differently than other companies because sometimes employees leave and then come back to us because they find those other companies don’t focus on the same things we do.”

Just because Lovett Services’ employees work in the construction world doesn’t mean they don’t need the same kind of corporate culture other professionals enjoy, Sawyer notes.

“We see such a high need for it,” he says. “In the construction field, there’s usually a grab-your-shovel-and-go-to-work mentality — and don’t ask any questions. But we do things differently because that’s a recipe for disaster. All you do is create stepping stones for people to go elsewhere.”



Lovett Services

PORTLAND, OREGON

OWNERS

Dale Lovett and Gary Cosmer

FOUNDED

1997

EMPLOYEES

125

SERVICES

Directional drilling, hydroexcavation, excavation, plumbing, drain cleaning and vac truck services

SERVICE AREA

30-mile radius Portland

WEBSITE

www.lovettservices.com

In the end, it’s hard to argue with the results. The company generates more than \$25 million in annual revenue, employs about 100 workers, owns a large fleet of equipment and caters to a wide range of customers, primarily commercial facilities, municipalities, schools and restaurants.

On any given day, Lovett Services’ crews might be exposing utility lines with hydroexcavators at hospitals and large companies; using vac trucks to clean debris from catch basins and remove fats, oils and grease from drainlines; deploying directional drills to bore pathways for new water,

✓ Lovett Services started getting into directional drilling in the early 2000s, one of several complementary services the company now offers. Aaron Sawyer, corporate communications manager, says, “All of our services flow together and produce a seamless one-stop shop for customers.”





⤴ Donovan Manchego operates a Universal ViO 35 excavator while Brandon Myrick looks on.

⤵ Manchego inspects and decouples drilling rods on a project.

gas or electric lines; fixing water main breaks at plants and other facilities and performing mold prevention or water/fire mediation work.

“We’re busy,” Sawyer says. “And it’s something different every day.”

HUMBLE BEGINNINGS

Lovett started the company in 1997 with only an excavator, focusing primarily on residential sewer repairs. He slowly branched out into horizontal directional drilling in the early 2000s and then into drain cleaning.

A continual need for subcontractors, who often weren’t available when needed and didn’t always share the same values and standards for quality, drove Lovett’s diversification efforts. Plus it just made sense to keep adding bolt-on services that meshed well, Sawyer says.

“The beauty of our business is that all the services complement each other,” he says. “If you need a plumber, you might also need a drain cleaner. Or an excavation job or plumbing call might reveal a need to have a new service line drilled. All of our services flow together and produce a seamless one-stop shop for customers.”

Most of the jobs that crews perform tend to be smaller in nature. But as Sawyer notes, they add up in a hurry.

“There’s something to be said for drilling thousands of feet of lines at a time, but smaller projects tend to be more consistently available,” he says.

The company’s growth was kickstarted around 2018 by the arrival of a new co-owner, Gary Cosmer (now the firm’s chief executive officer), who came from the private-equity industry and worked on many merger-and-acquisition projects. He also brought with him a focus on operating efficiency, based on a Japanese philosophy called kata that emphasizes continuous learning and improvement.

Aided by Cosmer’s fresh business approach, Lovett Services also expanded its market offerings as well as its geographic footprint by acquiring Synergy Restoration & Construction in Portland in 2020 and Kruse Plumbing in Vancouver, Washington, in 2021.



“IF YOU NEED A PLUMBER, YOU MIGHT ALSO NEED A DRAIN CLEANER. OR AN EXCAVATION JOB OR PLUMBING CALL MIGHT REVEAL A NEED TO HAVE A NEW SERVICE LINE DRILLED. ALL OF OUR SERVICES FLOW TOGETHER AND PRODUCE A SEAMLESS ONE-STOP SHOP FOR CUSTOMERS.”

AARON SAWYER

“Those acquisitions fit into our strategy of buying companies that mesh well with services we already provide,” Sawyer says, noting that Kruse does new-construction plumbing, a service Lovett didn’t provide before. “We knew we couldn’t grow as much with just Lovett Services. We had to grow our portfolio of services.”

EQUIPMENT INVESTMENTS

As the company’s services expanded, so did its fleet of machines and equipment, primarily purchased from Papé Machinery. For industrial and municipal work, including hydroexcavation, the company relies on four Vacall combination sewer vacuum trucks that feature Kenworth and Freightliner chassis, 30,000-gallon debris tanks, 1,500-gallon water tanks and Vacall blowers.

The company also owns five horizontal directional drills manufactured by Ditch Witch (a brand owned by The Toro Company), ranging from JT5s (4,100 pounds of thrust force, 5,000 pounds of pullback force and up to 550 foot pounds of spindle torque) to JT20s (17,000 pounds of thrust force, 20,000 pounds of pullback force and up to 2,200 foot pounds of spindle torque).

In addition, the company has invested in a CCTV camera truck outfitted with an inspection camera system manufactured by

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Stephen Dahlstrom cleans the drill head of a Ditch Witch JT20.

CUES; eight Yanmar and John Deere excavators; and four custom jetter trucks outfitted with jettets made by US Jetting and Harben (a subsidiary of Flowplant Group Ltd.) The units feature 100-gallon water tanks and water pumps that generate pressure of 4,000 psi and flow up to 25 gpm.

The company also depends heavily on ServiceTitan, a business management software platform designed specifically for the trades. It offers a wide range of capabilities, from dispatching and scheduling to handling invoicing, customer payments, payroll, job costing, financial reporting and more.

“It’s one of the best investments Lovett ever made,” Sawyer says. “It’s a very robust business management platform.”

MASTERING PROCESSES

The Japanese concept of kata, which has its roots in martial arts and means “way of doing,” informs all aspects of the company’s operations. In simplest terms, kata is a structured way of mastering processes by doing things deliberately and repetitively, with an ultimate goal of continuous improvement and innovation.

On a job site, for example, that might mean ensuring that everything needed for a job is ready to go and in the same spot every time, Sawyer says.

“It’s been a real game-changer,” he says, noting that Toyota Motor Corp. is one of the more well-known adopters of the concept. “Our

“WHEN I WAS FIRST HIRED, IT WAS PRETTY OBVIOUS TO ME THAT ADOPTING TOYOTA’S KATA PHILOSOPHY WAS NOT GOING TO BE EASY. I HAD TO FORGET A LOT OF WHAT I LEARNED IN THE INDUSTRY AND UNDERSTAND THERE ARE BETTER WAYS TO DO THINGS.”

AARON SAWYER

CONTINUED >>

UNCONVENTIONAL MARKETING EFFORTS CREATE “ZOMBIE LOYALISTS”

Many construction-services companies rely on word-of-mouth referrals as a primary marketing tool.

While there’s no doubt this is one of the most valuable and cost-effective forms of advertising, Lovett Services — a company that prides itself on doing things differently — takes a much wider, as well as unorthodox, view of marketing.

“Word-of-mouth referrals might be the No. 1 way to reach potential customers, but there’s also a No. 2 method, a No. 3, a No. 4 a No. 5 and so on,” says Aaron Sawyer, the company’s corporate communications manager. “We’re one of the largest marketers in our industry and one of the most well-branded companies in Oregon. For all we know, some people might think we’re a company that makes snowboards. But that’s OK — we just want our name out there.”

Sure, the company depends on conventional marketing methods such as working with state and regional trade organizations to sponsor events ranging from symposiums and networking events to golf outings and fishing trips, Sawyer notes.

But the company also veers sharply from the norm by embracing consumer marketing to create what Sawyer calls “zombie loyalists,” aka extremely rabid fans. For example, Lovett Services gives away 5,000 to 10,000 pieces of Lovett-branded merchandise annually to everyday consumers through social media contests — everything from stickers and hats to hooded sweatshirts and Yeti cups, he says.

“We achieve organic growth from people who know about our brand but would probably never use our services,” Sawyer says. “It’s worth the effort because anyone who can spread our message is great. You never know when one of our fans is talking to someone who mentions that they have, say, a plumbing or drain emergency. You just never know where a job reference is going to come from.”

The company also does radio and television advertising — even over-the-top advertising on digital streaming platforms.

That may seem like a very counterintuitive approach for a construction-services company. But Sawyer notes that you never know who might be watching streaming television programs.

“A guy who runs a utility or a large facility might be watching,” he says. “We’re always interested in trying the next new thing to stay top-of-mind with consumers.”

The company’s focus on continual improvement and learning for employees also bolsters marketing efforts. As evidence, Sawyer points to the company’s five-star average out of 246 Google reviews.

“That’s hard to get in this industry,” he notes. “It takes a lot of work — a culture of people that are working to get five-star reviews.”

The company’s logo, emblazoned on every service vehicle and machine, also plays a big role in branding.

“Most people I meet know who Lovett is,” Sawyer says. “We’re very good at getting the word out.”

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▲ Lovett Services is 125 employees strong, including (left to right) Aaron Sawyer, corporate communications manager; Donovan Manchego, directional drilling operator; Ivan Memmer, field safety coordinator; Stephen Dahlstrom, directional drilling operator; Tylo Hartford, directional drilling foreman; and Brandon Myrick, directional drilling operator.

whole way of doing things changed by embracing the Toyota system. Once you get into it, things start working differently at your company.”

One central plank of a kata mindset is educating and empowering individual employees to suggest improvements that can improve efficiency.

“It’s about managing people for improvement — empowering them to pull a red flag and stop work when they see something wrong or that can be done better,” Sawyer says.

The company’s emphasis on self-improvements meshes well with the Toyota principles. For example, all employees are required to read a book titled *The 13 Behaviors of High Trust* published by FranklinCovey, a leadership-training company. Another book recommended for employees is *How Full Is Your Bucket?* by Tom Rath and Don Clifton, Sawyer says.

STRIVING FOR IMPROVEMENT

To bolster the self-improvement efforts, the company offers a bookstore that focuses on self-improvement books that employees can take home to read. Or they can buy books the bookstore doesn’t have and get reimbursed for the cost. There’s also a fully equipped gym for employees to use because physical well-being is important, too, Sawyer says.

“We also pay for professional development training,” he adds. “For instance, our salespeople often receive blueprints for projects to develop estimates but don’t know how to read them. So we’re sending them out to learn how to read blueprints. It’s these kinds of things that keep us ahead of the game.”

Sawyer concedes the company’s zen-like culture isn’t for everyone. But that’s OK, he notes.

“You either grow in it or find it’s too much and leave,” Sawyer says. “We let those employees go with grace and rehire them with grace if they come back. But developing this kind of culture pays dividends for us. If employees are happy with themselves and at home, they’re going to perform better at work.

“When I was first hired, it was pretty obvious to me that adopting Toyota’s kata philosophy was not going to be easy. I had to forget a lot of what I learned in the industry and understand there are better ways to do things.”

JOB REVIEWS FOR ALL

All employees also receive annual performance reviews as well as peer-to-peer reviews, another nod to the company’s emphasis on continuous improvement.

Effective performance reviews are especially important right

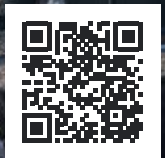
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now with the tight labor market. Why? Because it's much easier to give employees feedback that can improve their performance than to eventually fire them and then have to look for new employees and invest considerable time in training them, Sawyer says.

"Sometimes someone's job performance just needs a little bit of tweaking, so we want to help them understand what they need to do their job better and more efficiently," he says.

"WE'RE ALWAYS LOOKING TO MOVE PEOPLE TOWARD WHAT'S BEST FOR THEM TO GROW, WHICH IN TURN HELPS LOVETT GROW."

AARON SAWYER

In other instances, managers may determine that an employee needs a job change in order to keep improving, Sawyer says.

"Not everyone wants to do the same thing all the time," he says. "Sometimes you want to hit a different key on the keyboard. We're always looking to move people toward what's best for them to grow, which in turn helps Lovett grow."

AMBITIOUS REVENUE GOAL

Looking ahead, the company has set an ambitious revenue goal: \$100 million in sales within the next 10 years. To achieve that, the company expects to acquire more companies that can expand the company's geographic footprint as well as bolster existing services or add complementary new services, Sawyer says.

The only growth inhibitor on the horizon is the tight labor market, because the company's existing workforce can't take on much more work. If it tries to do more work than it can handle, it would jeopardize work quality and customer service, Sawyer notes.

"When you no longer finish projects on time, for example, you're doing C-grade work and start getting two- or three-star online reviews," he says. "And we're not a two- or three-star service company."

"If you grow a company the wrong way, you can ruin everything you've been trying to do from the start," Sawyer continues. "Growing by always putting customers first is the only way to do it."

Is \$100 million in revenue a doable goal?

"We're very confident that we'll hit it," Sawyer says. "We have the right team in place to achieve that kind of growth. Yes, there are challenges down the road, but we have a system in place to handle those challenges and turn them into opportunities." **c**



Employees, like Donovan Manchego, encounter a different operational approach than is typical at Lovett Services, but it's a positive experience for those who accept it, says Aaron Sawyer, corporate communications manager. "You either grow in it or find it's too much and leave. We let those employees go with grace and rehire them with grace if they come back. But developing this kind of culture pays dividends for us. If employees are happy with themselves and at home, they're going to perform better at work."

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STEADFAST DETERMINATION

AFTER A SLOW START IN ITS FIRST YEAR, AN INDIANAPOLIS HYDROVAC COMPANY HAS EARNED RESPECT AND EXPERIENCED BIG GROWTH THANKS TO QUALITY WORK AND A DEDICATED CREW // By Giles Lambertson

SOME COMPANIES BOOM AND FADE. The fundamentals weren't there. By comparison, US Hydrovac seems fundamentally sound, with the Indianapolis company's core values and best practices aligned for success. Plus, its founder is determined to succeed.

How determined? KP Panchal didn't earn a dime the first year in business in 2018. His two business partners in the startup — Tyler Vuurman and Dwight Cliff — had other primary jobs, but Panchal quit his job and went all in at US Hydrovac. During the first year, the then-28-year-old Panchal paid two hydrovac truck operators \$27 an hour at a minimum of 30 hours a week mostly to sit at home because there were no jobs for them to work.

"We did everything we could to drum up business. We beat the pavement, went to offices and sent out mailers. You can imagine," Panchal recalls.

He could have become discouraged but didn't give up, and his persistence finally paid off: A contractor called.

Globe Asphalt, a 90-year-old family-owned company, was paving a school parking lot in Indianapolis. The lot bordered an electric transformer station and the contractor was concerned about what lines might underlay the surface adjacent to it. Panchal's idle crew went to work, digging down a foot or two and reassuring Globe that there was no danger.

"We had a new customer," Panchal says. "So we went around saying, 'Hey, we worked for Globe Asphalt and we could do the same for you.'"

In two short weeks, a second customer, a telecom contractor, called about some hydrovac work on a downtown project.

"That was our first large customer, bringing in \$25,000 in revenue," Panchal says. "Then we got a third customer, and our clients became larger and the jobs more complex."

HONOR THY FATHER

Panchal's father was a first-generation Indian-American. Panchal himself was born in India, moved to the United States with his family when he was 3 years old and grew up in southern Indiana. His father was a contractor specializing in renovating motels. Panchal learned construction techniques from him.

"I grew up working with him on jobs. At 16, I ran a crew or two. After high school, I worked with him for four years," Panchal says.

An accident ended that. His father fell off a roof during a construction project and passed away after eight days in the hospital.

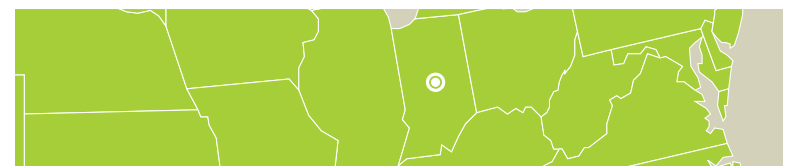
It was a pivotal moment for the young Panchal. In Indian culture, the oldest son becomes the head of the family and suddenly the 22-year-old Panchal had new responsibilities. He decided to honor his father by pursuing a career he had come to enjoy.

"I was good at construction, very good. I wanted to do it professionally, not just a small family-run business," Panchal says.

He went to community college and then a four-year college and earned a degree in construction engineering and management technology. His aspiration was to become a general contractor.



« Michael Stidham, heavy-equipment operator for US Hydrovac, uses a Tornado F4 Eco-Lite on a job in Greenfield, Indiana. (Photography by Marc Lebryk)



US Hydrovac

INDIANAPOLIS, INDIANA

OWNER KP Panchal

FOUNDED 2018

EMPLOYEES 40

SERVICES Hydroexcavation, pipeline cleaning/jetting, CCTV camera inspection

SERVICE AREA Indiana

WEBSITE <https://ushydrovac.com>



«Tornado Global Hydrovac is among the manufacturers in US Hydrovac's truck fleet. "The Tornado trucks are very reliable — they can run extended periods without downtime — and they don't contain proprietary components so when you do need a fix, you can buy parts off the shelf and complete the fix in-house," Owner KP Panchal says.

»Stidham grabs supplies out of a Tornado F4 Eco-Lite while on a job in Greenfield, Indiana.



"WE UNDERSTOOD THE MARKET [IN INDIANAPOLIS]. IT WAS A MARKET BIG ENOUGH TO HAVE DEMAND FOR A VAC COMPANY, YET AFFORDABLE ENOUGH TO LET US GET OFF THE GROUND."

KP PANCHAL

After college, he worked for construction companies as an estimator and came to notice something: the increasing use of hydroexcavation on job sites. So he and two college classmates who had noticed the same trend formed US Hydrovac. The first challenge: They needed a vac truck.

"It's a funny story, looking back," Panchal says. "I located a dealership outside Indianapolis and called the salesman. I got no answer and no response."

GETTING SERIOUS

Eventually, Panchal was taken seriously, familiarized himself with vac technology and rented a Vactor Prodigy, a midsize unit with 6-cubic-yard capacity, and an HXX model with 12-cubic-yard capacity.

By then, Panchal had moved around some, but he returned to Indianapolis to start the company. His return wasn't just nostalgia.

"We understood the market here," Panchal says. "It was a market big enough to have demand for a vac company, yet affordable enough to let us get off the ground."

That was five years ago. Today, the 32-year-old company president is presiding over a mushrooming business.

"When you start a business, you make projections," Panchal says. "Our projection was we would have five trucks after five years. We have 15-plus vac trucks and four camera units. That blows my mind."

Twelve are owned outright. The fleet consists of products by Vactor, Tornado (the Canadian brand) and some other suppliers. Panchal became acquainted with the Tornado equipment line at a trade show and bought a 12-cubic-yard truck there.

"The Tornado trucks are very reliable — they can run extended periods without downtime — and they don't contain proprietary components so when you do need a fix, you can buy parts off the shelf and complete the fix in-house," Panchal says.

EXPANDING SERVICES

For the first two years, US Hydrovac offered only vacuum excavation services — on-demand hydrovac digging. (The company can air excavate, too, but the clay soils of the region yield better to water under pressure.) Small and midsize contractors would call on the company as needed rather than maintain their own vac unit. By year three, though, Panchal wanted to expand the company's proposition.

"I was looking for what other things we could do to complement what we already were doing. I got my PACP certification in year two and we bought a small camera," Panchal says. "We didn't use it, but in year three we got good at it and started marketing our camera inspection work. We now have several jettors and cameras constantly working."

This is where Jake Whitney enters the picture. Vuurman, a childhood friend and vice president of US Hydrovac, asked Whitney to come to work. At the time, Whitney was scouting schools in pursuit of a doctorate in physical therapy. Persuaded to change his career plans — having two children at home helped convince him to forego more schooling in favor of a job — Whitney was hired to operate the company’s inaugural camera inspection service.

“Within about a year, we got a second unit and I came out of the field completely and began estimating jobs,” Whitney recalls.

The camera inspection division swelled rapidly.

“We went from two camera crews to four in eight months. And then a fifth,” Whitney says. “Right now, I’m running four camera and cleaning crews, but we have six jetter trucks so we could be up to six camera crews soon.”

Last year at one point, the division was operating shifts 24 hours a day.

The company’s CCTV customers generally are a mix of pipe rehab outfits and new construction contractors and include some of the largest firms in the country. The inspection work is in pipes ranging in diameter from 6 inches to 10 feet, mostly sanitary and storm sewers.

The company’s preferred robotic camera and software system is RapidView IBAK, an Indiana product. But Hoosier pride is not why it’s the company’s top choice, says Whitney.

“It’s cutting edge,” he says. “The technology and quality are unmatched. It is like it’s a Mercedes and the others are Fords.”

The company has on order an IBAK MicroGator reinstatement cutter unit, which combines camera inspection with grinding/cutting of pipeline defects and obstacles. US Hydrovac will be the first company in Indiana to have the state-of-the-art camera/cutter.

“We can cut all kinds of stuff out of the pipe with this,” Whitney says.

He notes that some liner companies use cutters to open holes in the liner at pipe junctions.

“HAVING A FEW MAIN CUSTOMERS IS A RECIPE FOR DISASTER. IF EVERYTHING IS IN ONE BASKET AND THEN THE BASKET GOES AWAY, THAT’S A DISASTER.”

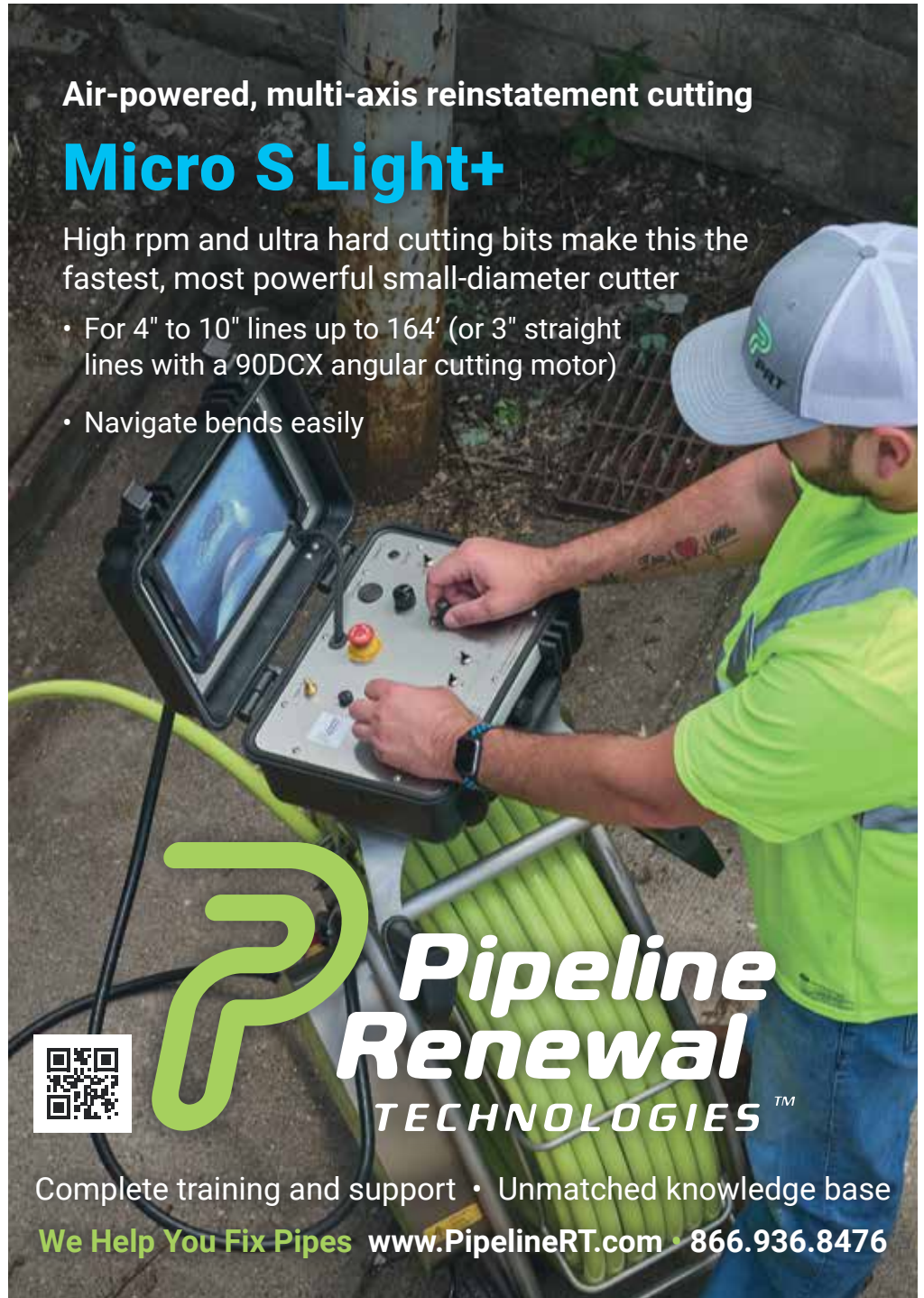
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« Freddy Garcia operates a RapidView IBAK mainline system during a post-cleaning inspection in Greenfield, Indiana.

experience operating a hydrovac unit, much of it in reclamation work. Panchal offered Crews the chance to join the company as a “truck operator/operations manager” and Crews came aboard. He doesn’t regret it.

“KP has been a great mentor to me,” Crews says. “He took the time to train me and to send me to multiple leadership classes.”

Panchal put together an office team and Crews began to assemble field staff. The company operates today with about 40 employees.

The company now operates from its “fourth and final shop,” according to Panchal. The firm began working out of a 2,500-square-foot facility before moving to an 8,000-square-foot space, then a 12,000-square-foot location. Several months ago, it purchased and moved into an 8-acre property with 40,000 square feet of shop and warehouse and 5,000 square feet of office area.

Crews says the expansive facility mirrors the rapidly maturing operation. The speed of the company’s growth has forced company executives periodically to re-adapt the company structure.

“When you grow so fast, the structure put in place what seems like two minutes ago suddenly isn’t sufficient for 10 trucks. But we’re in a good position now,” he says.

“But the systems they use are not nearly as sophisticated as this. They use a cutter and a separate camera. Ours is both in one.”

BRINGING EXPERIENCE

Another key member of the US Hydrovac team is Jon Crews, operations manager. He brought to the company 15 years of

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« Heavy-equipment operator David Beeman Fonseca uses a Kaiser Premier EcoCycler on a job in Greenfield, Indiana.

A BOLD FUTURE

The future? Panchal has looked into it and says, with a small laugh, “We want to take over the Midwest.” A bold goal considering the largest hydrovac company in the country is headquartered in Indianapolis.

“We don’t plan on going public,” he says. “No outside investment. We want to be a regional player. My vision is to be an industry leader in the utilities market.”

The main ingredients to reaching that goal are having capable people in key positions

(including his wife Anjali, who is the company’s chief financial officer) and building out clientele in different industries and of different sizes.

“Having a few main customers is a recipe for disaster. If everything is in one basket and then the basket goes away, that’s a disaster,” Panchal says.

Panchal doesn’t want US Hydrovac to offer too many services, preferring instead that it be expert in a few things. He already is planning for satellite offices, including in Ohio and Kentucky. And the company founder vows to maintain his focus on people.

“We are people-centered. We want to make customers’ lives easier and help them solve problems,” Panchal says. “This is a relationship business. When a customer is disappointed, we take that very seriously.” c

“YOU DON’T HAVE TO GO TO COLLEGE AND GET A DEGREE. YOU CAN, BUT YOU DON’T HAVE TO. YOU CAN BE A PROFESSIONAL AND MAKE GOOD MONEY FOR YOUR FAMILY IN THE TRADES.”

KP PANCHAL

Crews says the company has in place “processes that are sustainable so we can stay ahead of things instead of reacting to them.” It’s all in the “metrics,” he adds, the science of measuring what is happening so decision-makers can make informed decisions.

US Hydrovac has gone from that initial daylighting job in a school parking lot to completing a 10-month-long project in Louisville, Kentucky, where the city’s sewer department was rehabbing a failed 96-inch brick sanitary sewer line. It served multiple hospitals and critical businesses that could not be shut down for renovation. Three trucks and eight people were on the job in Louisville those months, inspecting, cleaning, clearing away debris. The job produced several millions of dollars in revenue for the company.

The company has a “three-P” mission statement that encapsulates Panchal’s idea of what a hydrovac company should be about: preserving the environment, protecting utility assets and preventing service interruptions.

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LED THERE BE LIGHT

Pipe lining system with LED light curing technology proves to be a high-impact investment for New Jersey contractor // By Ken Wysocky

MANY CONTRACTORS would think twice about spending roughly \$200,000 on a pipe lining system. Luis Fanlo, owner of Arrow Sewer and Drain in Middlesex, New Jersey, isn't one of them.

After Fanlo saw a demo of the SpeedyLight+ LED-cured pipe lining system from Sewertronics (a Poland-based company owned by Halma) earlier this year, he didn't hesitate to seal a deal. And the veteran plumber and drain cleaner has been reaping the considerable productivity and financial benefits ever since.

"In two weeks, we made more money with the SpeedyLight+ system than what we paid for it," says Fanlo, a self-confessed drain cleaning and pipe rehab technology hound. He founded the company in 2018, runs about 15 service trucks and employs 18 people while serving customers throughout New Jersey.

"We do about 2,000 feet of lining a month, mostly in 4- to 6-inch-diameter pipes," he continues. "We may be relatively new to the lining industry, but we're really pushing it."

The company can do two pipe lining jobs per day, courtesy of the lining system's LED light technology, which can cure liners at a rate of up to 3.3 feet per minute, depending on the pipe diameter. That's up to five times faster than conventional curing techniques, according to Sewertronics.

"IT HAS COMPLETELY EXCEEDED MY EXPECTATIONS. YOU COULDN'T PAY ME TO GO BACK TO THE OLD WAY OF LINING."

LUIS FANLO

"We've doubled our production and doubled our pipe lining revenue," Fanlo says. "Customers love it because they can use their sewers in about an hour or so, compared to some lining systems that leave them without sewers for 10 or 12 hours while the liner cures."

ARROW SEWER AND DRAIN

MIDDLESEX, NEW JERSEY

OWNER Luis Fanlo

MACHINE SpeedyLight+ LED system from Sewertronics

FUNCTION Lines pipes and cures them with heat from LED lights

FEATURES Lines pipes 2 to 24 inches in diameter and up to 300 feet long; cures felt and fiberglass liners, both horizontal and vertical runs; cures at speeds up to 3.3 feet per minute; can navigate 45- and 90-degree bends; camera inside the curing head enables inspection of liners before and during curing process; uses less energy than conventional lining methods; runs on standard electric power source

COST Around \$200,000 with all accessories

WEBSITE www.arrowsewrnj.com

STRATEGIC INVESTMENTS

Fanlo is no stranger to big expenditures. He stands squarely in the camp of you need to spend money to make money.

The company owns one Mud Dog hydroexcavation truck from Super Products, one Vactor 2100 combination sewer vacuum truck, Mini and Midi Miller drain cleaning machines from Picote Solutions (used mostly for prepping pipes before lining), pipe bursting equipment from Pow-R Mole Trenchless Solutions, and a LightRay pipe lining system from Perma-Liner Industries, to name only some of the company's investments.

So after watching a demo of the SpeedyLight+ system at an open house sponsored by Pipeline Renewal Technologies, the North American distributor for Sewertronics, Fanlo wasn't fazed by the price tag.

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MONEY MACHINES

“I saw how this tech was going to make our lives easier and better and allow us to market our services to a much bigger customer base — all with just one tool,” he says.

The SpeedyLight+ system has expanded the market for the company’s pipe lining services in several ways. For starters, previously crews could only line 6-inch-diameter pipes, while the SpeedyLight+ system can line pipes from 2 to 24 inches in diameter. Furthermore, crews now can line pipes about 300 feet in length, about twice as long as before, Fanlo notes.

Those increased capabilities catapulted the company into a much larger market for lining pipes. For example, the business can now line pipes at chemical and processing plants that it couldn’t do before, Fanlo says.

“And we keep getting calls from engineering firms that ask us to bid on jobs because they know about our capabilities,” he adds.

The SpeedyLight+ system also navigates 45- and 90-degree bends (the latter only in pipes 4 inches or more in diameter), lines vertical as well as horizontal pipes, uses less energy than conventional curing methods, runs on standard electrical power sources and offers four different-sized curing heads for various pipe diameters.

RIPPLE EFFECTS BOOST BUSINESS

Furthermore, the company obtains a lot of work from plumbing firms that simply can’t afford to invest in an expensive pipe lining system or just aren’t interested in entering the market, preferring instead to subcontract the work, Fanlo says.

In addition, doing pipe lining work for commercial customers helps Fanlo wedge his foot in the door to market the company’s numerous other services, such as drain cleaning, pipeline inspections and so forth, he says.

The system also provides a less-tangible benefit: Technicians are less nervous about lining pipes — and the odds of an installation error are dramatically reduced — courtesy of a camera, featuring a 150-degree field of vision, integrated into the curing head. This enables technicians to view the entire liner and ensure proper installation before curing begins, then monitor the curing process in real time.

“When you shoot a typical liner, you don’t know what it looks like at the end of the pipe until it cures and you camera it,” Fanlo



▲ Luis Fanlo says his company can do two pipe lining jobs per day thanks to the Sewertronics SpeedyLight+ lining system’s LED light technology, which can cure liners at a rate of up to 3.3 feet per minute.

says. “But with the SpeedyLight+ technology, you can push the cure head all the way to the end of the liner, where you want to start your cure, and view the installation prior to curing the liner.”

Furthermore, a wetted-out liner will not start curing until the LED lights start to heat it, so technicians aren’t under the gun to install liners within a specified amount of time.

“The liner won’t start to set up and cure until you hit the button,” Fanlo says. “Our guys used to be nervous about shooting liners — you’d cross your fingers and hope everything was good. But now there’s no guesswork and our guys are more excited to shoot liners because they have certainty.”

The bottom line: The SpeedyLight+ system is everything Fanlo hoped it would be.

“It has completely exceeded my expectations,” he says. “You couldn’t pay me to go back to the old way of lining.” **c**

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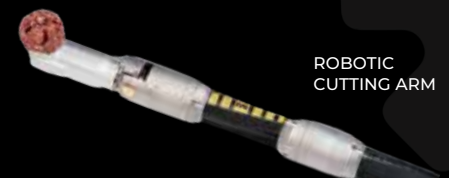
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MANUFACTURER	NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	# OF AVAIL FRONT JETS	# OF AVAIL REAR JETS	HOSE SIZE/ CONNECTING THREAD
ARTHUR PRODUCTS CO.	Eg-A-Nator-2 Tier 2	Clearing Blockages	4" - 12"	8 to 80	10,000	varies per NPT size	1	6@10°	3/8" - 1/2"
	Chizel 10- Tier 2 Stainless Steel Body	General Stubborn Blockages - sharp cutting edge-	4" - 12"	8 to 80	10,000	varies per NPT size	4	6	1/2"
	Chizel 10 -Tier 2 Alum Hard Coated Body	General Stubborn Blockages - sharp cutting edge-	4" - 12"	8 to 80	10,000	varies per NPT size	4	6	3/8"
	Flat Nose	General Cleaning	4" - 12"	8 to 80	10,000	varies per NPT size	Cust Spec	Cust Spec	1/2"
	Button Dual Groove	General Cleaning	2" - 12"	2.5 to 80	15,000	varies per NPT size	Cust Spec	Cust Spec	1/4" - 3/8" - 1/2"
	Tow Hook	Pulled by Cable or to Pull A Cable	2" - 12"	2.5 to 80	15,000	varies per NPT size	Cust Spec	Cust Spec	1/4" - 3/8" -1/2" -1"
	Mini-Mole	Special tapered thread for use in small tube cleaning on rigid lance	.200" - 1"	1.7 to 20	10,000	varies per NPT size	Cust Spec	Cust Spec	Special tapered thread
	Rodder Jets	General tube cleaning for use on Rigid Lance - male thread	.250" - 1"	1.7 to 40	15,000	varies per NPT size	Cust Spec	Cust Spec	Various male thread sizes
	Cnt-r-KUT™ EMAX	Roots and Other Blockages Rotating Chain & Cable	3" - 12"	4 to 80	10,000	varies per NPT size	Cust Spec	Cust Spec	1/4" - 3/8" - 1/2"
	Cnt-r-KUT™ CDMAx	3 Flexible Guide Vane Kit for nozzle centering - for your existing nozzles	3" - 12"	1.7 to 80	10,000	varies per NPT size	n/a	n/a	1/4"-3/8" - 1/2"
Mega-Thruster PX Revolver	Full 360° rotating nozzle for cleaning & polishing; designed for long runs	2" - 24"	1.7 to 80	10,000	varies per NPT size	Cust Spec	Cust Spec	1/4"-3/8" - 1/2"	



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ENZ USA INC.	Bulldog Antblast	Anti-Toilet Blowing in Residential	8" - 24"	55 to 80	1,500 - 1,800	17 lbs.	6		1" - 1 1/4 "
	Bulldog	Cleaning grease, roots, deposits, etc.	8" - 24"	50 to 120	2,000 - 2,900	17 lbs.	7	6	1" - 1 1/4 "
	Rotodrill	Cleaning blocked pipes, frozen pipes, heavy debris	2" - 14"	13 to 80	2,000 - 4,000	.25 lbs. to 1.5 lbs.	1	6	1/2" - 1"
	Grenade	Flushing heavy debris	6" - 12"	40 to 80	2,000 - 3,600	11 lbs.		10	1"
	Chisel 60.100L	Penetrating clogs, root masses, frozen pipes	6" - 16"	50 to 80	2,000 - 3,600	6 lbs.	4	6	1"
	10.125TR Chain Scraper	Root removal, hard grease, hard deposits	5" - 12"	14 to 80	2,000 - 3,600	6 lbs.		6	1"
	10.200R Rotating Chain Scraper	Removal of root masses, clogs, hard deposits	8" - 16"	50 to 80	2,000 - 3,600	78 lbs.		6	1"
	10.400R Rotating Chain Scraper	Removal of root masses, clogs, hard deposits	16" - 32"	80 to 120	2,000 - 3,600	105 lbs.		6	1"
	14.200 Milling Cutter	Removal of concrete & mineral deposits	8"	80 to 120	2,000 - 2,200	178 lbs.		6	1" - 1 1/4 "
Bulldozer 50.100G	Flushing debris from larger pipe	16" - 40"	40 to 80	2,000 - 3,600	57 lbs.	1	8	1"	



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GENERAL PIPE CLEANERS	Chisel Point Nozzle	Penetrating, breaking up debris	4" - 10"	12	2,500	4 oz.	4	6	1/2"
	Traction Nozzle	Sand and mud removal	4" - 10"	12	2,500	8 oz.	1	6	1/2"
	Cleaning Nozzle	Maintenance Cleaning	4" - 10"	12	2,500	12 oz.		8	1/2"
	Spring Leader Nozzle	Guiding hose around tight bends	2" - 10"	1.5 to 8	1,500 - 3,000	4 oz.		3 to 4	1/8" - 1/4" - 3/8"
	Downhead Nozzle	Dropping down T's	2" - 4"	1.5 to 4	1,500 - 3,000	2 oz.		3	1/8"
	Chain Saw Nozzle	Cutting roots	4" - 10"	4 to 12	2,500 - 3,000	2 lbs.		2 to 4	3/8" and 1/2"
Rotary Nozzle	Scour pipe walls clean	2" - 10"	1.5 to 12	1,500 - 3,000	2 oz. to 10 oz.		2 to 4	1/8" - 1/4" - 3/8" - 1/2"	



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HYDRA-FLEX, INC.	Reaper 1/4"	Cutting through and removing blockages and flushing debris in sewer lines	2" - 4"	6 or 8	4,000	0.4 lbs.	1	3 or 4	1/4" NPT
	Reaper 3/8"	Cutting through and removing blockages and flushing debris in sewer lines	3" - 6"	6, 9 or 12	4,000	1.12 lbs.	1	4	3/8" NPT
	Reaper 1/2"	Cutting through and removing blockages and flushing debris in sewer lines	4" - 8"	12, 15, 18 or 24	4,000	1.54 lbs.	1	4	1/2" NPT
	Reaper 1"	Cutting through and removing blockages and flushing debris in sewer lines	6" - 18"	40, 60 or 75	3,000	4.7 lbs.	1	8	1" NPT
	Marksman	Cutting through and removing debris at distances of 20-30 feet. Could be used in locations like lift stations or manholes. To be used with a gun + lance.	N/A	15, 20 or 25	2,500	1.93 lbs.	1		1/2" NPT

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NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	# OF AVAIL FRONT JETS	# OF AVAIL REAR JETS	HOSE SIZE/ CONNECTING THREAD
Torpedo Tier 3	Sanitary and Storm general cleaning heavy debris removal	6" - 18"	60 to 80	3,000	14 lbs.		8	3/4" - 1 1/2"
Royal Tier 3	Sanitary and Storm general cleaning heavy debris removal	12" - 48"	60 to 120	3,000	17.6 lbs.		12	3/4" - 1 1/2"
Traction Tier 3	Sanitary and Storm Clears path for other nozzles	2" - 12"	40 to 80	3,000	3.5 lbs.	1	6	3/4" - 1 1/4"
Rambo Tier 2	Sanitary and Storm remove total blockages of grease, roots, stone, sand	2" - 18"	60 to 80	3,000	5 lbs.	6	5	1/4" - 1 1/2"
OMG Tier 3	Sanitary and Storming Clearing path with minimal force on pipe wall	8" and Up	60 GPM and Up	3,000	36 lbs.	1	12	3/4" - 1 1/2"
Aquapoer 700 Controlled Rotation Tier 2	Sanitary and Storm Removal of grease, small roots, mineral deposits	6" - 24"+	50 to 120	3,000	22 lbs.	6	4	3/4" - 1 1/4"
Duce Vibration Tier 2	Sanitary and Storm removal of scale, mineral deposits, concrete, asphalt, tuberculation	2" and Up	5 to 125	1,300 - 2,000	0.5 lbs. - 14 lbs.	2 rotating	4	3/8" - 1 1/4"
Rotor Tier 2	Sanitary	2" - 20"	10 to 80	3,000	7 lbs.	4 rotating	4	1/4" - 1 1/4"
Floor Cleaner Tier 3	Sanitary and Storm removal of debris from lower half of pipe	6" to 72"+	18 to 120	3,000	18 lbs. - 52 lbs.	Up to 14	Up to 1 1/2"	
Kleinsight Camera Nozzle Tier 3	Sanitary and Storm Clean and Video Record	6" - 36"	50 to 80	3,000	26 lbs.		8	3/4" - 1"



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JAWS 100	High performance sewer cleaning or storm water cleaning	6" - 12"	5 to 80	400 - 4,000	4 lbs.		4	1/2" - 3/4" - 1"
Multi-Global Nozzle	Sewer and pipe cleaning for penetration	2" and Up	4 to 170	400 - 4,000	2 lbs.	4	1 to 6	1/2" - 3/4" - 1" - 1 1/4"
JAWS	High performance sewer and pipe cleaning heavy debris	6" - 30"	30 to 265	400 - 4,000	7 lbs.		5	1/2" - 3/4" - 1" - 1 1/4"
IceBear Penetrating Nozzle	Sewer and pipe cleaning penetrating nozzle	1" and Up	4 to 170	400 - 4,000	1 - 3 lbs.	3		1/4" - 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
C-RAY 200	Bottom cleaning for sewer and pipe	12" - 36"	30 to 265	400 - 4,000	22 lbs.	1	6	1/2"
C-RAY 400	Bottom cleaning for sewer and pipe	15" and Up	40 to 350	400 - 4,000	42 lbs.	1	8	3/4" - 1" - 1 1/4" - 1 1/2"
BL Swiper (large)	Ventura effect type nozzle to clean with water in the line and sucks the water down	15" and Up	40 to 265	400 - 4,000	13 lbs.		39	
Spinner Nozzles (No rebuilds)	Grease and other obstructions	4" and Up	14 to 350	400 - 4,000	3 - 15 lbs.	2		1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
Goblin Grease Eater	Grease nozzle sewer lines or storm lines	6" and Up	40 to 350	400 - 4,000	12 lbs.	1	10	3/4" - 1" - 1 1/4" - 1 1/2"
MONRO-JET	Hydro-Excavation	2" - 8"	3 to 20	2,000 - 36,000	2 lbs.	1		1/2"
MANTA	Bottom cleaner for recycled water trucks	12" - 72"	60 to 528	900 - 3,000	45 - 60 lbs.	1	8 to 12	1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
FIR	All stainless type penetrators	2" - 12"	5 to 80	400 - 4,000	1 lb.	1	3 to 6	1/8" - 1/4" - 3/8" - 1/2" - 3/4" - 1"
C-RAY 800	Dual truck operation for double the flow for large pipes	36" - 96"	120 to 350	400 - 4,000	50 lbs.		8	3/4" - 1" - 1 1/4" - 1 1/2"
Sweagle	Ejector Nozzle with Tier 3 Design	10" - 60"	60 to 350	400 - 3,625	19lbs.		6	3/4" - 1" - 1 1/4" - 1 1/2"
Paikert Intruder Cutter	Low Speed High Torque Impact Cutter	4" - 27"	58 to 120	1,450	Depends on the Setup			3/4" - 1" - 1 1/4" - 1 1/2"



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1" Root Rat	Roots and Encrustations	8" - 30"	40 to 120	Up to 5,000	5 lbs.		3	3/4" or 1"
1/2" Root Rat	Roots and Encrustations	4" - 10"	5 to 18	Up to 8,000	1 lb.		2	1/2" or 3/8"
3/8" Root Rat	Roots and Encrustations	2" - 6"	4 to 12	Up to 5,000	8 oz.		2	1/4" to 3/8"

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NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	# OF AVAIL FRONT JETS	# OF AVAIL REAR JETS	HOSE SIZE/ CONNECTING THREAD
Emperor Nozzle	Flushing debris from large lines	12" - 32"	80 to 120	2,000 - 2,500	19.8 lbs.		12	1" - 1 1/4"
Penetrator Nozzle	Flushing heavy debris in lines with off sets	6" - 16"	50 to 80	2,000 - 4,000	15.4 lbs.	1	8	3/4" - 1 1/4"
Power Pull Nozzle	Mud, Sand, Silt	4" - 12"	18 to 80	2,000 - 4,000	1.5 - 9 lbs.		8	1/2" - 1 1/4"
Spear Nozzle	Penetrating clogs/blockage, root mass	8" - 24"	50 to 80	200 - 4,000	6.2 lbs.	4	6	3/4" - 1"
General Nozzle	All around sewer cleaning, prevent maint.	4" - 16"	18 to 80	2,000 - 4,000	1.5 - 9 lbs.	1	8	1/2" - 1"
Arrow Nozzle	Penetrating clogs/blockages, frozen pipes	4" - 16"	18 to 80	2,000 - 4,000	1 - 2.5 lbs.	3 + 1	8	1/2" - 1"
Stealth Nozzle	Flushing heavy debris	8" - 24"	60 to 80	2,000 - 4,000	17.6 lbs.		8	3/4" - 1 1/4"
Raptor Nozzle	Penetrating clogs, roots/grease masses	4" - 24"	18 to 80	2,000 - 4,000	2.4 - 5.5 lbs.		3(1/2") 6(1")	1/2" - 1"
Big Foot Nozzle	Flushing debris from floor of large pipes	16" - 48"	40 to 120	2,000 - 3,000	33 - 56 lbs.		6 to 14	1" - 1 1/4"
Twister Nozzle	Cleaning grease, light roots, mineral deposits	8" - 24"	50 to 120	2,000 - 4,000	15.4 lbs.	5	4	1" - 1 1/4"
Typhoon Nozzle	Grease, light crust, light roots	6" - 12"	18 to 80	2,000 - 4,000	11 lbs.	4	6	1/2" - 1"
Antiblower	Shallow sewer line or close to home	6" - 16"	40 to 80	2,000 - 3,000	9 lbs.	1	8	3/4" - 1"



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Sandshoe	Sand, dirt and rocks	4" - 18"	12 to 18	2,000 - 4,000	7 lbs.		4	3/8" - 1/2"
Rotating	Scrubbing pipe walls	2" - 12"	4 to 18	2,000 - 4,000	1 - 3 lbs.		3	1/4" - 3/16" - 3/8" - 1/2"
Q Nozzle	Downhill jetting	4" - 12"	12 to 18	2,000 - 4,000	1 - 2 lbs.	3	4	3/8" - 1/2"
Rocket Nozzle	Long distance jetting	4" - 12"	12 to 18	2,000 - 4,000	2 lbs.	1	4	3/8" - 1/2"
Closed Nozzle	Standard jetting	2" - 12"	4 to 18	2,000 - 4,000	1 lb.		4	3/8" - 1/2"
Open Nozzle	Standard jetting	2" - 12"	4 to 18	2,000 - 4,000	1 lb.	1	4	3/8" - 1/2"
Brass Ball	Stainless steel hose jetting	2" - 8"	4 to 18	2,000 - 4,000	1 lb.		4	3/16"



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Ultimate Penetrator	High Performance Double Duty - Clears Blockages and Flushes	4" - 30"	10 to 150+	1,000 - 4,000+	5 lbs. - 31 lbs.	0 or 1	3, 5, 8 or 10	1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
Super Grenade	High Performance Heavy Duty Mainline Cleaning - Fast and Easy	2" - 30"	8 to 150+	1,000 - 6,000+	1.1 lbs. - 7 lbs.	0 or 1	3, 5, 6 or 8	1/2" - 3/4" - 1" - 1 1/4"
TriStar Chisel	High Performance Front-Boring Penetrator for Stubborn Blockage	2" - 30"	10 to 90+	1,000 - 3,000+	1 lb. - 4 lbs.	3 or 4	3, 5, or 6	1/2" - 3/4" - 1"
Shamrock-et	High Performance Penetrating and Sweeping	6" - 18"	30 to 80+	1,000 - 3,000+	12 lbs.	0 or 1	3	3/4" - 1" - 1 1/4"
Boat Nozzle	Heavy Duty Flat Bottom Sweeper for Sand, Silt, Gravel and Large/Heavy Debris	24" - 60"	65 to 150+	1,200 - 3,000+	51 lbs.		11	1" - 1 1/4" - 1 1/2"
Cobia	Heavy Duty Multipurpose - Efficiently Clears Sludge, Mud and Debris	6" - 36"	30 to 120+	1,000 - 3,000+	3 lbs. - 10 lbs.	0 or 1	6 or 10	1/2" - 3/4" - 1" - 1 1/4"
Rotating Nozzles-Blaster (Fast Rotating) and Huracan (Slow Rotating)	Removing Residue and Sidewall Buildup/Deposits	2" - 24"	6 to 120+	1,000 - 6,000+	0.2 lbs. - 10.9 lbs.	0, 1, 2 or 4	3, 4, 6 or 8	1/4" - 3/8" - 1/2" - 3/4" - 1" - 1 1/4"
Mini-Tadpole/Tadpole/Little Shamrock	Steel Skid Nozzles with Long Service Life for Sweeping Medium to Large Lines	6" - 60"	30 to 120+	1,000 - 3,000+	9 lbs. - 27 lbs.	0 or 1	9 or 12	3/4" - 1" - 1 1/4"
Sand & Sludge Nozzle/ Contractor Special	Aluminum Alloy - Glides Over Sand and Sludge to Quickly Sweep Lines	6" - 18"	30 to 90+	1,000 - 3,000+	3 lbs.	0 or 1	8 or 12	3/4" - 1"
Grease Nozzle	Aluminum Alloy - Smooth and Streamlined to Penetrate Grease and Ice Blockages; Great for Inclines	4" - 18"	12 to 90+	1,000 - 3,000+	2 lbs.	0 or 1	5 or 6	1/2" - 3/4" - 1"

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Primus 3D	Grease, Crusts, Light Roots	4" - 24"	18 to 120	2000 - 4,000	2.6/7.0/8.3/20.1	1	3/4/5/6	1/2 - 3/4 - 1 - 1 1/4
Rocket 3D	Sand, Silt, Large Debris	4" - 24"	12 to 120	2,000 - 4,000	6/2.6/4.85/11.4/44		6/8/10/12	1/2 - 3/4 - 1 - 1 1/4 - 1 1/2
Pipe Wolf 3D	Total Blockages from Roots, Grease & other Organic Matter	4" - 24"	14 to 120	2,000 - 4,000	2.4/5.7/11.9		6	1/2" - 3/4" - 1" - 1 1/4"
Bagger Max 3D	Sand, Silt, Solids, Sludge & other Heavy Debris	18" - 96"	50 to 120	2,000 - 3,000	33/53/66/114.5	5	6/8/10/12	3/4" - 1" - 1 1/4" - 1 1/2"
Chisel	Total Blockages from Roots, Grease, etc.	2" - 15"	8 to 120	2,000 - 4,000	22/33/66/1.54	4	4	1/4" - 3/8" - 1/2" - 3/4" - 1" - 1 1/4"
FS 3D	Total Blockages from Roots, Grease & other Obstructions	2" - 15"	8 to 80	2,000 - 4,000	22/44/66/1.54/3.7	4	4	1/4" - 3/8" - 1/2" - 3/4" - 1"
Tri-Jet 3D	Mud, Sand, Silt - Everyday Cleaning	4" - 48"	60 to 120	2,000	4.8/12.1/17.6/23.1/44		12/15	1" - 1 1/4"
FD 2 3D	Half-Open or Complete Open Drains - Mud, Sand, Silt	4" - 12"	14 to 120	2,000 - 4,000	2.6/4/8.3/14.3		6/8	1/2" - 3/4" - 1" - 1 1/4"
3D Extreme	Mud, Sand, Silt	6" - 15"	40 to 120	2,000 - 3,000	9.4	1	8	3/4" - 1" - 1 1/4"
3D Cleaning	Everyday Cleaning - Sand, Mud, Silt, Grease	4" - 15"	14 to 80	2,000 - 4,000	.6/12.1/17.6/23.1	1	6/8/10/12	1/2" - 3/4" - 1" - 1 1/4"

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Susan Robertson

OVERCOMING THE CURSE OF KNOWLEDGE

Being a knowledgeable expert in your field can sometimes impede your creative problem-solving ability // By Susan Robertson

WHEN WE THINK ABOUT FAMOUS visionary thinkers, we subconsciously assume that they have some magic characteristic that the rest of us don't have or can't achieve.

In reality, the only magic they have is an intuitive understanding of how to avoid some very common creative thinking blocks. One of those blocks is the "Curse of Knowledge," a cognitive bias, or mental shortcut, that all humans share.

STUCK INSIDE THE BOX

You've probably heard the term "Thinking outside the box." And you've probably, at some point in your career, been asked to think outside the box. But without any understanding of why the box is there or how it was created, it's hard to know how to break out of it. The reality is that we each create our own "box" through this "Curse of Knowledge."

To understand this concept, imagine for a moment that your task is to think of new ideas for salad dressing. Try to come up with a few in your mind right now.

Chances are, the ideas that came to your mind were incremental variations of existing flavors or ingredients. You may have thought of fruit-flavored dressing. Or spicy, chipotle dressing. Or perhaps dressing that's flavored like your favorite cocktail. Or your favorite dessert. All really interesting ideas if you are only looking for ideas that don't change the current nature of salad dressing, nor the

way it's currently manufactured, packaged, sold or used. But the task was to find new ideas for salad dressing. That challenge was not limited to simply new flavors, but your brain likely limited your thinking to mostly just new flavors.

Here's why incremental ideas tend to be the first (and sometimes the only) kind of ideas to emerge. All humans rely on past knowledge to subconsciously try to shortcut problem-solving. We instantly — and subconsciously — call on everything we know from the past to come up with solutions for the new problem. While this ability to call on past learning is an incredibly useful trait in many situations (it's one of the reasons we're at the top of the food chain), when you're looking for new ideas and solutions, it actually becomes a significant barrier. It limits your thinking to nothing but slight variations of what already exists.

The minute you saw the words "salad dressing," your brain made a bunch of instantaneous assumptions that you're likely not aware of. Those assumptions were probably things like these:

- It's stored in the refrigerator and served cold.
- It's used on lettuce.
- It's liquid.
- Salad is eaten from a bowl or plate.
- Salad is eaten with the fork.

Using the salad dressing challenge again, now assume one of the above "facts" does not have to be true. What ideas could you come up with then? You might think of ideas like these:

- Salad dressing that you heat in the microwave (not cold).
- Dressing for fruit, or for meat (not used on lettuce).
- A powder whose full flavor is activated when it contacts the moisture of the lettuce (not liquid).
- Salad dressing in the form of a wrap, so you can eat the salad on the go. (Salad isn't served on a plate.)
- Salad dressing in the form of an edible skewer. (Salad isn't eaten with a fork.)

As you can see, the nature of the ideas that arise after crushing the embedded assumptions is dramatically different from the ideas

ALL HUMANS RELY ON PAST KNOWLEDGE TO SUBCONSCIOUSLY TRY TO SHORTCUT PROBLEM-SOLVING. ... WHILE THIS ABILITY TO CALL ON PAST LEARNING IS AN INCREDIBLY USEFUL TRAIT IN MANY SITUATIONS ... WHEN YOU'RE LOOKING FOR NEW IDEAS AND SOLUTIONS, IT ACTUALLY BECOMES A SIGNIFICANT BARRIER.

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that came before. That's because your brain is no longer limiting your creativity with artificial guardrails that may not actually exist and that you weren't even consciously aware of.

Interestingly, the more expertise you have in an area, the more of these limiting assumptions you have subconsciously embedded in your thinking. So as an expert in the drain cleaning and pipe rehab field, you likely have many embedded assumptions that you're not aware of but that are likely impeding your creative thinking in a significant way.

THE CURE

Fortunately, there is an antidote to the "Curse of Knowledge." We have to consciously surface and challenge our hidden assumptions.

Step 1 — Surface your subconscious assumptions by generating a long list of statements that start with things like:

- Well, in our business everyone knows...
- We have to...
- Our product is/does/has...
- Well, of course...
- We could never...

Be sure to list some really obvious, superficial, or seemingly trivial "facts," observations, processes, etc. Sometimes breaking the obvious ones can lead to the most innovative ideas. For example, the fact that salad dressing is liquid seems fairly trivial. But breaking that assumption led to some truly breakthrough ideas.

Step 2 — Once you've come up with a long list, pick one that may

not have to be true and start thinking of new ideas based on breaking that one. Then pick another and do it again. And again. You'll amaze yourself with the innovative ideas you come up with.

Remember that the "Curse of Knowledge" is based on experience and expertise. Many people often assume that the best way to get new thinking, new ideas, and new solutions is to bring together a bunch of experts on the topic. But the reality is that all those experts will have a very similar set of subconscious mental frameworks. They'll all have essentially the same "Curse of Knowledge."

A better way to generate new ideas is to invite a few experts, and then several other people with different experiences, knowledge and perspectives. Those non-experts will help force the experts to confront and overcome their knowledge curse.

The "Curse of Knowledge" is a formidable adversary that exists in our brains all the time and hinders our visionary potential. But it's possible to shatter the chains that confine our thinking and unlock the path to visionary breakthroughs. **c**

ABOUT THE AUTHOR

Susan Robertson empowers individuals, teams, and organizations to more nimbly adapt to change, by transforming thinking from "why we can't" to "How might we?" She is a creative thinking expert with over 20 years of experience speaking and coaching in Fortune 500 companies. As an instructor on applied creativity at Harvard, Robertson brings a scientific foundation to enhancing human creativity. To learn more, visit www.susanrobertsonspeaker.com.

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OPTIMAL HYDROEXCAVATION

From understanding the differences in ground conditions to using the right water pressure, hydroexcavator operators can streamline efficiency and ensure job site safety with these best practices // By Chris Thompson

WITH TODAY'S INCREASINGLY COMPLEX and congested underground environments, there is no room for error when excavating or exposing utilities.

Underground professionals know that damaging existing utilities — whether it be fiber, gas, electric, water or sewer lines — can result in dangerous and often costly consequences. To help ensure operator safety and minimize downtime, contractors have turned to vacuum excavators — and often more specifically, hydroexcavators — as their secret weapon on a variety of underground projects.

From ground and soil considerations to ensuring the proper water pressure, following key best practices can help underground construction professionals improve efficiency, increase productivity and maximize job site safety while hydroexcavating.

BEST PRACTICES FOR COMPLEX UNDERGROUND

Damage mitigation is the name of the game in the underground construction industry. In an industry that continues to evolve, it takes a village to keep crews safe. From utility locating technicians to underground construction professionals, everyone plays an important role in damage mitigation.

Not to mention, today's job sites are rarely simple, especially when considering the complicated web of utilities and infrastructure that weave underground. In addition to managing a variety of ground

and soil conditions, hydroexcavators have the power to support work in complex underground environments. Unlike a traditional excavator or trencher that can cause immense disruption, hydroexcavators are much gentler at removing soil and debris when working underground. When exposing utilities, contractors should always keep their nozzle 8 inches away from the utility to prevent damage to both the equipment and utility. Water pressure should be kept below 2,800 psi with the nozzle consistently moving when actively excavating.

When operated according to these best practices, hydroexcavators can be used to expose utilities while mitigating potential damage. On today's underground construction job site, a utility strike or cross bore can be extremely costly and potentially dangerous, so a hydroexcavator is a key job site addition.

BEST PRACTICES FOR VARIOUS GROUND CONDITIONS

Today, most equipment manufacturers design vacuum excavators with both air and hydro capabilities, so operators don't have to choose between the two. For example, contractors can start excavating the ground surface with air and switch to hydro once they reach harder soil formations. With the ability to switch from hydro to air, operators can better adapt to changing job site conditions and stay productive in a variety of ground environments.

When choosing between hydro or air excavation, contractors should consider the job site and soil conditions to ensure



⚡ When exposing utilities, contractors should always keep their nozzle 8 inches away from the utility to prevent damage to both the equipment and utility.

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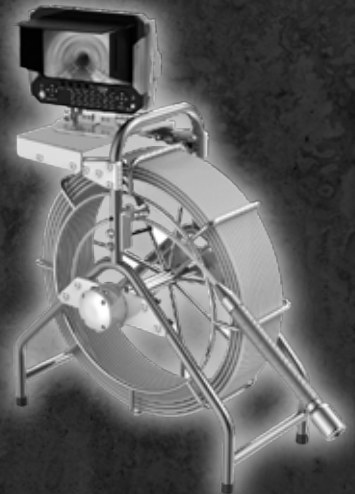
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TECH PERSPECTIVE

» Because hydroexcavation uses pressurized water to do the hard work, it can be used in a range of soil conditions, including tightly compacted and hard soil, cobble and clay.

the method used is the most efficient. For example, pressurized water typically exposes utilities faster than air, however, air is often the better choice for more delicate job sites that are at risk of washout near roadbeds.

Hydroexcavation uses pressurized water to do the hard work. It is the most widely practiced form of soft excavation because it can be used in a range of soil conditions, including tightly compacted and hard soil, cobble and clay. Because hydroexcavation requires operators to dispose of liquid spoils and replenish water sources while on the job site, following best practices for water conservation is important. However, the ability to conquer various soil conditions quickly and efficiently makes hydroexcavation the preferred method for many contractors.



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Air excavation allows operators to break up soil with compressed air and vacuum dry spoils, which can be reused on site as backfill. This method works best on softer soils such as topsoil, sand and some clay formations. Unlike hydroexcavation, which requires access to water, air excavation keeps machines running and operators on the job site

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without having to make trips to acquire water or dispose of liquid spoils. Additionally, many operators are turning to air excavation on job sites as liquid spoils disposal restrictions tighten and certified disposal sites become more difficult to find.

For both hydro and air excavation situations, the recommended pressure for soft excavation is no greater than 2,800 psi. Although many vacuum excavators and nozzles offer higher psi capabilities, too much pressure can damage utilities and other underground infrastructure. The pressure should be reduced even further if using heated water. c

ABOUT THE AUTHOR

Chris Thompson is Ditch Witch's vacuum excavation product manager.

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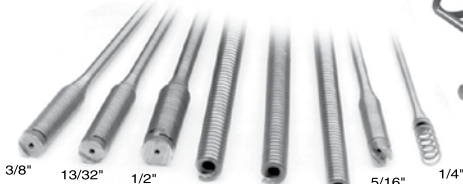
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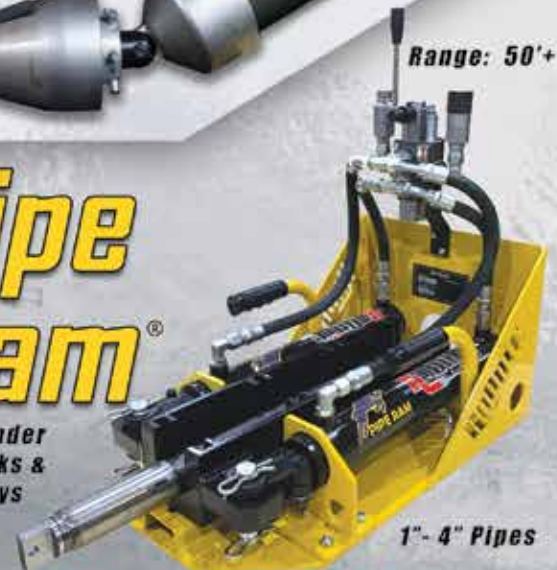
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EVALUATING YOUR SAFETY CULTURE

Injuries and lost days aren't always the best measure of an organization's safety record /// By Ronnie Freeman

FOR MOST COMPANIES, having zero injuries is the ultimate safety goal, but this can be very hard to attain especially when you have hazardous job tasks.

Safety records are often judged by the number of injuries that occur on an annual basis. So when a company does have zero injuries, it's time to celebrate, right? A big pizza lunch for everyone is usually par for the course. Maybe some nice certificates or awards for managers and supervisors. Sounds perfect.

But does that mean you suddenly have a safe environment for your employees to work? Zero injuries does not always tell the tale of a company and its safety culture. Some organizations dissuade employees from reporting injuries thereby creating that zero-injury report that looks very nice on paper. In some cases, they might just have been lucky that no employee got injured despite the hazards that go unnoticed and unaddressed.

FOR AN ORGANIZATION'S SAFETY RECORD TO BE JUDGED YOU CAN'T JUST LOOK AT THE NEGATIVE NUMBERS LIKE INJURIES ... TO REALLY EVALUATE YOUR ORGANIZATION'S SAFETY CULTURE, THERE ARE SOME BEHAVIORS YOU CAN LOOK AT TO GET A BETTER OVERALL PICTURE.

I have long thought that for an organization's safety record to be judged you can't just look at the negative numbers like injuries to determine whether your track record is excellent or poor or somewhere in between. Safety numbers are often viewed in poor light because you're dealing with the number of injuries, days away from work, restricted duty days, OSHA recordables, workers' compensation cases and many others that all have a negative connotation. If those numbers are high, you must obviously have a poor safety culture. So when the numbers are zeroes, it is easy to understand why you want to celebrate and in some cases you should.

But to really evaluate your organization's safety culture, there are some behaviors you can look at to get a better overall picture of what's happening:

1. Do employees keep their work areas clean and free from hazards?
2. Do employees feel comfortable reporting hazards or bringing up safety concerns with managers and supervisors?
3. Do employees feel free to address safety hazards in their workplace?
4. Do employees feel free to report workplace injuries without fear of retribution?
5. Do managers and supervisors encourage employees to attend safety training?
6. Is safety training conducted regularly within your company and is it up to date with OSHA regulations?
7. Are workplace and job site safety inspections within your company a regular occurrence?
8. Are company equipment, tools and vehicles required to undergo regular maintenance and inspections?
9. Does your company have a safety committee that can address safety issues and concerns?
10. Is upper management supportive of initiatives to improve your safety culture including the costs necessary to implement changes?

Getting to zero injuries is certainly a worthwhile and attainable goal to strive for. However, the effort being put into reaching that goal is truly how an organization should be evaluated regarding its safety culture. **c**

ABOUT THE AUTHOR

Ronnie Freeman is safety director for Mount Pleasant Waterworks and Safety Committee chair for the Water Environmental Association of South Carolina.

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HYDROEXCAVATION AND INDUSTRIAL JET/VAC SERVICES, SEWER NOZZLES

By Craig Mandli

» CLEANING NOZZLES

1 // ENVIROSIGHT JETSCAN

Envirosight's Jetscan wireless, HD video nozzle system streams video footage straight to a tablet post-cleaning. This footage can be offloaded wirelessly or via a USB connection. Using it means operators don't have to clean blindly and can conclusively document that a line has been adequately cleaned. It provides an inexpensive solution to assess pipe condition and cleaning success, eliminating repeated callouts and wasted resources. This video nozzle system includes features for ease-of-use and increased efficiency: tool-free sleds of varying sizes for simple deployment in a variety of lines, wireless charging and an app-based tablet interface making it easy to view, annotate and share footage. 866-927-5634; www.envirosight.com



2 // ENZ USA 10.125TR TURBINE

With operating flows as low as 13 gpm at 2,000 psi, the Enz USA 10.125TR Turbine nozzle is a powerful cleaning tool. The turbine design allows for lower flow and less water usage while still maintaining high torque for effective pipe cleaning in lines ranging from 5 to 12 inches. Because of its sealed bearings, this nozzle can be operated with both clean and recycled water while being relatively maintenance-free. This compact, efficient nozzle is a powerful root remover and conquers grease, solids, mineral deposits, concrete and grout. Its complete kit offers a selection of pre-cut chains, skids and two head styles to competently clean pipes efficiently. 877-369-8721; www.enz.com



3 // HYDRA-FLEX MARKSMAN

With controlled flow of over 20 feet, the Marksman from Hydra-Flex provides long-distance cleaning for hard-to-reach places. Its powerful impingement force works to completely clean solid and grease buildups at long distances while simultaneously reducing potential damage to electrical components. This nozzle is ideal for cleaning lift stations, manholes and tanks as operators no longer need multiple lances to extend distance or to lower themselves into confined spaces exposing them to hazardous substrates. Its low-flow design reduces water consumption and job duration with a flow rate range of 4.8 to 17.4 gpm and an inlet pressure range of 500 to 2,500 psi. The stainless steel housing extends the nozzle's life and makes it lightweight and highly durable. 952-808-3640; www.hydrflexinc.com



» HYDROEXCAVATION EQUIPMENT

4 // ALL JETTING TECHNOLOGIES PARKER HANNIFIN TOUGHJACKET

Parker Hannifin TOUGHJACKET water blast hoses, distributed by All Jetting Technologies, are designed to eliminate the need for an additional PVC sleeve and reduce the hose weight by up to 16%. This allows for ease of handling, improved productivity and reduced operator fatigue. They have polyurethane jackets, are tested to DIN EN 1829-2 standards and exceed the abrasion resistance and durability of standard PVC-covered assemblies by more than 100%. ColorGard technology means the primary hose jacket is a different color than the



abrasion-resistant WJTA-compliant colored outer jacket to provide easy visual identification of abrasion issues, allowing for efficient inspections and reducing unscheduled downtime. 772-286-1218; www.alljetting.com



5 // DITCH WITCH WARLOCK W12

The Warlock W12 from Ditch Witch is a PTO-driven vacuum excavator that offers dual 600-gallon saddle tanks and a 12-cubic-yard debris tank, bringing increased capacity and performance to the job site. Available with a 5,000 cfm blower and 27 inches Hg of vacuum power, it helps operators take on bigger jobs and maximize job site uptime. 580-336-4402; www.ditchwitch.com

6 // DYNABLAST PRATISSOLI KTX SERIES

The Pratisoli KTX Series water pump, distributed by Dynablast, is designed for hydroexcavation. The KTX24ASPF offers 13.5 gpm at 3,625 psi and 1,450 rpm and the KTX28ASPF offers 18.4 gpm at 2,900 psi and 1,450 rpm. Its T13 female spline shaft input and SAE B 2/4 bolt flange enable direct mounting to the hydraulic motor. It has run dry seals with a Kevlar Graphite rope, a 420 stainless steel manifold for protection from cavitation, and a self-lubricating design so that no oiler kit or weekly oiling is required. Its symmetrical crankcase makes it easy to reverse shaft the pump. Internal fins on the aluminum crankcase provide cooling to lower oil temperature. A tapered roller bearing improves lateral loading. The two-bore ceramic plungers are thicker ceramic on the water end to prevent thermal shock. 905-867-4642; www.dynablast.ca/product/hydrovac



7 // HI-VAC X-13

Contractors, municipalities and utility service providers depend on Hi-Vac X-13 hydroexcavators to safely and efficiently trench for new sewer and wastewater lines with minimal disturbance to surrounding areas. They combine surgically precise hydroexcavating power with low-maintenance components that help minimize downtime. Simple, intuitive controls and quick access to all critical systems mean jobs get done faster. A 13-cubic-yard debris tank, up to 24,500-pound payload capacity and 1,140-gallon freshwater capacity help reduce the number of costly job site returns. Power is provided by a 5,800 cfm, 27-inch Hg high-performance blower and a run-dry water pump that delivers 20 gpm at 2,500 psi. The 360-degree, top-mounted boom provides full accessibility in every direction, and a heavy-duty hydraulic vibrator provides fast and efficient unloading of the debris body. Designed for safe and easy operation, it only requires a short learning curve. 800-752-2400; www.x-vac.com



8 // RIVAL HYDROVAC T7 TANDEM

The T7 Tandem from Rival Hydrovac was designed primarily to be loaded with debris and drive within legislated road limits with most types of debris on board. Standard features include a scale that reads real-time weights both in the cab and on the wireless remote to confirm weights prior to travel. The operating system is engaged through one PTO switch. The remainder of the operation occurs from the rear panel or the wireless remote. The truck uses high-performance components and will dig at levels competitive to large units, according to the maker. 403-550-7997; www.rivalhydrovac.com



PRODUCT FOCUS

9 // SEWERPROSHOP RAVEN

The Raven hydroexcavation nozzle from SewerProShop has been precision engineered by Intersewer and manufactured to the highest technical standards of ISO 9001:2008 certification in Germany. The weight counteracts the high-pressure kickback of the wand. It is constructed from high-grade stainless steel, is threaded and includes a replaceable ceramic nozzle insert with forward water jet angled at zero degrees or a fan jet. It is rated for 18 gpm at 4,000 psi up to 80 gpm at 2,500 psi. It includes a 1/2- to 1-inch sewer hose connection. It is operator-friendly with no maintenance required. 877-864-9394; www.sewerproshop.com



10 // SUPER PRODUCTS MUD DOG 700

Mud Dog 700 vacuum excavators from Super Products are designed to meet the challenges of compact, urban projects as well as large-scale excavation projects. They offer a compact footprint for excavation in urban environments while maximizing payload and maintaining the power and precision that larger units offer. The unit features a 7-yard debris body and 600-gallon water tank. This model comes standard as a dump body with an electric vibrator offering a 50-degree dump angle with the capability of dumping into a 48-inch container. Additionally, it is equipped with a rear-mounted, extendable, 8-inch-diameter boom that reaches 18 feet, has 270-degree rotation and pivots 10 degrees downward, which minimizes job site restoration and eliminates traffic congestion near roads. 800-837-9711; www.superproducts.com



11 // TRUVAC ABRASION RESISTANT ELBOW

The Abrasion Resistant Elbow from TRUVAC is a 70-degree boom elbow developed for demanding vacuum excavation jobs. Embedded with noncorroding carbide steel, the interior of the elbow is engineered for maximum wear resistance. It is retrofittable to all full-sized TRUVAC HXX vacuum excavator models with an 8-inch telescopic boom. 815-672-3171; www.truvac.com



12 // VAC-CON MUDSLINGER MS800

The Mudslinger MS800 trailer-mounted hydrovac from Vac-Con is designed to provide the same power, suction and capacity of a truck hydroexcavator on a portable, pull-behind trailer. It includes the choice of Tier 4 diesel or gas engine options providing up to 1,190 cfm and 16 inches Hg with a PD blower and 325 gallons of water. It has an 845-gallon debris tank and a 9-foot boom with 24 inches of hydraulic extension providing a full range of motion. It is designed to be a standalone unit but can also provide support to construction, HDD and public utility fleets. A variety of applications include daylighting, potholing, culvert and manhole cleaning, and utility locating. 904-284-4200; www.vac-con.com



13 // VACALL ALLEXCAVATE AND ALLEXCAVATE2

Vacall AllExcavate and AllExcavate2 machines feature standard intelligent controls and easy startup operation. Both models are designed to efficiently remove dirt around utility lines and foundations. Water pumps generate 24.5 to 120 gpm and pressures to 3,000 psi. The AE2 model adds air excavation at 185 cfm and dual psi of 110 and 150. Water system, wand, control panel, tools and worker apparel are protected in a heated compartment. An AllSmartFlow CAN bus control system features a programmable LCD display that monitors engine, water flow, air pressure and vacuum performance for precise boom and reel adjustments. Aluminum water tanks with lifetime warranty carry 1,000 to 1,300 gallons. Galvanized debris tanks have a supreme finish and are available with 8-, 10- and 13-cubic-yard capacities. They use one engine to power the chassis and excavation functions, designed to reduce service and operation costs. 800-382-8302; www.vacall.com





» JET/VAC COMBO UNIT
14 // VERMEER JTV PTO

The Vermeer JTV PTO vacuum excavator/jetter is equipped with an 800-gallon debris and 400-gallon water tank. The PTO of the truck drives the positive displacement vacuum blowers that produce 1,000 cfm. The truck's jetter is capable of producing 15 gpm at 3,000 psi and comes with 425 feet of 1/2-inch hose on an electric self-retracting hose reel. All components are controlled from the truck, eliminating the extra weight, space, and cost of the pony motor. The rear hydraulic claw door has an over-center locking mechanism for a no-fuss positive lock and unlock. An optional hydraulic boom is available with full six-way function, wireless remote with vacuum valve operation, 330-degree rotation, remote water jet for ease of clean-out, and a 5-inch hose with quick connect to 4-inch tooling. It is built on a Ford chassis. 352-728-2222; www.vermeer.com



» ROOT CONTROL EQUIPMENT
15 // ARTHUR PRODUCTS CNT-R-KUT G2 EMAX2

The Cnt-r-KUT G2 EMAX2 from Arthur Products is an interchangeable cutter nozzle to clear roots and debris. The centering devices can be modified for custom applications. They help operators tackle tough jobs, including when using drain cleaning nozzles in tight spaces in damaged sewers. Technicians can expect to achieve maximum cleaning spread in drains and other pipes, according to the maker. 800-322-0510; www.arthurproducts.com

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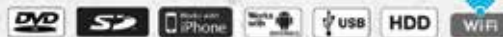


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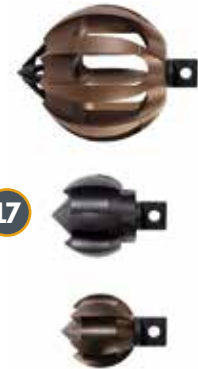
16 // DURACABLE DM55

When up against a sewer line that's been infiltrated by tough tree roots, the DM55 machine from Duracable can be used. With the versatility to clear obstructions from 2- to 10-inch lines, it is suitable for municipal, commercial and residential work. The direct-drive 10-1 gear box ratio provides all the torque needed to tackle heavy roots. A power cable feed and return on this machine makes it easy to use. It comes standard with 110 to 150 feet of 11/16-inch hollow-core cable in a 26-inch reel, but the user can switch to 3/4-inch cable when needed. Duracable's lineup of tough, heat-treated and coated blades make it ready for any root removal job. 800-247-4081; www.duracable.com



17 // GENERAL PIPE CLEANERS CLOGCHOPPER

The ClogChopper cutting tool from General Pipe Cleaners has six self-sharpening blades that dig into encrusted debris and root masses, easily grinding up stoppages, scale and crystallized urine, without risking pipe damage. The spherical design maneuvers around tight bends and traps, thoroughly and safely cleaning metal, plastic and clay pipes. It is available in 1-, 1 1/2-, 2-, 2 1/2-, 3- and 4-inch sizes, and is ideal for downspouts to drain lining and all jobs in between. It can negotiate multiple, tricky bends, clearing clogs and scraping encrusted debris from inner walls in one operation. It is durable enough to handle years of demanding use and also self-sharpens while working. Connectors are available for most popular brands of drain cleaning machines. 800-245-6200; www.drainbrain.com



18 // ROOT RAT CUTTING NOZZLE

Root Rat cutting nozzles are used with jettors from 11 hp to large truck-mounted models. The cutters are made of hardened stainless steel and come with a toolbox with two interchangeable rotors — one with cables and the other with chains. The combination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes for under \$10 in parts. 800-288-7873; www.rootrat.net



19 // USB-USA TURBO CHAIN CUTTERS

The heavy-duty Turbo Chain Cutter series from USB-USA are tough and powerful. These cutters continuously adjust from 8- to 15-inch (Turbo S200) or 12- to 24- inch (Turbo S600) and easily fit into the pipe. Turbine technology powers the durable chain retainer on a robust body to remove roots, concrete, calcium deposits, hardened grease and tuberculation from sewer lines. They are designed to be very aggressive for the hardest materials. The beefed up, heavy-duty cutters have double the amount of turbine driving water jets as the company's other cutters, generating tremendous cutting power. Easily adjust the cutter to within 1/16-inch by spinning the rear to make it larger or smaller. Internal 3D fluid mechanics in conjunction with one-piece ceramic nozzle inserts allow the cutter to be used with recycled or clean water. 844-285-5770; www.usb-usa.com





20

» SAFETY EQUIPMENT
20 // PROCOM HEADSETS

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21

» TRUCK/TRAILER JETTERS
21 // AMERICAN JETTER 58 SERIES INFERNO BURNER HOT JETTER

The 58 Series Inferno Burner Hot Jetter from American Jetter offers up to 67% more efficient heat over traditional burners, according to the maker. This fuel-saving hot-water system provides power for grease cutting and deicing, utilizing a 38 hp EFI Kohler gasoline engine with flows up to 20 gpm and pressure to 5,000 psi. The rear speed control reel provides precise cleaning speeds and easy access to the jet hose with the included hose guide. Low-water shut-off stops the engine if the 220-gallon tank runs low. The optional 1-mile open range wireless remote has water ON/OFF, engine shutdown and hose reel control. The heavy-duty square tubing trailer has a 2-inch ball coupler and standard electric brakes. 866-944-3569; www.americanjetter.com

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22 // CAM SPRAY 3012H COMPACT SKID MOUNT JETTER

The 3012H Compact Skid Mount Jetter from Cam Spray is designed for a high cube van or pickup bed and takes up as little space as possible while providing 12 gpm at 3,000 psi. Features include a Honda iGX800 fuel-injected gasoline engine with oil alert and hour meter, powering a gearbox-driven plunger pump with ceramic plungers, stainless steel valves, pressure gauge and 80-mesh water filter. The pump is protected by an unloader valve and secondary pop-off. A power pulse feature is used for navigating longer runs and elbows. The 100-gallon tank includes low-water shut-off and a float valve to manage filling. An industrial-coated skid platform and frame allows transfer among vans, trucks and trailers, while mounting flanges and D-rings allow the machine to be fastened or tied down. The machine measures 52 inches long by 41.5 inches wide by 50 inches tall. 800-648-5011; www.camspray.com



23 // GAPVAX G7 JETTER

The G7 Jetter from GapVax is built on a heavy-duty, contractor-grade NATM-certified trailer. Several engine choices, including Cummins diesel, are certified and sized appropriately for the water pump combinations. The unit's hose reel is hydraulically powered with a direct-drive gearbox and variable-speed control. The hose reel offers a 3-foot (curbside) articulation from center of bearing, 180-degree rotation and a capacity of 800 feet of 3/4-inch jetter hose. The polyethylene plastic water tank is available in 300, 500, 600 or 700 gallons. The water pump is center-fed for optimum performance. The controller is interlocked with safety features that will show low fuel levels and low water, and is capable of a complete engine shutdown in an emergency. 888-442-7829; www.gapvax.com



24 // HOTJET USA DRAIN LINE CLEANING BUSINESS PACKAGE

For drain line cleaning professionals looking to start or expand their jetter division, the HotJet USA Drain Line Cleaning Business Package includes a HotJet II trailer jetter that offers 10 gpm at 4,000 psi with a 35 hp engine. Including everything needed to clean drains from 2 to 12 inches with hot or cold water, the package comes with a choice of a handheld or roll-around electric jetter, inspection camera and locator. It also includes safety and operational training. A cold water drainline cleaning business package is also available. 800-624-8186; www.hotjetusa.com



25 // JETTERS NORTHWEST BRUTE JETTERS SKID-4009 AND SKID-3012

Brute Jetters SKID-4009 and SKID-3012 from JETTERS NORTHWEST provide trailer-sized power in a compact skid package that mounts to a truck, van or trailer. Available at either 9 gpm/4,000 psi (SKID-4009) or 12 gpm/3,000 psi (SKID-3012), they have the power to run root-cutting nozzles such as the Reaper, Warthog and Bulldog. Compact water-tank skids are available in 100-, 150- or 200-gallon sizes which easily couple to Brute Jetters. Fuel-injected engines provide choke-free electric-starting and work with an optional wireless remote control that controls jetting on/off and engine on/throttle/off. They also feature panel-mounted controls to allow handy operator-access, a 12-volt power-reel holding up to 400 feet of jetting hose (300 feet standard), adjustable pulsation control and four jetting nozzles. An optional wheel-kit is available for increased portability. 877-901-1936; www.jettersnorthwest.com



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PRODUCT FOCUS



26 // MONGOOSE JETTERS BY SEWER EQUIPMENT MODEL 184

The Mongoose Jetters by Sewer Equipment Model 184 comes with a run-dry pump offering 18 gpm at 4,000 psi, a tubular steel frame, corrosion-resistant repainted subassemblies, state-of-the-art controls, strong hose reel and high-quality gas engine. It is suitable for drain cleaning and sewer jetting, remote access locations, mainlines up to 12 inches in diameter, and commercial and industrial lines. The trailer unit comes with a water tank capacity of 300 gallons and standard hose reel capacity of 600 feet of 1/2-inch hose. The trailer setup consists of a 6,000-pound-rated single-axle trailer, and the addition of a wireless remote control system makes this equipment a true one-person operation. It is also available as a van pack or truck-mounted unit. 815-835-5566; www.sewerequipment.com

27 // MYTANA ROM COMPACT JETTERS

MyTana offers two compact ROM-built truck-mounted jetters suitable for house connections and light industrial work. Both models fit medium-duty commercial vehicles and deliver 15 gpm at 4,000 psi for work in lines up to 24 inches. The smaller Economic has a hydraulic hose reel that swivels 225 degrees and holds 300 feet of 1/2-inch hose. A second reel is for a water fill hose. The EcoFit features three reels. Two hydraulic hose reels swivel 270 degrees along with the control panel, each with a hose entry guide. The main reel has 300 feet of 1/2-inch hose but could hold up to 550 feet. The second reel can hold up to 300 feet of 1/2-inch hose. A third reel houses the water fill hose. Both models include a handheld remote control unit and pulse action. 800-328-8170; www.mytana.com

28 // SPARTAN TOOL WARRIOR

With fiberglass casing to protect and silence the entire machine, Spartan Tool's Warrior trailer jetter provides 4,000 psi at 18 gpm to clear almost any line, according to the manufacturer. The 180-degree pivoting hose reel and optional four-function remote control allow technicians to handle the tightest spots. With pulsation and a full antifreeze system, it is designed to remove tough clogs in any weather. Its design includes room to customize it with a company logo and colors, and it provides a 300-gallon towing capacity. 800-435-3866; www.spartantool.com

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PRODUCT SPOTLIGHT

MILLING MACHINE PROVIDES MORE POWER FOR TOUGHER JOBS

By Craig Mandli

Milling machines have become essential tools for fast and efficient cleaning. This includes many of the obstacles sewer cleaning crews face on a daily basis, such as soft blockages, scale and calcium buildup, tree roots and concrete deposits, as well as failed liners and pipe imperfections. One of the newest milling machines on the market — the Maxi Power+ from Picote Solutions — is designed for even higher performance cleaning, liner removal, and cutting/reinstatements in larger-diameter pipes.

“It provides nearly double the power of our next biggest machine — the Maxi Miller — and operates between 500 to 1,500 rpm,” says Ryan Bolden, global learning solutions director for Picote Solutions. “It has a working range of 60 feet, but that can be lengthened to a maximum range of 132 feet with extensions to the 3/4-inch shaft. It is an extremely powerful machine that excels in even the toughest situations, but it is still easy and safe to operate thanks to its unique safety features.”

According to Bolden, these safety features include a protective outer-shaft casing, operator presence foot control, electric safety clutch, internal GFI and an emergency stop to help keep operators and their equipment investment protected. Due to the increased power it provides, Bolden suggests that the unit should only be run off a 400-volt, three-phase Picote generator or a comparable unit.

“I recently spoke to one of our U.S. contractors about the Maxi Power+, and he described it as a big specialty machine with serious



torque that is great for laterals and mainlines over short distances,” Bolden says. “It’s affordable compared to some high-pressure water solutions for heavy-duty cleaning. This allows for faster payback on the investment.”

Bolden says that, according to that particular contractor, the unit works well for concrete and liner removal, as the contractor himself removed more than 100 feet of concrete liner in 8-inch sewer pipe using it. It’s also ideal for waterlines to remove buildup and other industrial projects.

“We believe that the Maxi Power+ is a powerful, unique solution for those projects that often don’t have other options,” Bolden says. “Simply mount the generator on the back of a truck and you’ll always be ready when a job comes up.” **864-940-0088; www.picotegroup.com**

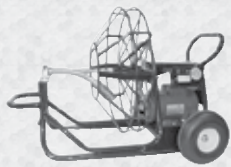
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RTD100-200SX	25.0	94.6	2900	200	49.8	32	42	3	128
RTD130-160	32.0	121.1	2300	160	50.5	36	42	3	128
RTD130-200H	34.5	115.0	2900	200	68.0	36	42	3	128
RTD160-130	40.0	151.4	1850	130	50.8	40	42	3	128

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RTX85	21.0	85.0	2200	200	31.7	30	28	1	72
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INDUSTRY NEWS

Sewer Equipment celebrates 82 years

Dixon, Illinois-based Sewer Equipment is celebrating 82 years of business this year. The company began in 1941 in a garage in Park Ridge, Illinois, by H.T. O'Brien with a simple idea of a tool to unclog kitchen sinks. In the 1970s, the second generation of the O'Brien family developed several machines in Chadwick, Illinois. The company has continued to evolve, developing safe, simple and reliable solutions for municipalities, plumbers and industrial contractors. This past June, Sewer Equipment manufactured its 10,000th unit, a Sewer Equipment Co. of America Model 900 ECO combination sewer cleaner truck, a production milestone highlight.

RIDGID employees donate food and personal care items

RIDGID, a part of Emerson's professional tools portfolio, and its employees donated more than 400 food and personal care items to Elyria, Ohio-based Pioneer Freedge as part of a donation drive sponsored by Mosaic, an Emerson employee resource group focused on serving the community, celebrating diversity and creating an inclusive work environment for people working away from their home location. The Freedge, located at the Elyria Public Library South Branch, is a place where people can leave surplus food items for others to take, reducing food waste and promoting community connections. **c**

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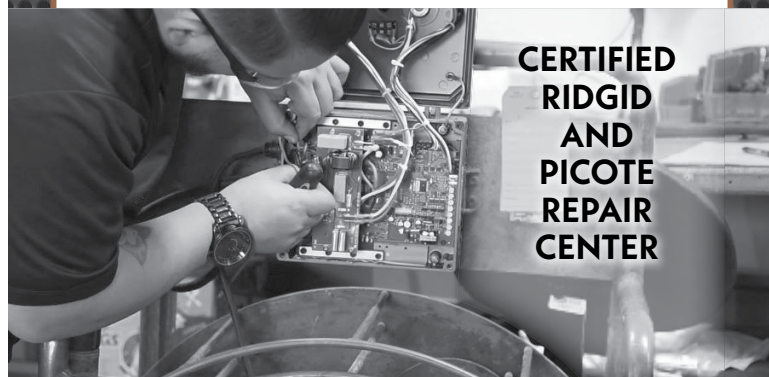
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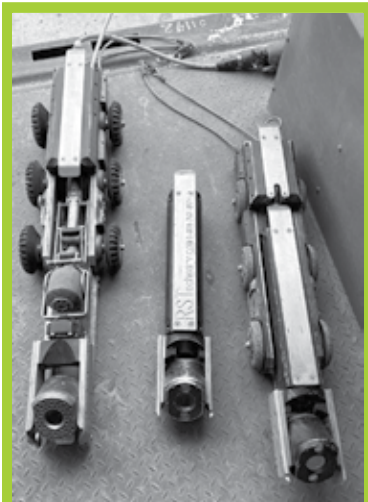
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