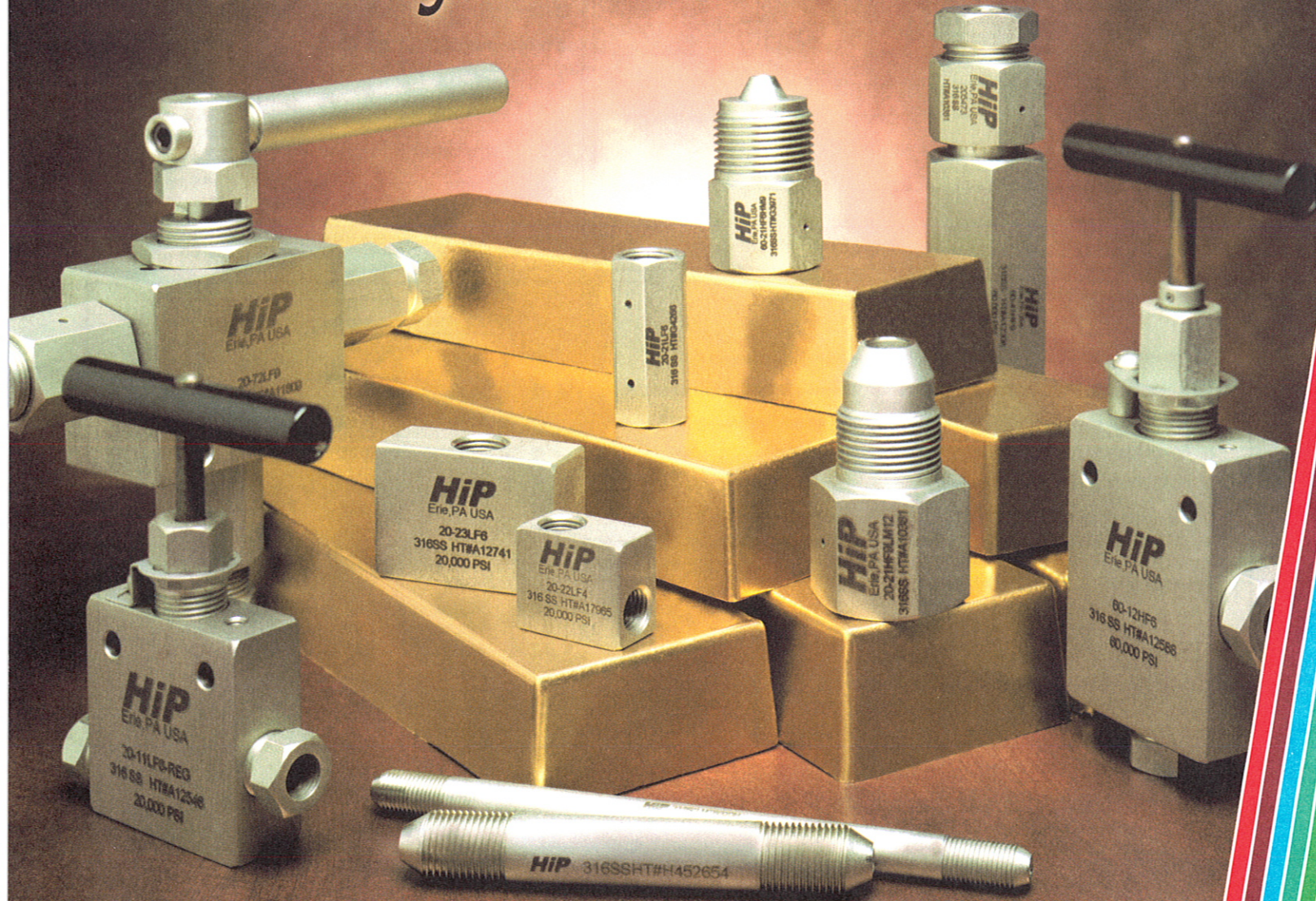


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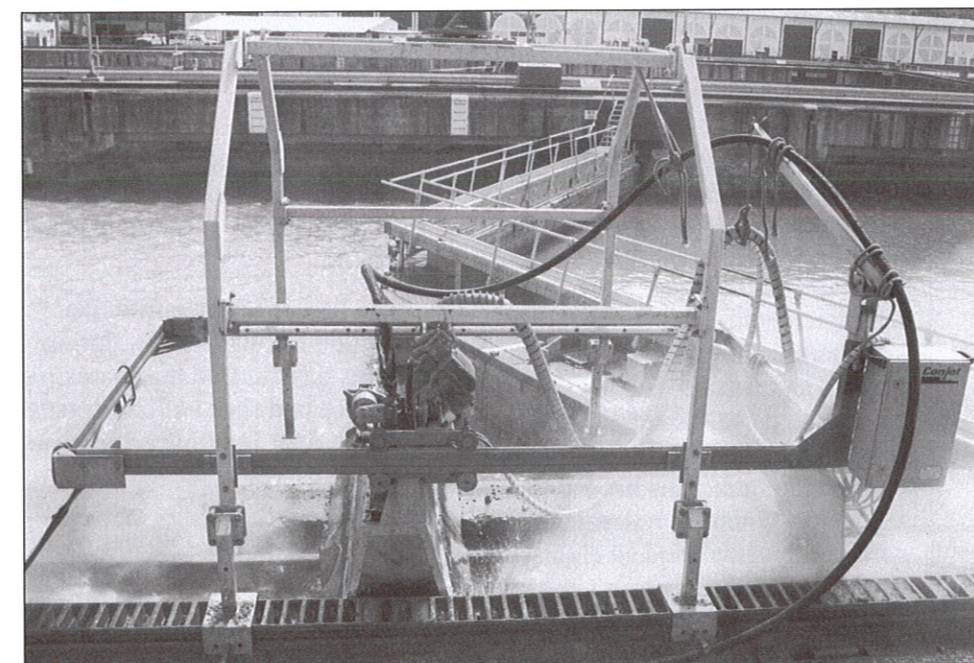
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Hydrodemolition On The Panama Canal



Locomotives running on a rack-and-pinion tow-track guides vessels through the lock at the Panama Canal.



The Conjet equipment cuts out a trench alongside the lock edge and blasts away concrete between the tracks.

See article on page 2.

Hydrodemolition On The Panama Canal, from page 1

Conjet hydrodemolition equipment is playing a key role in removing concrete and assisting with the replacement of the Panama Canal's special tow-track rail system. The track is used by powerful electric rack and pinion drive locomotives to assist in towing and guiding ships through the canal's three sets of twin lane locks. The "Autoridad Del Canal De Panama" (ACP), Panama Canal Authority, which has the exclusive charge of the canal's administration, management, operation and maintenance, is responsible for removing the 16,188 m of worn out tow track, which runs along the tops of the lock walls, and replacing with a new, stronger system to cater to the increase in canal traffic and high loadings from the locomotives.

The ACP Locks Track & Structural Maintenance Unit is supervising the tow track modernisation program. The ACP is using a pair of Conjet Jetframe 122 hydrodemolition machines to accurately cut out the old concrete between the waterside rail and edge of the locks and between the twin rail's supporting steel crossties, prior to taking out sections of the worn out track.

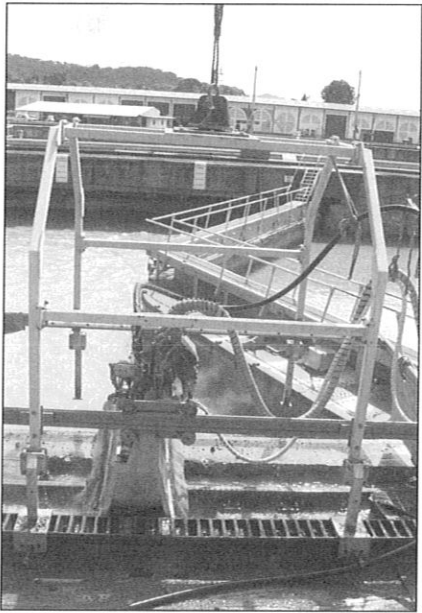
The 80km long canal, joining the Atlantic and Pacific Oceans, was cut through the narrowest part of the isthmus joining North and South America between 1904 and 1914. It uses a system of three sets of dual lane locks to raise ships 26m from the level of the Pacific or the Atlantic to the level of Gatun Lake to navigate the channel through the Continental Divide. The Gatun lock, on the Atlantic side, has three separate chambers each 33.5m wide by 305m long, while the Pedro Miguel and Milaflores locks on the Pacific side, have respectively one and two chambers of the same size.

The 197,000m³ of fresh water, used to raise and lower vessels through each lock, flows by gravity from

Gatun Lake through a system of tunnels and culverts under the lock chambers and eventually into the sea. Up to eight 580hp(432kW) locomotives, each with a towing capacity of 311kN at 4.8km/h, assists in guiding and towing each vessel with steel wire ropes through a set of lock chambers. The canal has approximately 9,000 employees and operates round the clock, 365 days a year, handling between 13,000 and 14,000 vessels annually.

The unique tow-track system has twin rails, which together with the central raised rack to engage with the locomotives' pinion drives, are supported on steel crossties and embedded in concrete. The original track was initially designed for loads of 41t on the waterside rail, which, being nearest the edge of the locks, has to accommodate the highest forces. But increase in canal traffic and weight of the ships, since it was opened in 1914, has needed heavier and more powerful locomotives, which has increased the load on the waterside rail to 85t in 1965 and to 92t in 1996.

Under a continual maintenance program the track system was modified three times: during the 1960s, 1980s and again in the 1990s. This included complementing the original track's steel crossties with additional short intermediate supports under the waterside rail, replacing some of the original crossties, replacing some and improving the specifications of the central rack, changing the rail section from 90lb to 105lb and replacing the fish-plated bolted rail connections with thermically welded joints. But the increase in the forces and loadings has caused extensive cracking of the surrounding concrete along the entire tow-track system. This has led the ACP into a complete redesign of the worn out tow track and an eight-year major reconstruction project costing an estimated US\$121M, which is part of



ACP's two Conjet Jetframe 122s have proved ideal for removing concrete from around the damaged tow track.



The computer-controlled Conjet Jetframe hydrodemolition equipment is remotely operated.

a current US\$1 billion capital investment and modernization program to cater to a 20% increase in canal traffic.

The loss of revenue from the reduction of canal traffic, during repairs, has dictated the reconstruction sequence and speed of construction, with the ACP focusing on reducing the partial closures of the locks to a minimum. Some of the very largest vessels have to pay toll fees of up to US\$200,000 to navigate the canal.

(continued on page 7)

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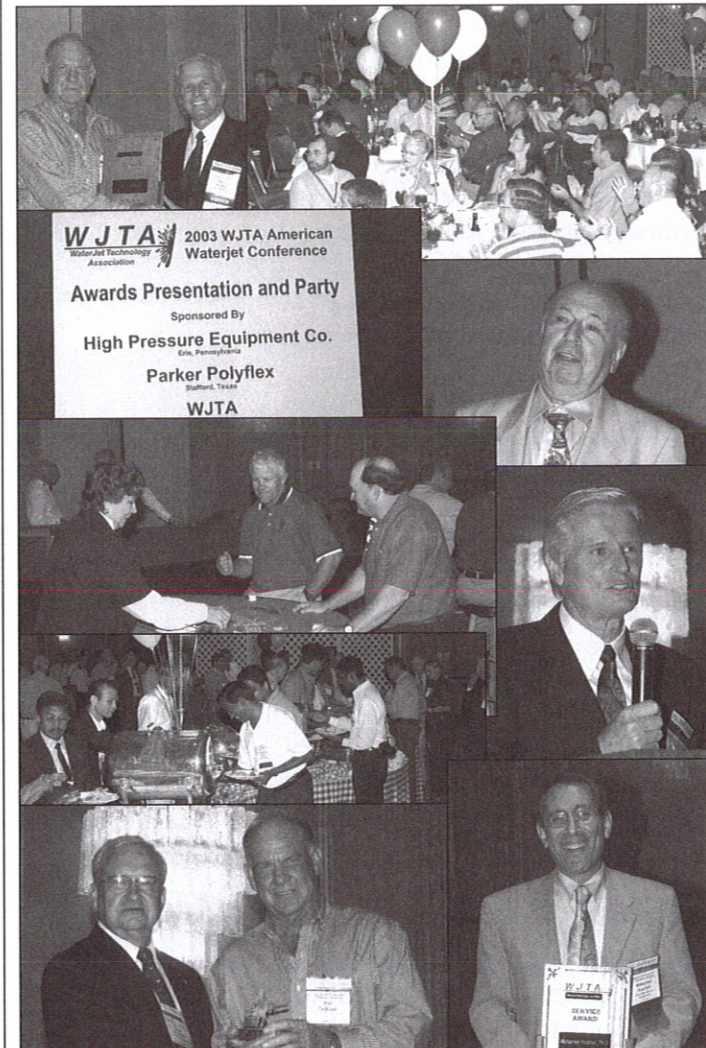
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Awards Presentation and Party, from page 6



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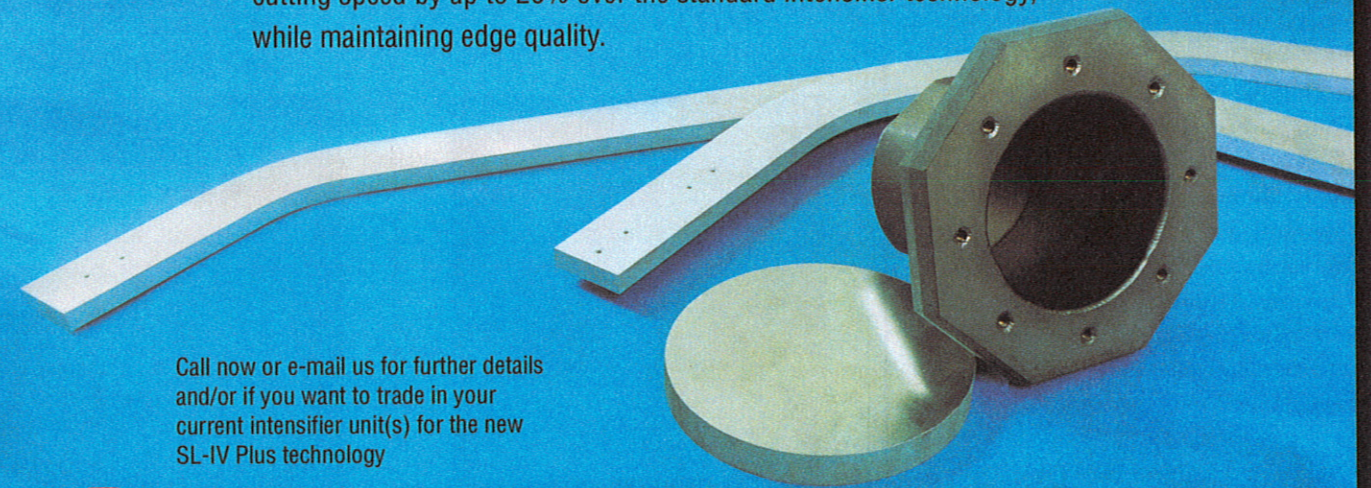


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Ingersoll-Rand Waterjet Acquired By Swedish Firm

Karolin Machine Tool (KMT) has recently signed an agreement with the **Ingersoll-Rand Company** to acquire the Ingersoll-Rand Waterjet business. The deal is expected to be consummated shortly, pending approvals by shareholders and legal authorities. The acquisition includes all the assets of the Ingersoll-Rand Waterjet business as well as the 49% holding in the ABB I-R Waterjet Systems AB in Ronneby, Sweden. The Ingersoll-Rand Waterjet business will, after the deal has been approved, be known as KMT Waterjet. "Finding a new home with KMT will not disrupt the current business model, which has left an indelible print and a legacy of success on the market," says Duane Johnson, current Ingersoll-Rand Waterjet's General Manager and future KMT Waterjet's President. KMT Waterjet will continue to leverage its world-wide cadre of premier OEMs and the Swedish-based Joint-Venture, to ensure end users get the highest returns on their waterjet system investment.

Ingersoll-Rand Waterjet, headquartered in USA, is a leading manufacturer of ultra-high pressure waterjet cutting technology, and has earned the highest reputation in the automotive and industrial markets worldwide. The Ingersoll-Rand Waterjet business, otherwise known as IR Waterjet, has operated successfully as an autonomous business unit within Ingersoll-Rand Company since 1963. To ensure continuity of high quality customer satisfaction and operational and service efficiencies, the business will be run by the current and highly experienced management team.

Karolin Machine Tool (KMT), headquartered in Stockholm, Sweden, markets, develops and manufactures advanced production machines and system solutions for the engineering

industry within the precision grinding, metal working and tube forming markets. With the addition of waterjet technology KMT now has the full line of capabilities and solutions in the areas of cutting, pressing, punching and grinding.

KMT Waterjet will continue in the development, manufacture and supply of high pressure technology including Streamline intensifiers, Autoline abrasive cutting nozzles, high cycle life on/off valves, and genuine replacement high pressure aftermarket parts. According to Lars Bergstrom, KMT's CEO and President, "The acquisition of Waterjet, which is consistent with KMT's strategic direction, gives KMT Waterjet new growth opportunities while continuing to service our installed base." The current Ingersoll-Rand Waterjet's General Manager and future KMT Waterjet's President, Duane Johnson, commented, "I see this as an exciting time for KMT Waterjet employees

and our customers, and we plan to continue to increase our high pressure knowledge and expand the products and services to meet the future needs of the waterjet community."

Invitation to Press Conference

KMT Waterjet is extending an invitation to a press conference on Monday November 17, 2003, at 11:00 a.m. The press conference will be held at the Fabtech International Conference, McCormick Place, Chicago, Illinois, Booth number 15156.

For more information, please contact: Lars Bergstrom, KMT CEO and President, tel: [46](0)8 594 21150 or [46](0)70 240 5235, website: www.kmt.se; Duane Johnson, Ingersoll-Rand Waterjet's General Manager and future KMT Waterjet's President, tel: (419)633-1300 website: www.kmtwaterjet.com and www.irwj.com

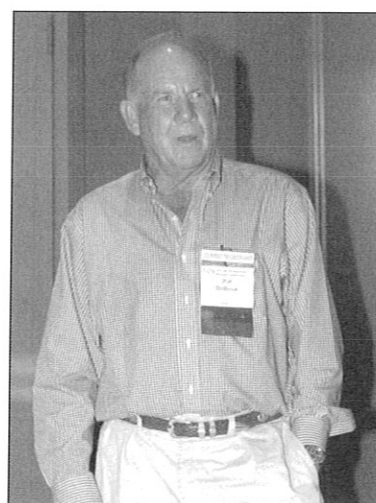
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Pat DeBusk Receives 2003 Pioneer Award



High Horsepower Pump Is Convertible And Mobile

The new NLB 331 Series high pressure waterjet pump offers high horsepower in a mobile unit, and is easily convertible to various operating pressures. This combination of power (330-hp diesel engine) and flexibility makes the unit suitable for a wide range of product removal and surface preparation jobs.

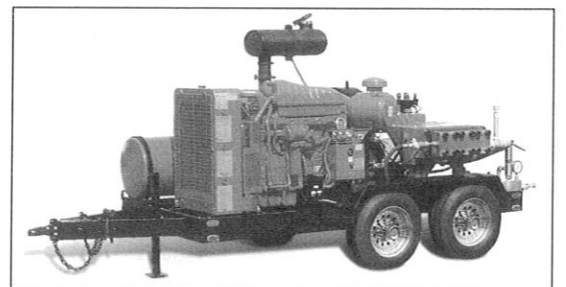
The NLB 331 Series features a quick-change fluid end that lets users choose any of five pressures, from 8,000 psi to 20,000 psi (552 to 1,400 bar). Flows range from 24 – 58 gpm (91 to 219 lpm). All fluid end conversion parts fit easily in a handy case.

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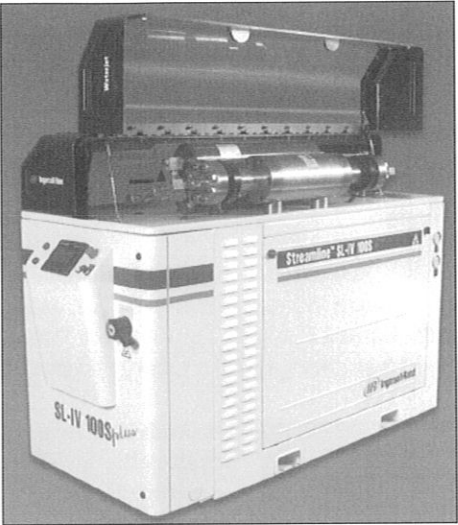
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(continued on page 22)

KMT Secures Ingersoll-Rand's Streamline™ Technology



Streamline™ SL-IV Plus Intensifier Series

Ingersoll-Rand Waterjet (IRWJ), soon to be known as KMT Waterjet once approvals by share holders and legal authorities have been secured, is introducing a whole new revolutionary Streamline™ SL-IV Plus Intensifier Series. The new series is available in standard offering including the SL-IV 15, SL-IV 30, SL-IV 50 and SL-IV 100. It should be noted that all standard products, except for the SL-IV 15, provide for a redundancy option. Following are a few features and benefits that are common across all Streamline™ Plus intensifier models:

- The patent-pending new **Hyperlife™ seal technology** – extends plunger seal life and boosts high-pressure components reliability to unprecedented levels.
- The new **innovative hard-seal-end-cap (HSEC) design** – eliminates the need for soft seal head seals, and improves maintainability by high scores.
- **60,000 psi** (4,138 bar) continuous operating pressure – increases cutting speed by up to 20% without sacrificing edge quality, while increasing production output.
- **Serviceability and maintainability** – increases

operator uptime due to the simplicity of the design and ease of access to critical components – quick maintenance contributes to high productivity.

The company boasts over four decades of ultra-high pressure design expertise, upon which most current waterjet product innovations and services have drawn their strength. Continuing its tradition of manufacturing the highly reliable and world-renowned Streamline™ series, Ingersoll-Rand Waterjet is now launching yet another two high-performance *Plus* intensifiers – namely, the SL-IV 75 S and SL-IV 100 S.

The New SL-IV 75 S and SL-IV 100 S

Both models are designed to operate one intensifier (S) with redundancy (R) as an option. Each of these could be labeled as an S or an R model, depending on customer requirements.

These are specifically designed for multiple-nozzle, high demanding and 24/7 operational environments such as the automotive industry. Consider the table below for a typical pressure, horsepower & flow-rate configuration.

“The strong ultra-high pressure technological platform established by Ingersoll-Rand will assure our continued success in delivering high value waterjet solutions to our end users, at the lowest process cost possible,” says current Ingersoll-Rand Waterjet’s General Manager and future KMT Waterjet’s President, Duane Johnson.

KMT Waterjet will continue to leverage its world-wide cadre of premier OEMs and the Swedish-based Joint-Venture, to ensure end users get the highest returns on their waterjet system investment. The company, recently acquired from Ingersoll-Rand, pioneered the waterjet industry in 1971 when it designed and introduced the very first ultra-high Streamline™ SL-I intensifier pump.

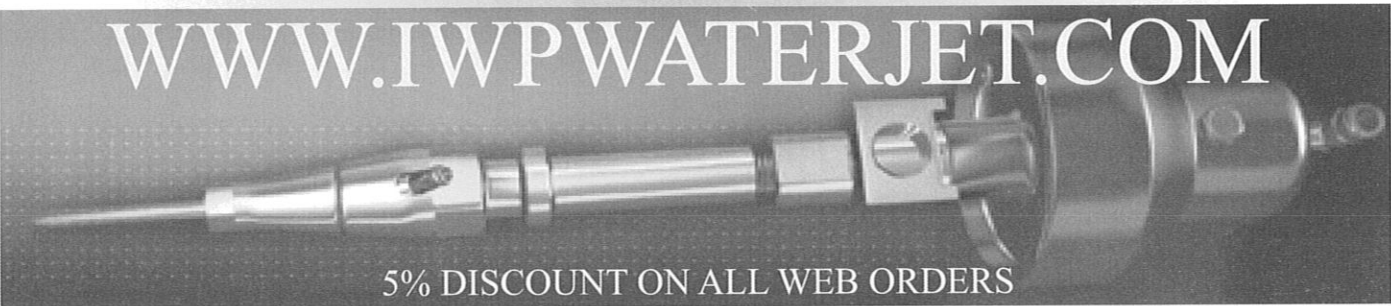
Pressure and Horsepower, SL-IV 75 S/R & 100 S/R				
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50,000	0.018" x 1 ea.	1.5	0.021" x 1 ea.	2.1
55,000	0.017" x 1 ea.	1.4	0.020" x 1 ea.	2.0
60,000	0.016" x 1 ea.	1.3	0.019" x 1 ea.	1.9

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Appreciation dinner for board members, international advisors, pioneer award winners and sponsors.

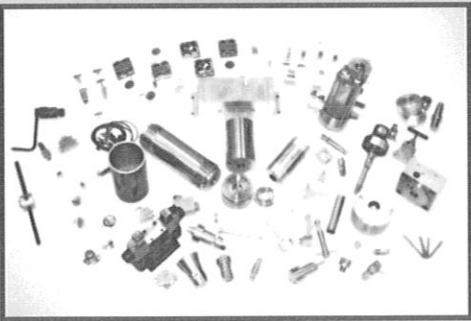


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Dr. Ernest Geskin receives the 2003 Technology Award from Dr. David Summers



Dr. Mohamed Hashish receives the 2003 Service Award from Dr. Thomas Kim



Present and Past Pioneer Award Winners from left: Dr. John Olsen, Pat DeBusk, Dr. Mohamed Hashish, Dr. Fun-Den Wang, George Rankin, Dr. David Summers and Dr. George Savanick



Dr. Andrew Conn (r.) receives the retiring secretary/board member award from Dr. David Summers. Dr. Conn has been designated an emeritus member of the Board of Directors.



Dr. Lydia Frenzel receives a certificate of appreciation for her service as Vice President from Dr. David Summers. Dr. Frenzel will continue to serve on the board.



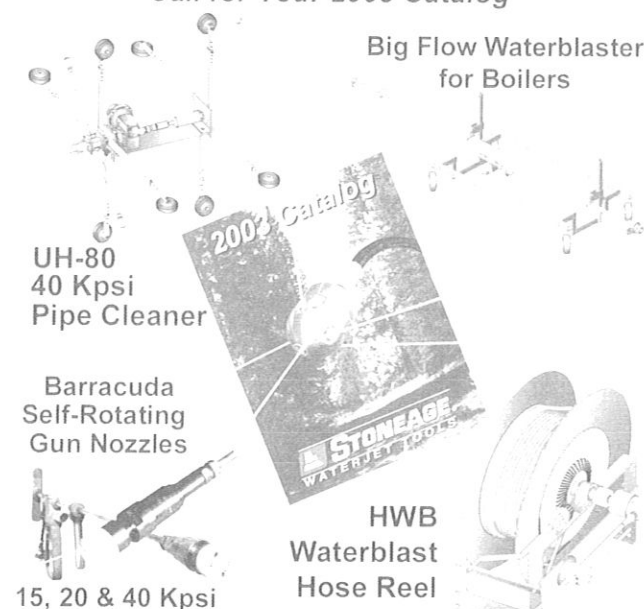
Axel Henning (r.) receives the Best Paper Award - Research from Dr. Mohamed Hashish. The paper was also authored by E. Westkämper.



Antonio Vergari received the Best Paper Award - Applications. The paper was co-authored by E. Grossi and Michele Monno.

(continued on page 22)

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Barton Mines Co., LLC, is celebrating its 125th Anniversary by introducing the newest additions to its waterjet abrasives line: 65 HPX and 85 HPX. From its comprehensive family of high performance waterjet abrasives (HPX, HPA and CG) Barton's 65 HPX and 85 HPX "Hard Rock" abrasives offer enhancements to its product line providing an even greater selection for any cutting application.

Barton has also expanded its line of replacement components for waterjet systems to include whips, adaptors and valves along with a new line of Durobrick™ waterjet bricks.

Barton Mines will be exhibiting at the Fabtech International Conference at McCormick Place in Chicago, Illinois. The booth number is 7126.

For more information, visit www.barton.com, or call Barton toll free in the US and Canada at (800)792-5462, or call: (518)798-5462, fax: (518)798-5728 or write: Barton Mines Co., LLC, 1557 State Route 9, Lake George, NY 12845-3438.

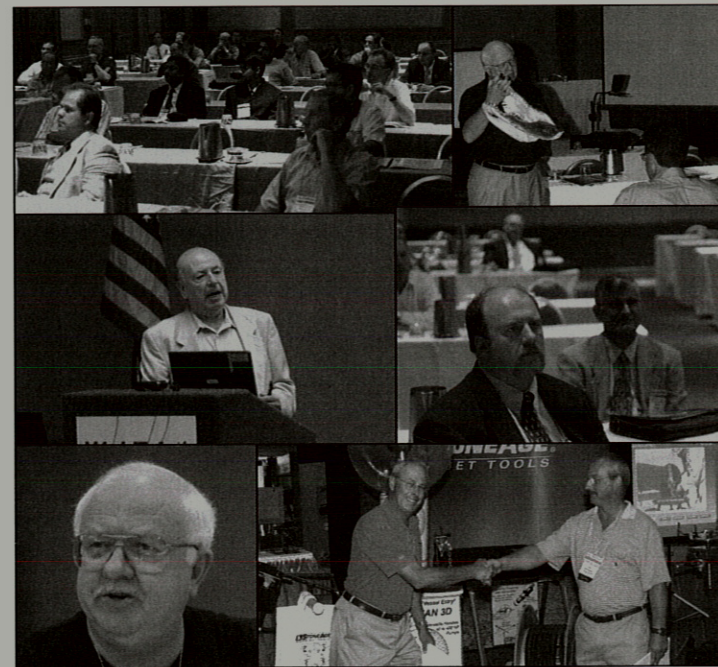
Safety Committee Solicits Comments On Improvements To Recommended Practices

The WJTA Safety Committee solicits comments regarding improvements to the publication, *Recommended Practices for the Use of Manually Operated High Pressure Waterjetting Equipment*. While the Recommended Practices is reviewed periodically at the biennial conferences of the WaterJet Technology Association, your comments and suggestions for improving the publication are invited and welcome anytime.

Please address your comments and suggestions to: Safety Committee, c/o WJTA, 917 Locust Street, Suite 1100, St. Louis, MO 63101-1419, fax: (314)241-1449, e-mail: wjta@wjta.org, web site: www.wjta.org.

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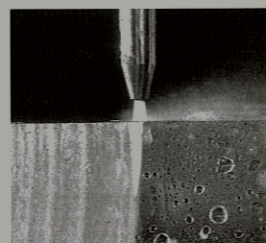
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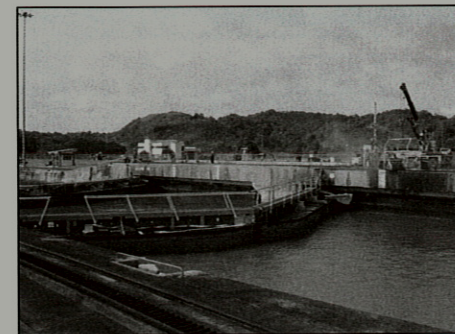
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Hydrodemolition On The Panama Canal, from page 2



The Conjet hydrodemolition equipment is expected to remove about 800m³ of concrete during lock repairs.

"Everything is geared to reducing disruption of the canal traffic for our customers," says ACP Locks Track & Structural Maintenance Unit manager Wilfredo Yau. "When we first started in 1997 we took about one and three quarter days to replace a 30m section of track, during a 10 day to 12 day outage or occupation, but we have improved our technique and system and with the help of the Conjet equipment we can now replace the same amount of track in about half a day."

The Conjet Jetframe, which supports the shrouded oscillating jetting nozzle and travelling feedbeam assembly, is controlled by a remotely operated Conjet CCU197 computer control unit. High-pressure water is supplied to the nozzle through a flexible hose from a Conjet 345-400 power pack housing a 400kW Caterpillar engine driving a high-pressure pump providing 195litres/min at a pressure of 1100bar. The Jetframe equipment cuts out a 300mm wide by 350mm deep trench alongside the edge of the waterside rail and also blasts away concrete between the twin track's supporting steel crossies.

"We have two sets of Conjet Jetframe hydrodemolition equipment, which have proved to be very good," adds Wilfredo Yau. "We elected Conjet from open bids and bought the first unit in 1999 and a second one last year. They are proving ideal for the work we are using them on selectively

removing concrete from the tow track, lock-gate sills and the culverts, which channel the fresh water from the lake in and out of the individual lock chambers. I expect we will remove about 800m³ of concrete by hydrodemolition. Conjet has also supported us with excellent service and technical backup and provided

operator and service training at their headquarters in Sweden and on site here on the canal."

The tow track repair and maintenance work is always programmed during lane closures,

(continued on page 17)

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 Telephone: (304)768-4307
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Robert Timmons
Dennis Walker
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 Rimmington
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 Fax: (651)483-2689

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 Fax: (330)677-9121

Martin Caouette

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 P.O. Box 304
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 Canada
 Telephone: (800)252-9288
 Fax: (800)728-9649

John Crane

BuTech Pressure Systems
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 Erie, PA 16509-6207
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 Fax: (814)833-2612

Kevin Crawford

BEI – Pecal
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 Waterdown, ON L0R 2H0
 Canada
 Telephone: (905)689-6661
 Fax: (905)689-0485

Melanie Delfakis

WGI Heavy Minerals, Inc.
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(continued on page 11)

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Hydrodemolition On The Panama Canal, from page 7

when the lock's mitre gates, culverts and valves also receive maintenance and repair. The ACP spends several weeks using the Conjet and other demolition equipment in advance preparation to replace between 300m and 750m of track, depending on location, during an approximate 11 day occupation of one of the lock's two lanes. The process is geared for a combination of speed, quality and safety with the ACP prefabricating 9m long sections of track. These preassembled sections can then be quickly positioned and concreted in place after final cutting and lifting out approximate 15t blocks of concrete about 3m wide and 0.5m deep complete with the old track sections. The ACP civil engineering team has to work to a very tight mechanical tolerance of ± 2 mm in 450m of track.



Installing new sections of prefabricated tow track along the tops of the locks.

ACP's two sets of Conjet Jetframe 122 hydrodemolition equipment have proved ideal for removing the concrete from the tow track and are making a major contribution towards the ACP completing the extensive track rehabilitation project on schedule in 2004.

For further information please contact: Lars-Göran Nilsson, Conjet



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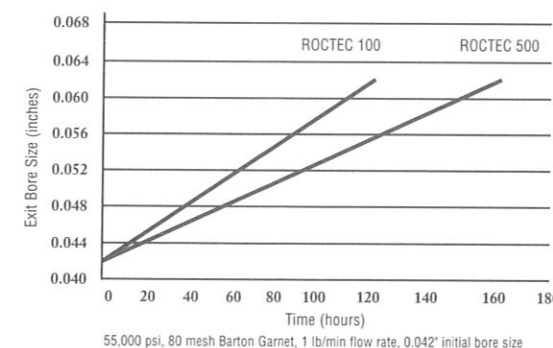
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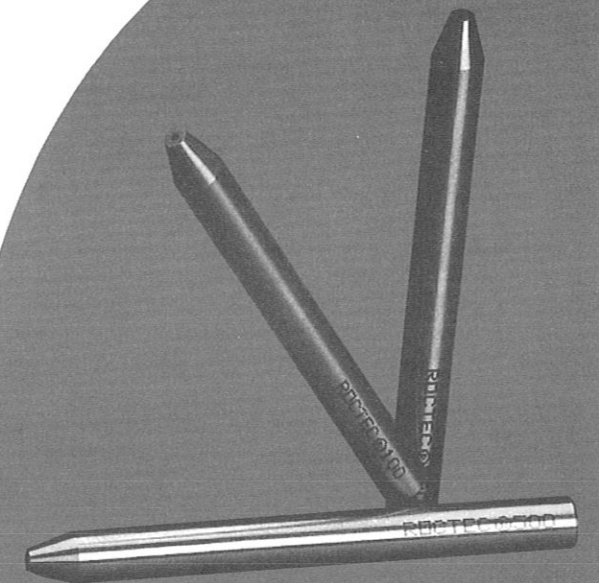
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(continued on page 20)



2003-05 WJTA Board of Directors from left: Pat DeBusk, G.J. DeSantis, Dr. Mohamed Hashish, Larry Loper, Dr. Lydia Frenzel, John Wolgamott, Forrest Shook, Craig Anderson, Jack Russell, Dr. George Savanick, Dr. David Summers and Dr. Fun-Den Wang. Not pictured are: Randy Kruger, Dr. Andrew Conn, Dr. Thomas Kim and Thomas Labus

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Onsite Live Demonstrations

Equipment/Application demonstrations included both live and static displays. A list of participating companies and their display descriptions appear below:

AQUA-DYNE, Inc. demonstrated 40,000 PSI surface preparation blasting to bare metal using the latest GA 200 DS Vacuum System, Aqua-Spider, Aqua-Scrubber and Robotic Cleaner for vertical and horizontal walls, ship hulls/bottoms and vessels. AQUA-DYNE's rotary gun, mini scrubber and Dyna Mo (grate and floor cleaner) were also demonstrated.

Gardner Denver Water Jetting Systems demonstrated the new 50K X-Stream waterjetting unit showing significant improvement realized by utilizing 50,000 PSI high pressure water for cutting and coatings removal.

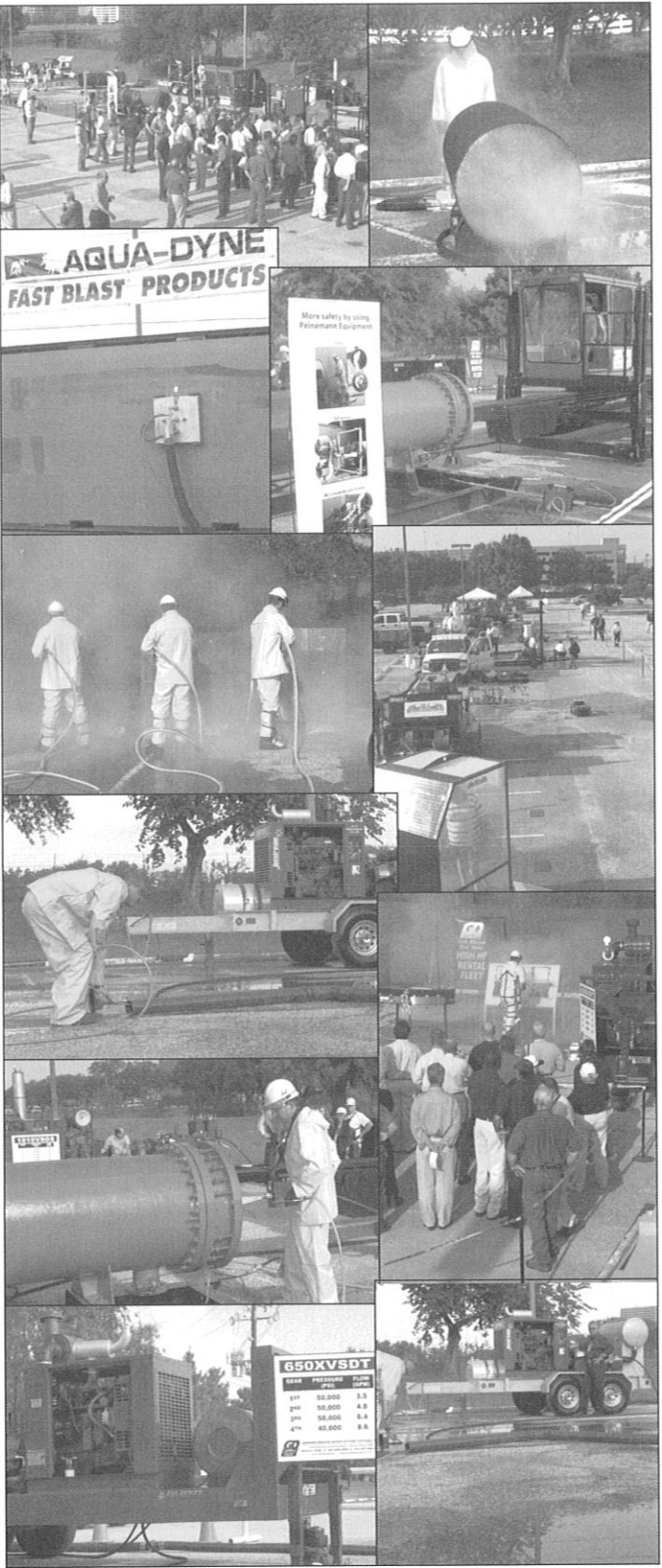
Hydro-Engineering, Inc. introduced the revolutionary Hydrojet-40, the all new, self-rotating, UHP surface preparation nozzle, with “interspin” technology, rated for up to 40,000 psi and demonstrated why air rotary guns may soon be a thing of the past. Hydro-Engineering showed single gun operations with a standard 40,000 psi dump gun and the Hydrojet-40 and, for multi-gun applications, showed standard 40,000 psi shut-off guns with a pressure regulator.

Jetstream of Houston, LLP demonstrated its 4200 D series waterblaster. Customers were shown how advanced engineering can take the basic concept of pressurizing water and simplify it for ease of maintenance and user-friendly operations. The demonstration highlighted how easy it is to accomplish conversion of pressures, preventative maintenance and field repair. They showed how univalve and cartridge design can limit downtime, decrease operating cost and improve productivity.

NLB Corporation, a worldwide manufacturer and marketer of high and ultra high pressure waterjetting equipment, demonstrated its 40201D UHP pumping unit removing coatings from steel and concrete surfaces utilizing a vacuum recovery hand lance and SpinJet®.

Peinemann Equipment operated several of the Peinemann inside tube cleaning machines, including the IBC-5, a 5-lance rigid lance machine. Also two of the Peinemann flex lance units were demonstrated: the 3-lance TLE and the portable 1-lance LTC.

(continued on page 10)



Onsite Live Demonstrations, from page 9

Reliable Pumps, Inc. demonstrated the 40,000 PSI waterblaster with the new Segmented In-Line Fluid Cylinder and integral manifold. This design has made the 40K simple, user friendly, and low maintenance cost. The simple and easy seal replacement gives the operator confidence that any maintenance can be addressed quickly to minimize downtime and reduce cost significantly compared to other pumps.

StoneAge, Inc. demonstrated its newest concept in design for self-rotary tools, a product called the "Badger," which allows contractors the ability to clean 4" to 12" ID pipeline at 15,000 psi.

TurtleSkin WaterArmor by Warwick Mills protects operators from accidental swipes as high as 40,000 psi. Warwick Mills demonstrated how this lightweight, flexible material is capable of preventing an injury at high

pressures. Seeing is believing. The demonstration replicated an accidental swipe traveling at a rate of 8 feet per second with an NLB pump running at 40,000 psi at a flow rate of 5 gpm at a distance of 3 inches using a single orifice 0.035" sapphire nozzle of 0 degrees with a 22 efficiency factor.

Universal Minerals demonstrated its RIPP 3000 rotating abrasive nozzle that may be used with any 20K to 40K system and fits on most gyro guns. Universal Minerals removed 10 to 14 mil of both standard and cold tar epoxies and mill scale and heavy corrosions.

VLN Advanced Technologies, Inc. demonstrated its new and unique product, "The Forced Pulsed Waterjet Generator," called the RFM (Retrofit Module) that can be integrated to the end-user's existing pumps to produce highly effective pulses of water.

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Exhibitors, continued from page 14



Exhibitors



(continued on page 15)

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Hugh Hobson

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Bob Hufschmidt

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Adrian Hugentobler

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Keith Lemmer

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Navarre, OH 44662

Kevin O'Brien

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Curtis O'Hagan

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Ahmed Sawaha

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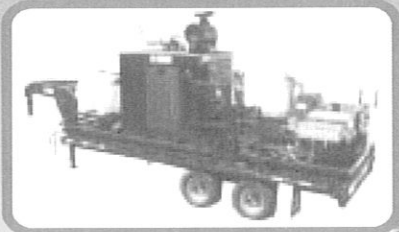
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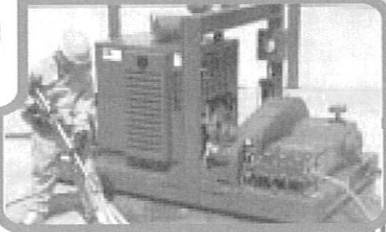
(continued on page 16)

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FEATURES

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- 1000 hp
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Transmission Waterblasting Units Offer "Pressure Versatility"

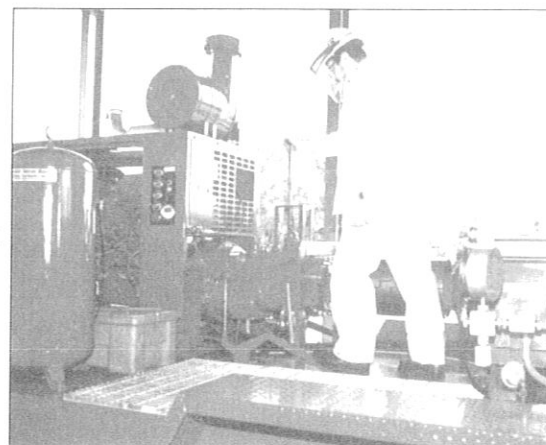
Gardner Denver Water Jetting Systems offers a complete line of innovative Liqua-Blaster transmission water jetting units that enable the operator to go from 15,000 PSI to 20,000 PSI, and even to 36,000 or 50,000 PSI in mere seconds with the movement of a stick shift! Depending on the flow and horsepower range, the transmissions on these units can have anywhere from 3 to 16 speeds to closely match the requirements of the particular cleaning job. This might be news to you, but Gardner Denver has been manufacturing and selling these multi-speed units since the early 1970s, with thousands in operation worldwide.

Gardner Denver transmission units affords a cost-saving alternative to the expense of stocking **multiple fluid ends** for each waterblasting unit, having **two or more men** spend **30 minutes and up** switching fluid ends to make the jump from 15,000 PSI to

20,000 PSI, not to mention the possibility of damaging the fluid ends. The costs of these factors over the life of a given waterblasting unit can be staggering.

The aspect of pressure versatility is especially important in instances such as when a contractor would use a unit in a variety of assorted cleaning applications, so the ability to easily change pressure ranges would determine the profitability of each industrial cleaning job.

All Gardner Denver multi-speed water jetting units are made with durable Partek brand triplex or quintuplex shaft pumps, skid or trailer mounted, with a wide selection of available diesel engines, and a complete range of options are available to closely match your job requirements. Possible options range from whisperizing noise reducing



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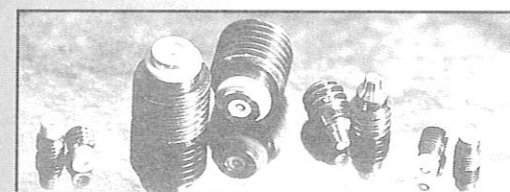
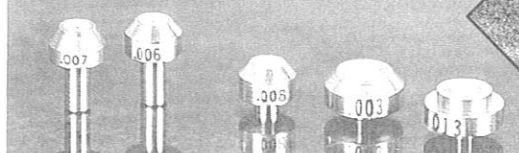
cabinets, hose racks, filtration systems, water tanks and electronic engine throttle controls. For those who are new to the Liqua-Blaster line, Gardner Denver offers a rental fleet program that gives customers the opportunity to try the equipment before they buy it.

For more information, call Gardner Denver Water Jetting Systems toll free at 800-231-3628.

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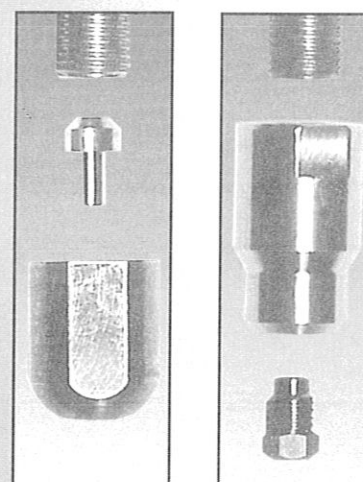
We offer many different types of mountings. Assemblies have the size clearly marked, for easy identification.



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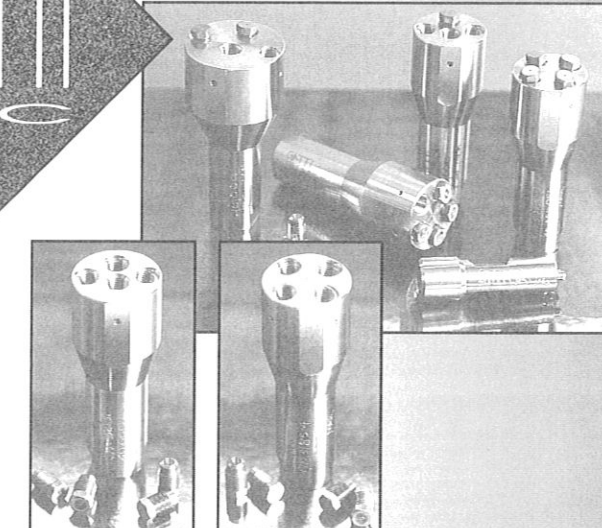
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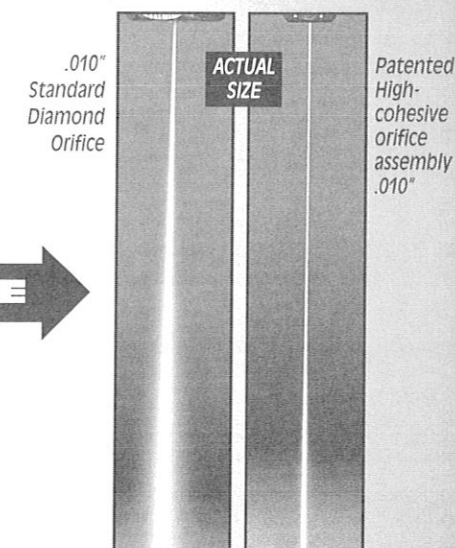
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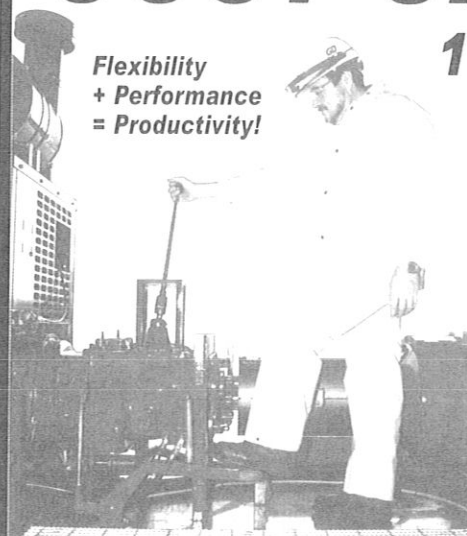
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