

POCLAIN MAG

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**South Hall
Booth S81613**

POWERED
by CreepDrive system p.14

POWERED
by MT07 Motor p.10



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Markus RAUCHHAUS
Executive Director
for North America

LOCAL HAS BEEN A KEY DRIVER
IN POCLAIN HYDRAULICS NORTH
AMERICA'S GROWTH. BEING CLOSE
MEANS WE INTEGRATE WHAT OUR
CUSTOMERS AND DISTRIBUTORS
EXPECT, IN TERMS OF PRODUCT
QUALITY, INNOVATION, AND
SUPPORT.

“ The past couple of years have been exciting for Poclain Hydraulics in North America as we focused our energies of growth and development. With the promise of new opportunities and potential in several markets, we have positioned ourselves for success by optimizing our processes and investing in resources that enable us to better serve our customers. We expanded our production area by roughly 70,000 square feet, a nearly 70% increase in space for the production area overall. This addition provides the framework and floor space needed for new processes and product manufacturing for our North American portfolio. Additionally, we have developed products that align with the needs of the industrial and construction markets in order to position them for growth. Along with highlighting new product developments, creating stronger relationships with our distributors, OEMs, and others in the industry is a large focus for us. We are always striving to strengthen our relationships with our OEM customers as we focus on stronger partnerships with collaborative designs and industrial manufacturing integration. As new technologies advance rapidly, we understand this requires greater alignment for successful results.

Working hand-in-hand with our channel partners is an important component in our relationships. It is how we ensure that our distributors are confident in their understanding and implementation of our technology. We offer several training sessions each year that cover a complete technical training curriculum in order to ensure they are knowledgeable about all of our products and have access to high quality support.

To that note, we are excited for IFPE 2020 as it is an opportunity for us to introduce our customers and industry partners to several new and innovative solutions: The MT07 motor, the PM70 pump, and the CreepDrive 2 system.

The MT07 is our reinforced high-performance motor for track drives. This motor is capable of withstanding the high axial loads and demanding working conditions tracked machinery encounters. It will allow us to expand our offering and apply our history of expertise in compact construction equipment to meet a need in a market that has been making a shift towards this type of drive.

The new PM70 pump completes our PM range of pumps, giving OEMs the ability to conveniently cover all their requirements with Poclain Hydraulics. The PM70's size accommodates a wide range of larger mobile applications in construction and other markets.

CreepDrive is Poclain Hydraulics' hybrid mechanical-hydraulic transmission that allows vehicles that travel at normal speeds on-road to perform work functions at steady speeds while maintaining the high engine RPM required for auxiliary system functions. At IFPE this year, we will feature parts of the new CreepDrive 2 system, which includes our CDM20 and electronics that allow trucks to travel at increased speeds. These new product developments are the fruit of product teams that have worked hard to design and develop solutions after extensive research and understanding of market needs. Learn more about them in this edition of Poclain Mag, and at our booth S81613 in Hall 3 at IFPE 2020. “



Investing for Growth in North America

In recent years, Poclain Hydraulics has made significant investments in order to expand and grow our location in North America. By expanding our facility, we have advanced and expanded our production capacities and renewed our commitment to providing exceptional local customer service.

Poclain Hydraulics acquired the facility in 2001 for use as their North American headquarters. This year's expansion provides the needed framework and floor space to add future processes and product manufacturing to the North American portfolio.

"The need for this addition was due to the strong growth of Poclain Hydraulics in North America and the expansion of our current product lines. It positions us to respond to future growth and enables us to

add manufacturing for our pump portfolio." Markus Rauchhaus, Poclain Hydraulics' Executive Director for North America, explains. "Despite the traditional lower market demand during election years and the demand slowdown at the end of 2019, we are positioned to support future growth as the market trends in a positive direction," he continues.

One significant investment and process improvement is our paint material and

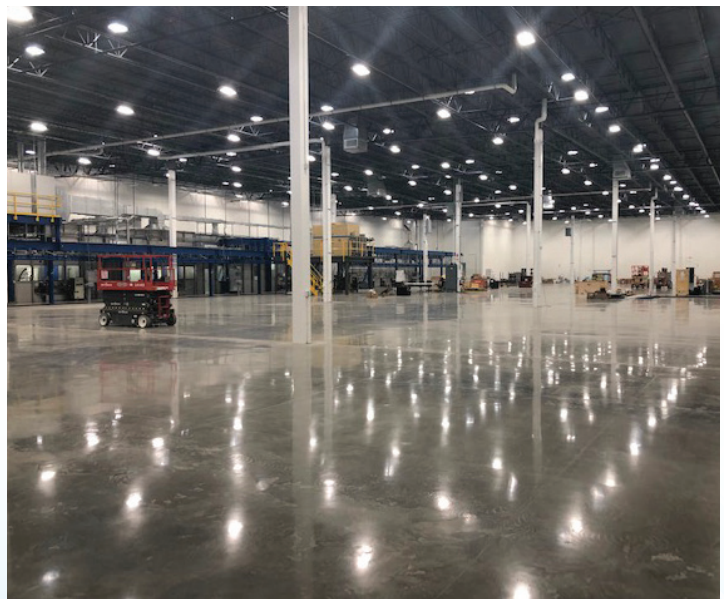


The Poclain Hydraulic Inc. facilities, before and after the expansion

application for motors manufactured in Yorkville. In order to meet high quality requirements, we are leveraging state-of-the-art automation in the painting process.

In order to drive agility upwards and reduce lead-time, we revamped our material handling warehouse automation for forklift-free manufacturing environments. As the price of industrial space rises and the global market becomes more competitive, we are aiming for industrial density and agility utilizing lean principles.

Customers in North America have access to an extensive channel partner network and account managers located throughout North America. This is reinforced through best-in-class application engineering, a design team supporting all product lines, commissioning expertise, and project support combined with local manufacturing expertise. ✕





Getting the Best Transmission Performance with the Applications Team

Poclain Hydraulics' North America location is comprised of several disciplines that all work together to promote success and enable close relationships with our customers. Our full-service headquarters works directly with customers to provide best-in-class service. One example, of team collaboration is between our application engineers (AE) and sales team, who work closely in order to quickly and effectively solve issues and provide direct support. From small to large OEMs, distributors and even end users, our partners can count on these teams to provide the support they would expect from a local company.

The AE and sales team work in conjunction on a daily basis. The sales team serves as the primary contact of Poclain Hydraulics and frequently visits customer locations, provides pricing and delivery, and works with internal teams to devote time and resources to their specific territory. The AE team is divided between the sales team and provides sizing for customers, on-site technical expertise, testing, and serves as an internal liaison to finalize projects from design to manufacturing.

By having a group of AE and sales people that work closely together, customers have the benefit of direct communication in order to navigate potential opportunities, solve issues as they arise, and work with the team to understand our products for better machine integration.

Additionally, the North American AE team complements the larger global AE group by sharing best practices that are generated in the U.S. market and sharing global trends being

driven by the North American market. Many of our customers have a global presence. Our application engineers form close working relationships with our customers at a local level all across the globe.

Joe Iberl, Application Engineer Manager for North America, explains, "We have an AE support network that stretches around the globe. At least once a year we make it a point to meet as a group to discuss technical topics ranging from product development to unique or challenging applications. This allows us to establish strong ties with our colleagues around the world, making us a more effective team."

Poclain Hydraulics has 30 years of best practices built into its processes and training for application engineers. Additionally, design reviews and best practice sharing ensures that we are getting the right solution for each customer every time. ✕

POWERED *by* **HIGH PERFORMANCE**





Strong Ties Generate Growth for Applied® and Poclain Hydraulics

With more than 20 companies within the Applied Fluid Power group, Poclain-Hydraulics has been fortunate to collaborate with some of the niche divisions such as Hydro Air and HyPower for over two decades. The long-standing relationships have resulted in partnering with more divisions over the years and enabled joint success while developing new applications.



Warren «Bud» Hoffner, Vice President/GM of Fluid Power and Flow Control at Applied Industrial Technologies, shares his insights into how this partnership has led to successful joint ventures.

Which elements of working with Poclain Hydraulics have been key in driving your success?

Poclain Hydraulics has a broad range of unique, high-performance, closed-loop hydrostatic products that complement Applied Fluid Power's electronic control and integration capabilities. Also, their strong technical sales force supports and collaborates with our design teams to create unique and valuable customer solutions.



How do Applied Industrial Technologies and Poclain Hydraulics complete each other?

Our teams work to provide complete propulsion and work function solutions to operate with our electronic control systems. Poclain has a broad range of unique motors and products that play to the power density strengths of hydraulics and integrate seamlessly into the modern electronic control systems we are creating.

How does having access to Poclain Hydraulics' application and design engineers locally benefit your team?

It benefits our design teams by enabling close collaboration and problem solving to create system designs that dramatically improve machine performance, efficiency and control.

Can you tell us how local manufacturing of Poclain Hydraulics products makes you more competitive?

In a number of ways. First, it reduces shipping times by one month or more. It also reduces shipping costs. When it is easy for us to bring our customers to visit the plant, it creates greater customer confidence, both in the products, and in the Poclain Hydraulics personnel that build and support those products. It is also an advantage for us to be able to bring our own people to visit. It accelerates learning and application confidence, which ultimately makes us more competitive in supporting our customers.

How have you and your team members benefitted from Distributor Sales Training or onsite training?

The inclusion of hands-on work in the Poclain Hydraulics training program creates solid learning and retention. All of our attendees have commented on how helpful the training has been in learning how the motors are designed and built for rugged service and long life. The training also features unique products and features, like the CreepDrive system, that have accelerated new application activity.

Describe a challenge you have faced that we helped to solve?

One that comes to mind is a customer that makes a unique machine. They wanted to upgrade the control and performance of their flagship model. Our electronic controls design team created a system that dramatically improved operator control and safety. Working with Poclain Hydraulics, we were able to increase the operating pressure of the propulsion systems, allowing our designers to the components, while utilizing the compactness of the Poclain Hydraulics steerable motors and their excellent starting torque. Using electronics, we were able to remove all mechanical control linkages and ultimately lowered the total cost of the machine, while greatly improving its performance.

How do you see Poclain Hydraulics supporting you in your future developments?

We look for Poclain Hydraulics to support us by producing additional products in North America. Regarding future developments, we rely on them to design products that play into the tremendous power density of hydrostatics in the machinery of the future. ✕



Compact Motor for Next Gen CTLs

Compact track loaders, also known as CTLs, have gradually gained ground against wheeled skid steer loaders, representing a vast majority of the market, according to Equipment World. Poclain Hydraulics has a long track record in equipping compact construction equipment, encompassing mini-loaders and skid steer loaders. To address the rising demand for tracks versus wheels, they are launching a robust and high-performance motor based on the company's proven radial piston design, the MT07.

CTLs are a particularly demanding application. Drivers expect them to move fast between jobs, and be able to move, dig, lift, load, plow, drill, trench, and much more. Their drive components go from zero to peak pressure repeatedly, as well as change direction of rotation.

Designed to satisfy all CTL market players, Poclain Hydraulics' new MT07 specifically addresses the tough working conditions of the application and tracked vehicles in general. Each feature has been carefully gauged to offer best value for money in the industry:

No compromise between performance and compactness

The design of the MT07 benefits from the breakthroughs the engineering team made on the MHP range regarding architecture, performance and materials. With a displacement between 30 and 56 cu.in per rev (495 to 920 cc), the MT07 fits in a size 05 MS motor and can bear as much load as a size 18. The superior efficiency of the MT07 also reduces heat generation and noise.

6,500 PSI (450 bar)

max pressure

The MT07 has gone through extensive validation for 6,500 PSI max pressure.

High speed and efficiency

With the MT07, a tracked machine can run at 12.3 mph (20 kph) maximum ground speed without compromising on torque. Providing a 1.5 displacement ratio, the motor withstands maximum travel speed in both low and high displacement. Moreover, its exceptional overall efficiency avoids overheating and enhances machine productivity.

High bearing capacity

Specifically sized for tracks, the motor's high bearing capacity can withstand shock loads. Perfectly balanced around the sprocket mount, its robust design enhances reliability.

Easy integration

The track and chassis mounts are positioned to exactly match the track configuration.

Compact envelope

Measuring 13.8" (352 mm), the motor fits inside standard tracks.

High-performance braking

The powerful brake can withstand emergency braking without suffering any deterioration. Furthermore, the brake is spring applied and hydraulically released (SAPR), so any issue in the hydraulic circuit will bring the tracked vehicle to a halt.

Superior resistance to pollution

Maintenance-free and specifically designed for tracks, the seals can withstand exposure to packed mud, debris and chemicals.

Identical performance in forward and reverse

The MT07 delivers the same level of performance in both directions of rotation to enable the CTL to be as powerful in forward and reverse. The symmetrical design also simplifies sourcing, as there is a single part number for the left and right sides.

Freedom of integration

The track and chassis mounts are positioned to exactly match the track configuration. Regarding ports, the motor is available with either axial or radial connections to give the OEM greater freedom of integration. It can interface with a fixed or suspended undercarriage.

Designed in conjunction with the CTL OEMs, the MT07 is designed to fulfill the needs of current and next-generation machines. Its performance level, ruggedness and versatility go beyond the application and make it suitable for tracked vehicles in agriculture, forestry, and mining. ✖



Power Dense Transmission for the Largest Stand-On Skid Steer by Ditch Witch



The inventor of the mechanical trencher, Ditch Witch® takes pride in its orange blood, independence and global presence. The company has expanded its offering over the decades, adding directional drills, vacuum excavators and stand-on tracked skid steers. In 2019, they launched their largest stand-on skid steer yet, the SK3000. They called on Poclain Hydraulics to provide outstanding power density, bringing the machine to the same level as the traditional skid steers of its class.

Meet the SK3000, the largest stand-on skid steer

A no-compromise machine, the SK3000 is powerful and nimble at the same time. It can lift as much as 3,100 lbs, 50% more than its closest stand-on competitor. As for being nimble, it weighs only 7,600 lbs, much less than skid steers with cabs, which allows transport without a CDL. It's only 57 inches wide, easy to get on and off, and its stand-on operator platform provides 360° visibility. The SK3000's features are particularly appealing to arborists, landscape and hardscape professionals who work in wooded and confined areas. While they might have needed two machines in the past because of a narrow entrance, they can now carry out the job from start to finish with a single machine.

Poclain Hydraulics, a historical partner of Ditch Witch

Poclain Hydraulics Inc. District Sales Manager, Mike Arnold has been visiting Ditch Witch for 14 years and worked closely with them on several projects. Poclain Hydraulics motors run today on some of the OEM's directional drills, rock wheels and trencher attachments. So, when the time came to select a drivetrain for the SK3000, their most demanding skid steer yet, they naturally turned to Poclain Hydraulics.

Ditch Witch Senior Design Engineer, Brant Kukuk designed with Mike and the engineering team a system consisting of a tandem PM30 pump and two MSE03 motors. "With the SK3000, we hope to break into the traditional skid steer market. The Poclain Hydraulics drivetrain contributes to the machine's outstanding features. We like its superior pressure and torque capabilities, in a compact and price-competitive package. During field testing, we also realized that the system provides minimal sound disturbance. Besides, the pump and motor are optimal at working together. And single-sourcing means there can be no finger-pointing if there is contamination." In addition to technology, the tight relationship counts a lot to Brant. "Poclain Hydraulics gave us components to test their integration on our prototype machines, and they stayed involved during the 1,000-hour lab and field testing. If we had a problem, Poclain Hydraulics always came up with a solution."

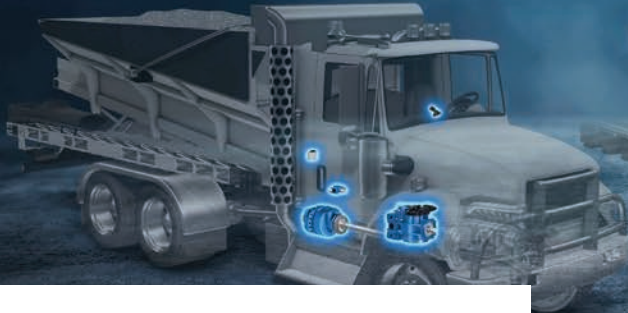
The SK3000 is available in Ditch Witch's expansive North American dealership network, as well as in Australia, from the beginning of 2020. It will no doubt disrupt the stand-on skid steer and CTL markets, and bring higher productivity to landscaping and hardscaping projects. ✕

POWERED

by

MT07



CREEPDRIVE 1**54 hp (40 kW)**
Up to 42,000 lb trucks (19t)**From 0.25 to 4.5 mph (0,4 to 7 km/h)****CREEPDRIVE 2****140 hp (105 kW)**
Up to 97,000 lb trucks (44t)**From 0.25 to 7.5 mph (0,4 to 12 km/h)**

Poclain Renews Its CreepDrive Range

Poclain launches the new CreepDrive 2 system, helping the end user to maximize productivity, work quality and driver comfort. Likewise, the system is optimized to facilitate installation on the chassis. It's not only about increasing the performance in terms of speed and torque!

The CreepDrive system, a true hybrid mechanical-hydraulic transmission, allows vehicles to work at very low constant speeds regardless of the engine speed, providing auxiliary systems with the power they need to perform work effectively. When the vehicle drives on the road in non-working mode, CreepDrive is totally disengaged, allowing the vehicle to reach the max vehicle speed and at the same time, preventing any mechanical losses. The complete CreepDrive line-up contains two different sizes of motors, a range of pumps, valves and the plug & play control kit including the CAN bus communication. The new CDM20 motor provides up to 2.4 l (122 cu.in) of displacement with two speeds (possibility to switch from full to half displacement). In conjunction with the gear reduction ratio in the rear drive axle differential, the CDM20 can provide an overall torque ranging from 36 000 to 72 000 ft.lbf (50 000 to 100 000 Nm). Other new features include a reinforced shift cylinder as well as an extremely robust design. This new motor complements the existing CDM222 motor by offering twice the speed and three times as much torque.

CreepDrive removes the added stress on braking and clutching that trucks working at low speeds experience, as well as the additional maintenance required to keep those systems working properly. Replacing friction braking with hydrostatic braking, which acts as an integral decelerator reduces the need to feather the brakes. This allows for more precision and less opportunity for error, helping operators increase safety and productivity. In addition, radial technology eliminates the need for an additional reduction stage and offers some of the highest efficiencies on the market. This reduces fuel consumption and noise, which is a key requirement for urban applications. Finally, an integration benefit - the CDM20 motor is fixed only on the one side of the chassis, which guarantees the original chassis flexibility.

CreepDrive 2 meets the needs of a wide range of applications such as road maintenance & road marking, concrete mixers, bridge inspection, rail track maintenance, airport & road sweepers, deicers, snow cutting, suction dredging, slinging and mulching/chipping machines, among others.

Case Study: Road Marking Applications

Arrow Striping and Manufacturing

(Billings, Montana, USA)

Arrow, one of the first US CreepDrive customers, is focused on engineering and production of pavement marking, surface prep and removal grinders, saw, grooving and pavement marker palletized and truck mounted equipment. Company's CEO Steve Stark shares Arrow's vision on the CreepDrive range expansion.

CreepDrive 1 experience

"We've been using the CreepDrive 1 for 10 years. We use it on our thermal paint trucks, rumble trucks and grinders. We chose CreepDrive for the low speed performance with speeds around 3-4 mph, a difficult speed for a standard truck's cruise control. We also liked how compact it was and being able to maintain low speed at idle versus having the truck engine at full RPM. The CreepDrive system significantly lowers engine wear and tear and saves on fuel."

CreepDrive 2 expectations

"The original CreepDrive system was sometimes limited in terms of gradeability and max speed. Our biggest expectation is to reach 8 mph, and it's going to be possible with the new generation of CreepDrive."



CreepDrive 2 value for thermal trucks, epoxy and grinders

"Maintaining steady speeds between 3-8 mph is very important. With autonomous driving vehicles, there is more focus on road striping as the stripes are used to guide the vehicles. When applying the stripes, regardless of thermal plastic or epoxy stripes, the application mill thickness needs to be maintained. When the material gun and the ground speed are linked, we can manage the deployment of material very precisely. In the past, we may have used the truck cruise control. What happens is, when the truck is loaded on a level grade or incline, the cruise is accurate; however, going downhill we have difficulty maintaining that speed and the vehicles tend to 'run away' and over-speed. This leads to thin stripes on the road. The new CDM20 will allow for higher speeds and higher grades, and we should be able to hit most applications full range."

Century Fence (Pewaukee, Wisconsin, USA)



Pewaukee's centenarian Century Fence has been using Poclain's CreepDrive motors since 2010. In addition to pavement marking vehicles, the company operates in the fencing and sliding gates industry. Century Fence was a pilot customer in testing the new CDM20 motor. Construction

Superintendent Keith Brahmer tells us about their experience with the established CDM222 motor and their first impressions of Poclain Hydraulics' new CDM20 motor.

CDM222 experience

"Initially we used a high speed motor and gearbox with a chain drive for our striping removal machines. This solution had major control issues as well as motor 'cogging' during creep

mode. Due to these problems, Century Fence switched to Poclain Hydraulics' CDM222 in 2010. Since then, the CDM222 has been installed on striping removal models 125, 126 and 127."

Testing the CDM20

"The latest 128 model had the CDM20 motor installed, which ran for 500 hours in creep mode. In the second speed (in half displacement) the creep function ran without any issues. The motor was inspected at PH Inc. and the wear was very minimal. We are very impressed with CDM20 motor on our removal machine! No issues climbing grade. The motor is even quieter than CDM222."

CDM20 value for striping removal trucks

"CDM20 is used during the highway work mode, i.e., from April to October, in the Midwest. It allows the engine to have the RPM set while operating during work mode (the creep function separates ground from engine speed, allowing operating the auxiliaries with engine RPM while in the work mode with Poclain Hydraulics' CDM). Consistent slow speed during work mode allows the stripe removal to run consistently at the lowest cost."



Outstanding Torque and Highway Speed Trackway Railcar Mover

According to the Association of American Railroads, U.S. freight railroads are the world's busiest, moving more freight than any rail system in any other country. The railways are used by a slew of industries including grain, feed, building materials, chemicals and energy resources. The producers own railcar movers to transfer their loaded goods, rather than rely on a third party. The machines must be swift and agile to expedite delivery.

Trackway Industries and Dandee Industries

design a roadworthy railcar mover

Based in Edmonton, Alberta, Canada and specializing in providing equipment and services to the railroad industry, Trackway identified a need in the railcar mover market. There had to be a way to efficiently transfer the heavy machines between sites. That's how the OTRX21 came to life. It's a genuine hybrid, fit for both railways and highway. From 2015, the model was designed from the ground up by Trackway Industries and Dandee Industries. The priority being roadworthiness, the locomotive needed to be light enough to drive all year round. Most mechanically-driven railcar movers are too heavy to be legally driven during the road restriction season. As for highway speed, the target was 110 kph.

The patented axles with Poclain

Hydraulics motors can move over 20 loaded rail cars

The design team opted to use Poclain Hydraulics motors to replace the bulky mechanical axles. They turned to Applied Technologies, the local distributor, to supply the system. Dan English, Dandee Industries' owner, knew that Poclain Hydraulics' technology would outperform mechanical axles. «I had seen the motors at work on construction equipment and knew they were what I needed for traction control, smooth power flow, reliability and reduced weight,» Dan explains. The system integrates four MS05 motors – one in each steel wheel – and one PM50 pump. A SmartDrive Easy control unit manages traction control and freewheeling. The performance of the Poclain Hydraulics transmission far exceeded Dan English's initial requirements, pulling over 20 cars for an overall weight of 5.5 million pounds on the tracks.

The machine operates in three distinct modes:

Work.

The four MS05 motors are engaged and can pull over 20 loaded cars, with a maximum speed of 6 kph and a grade of 0.5%.

Coasting.

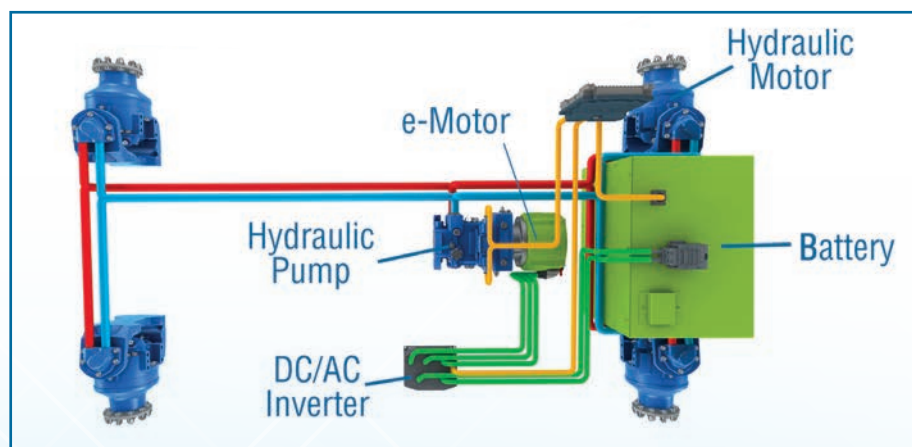
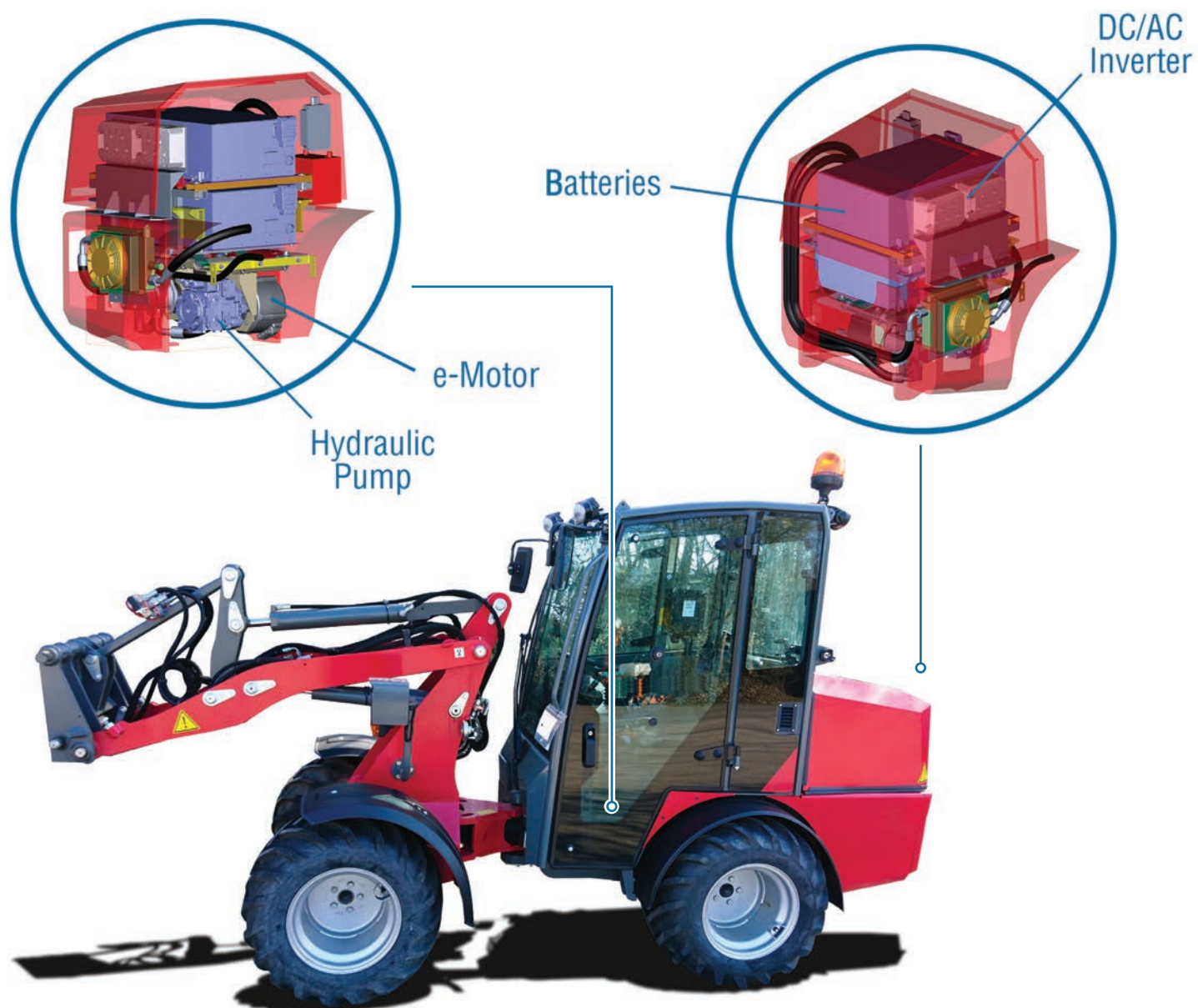
If the ground speed exceeds 6 kph during a railcar transfer, the SmartDrive Easy control unit disengages the hydraulic motors, and the machine is powered by the two mechanical axles. As soon as the machine slows down to 6 kph, on a grade for example, the hydraulics are automatically re-engaged. In the freewheeling mode, the mover can pull the railcars at 50 kph.

Highway.

The operator switches the hydraulic axles to their high position, enabling the locomotive to drive off the track. Its weight and specifications comply with road regulations, and it can travel at a max speed of 110 kph for an unlimited distance. «The mover can work in several yards on the same day, compared to waiting three or four days to hire a heavy-haul. Not only do you save the expense of the rental, but you also drastically shorten delivery time,» Dan English adds.

Commercial use of Trackway's OTRX21 railcar mover starts in 2020. The model integrates the latest improvements that were identified during the field tests with Poclain Hydraulics' application engineers. Its unmatched versatility should redefine how freight transporters operate. ✕





Full-Scale Testing of an Electrohydraulic Transmission at Poclain Hydraulics

Poclain Hydraulics is known worldwide as a best-in-class player for hydraulic expertise in designing hydrostatic transmissions and producing the main hydraulic components to provide an optimized system for the power transmission. Over the past few years, Poclain Hydraulics has been growing its traditional scope of activity and focusing in parallel more and more on zero emission vehicles.

At Poclain Hydraulics, we see this new trend of zero emission vehicles for off-road applications more as market diversification rather than a deep market disruption.

In order to support this strategy, a dedicated team with multiple skills has been put in place to design a complete zero-emission transmission, from the machine batteries to the wheels motors, in order to assist our OEM customers with their new zero-emission machine developments.

The first two years, the team worked with pilot customers to design, commission and fine-tune their prototype machines. Since 2019, the team obtained and are using their own demo vehicle to pursue internal developments. The objective is to test and compare different machine architectures directly on the machine and further optimize the proposed solutions. In order to achieve this ambitious target, they purchased a wheel loader that was initially equipped with a diesel engine and modified it in their main laboratory in France, where the electric e-mobility team and the main R&D center are located.

The result is an optimized electrohydraulic transmission for the machine, taking into consideration different experiences on previous prototype machines. The team has been working on modifications carried out on prototypes and the simulation results that enabled them to optimize the circuit losses and identify the best components for the loader.

The loader has gone through a complete makeover, starting with the diesel engine and encompassing the entire

electrohydraulic transmission: battery pack, battery pack, electric motors, hydraulic pumps, hydraulic wheel motors.

Why choose to start with an electrohydraulic transmission on the demo vehicle? Because this type of architecture allows for a shorter development time to market and a smaller impact on the machine design (no chassis modification, the hydrostatic transmission remains hydraulic...). Field tests on several applications have demonstrated that an electrohydraulic transmission provides the same efficiency as a full electric vehicle. So for this type of architecture, the electrohydraulic transmission is the best compromise between performance, cost and industrialization during the transition period.

The demo machine is now fully operational and a complete set of tests will take place in the coming months to validate all the previous simulation results. It will compare different architectures on a real machine and will help to support and finalize Poclain Hydraulics' offering that could then be proposed to customers.

After completing the first batch of tests, the electrohydraulics team invites interested OEMs to visit our testing grounds in Verberie, France to see the demo machine at work.

Poclain Hydraulics' demo machine is another step towards consolidating the group's lead in supporting OEMs for their e-machine design. ✕

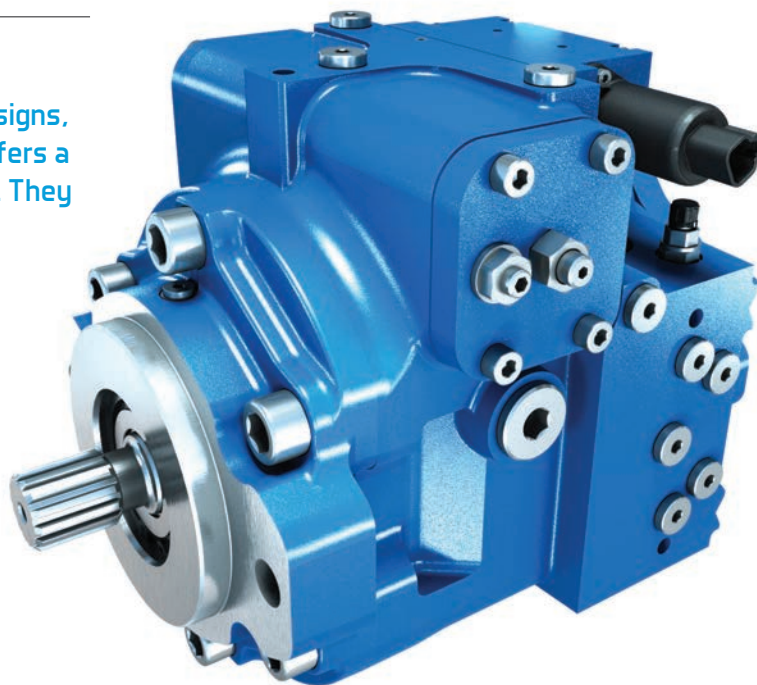
New PM70 Rounds off the Medium - Duty Pump Range

With six sizes and two designs, Poclain Hydraulics now offers a complete range of pumps. They meet the requirements of the company's strategic applications, and work in synergy with the high torque motor technology.

The PM70 is the last addition to the PM range, which spans from 7 to 70 cc.

Integrating a robust design and taking experience of the well appreciated PM30 and PM50, the PM70 is a genuine $\frac{3}{4}$ heavy-duty pump, capable of operating at 420 bar (6000 psi) of maximum pressure. As a first step, it is available in one displacement: 70 cc/rev (it could be reduced to 55 cc/rev). It is sized for large soil and asphalt compactors, large rough terrain loaders and forklifts, telehandlers, specialty harvesters and street sweepers.

The PM70 shares common design features with the PM30 and PM50, making it easier for OEMs to manage inventory and quick mix &



match conversions. Its controls are interchangeable with the sizes 30 and 50:

- Mechanical servo with feedback
- Hydraulic servo
- Electro-proportional with feedback

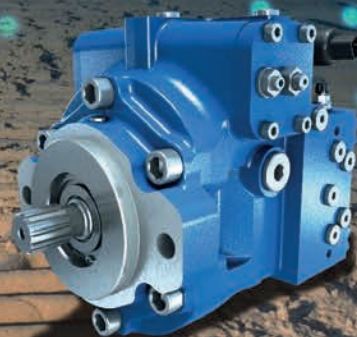
The PM70 is a strategic asset in Poclain Hydraulics' system offering, which brings together direct drive motors, pumps, valves and electronics. It enables OEMs to rely on a single partner to size, optimize and deliver a solution whose performance and functionalities will set them ahead of the competition.

Poclain Hydraulics' PM range:

| | PMV0 | PM10 | PM20 | PM30 | PM50 | PM70 |
|------------------------------|-----------------|-------|-------|---------------|-------|------|
| | Trunnion design | | | Cradle design | | |
| DISPLACEMENT [cc/rev] | 7-18 | 11-21 | 21-28 | 28-34 | 40-52 | 70 |
| Max pressure [bar] | 300 | 350 | 350 | 420 - 400 | 400 | 420 |

POWERED

for THE FUTURE





Rayco's Powerful 1800AWL Loader Sports a Poclain Hydraulics Drivetrain

Part of the Morbark group dedicated to serving the tree care industry, Rayco is best known for its line of stump cutters and grinders. In 2019 the company launched their first articulated wheel loader to address the material handling needs of their target market: landscapers, light construction and agricultural businesses, as well as rental companies. In addition to chipping the tree stumps, they need a vehicle to remove the chips, stems and dirt. The machine is branded 1800AWL and makes low impact and nimble work on all landscape surfaces possible.

Powerful and agile

"A hot little item" is how Ethan Tegtmeier, Design Engineer at Rayco, likes to call the 1800AWL. It's a refreshing alternative to the skid steer loader for more than one reason: it is versatile, and its standard plate accommodates a wide range of attachments. Its telescopic boom boasts a lift capacity of 1,800 lbs and can reach above the side of a truck. Its third remarkable feature is the way it moves: lighter than the skid steers of its class, articulated and equipped with turf-style tires, it maneuvers swiftly in tight areas and causes minimal turf disruption. Last, the 1800AWL's features are enclosed in a body made exclusively of sheet metal, so it is durable and robust.

Poclain Hydraulics for a smooth driving experience

In the design phase, Ethan and his team benchmarked the European small loader market, which is more mature than the US one. One drivetrain solution came up repeatedly on the existing machines: Poclain

Hydraulics' PM30 pump and small-displacement MS motors. They turned to SunSource, their fluid power distributor, to validate the solution and size it for the 1800AWL. Together with Poclain Hydraulics, SunSource designed the transmission to reach the best possible performance. It consists of four MSE02 motors and a PM30 pump. Three operating drivetrain modes are available depending on performance requirements: open differential, locked differential, and traction control.

Ethan is delighted with the driving behavior of the machine: "The MSE02 motors were a nice fit for our loader. When we worked on drivetrain design and commissioning, Poclain Hydraulics helped make the machine very controllable and smooth, so it is easy to master and a pleasure to work with. Everybody can drive it" explains Ethan. The 1800AWL will be on display at ConExpo, on Rayco's booth, number S5573. It should confirm Rayco's entry on the compact loader market, and lead the way to larger sizes, featuring more of Poclain Hydraulics' transmission systems. ✕



Corniver Passionate about Poclain Hydraulics

A family-owned business since 1988, Corniver is part of the compactor landscape beside giants such as Bomag and Volvo. This amazing feat is the result of a strong customer-centric culture and a unique niche positioning - the small ride-on soil compactor. We talk to Oliver Cornelia, the son of the founder and current owner of the company, about how he sees his business and partnership with Poclain Hydraulics.



What is the secret for Corniver's on-going success, on a market that is governed by multinationals?

Oliver Cornelia: First of all, our models CT 40 and 48 excel in their niche. They're small – 40 and 48 inches wide – and ride-on, so they offer a more comfortable experience than the walk-behind models on the

market. Second, their performance is outstanding. Our product excellence is also backed with the care we give to our customers. My focus is on continuous growth and dedicating time and attention to each of them.

Where are your machines used?

O.C.: They're meant for infrastructure: sewers, watermain, retaining walls, utilities and foundations. Our first market is for rental, so our machines need to be reliable, simple and maintenance-free. We know that people use and abuse the machines and they often need fixing when they are returned. We prefer to stay away from electronics, unless they enhance the performance of our rollers, and it's the case of Poclain Hydraulics' SmartDrive ECU on our size 55 model.

Your partnership with Poclain Hydraulics goes back to your first compactor design, is that right?

O.C.: That's right, Poclain Hydraulics has powered our

soil compactors from the beginning, and their motors are on all our models. Poclain Hydraulics shares our vision of product excellence and customer care. We are deeply attached to the brand.

What makes Poclain Hydraulics special?

O.C.: I have worked with many hydraulic suppliers over the years, and none matches the standards of Poclain Hydraulics. The Bataille family (the company founders), whom I have met several times over the decades, have outstanding leadership skills. They've succeeded in creating a strong company culture based on product excellence and customer support. Every time we've changed the design of our machines, Poclain Hydraulics has given us ideas to improve the transmission and overall performance. While other suppliers keep a tight control over travel expenses, Poclain Hydraulics understands the importance of working with us on the field to design our rollers. I've experienced the same closeness and family spirit at their events, and I never miss one; they're an amazing team.

Corniver's business has been growing steadily since 2015, leading them to move into larger facilities to satisfy demand. The North American infrastructure market has a bright future ahead, and we can expect to see more of Corniver's soil compactors as ageing installations need to be replaced. ✕

Sumitomo Adopts Poclain Hydraulics Motors for their Triple Screed Pavers



Sumitomo (S.H.I) Construction Machinery Co., Ltd. produces excavators and road construction machinery and is a member of the Sumitomo conglomerate, whose history in Japan goes back 400 years. Overall, the group has a workforce of 2,500 employees, 3 manufacturing plants and their machines are sold worldwide. For road construction machines, Japan, their domestic market, is first in terms of volume, followed by China, South-East Asia and Europe. Since 2006, the company has chosen Poclain Hydraulics to power their HA60W wheeled and HA60C crawler pavers, followed more recently by the HA90C crawler paver.

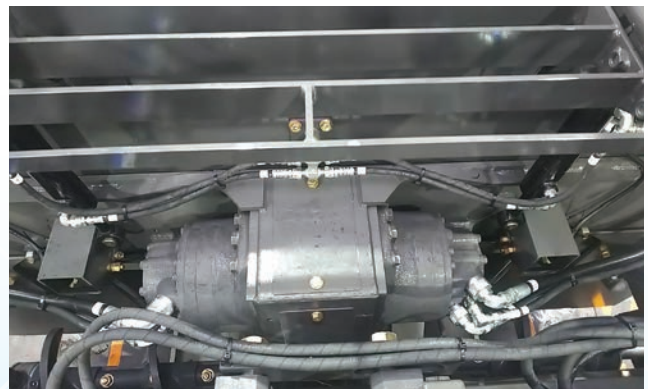
**Sumitomo launches the first paver
with an infinitely variable triple screed**

Pavers are critical in ensuring the paving quality of the asphalt mat. The asphalt in the paver hopper is transferred to the screed at the rear of the paver and is heated. It's the role of the paver screed to compact the heated asphalt mat and lay it as flat as possible. Sumitomo's pavers provide outstanding paving performance, both in terms of density and flatness. They also produce a paved surface with a minimum number of pinholes, which is critical in Japan, their number one market: when rainwater collects in the pinholes, it turns to ice in the winter and deteriorates the surface. In addition to performance, Sumitomo screeds can extend to three widths to adapt to the road width. As a result, the pavers cover a broad road width without requiring a bolt-on extension screed.

**High torque and smooth rotation
for the paver auxiliaries**

Sumitomo's HA60 and HA90 pavers cover a road width from 0.8 to 9m. For the crawler drive, both models integrate four Poclain Hydraulics MS05 motors, two for the conveyor and two for the auger. For the 6-meter wheel drive version, the four motors come with two MS08 wheel motors for the front assist. Their reliability and stability at low speed were decisive in switching to Poclain Hydraulics. The Sumitomo team was also impressed by the competitive pricing, the on-time deliveries and the support it received from Poclain Hydraulics Japan.

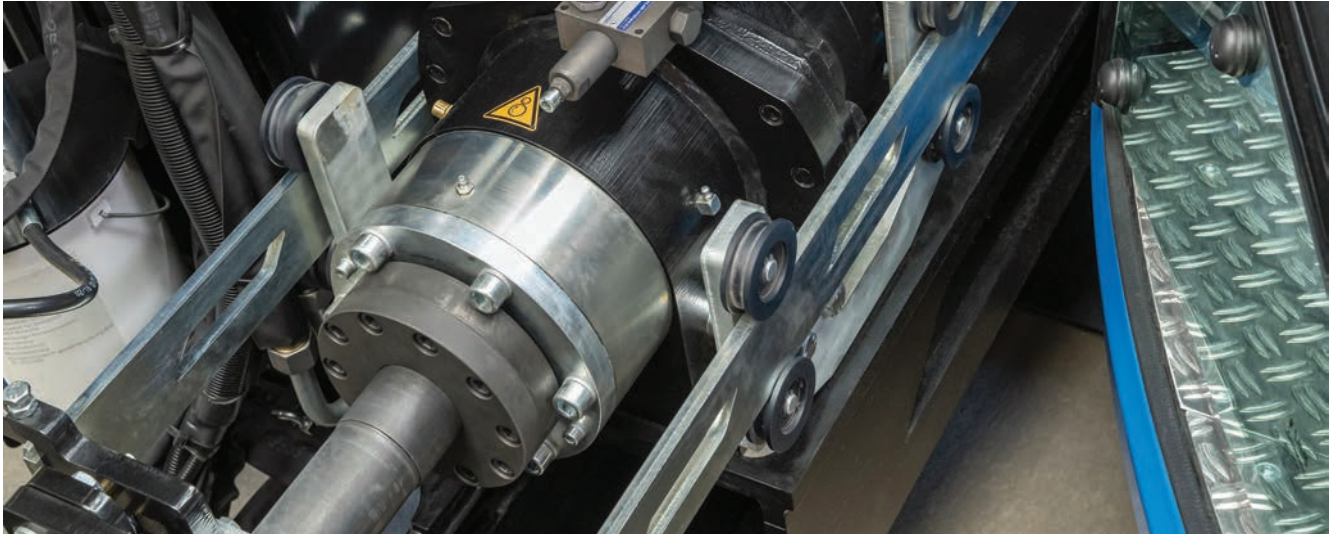
Given its strong focus on innovation, Sumitomo has integrated IoT to its pavers to enable autonomous control and address the contraction of the Japanese workforce. Regarding emissions, the OEM believes that engine performance can be further enhanced, along with efficiency improvement for the hydraulics. While e-motors are advanced in the automotive industry, it may take time in the construction market, which must accommodate heavier loads. ✕



Tracto-Technik Challenges the Directional Drill Market with a Poclain Hydraulics-Driven High-Power Rig



Anytime underground utilities are installed and excavation is adverse or prohibited, trenchless equipment is used. From fiber optics to water and sewage systems, oil, gas and electricity, the projects abound. Trenchless technology is 70 years old, roughly the same age as Tracto-Technik, a leading supplier in trenchless equipment. Headquartered in North Rhine-Westphalia, the company sells its extensive range of trenchless equipment around the world. Their new generation of HDD systems, the Grundodrill JCS/ACS series, combines innovative technology and automatization. The Grundodrill 130ACS, which enables boring in complex soils, integrates a revolutionary Poclain Hydraulics motor.



Drilling Unit with Poclain Hydraulics High Performance motor

With over 350 recorded patents, Tracto-Technik has built its name around its passion for innovation, high-quality German-made and in-depth knowledge of underground drilling. From 6 to 28 tons pulling force, the new Grundodrill series exemplifies their latest breakthroughs. It allows for remote drilling, which means only one operator is required to steer the drill head and engage the rods. The touchpad provides a slew of data, including 3D bore planning and fleet management. The Grundodrill 130ACS combines smart with powerful. Its bore head can drill through both soil and solid rock depending on the operator setting. The outstanding operating range is made possible thanks to the combination of two Poclain Hydraulics co-axial hydrobases. A size 05 MS hydrobase rotates the inner tube of the drill and crushes the rock.

A 30 cu.in per rev (500 cc) high-performance hydrobase, deriving from the MHP design, powers the outer tube at 230 rpm for steering and drilling. Lucas Jostes, Tracto-Technik Hydraulic System Designer, took part in designing the solution: "Poclain Hydraulics' direct drive motors are on a number of our machines for the feed and rotary drives. With the MHP technology, we can also use them for the drill head drive and provide exceptional power and speed."

High performance and direct drive position

the 130 ACS above the rest

The two hydrobases provide high torque at optimal drilling speed and eliminate the need for expensive and maintenance-intensive gears. The package is short and placed in line with the rods, while the previous designs required a complex set-up of gears to transfer the torque. As a result, the slimmer 130ACS can access confined construction sites. The second benefit is the 60 mm hollow shaft, which enables the bentonite to flow through the motor at high pressure, thus greatly reducing pressure losses.

A co-designed solution

"The engineers at Poclain Hydraulics adapted the MHP concept to meet our requirements. The hollow shaft and our specific displacement were not in their catalog." Tracto-Technik proposed the dual-hydrobase concept, and Poclain Hydraulics matched the speed and power requirements. Tracto-Technik then integrated the hydrobases to the drill rig. During the tests the company carried out in their test area, the co-designed solution worked instantly.

Tracto-Technik's US sister company, TT Technologies, is displaying the whole range of trenchless equipment at ConExpo 2020 at booth C32328 in Hall C3-C5. Production will begin in 2020 and the new hydrobase combination will likely be integrated to additional models. ✕



TLD Leads Poclain Hydraulics on the Runway

According to IATA, the International Air Transport Association, the number of airline passengers will double by 2037, to reach 8.2 billion. As the number of aircraft navigating our skies and airports continues to grow, taxiing on the ground is of prime concern, to streamline traffic as well as reduce emissions. The world leader in aircraft ground support equipment manufacturing, TLD provides every machine that drives on the tarmac, except for deicing and firefighter trucks. We talk to Laurent Decoux, Product and Innovation Director, about his insight on the market and TLD's partnership with Poclain Hydraulics.

Poclain Hydraulics: TLD is the unrivaled leader in ground support equipment. How did you achieve this?

Laurent Decoux: TLD groups ten factories. Each one is specialized in a specific line of machines, and shares product lines with other factories. As a result, TLD brings together a broad offering, among which you find luggage conveyors, transporters, cargo loaders, baggage tractors, aircraft tractors and air conditioning units. The common denominator throughout our offering is made-to-measure machines, as well as high reliability and low maintenance costs. Beyond our product line, our factories and 45 sales and service centers across the globe provide local production and support to our customers, in practically every airport.

P.H.: Where are your biggest markets?

L.D.: North America is number one, with the military representing a significant volume of our business. The rest of our sales is well balanced between the six continents. Our customer base is made of cargo and commercial airline companies, as well as ground handlers in the airports. As a result, we have a reasonably limited number of account numbers, yet they are spread across 140 countries.

P.H.: When did you start working with Poclain Hydraulics?

L.D.: Pretty much from the start, in the 90s, as the direct-drive design of the MS is a perfect fit on our low profile machines. The freight and container transporters must be under 20 inches (500 mm) high, so there is not much room for an axle. Our towbarless tractors, which clamp around the airplane front wheel, and use the plane weight to push it out of its parking place, can only integrate compact wheel motors.

P.H.: So you designed your TPX 200 towbarless tug with a Poclain Hydraulics transmission...

L.D.: That's right; it's powered by two MS50s and a SmartDrive CT control unit. Your direct drive motors are essential as they provide the torque needed to push back the several hundreds of tons the loaded airliner weighs. Their superior bearing capacity also enables the tug to lift the airliner nose off the ground. Last, we need the high efficiency of the motors, coupled to SmartDrive, to steer the front carriage smoothly and avoid damage. Besides precise control, your SmartDrive is connected to our onboard intelligence. It adjusts the force applied to the aircraft according to its weight.

P.H.: What's your insight on the evolution of ground support equipment for the next decade?

L.D.: The first trend is already well underway, and that's electric vehicles. Driven by the government's legislation, Chinese customers systematically opt for electric vehicles in their airports if the technology is available. Electric vehicles represent 50% of our sales today for many product lines and the trend keeps on progressing. Another trend we see is assisted driving. As Boeing and Airbus turn to carbon fiber for the fuselage, we have enhanced our safety devices on our vehicles to prevent and signal impacts. We're also integrating IoT to carry out fleet management preventive maintenance and driver assistance. As air traffic reaches new highs, TLD embraces the challenges of airport congestion and pollution, relying on partners like Poclain Hydraulics for power density, safety and reliability. ✕

Operators Navigate Inside the Poclain Motor With Virtual Reality



With techno-savvy millennials and generation Z employees populating the workforce, training at Poclain Hydraulics needed to evolve. The traditional workbenches are outdated in comparison to the attention-grabbing graphics on mobile phones. Young job seekers also tend to view the hydraulic industry as less appealing than high-tech companies. So techno-enabled training using mixed reality (augmented and virtual) is a new way to attract and train the new generation of operators.

Manufacturing engineer at Poclain Hydraulics, Nicolas Durlin launched the mixed reality project at the beginning of 2019. With Loïc Sainte Beuve, the Plant General Manager, he set the goal of increasing operator awareness in two areas: quality and safety. They partnered with 6 Freedom, a start-up specialized in building training applications in virtual reality (VR) and augmented reality (AR) for industries, to design two training modules. The first one takes the trainee inside a Poclain Hydraulics motor to understand how it operates. The second puts the trainee in high-risk situations that can cause injury, such as reading a text message while driving a forklift truck. « When a high-risk event occurs, you have no time to think. With augmented reality training, you can repeat moves repeatedly, until they become automatic » explains Nicolas. « Trainee retention is also much higher than with academic training,

because you are completely immersed, and you learn through doing ».

The modules are available to any employee who works directly or indirectly on the shop floor. 200 staff members should be trained by the end of 2020. The augmented reality session is part of an on-site course led by a trainer, who remains the centerpiece of the skill acquisition process. “Augmented reality is very powerful, however it will never replace the interaction between the trainer and the trainee” Nicolas adds. The Poclain Hydraulics training room is equipped with an HTC headset, a Microsoft HoloLens and a large screen for the group of trainees to guide and give their feedback to the trainee wearing the headset.

The virtual reality training room is currently available to all employees in contact with the shop floor at the French head office. ✕

Poclain Hydraulics Experts on Stage at ConExpo



Speaking is a unique medium to connect with a large audience and share best practices. This edition of ConExpo will see two senior Poclain Hydraulics experts on stage: Jean Heren, Engineering Manager for the Electro-Mobility Program who will present how to optimize a powertrain using electro-hydraulics. Scott Betzen, Global Director of Distribution and North American Business Development, will explore the application of on-demand hydraulic assist for vocational trucks.



JEAN HEREN

Engineering Manager -
Electro-Mobility Program

Powertrain Optimization
using an Electro-Hydraulics
System - Mobile Hydraulics

Description:

Partial or full integration of an electric solution into off-highway vehicles is an opportunity to optimize vehicles such as excavators, harvesters and material handling. A hydrostatic drive, when used in a closed loop circuit, offers a simple, robust and efficient solution for energy recovery and performance optimization. Poclain Hydraulics and its customer engineering experts have developed innovative solutions combining the unique features of hydraulics and electric motors.

Thursday, March 12 • 3:00 PM - 4:00 PM

Friday, March 13 • 11:00 AM - 12:30 PM

Location: S229



SCOTT BETZEN

Global Director of
Distribution and North
American Business
Development,
Sales & Sales Support

On-Demand Hydraulic Assist
for Vocational Trucks

Description:

Even on the most treacherous terrains, vocational trucks are expected to operate at the highest capacity. Operating in off-road conditions such as in fields and forests or construction sites, these trucks require all-wheel drive systems that are fully equipped to navigate terrain obstacles.

During this education series, we will explore the pros and cons between hydraulic and mechanical AWD drive systems and take a deeper look into which system is most effective given its application and the difference between integrating each system.

Thursday, March 12 • 3:00 PM - 4:00 PM

Location: S230

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www.poclain-hydraulics.com/en/contact-us/distributors

