

# POCLAIN MAG

## #18

October 2022

### Innovation in Motion

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NEW e+h  
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NEW GENERATION  
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Munich 2022

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# POCLAIN MAG

## #18

### Innovation in Motion

October 2022

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“  
**OUR ENERGY TRANSITION PLAN ALSO  
USES CLOSED-LOOP HYDRAULIC OR  
ELECTRO-HYDRAULIC TRANSMISSIONS  
THAT ARE COMPATIBLE WITH VARYING  
SOURCES OF ENERGY INCLUDING GAS,  
THERMAL AND ELECTRICITY.**  
”



# EDITORIAL

## OLIVIER LE MAIRE MARKET BUSINESS MANAGER - EUROPE

The evolution of POCLAIN transmissions in the face of the energy transition.

The construction market faces major transformation challenges in the next 20 years:

Environmental transformation depends on the evolution of primary energy sources for heavy machinery from traditional sources into power from batteries, hydrogen, bio-fuel, natural gas, etc. Solutions vary depending on the types of machines, their power requirements, intended use, application and other factors.

Whatever the case, energy innovation will lead construction manufacturers of equipment and machinery to seek optimized power solutions that constantly improve efficiency while reducing emissions - and that can keep these machines working at the same or improved capacities.

Another challenge in the construction market is the transfer to digital operations of public and private works with the purpose of increasing machine inter-connectivity. Another goal is to effectively deal with labor shortages and put existing man hours to better use - all while decreasing threats to worker safety.

By 2030, 40% of active employees in the United States alone will retire, giving way to a younger workforce with more experience in digital and technological developments. Connected and autonomous machines are expected to integrate into operations along with more sensors, advanced data management and the cybersecurity necessary to safeguard it all.

POCLAIN is a specialist in meeting these new industry demands and has directed its R&D department to anticipate and stay ahead of these challenges. We have implemented a two pronged strategy:

1. Hydraulics use in motors, drive trains, valves, etc. powered by alternative energy sources.
2. Electro-hydraulics and full-electric drives with an emphasis on digitization.

Our energy transition plan also uses closed-loop hydraulic or electro-hydraulic transmissions that are compatible with various sources of energy including gas, thermal and electricity.

We see these and other similar items as definitive solutions for the market and are committed to helping our customers meet or exceed their evolving demands for the future. ▀



**GERY DEPIERRE**  
Poclain Hydraulics GmbH  
Sales Manager



**H**ave a look in the mirror: two years of pandemic with limited chance to meet together. Followed by a long period of peak demand pushing our organization to adapt a daily focus on customer loyalty and agile cooperation coupled with challenges in supply chains. In parallel, we live in a world of rising geopolitical tensions that impact our footprint and grow pressure to provide even more solutions for decarbonization. Unfortunately, nobody can run away from meeting this kind of challenge!

*Having the right technological expertise is key, but strong cooperation with customers remains a must for our new solutions to go from development to real world use*

Despite this difficult environment, Poclain has developed a new strategy dubbed “SHIFT-UP 2025.” The overall goal is to be easier to do business with, be more industrial, more innovative and more entrepreneurial.

Having the right technology is key to bringing valuable solutions to our customers in their respective markets. As a result, Poclain’s innovation will focus on four points:

1. **Electrification**
2. **CO<sub>2</sub> & environmental pressure**
3. **Downsize**
4. **Measure & control to optimize sizing of transmission and controllability of machines**

For example, Poclain is now able to provide complete e+h solutions for electrification that is already part of some customer’s portfolios. We have developed solutions for small machines below 20kW. Typical applications include wheel loaders, multi tools carriers, site dumpers, truck-mounted forklifts and tandem rollers.



## OUR NEWEST MEMBER: FELIX DEBERDT

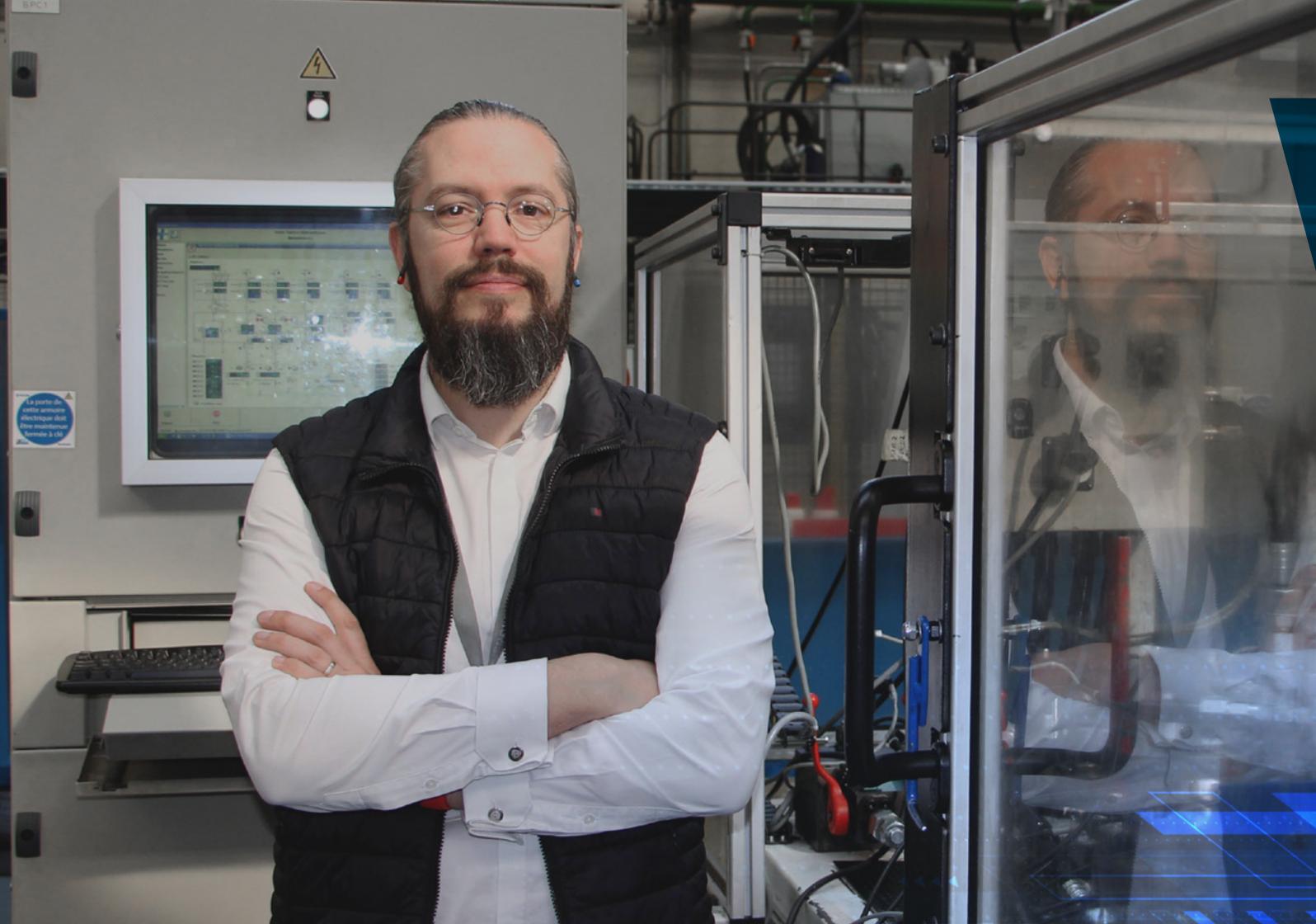
Having the right technological expertise is key, but strong cooperation with customers remains a must for our new solutions to go from development to real world use. This is the reason why we focus our efforts in collaborating with customer teams. A good example is the development of the 30kph 5040 wheel loader for Kramer which we discuss in detail here. Another recent example is the e+h Roadshow conducted across Germany and Austria. We firmly believe there is no better choice than Poclain for electrifying your existing machine, and we prove it by testing our demo-machine at customer's own locations.

On a personal note, it is a pleasure for me to introduce myself in my new position. After 14 years in France, the challenge of moving to our German subsidiary in Pfungstadt is just an extra motivation in my daily job. "Poclainers" like to say there are 4 core values here. People & International are two of them, and being part of the German team makes this real for me. Independence and Innovation are the two other core values I look forward to pursuing. Poclain certainly remains a family owned company, and you will learn more here that Innovation is definitely a strong part of our DNA. ▀

Since March 2022, Felix Deberdt has been part of the Poclain Team in Pfungstadt, Germany as a Distribution Sales Engineer to strengthen the sales team led by Sales Manager Géry Depierre. Felix's focus lays on the management and development of our distribution network in Germany, Austria and Switzerland.

Distribution Sales is an important pillar for Poclain and its importance will continue to grow in the future due to constant efforts to expand and improve the existing distributor network. Thanks to his French and German roots, Felix is fluent in German, French and English and is therefore a perfect fit for an internationally focused company such as Poclain Hydraulics.

Felix spent his earlier years studying in Stuttgart and graduated with both a Bachelors in Agricultural Science and a Masters in Agribusiness from the University of Hohenheim. At the age of 28 years, Felix is expecting his first child at the end of this year with his wife, Fabiane. He currently spends his spare time building a house in the village of Schaafheim, which lies south of Frankfurt.



# NEW GENERATIONS OF MOTORS

We, at Poclairn Hydraulics, are specialized in motors since 1958 when we began our journey in hydraulic motors which brought us today to the position of a worldwide leader in the industry. The last generation of the MS, the 4th one, was released in 1983. Over the years, the MS became more and more robust and more competitive. And it had also to face bringing more and more performance while being the global macro-trends around environmental pressure and connectivity.

## **LISTENING TO OUR CUSTOMERS BUT NOT ONLY...**

In order to be proactive and really differentiating in our value proposition, we ran surveys and interviews, not only with our customers but also with machine users and other people who are part of our global ecosystem. Putting ourselves in our customers' shoes helped us to deeper understand their main stakes and how we can address them through innovations in the motor product.

We have been also getting closer to our Sales & Applications teams. They helped us to guide our choices and they co-built our value and technical propositions.

## **HYDRAULIC IS SUSTAINABLE**

From all these connections and the technical dialogue that took place, it became clearly apparent that hydraulics will remain a technology of reference for a long time. Not because we are in this business, but truly because of the simplicity, the power density, the compactness and the efficiency we can get out of it.

Additionally, because of the high competencies that our customers have and that we have, it became obvious that there is still a lot of untapped potential to cope with the global challenge we all share.

*“We are defining not only one new range of motors but two. One for a segment of our sales driven by the need of torque and a second one driven by the need of power.”*



**VINCENT LANGLOIS**  
Program Manager  
Cam Lobe Motor  
at Poclain hydraulics

## OUR ANSWER

We are defining not only one new range of motors but two. One for a segment of our sales driven by the needs for off-road wheel drives and a second one driven by the needs of high performances tool drives.

In the first segment, our customers are requiring our motors to be a “peace of mind” components, simple, reliable and robust, in order to fulfill the propel function. As such, our product is not part of the key function of the vehicle, but our customers can rely on our propel solutions to better focus on their work functions. The main applications are on compaction, (mini)loaders, forklifts.

In the tool drive segment, the motors are part of the key productive part of the vehicle. Customers expect these working functions to be as performing and powerful as possible, in order to support the productivity of their machines. The main applications are on attachments (rock processing, forestry,...), vertical & horizontal drilling, shredders.

On top of this we are developing a common option for both ranges called Edge, which will upgrade the motors with sensors, connectivity and local intelligence in order to capture, process and exchange data. It opens up lots of potential for connected services, which is another R&D program that we are running in parallel to this new generation of motors.

## AND NOW...

Relying on some new radical innovative concepts, we will be able, for example, to reduce drastically the motor losses, the volumetric and mechanic ones, using new pistons and new designs.

The program team is working hard in order to make this progress real soon, starting to test already some first concepts on mock-ups with promising testing results.

We shift-up in our ways to innovate – You will be able to feel it starting at Bauma.

It is going to happen ! ▀

## RADIAL MOTOR TECHNOLOGY IS A KEY TRENDY ONE

The hydraulic radial motor has been considered during a long time as a niche product, as a performing but expensive technology. But as it became more and more competitive, it gave the opportunity to a larger number of people to take advantage of the overall performance in efficiency and compactness. The level of productivity you can get out of it is so amazing that even in hostile environment we know that we will not be stuck. And last but not least, the lack of scarce materials, the recyclability and its mass put it forward as a real green solution for a sober world.

For all these reasons, we are investing in this program to create the next generation of radial piston cam-lobe motors, to remain ahead of the competition, at the very time when competition is investing in this technology in order to catch up.

# e+h ROADSHOW AMAZES PARTICIPANTS WITH AMAZING TECH

**Z**ero emissions equipment is now part of the worldwide landscape in the construction industry, material handling and other related markets. The trend is expected to accelerate within the next decade, and Poclain Hydraulics will lead this evolution by continuing to create innovative, differentiating electric solutions.

## WHAT IS e+h?

POCLAIN e+h is the flexible and efficient electrification solution built for OEMs to develop and advance their electric off-highway machines and equipment. We combine our advanced engineering services with a versatile system platform tailored to each of their needs.

POCLAIN e+h fits compact machines of all types, such as:

- Wheel-loaders
- Multi-tool carriers
- Site dumpers
- Truck-mounted forklifts
- Tandem rollers
- Mini compact track loaders
- Autonomous agricultural machines
- And many others

System  
platform

Engineering  
services



+



Electro hydraulics is a strategy that includes our complete engineering services package for OEMs to outsource the work needed for their electric transmission and power supply needs in an efficient and cost-effective manner. Rather than developing costly and time-consuming ideas in-house, OEMs benefit from our experience from prototype development to final product to future innovations.

## OUR SERVICE PACKAGE IS COMPRISED OF:

- Connected engineering for duty cycle consolidation on diesel machines
- Components selection and sizing
- System simulation
- Embedded software specification and development
- Electric prototype commissioning including connected commissioning
- System functional safety assessment and support
- Continued product support and customer training

## THE USUAL PROCESS FOR THE CUSTOMER INVOLVES:

1. The customer needs to provide a duty cycle analysis of the current machine if already available
2. We provide components that are already qualified
3. We take care of integration with the customer's machine
4. We test the machine and improve as necessary



### THE e+h ROADSHOW

With such an amazing offering, we at POCLAIN had to take the show on the road. During the summer of 2022 we took a 7,000 kilometer journey to visit 30 customers with approximately 300 visitors overall. We used the «Mini Zev» (the nick name for our small battery driven articulated wheel loader) in our demonstrations to show the benefits of POCLAIN technology, which included but weren't limited to:

- Zero emissions
- Improved fuel efficiency
- Lower noise
- Equal performance to diesel machines
- Lower investments and lower maintenance
- Advanced user comfort
- Connected services for advanced data collection
- Better safety features

The feedback was amazing! «Thank you again for your visit. (For) the very spectacular presentation of your e-wheel loader and the interesting conversations with your very committed technicians and product managers,” Simon Aichberger – Global Commodity Manager, Wacker Neuson.

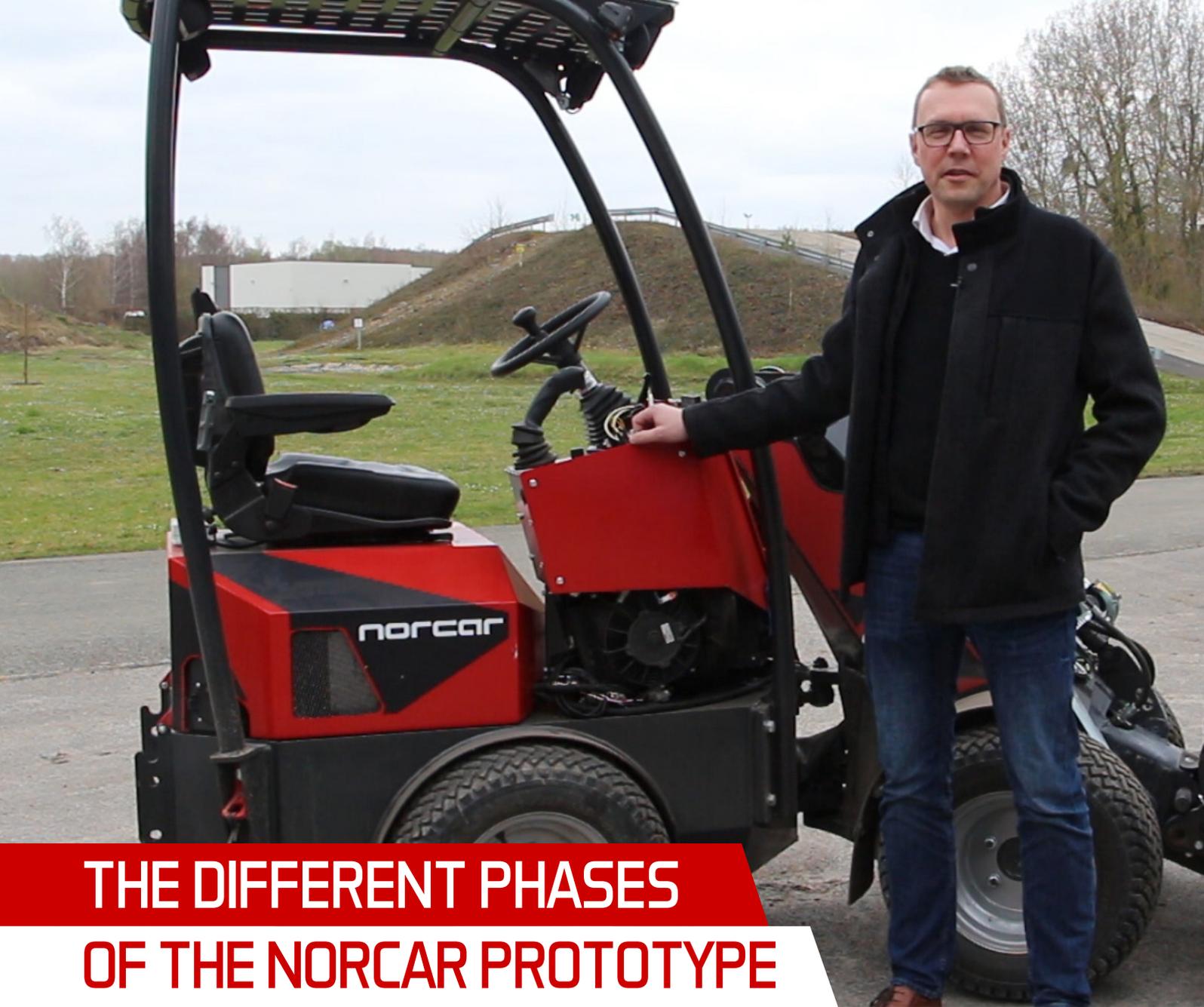
### KEY TAKEAWAY FROM THE e+h ROADSHOW

Unfortunately, we weren't able to get to everyone we wanted to. So we wanted to share more on what we and our customers learned. Many were amazed at our strategy in regards to electrification and our ability to provide detailed data. They were also surprised to see that our typical lead time was from eight to ten months to run a full project to completion. But we found that nothing compared to a live showcase of our real machines in real working conditions - especially how our electric machines stood up to traditional diesel machines.

### FUTURE ROADSHOWS

We enjoyed our roadshow so much in Germany and Austria, that our subsidiaries in other locations are looking to do the same. Our team in the Czech Republic is currently conducting a similar roadshow. We are also planning a tour for the United States in 2023. ■





## THE DIFFERENT PHASES OF THE NORCAR PROTOTYPE

**W**e at POCLAIN are often contacted by companies around the world looking to optimize their equipment with our e+h technology. Once such company was Norcar Miniloaders, which needed to optimize their engines for their mini-loaders. What resulted was an impressive partnership that immensely benefited both parties.

### MORE ON NORCAR

They are known for their Finnish technical knowledge and ingenious inventions, smart work and better solutions. Norcar was established in 1979 and has been developing and manufacturing high quality mini-loaders for many industries since 1998. Their products are ideal for entrepreneurs, those working in green area maintenance, agriculture and construction applications. The robust and durable loaders are also useful for tasks both inside and outdoors.

### 1. PLANNING

Norcar currently used diesel engines in their mini-loaders. However, with the emergence of our new and more efficient electro-hydrostatic technology, they were interested in researching the benefits vs costs.

### 2. COLLECTION

The Norcar need for electromobility prompted us to attach data collection devices on their current units for the purpose of knowing its needs. One of our main contacts was Magnus Holm, Norcar research and development manager with 15 years of experience. *“It was natural going to start up a joint venture for the electrification of our machines,”* he said when referencing his previous working relationship with POCLAIN. We used Norcar’s units to collect data such as the energy used by the loader so that we could calculate the battery that would optimize its performance.

SD- Databox installed on a60 mini-loader to get duty cycle data



Magnus Holm from Norcar during the test session of a60 model on Poclair Hydraulics test-track

For more information

**ANTHONY GALLAIS**  
Services Program  
Manager at Poclair



### 3. PROTOTYPE

With the data collected, Poclair eMobility teams assessed several “e+h” system architectures and designed an optimized solution for Norcar’s new battery powered mini-loader. The Electro hydrostatic a60 series mini-loader was then prototyped, commissioned by POCLAIN teams and delivered to Norcar to test drive. “We wouldn’t have the equipment in our R&D team,” Holm reported. The users were very pleased with the performance of the machine, especially the power when going up and down slopes, along with the safety features and data collection.

### 4. MEASURING PERFORMANCE AND BENEFITS OF THE NEW MINI-LOADER

Our main goal was for this loader to have same performance as our diesel achieved in terms of both speed and torque. Additionally, the a60 model also gave Norcar reduced noise output, no CO<sub>2</sub> emissions, we optimized the entire transmission to reduce energy consumption and also reduced the overall pollution of the loader.

Holm said at the end of the project, “It’s a very precise vehicle that can do very precise work. It’s very well optimized.”



# SEAMLESS TRANSITION FROM DIESEL TO NEW e+h ELECTROHYDRAULIC TANDEM ROLLERS

**A**n important breakthrough at POCLAIN allows us to transition from the costly and contaminated diesel market to clean and efficient electrohydraulic motors in tandem rollers, as well as other pieces of heavy machinery. The new innovation has many benefits from financial to environmental.

## ELECTRIC TANDEM ROLLER FOR OEMS

We are excited to offer this new option to both OEMs as well as for owners and end users. We have found that OEMs are very interested in transferring from diesel units to electrohydraulic to help better meet sustainability and pollution reduction goals. Our team takes customer specifications and implements surprisingly few changes to existing tandem rollers to achieve this goal. This elimination of a large scale redesign is beneficial both in cost as well as for meeting harsh deadlines.

## INVEST IN THE e+h TANDEM ROLLER

Our clients prefer to consider the costs associated with the transition to an electrohydraulic tandem roller as an investment. This is especially true for clients who invest in a partnership with us. Demand is on the rise and expected to continue, but we are able to deliver amazing prototypes within one year for client review. In fact, many leading OEMs are interested in our services.

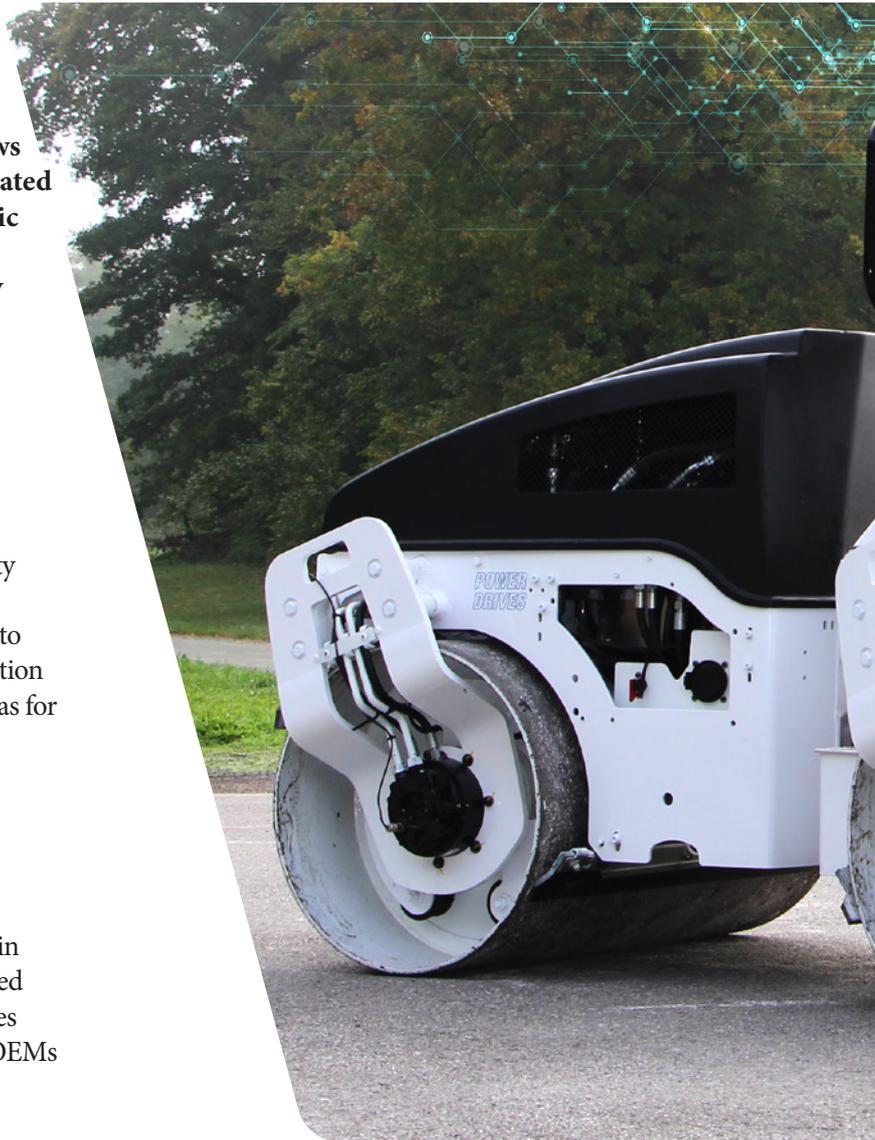
We reduce development costs by implementing such practices as keeping existing components such as the drive motor whenever possible. Our after market sales teams will offer simplified procurement thanks to high commonality in our platforms.

## THE BENEFITS OF THE e+h TANDEM ROLLER

The ultimate goal is to create a machine with a brand new electric motor that looks and operates just as well as the original one.

End users and owners also enjoy the low noise and zero emissions from new rollers. This allows them to access areas such as low or zero emission zones, underground areas and other areas where reduced noise is ideal. Another amazing added benefit is that new E+H rollers can reduce the total cost of ownership due to lower fuel costs, better efficiency and lower maintenance.

In certain cases, new tandem rollers can even offer increased productivity as well as safety over the models they replaced.



LLER



### A COMPLETE RANGE OF ENGINEERING SERVICES TO SUPPORT YOUR ELECTRIFICATION

In addition, advancements in technology allowed us to develop amazing connected services. They are a great tool to monitor these machines in real time to make sure all systems are working properly, within designated range and can even indicate when certain maintenance tasks need to be performed. This data can be collected on all rollers and machinery Poclain has equipped, analyzed by our team specialists and shared with authorized users.



Mobile test e-compactor equipped with the POCLAIN electro-hydraulic solution

### THE FUTURE OF TANDEM ROLLERS

We will preview the new tandem roller at the BAUMA show in Munich for all to see. We are currently designing the technology for energy recovery and hope to improve results with time. We are also using an innovative solution, rather than a standard, that uses a closed loop hydraulic pump that works to recover energy when vibration is deactivated. ▀





## STRATEGIC PARTNERSHIP TO GEAR UP IN eMOBILITY TECHNO BRICKS

**P**OCLAIN is proud to enter into a partnership with EMSISO, a Slovenian based company specializes in eMotor control and power electronics solutions for eMobility.

### FREQUENCY CONVERTER TYPES

EMSISO converters are an amazing breakthrough because they are more compact in size than traditional converters and can be more easily installed into the intended equipment. Other benefits include:

- More compact in size
- EMSISO inverters are compliant with the higher safety standards on the industry ISO26262
- Inverter can even act as an electronic controller

### ABOUT EMSISO

Created in 2005 by four electronic engineers and doctors, EMSISO has built its expertise in e-motor control and power electronics, specializing in the development of dedicated OEM solutions of standalone or integrated inverters. EMSISO also developed over the years a range of Off the shelf high performance emDrive inverters for low and high voltage systems. The second generation is now entering progressively its market launch phase.

Offering exceptional power in a compact design, these new inverters have been designed to offer the highest safety standard compliance (ISO26262).

Combining POCLAIN system engineering capabilities and application knowledge together with Emsiso's competences and know-how will fast track the development of new innovative solutions for the off-highway markets in the years to come in e+h and full electric transmissions. ▀



### CONTACT US TO LEARN MORE

EMSISO Frequency Converters from Slovenian Partner  
<https://www.emsiso.com/>  
<https://www.emsiso.com/products>  
<https://pscpower.com/frequency-converters/>

# A CO-EXPERIMENTATION PROJECT WITH KALYSTA

Launched in November 2021, a major campaign to connect start-ups and corporations was orchestrated by WAI by BNP Paribas for POCLAIN. Evidenced by the richness of research and innovation in France, no less than 100 startups were approached as part of this operation.

“Open innovation” means collaborative research mixing of agile structures and established companies. These are the major characteristics that POCLAIN wanted to explore through this experience with the help of the Wai BNP Paribas team.

For POCLAIN, this relatively new campaign for the company once again marks our commitment to a development and strategic transformation plan aimed at speeding up our ability to not only follow the market trends but also anticipate on the best solutions for future needs. It strives to better respond to the challenges of tomorrow: increasing electrification of equipment, development of connectivity within hydraulic systems (IoT, data), development of associated services and the reduction of our ecological footprint.

On June 27 2022, a jury made up of Poclair Innovation team members, our managing director and members of the group’s management committee invited the three final startups to present their plans for meeting our two most vital expectations:

- Improving the performance of our already efficient hydraulic motors
- Capturing contextualized data to help us improve further

After deliberation by the jury, KALYSTA was the startup selected to collaborate with POCLAIN on ways to improve the performance of our hydraulic motors.

KALYSTA is a DeepTech startup created in 2020 by Jean-Claude Rassou within the SATT Paris-Saclay, Technology Transfer Acceleration Company of the Paris-Saclay Cluster (whose shareholders are the University of Paris-Saclay, the CNRS, the Polytechnic Institute of Paris and Bpifrance).

KALYSTA’s expertise is in marketing high-performance actuators for on-board mechatronics applications requiring optimized movements. They excel in the ease of use of their technology to allow development of new applications while simplifying system architectures.

Its main markets are aerospace, robotics, mechatronics, exoskeletons and any related application requiring strength in reduced volume and weight.

Kalysta and POCLAIN are an ideal partnership to address our challenges of developing improved hydraulic motors that offer increased power with iso-dimensions or identical power within reduced dimensions.

There is no doubt that this collaboration will open up extraordinarily exciting fields of research and development for POCLAIN. As for the two other start-ups not selected during this final phase, their story continues since their projects are aligned with some of our innovation main trends. ▀





# WE ACCOMPANY YOU THROUGHOUT THE LIFECYCLE OF YOUR MACHINES

POCLAIN is a partner you can rely on to accompany you with the design and sizing of your hydrostatic or electrohydraulic transmission.

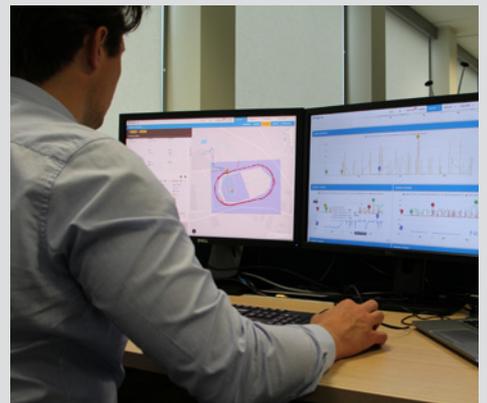
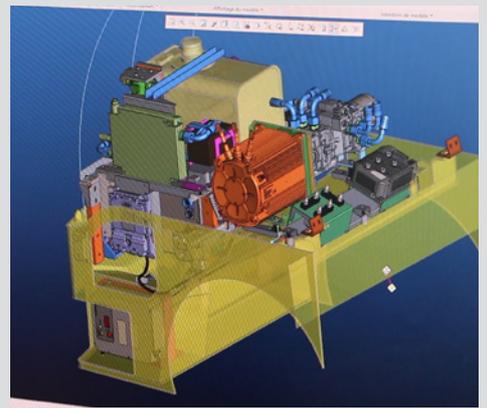
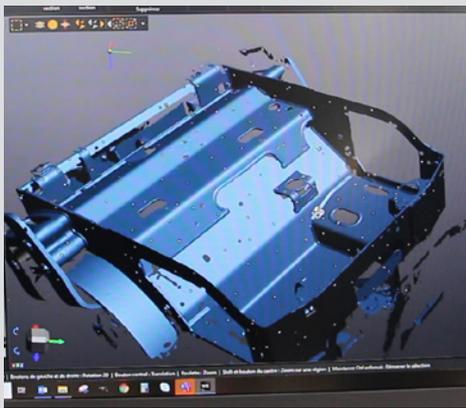
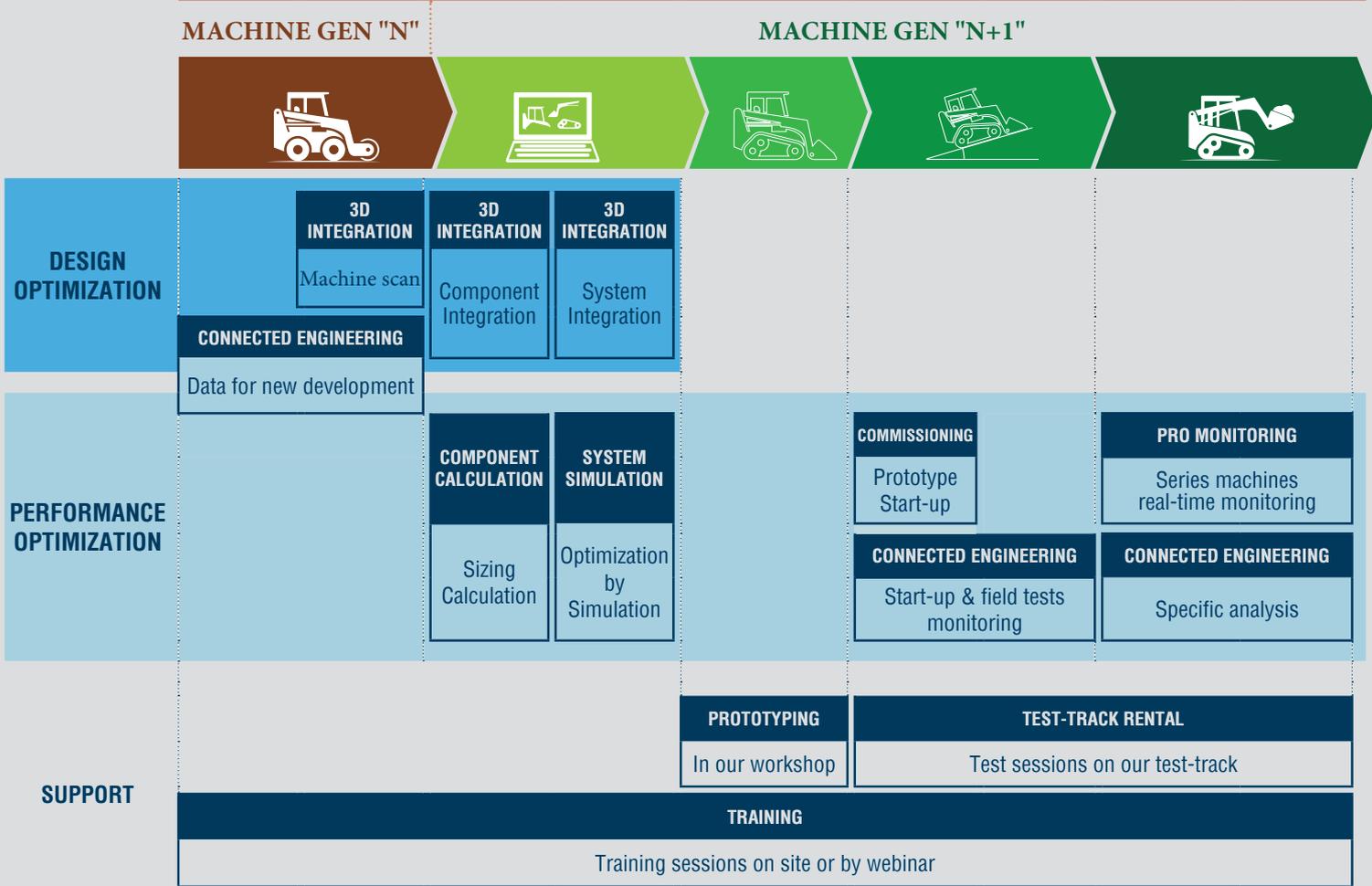
Whatever your expertise in hydraulic or transmissions, whatever your application, we offer you the background of 60 years of experience at all stages of your machine's lifetime. From design to after-sales, we guarantee the highest level of quality throughout our collaboration.

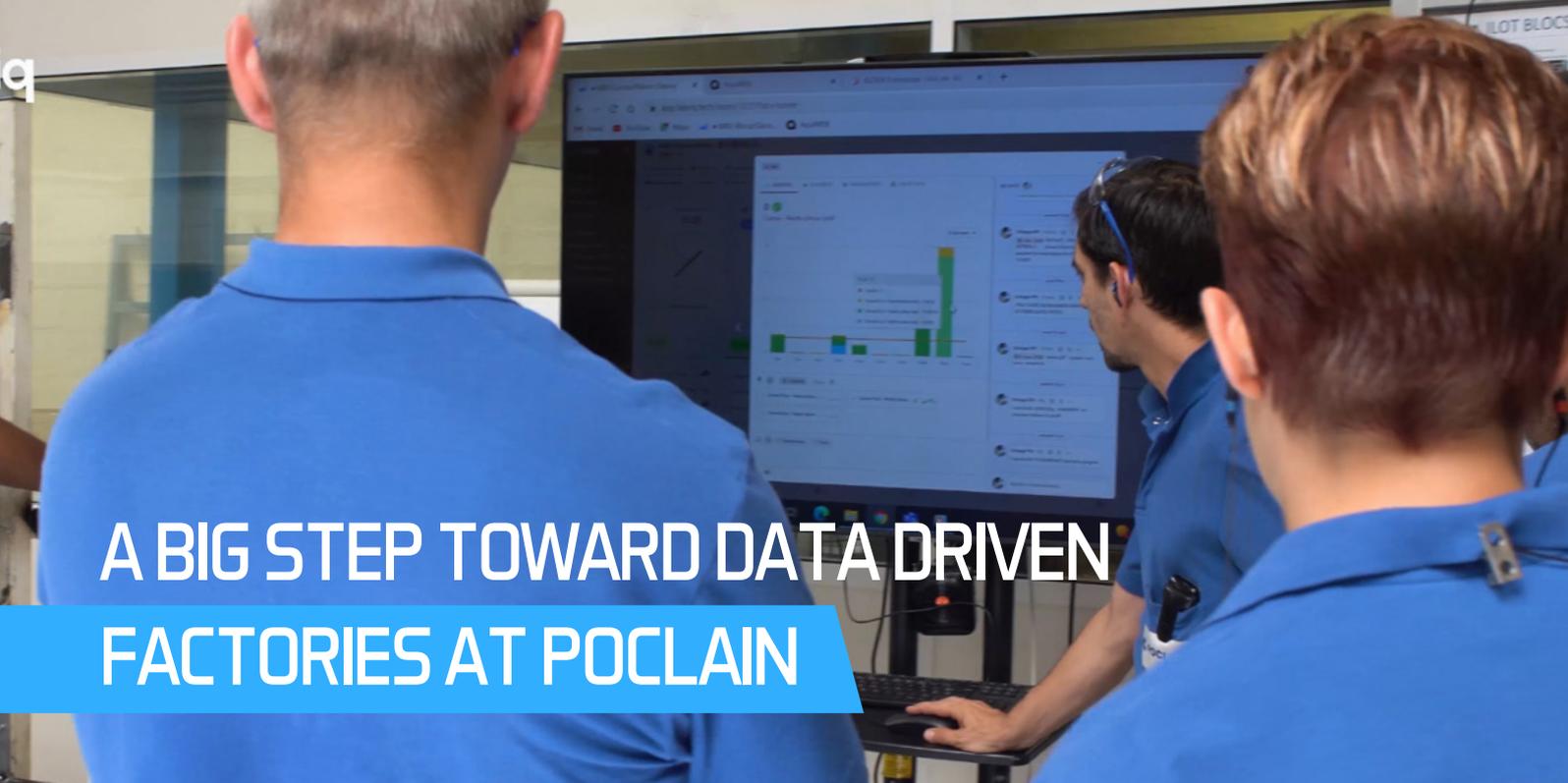
**Your transmission will perform at an optimum level**

**Time to market and technical risks are reduced**

- **Specific studies, support for customers' projects & new developments**
- **Connected services: collect and analyse machines' operation data**
- **Prototyping and tuning a new machine**
- **Testing prototypes and vehicles**
- **Software development and customization**
- **System delivery for a complete transmission**
- **Trainings**

# CUSTOMER PROJECT & NEW DEVELOPMENT





# A BIG STEP TOWARD DATA DRIVEN FACTORIES AT POCLAIN

One major trend of Industry 4.0 is about connecting equipment and collecting tons of data. But the key success factor is to put humanity at the center and to turn all these data into levers contributing to Operational Excellence.

## POCLAIN DATAHUB SYSTEM

“The main challenge is to control the diversity of data generators and to design a scalable architecture simplifying data collection from existing assets and accompany our growth.” highlights Rija Rakotoarisoa.

“It is based on this observation that the ‘Shopfloor Datahub’ initiative was born. The goal was to set-up a standard solution in all POCLAIN’s factories allowing the connection of physical and digital assets, as well as the collection and transformation of the data.”

From solutions benchmark and Proof of Concept in its Digital Lab, to the effective deployment in all nine factories, it took POCLAIN less than ten months to create what becomes the real backbone of the plants digitalization. This fast-paced project has been possible thanks to an innovative deployment methodology that allows task parallelization and shorter implementation time.

The Data Hub is today a key enabler to automate data collection, consolidation, visualization and inter-connection of equipment and software all over the shopfloors. Over twelve use cases are in production. It also comes with savings in efficiency, with better data integrity and visibility to allow for the creation of actionable data. ‘Data driven’ decisions are much simpler for plants leadership.

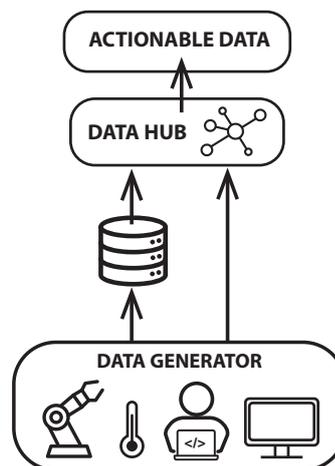
## THE RESULTS

Adoption of this system by the plants has been progressive. Spending less time in collecting, cleaning, sorting, but also questioning the data allows to switch the focus to deeper analysis and data-based problems resolution.

The first successful use cases call for more and more requests – implementation times are shortened thanks to this robust backbone! 🚀



**RIJA RAKOTOARISOA**  
Poclain Hydraulics  
IT shopfloor Manager





## CUT OPERATING AND PURCHASING COSTS FOR THE BENEFIT OF THE ENVIRONMENT!

**The manufacture of IT equipment requires the extraction of precious minerals, along with the assembly and transport of electronic components. These different processes come with various social and environmental issues.**

Given the heavy tensions associated with the scarcity of certain natural resources along with shortages of raw materials and longer transport times, we at Poclain are rethinking how we use and acquire our IT equipment.

Our Green IT approach puts into question the over-consumption and disposal of equipment when it is entirely possible to repair and reuse it.

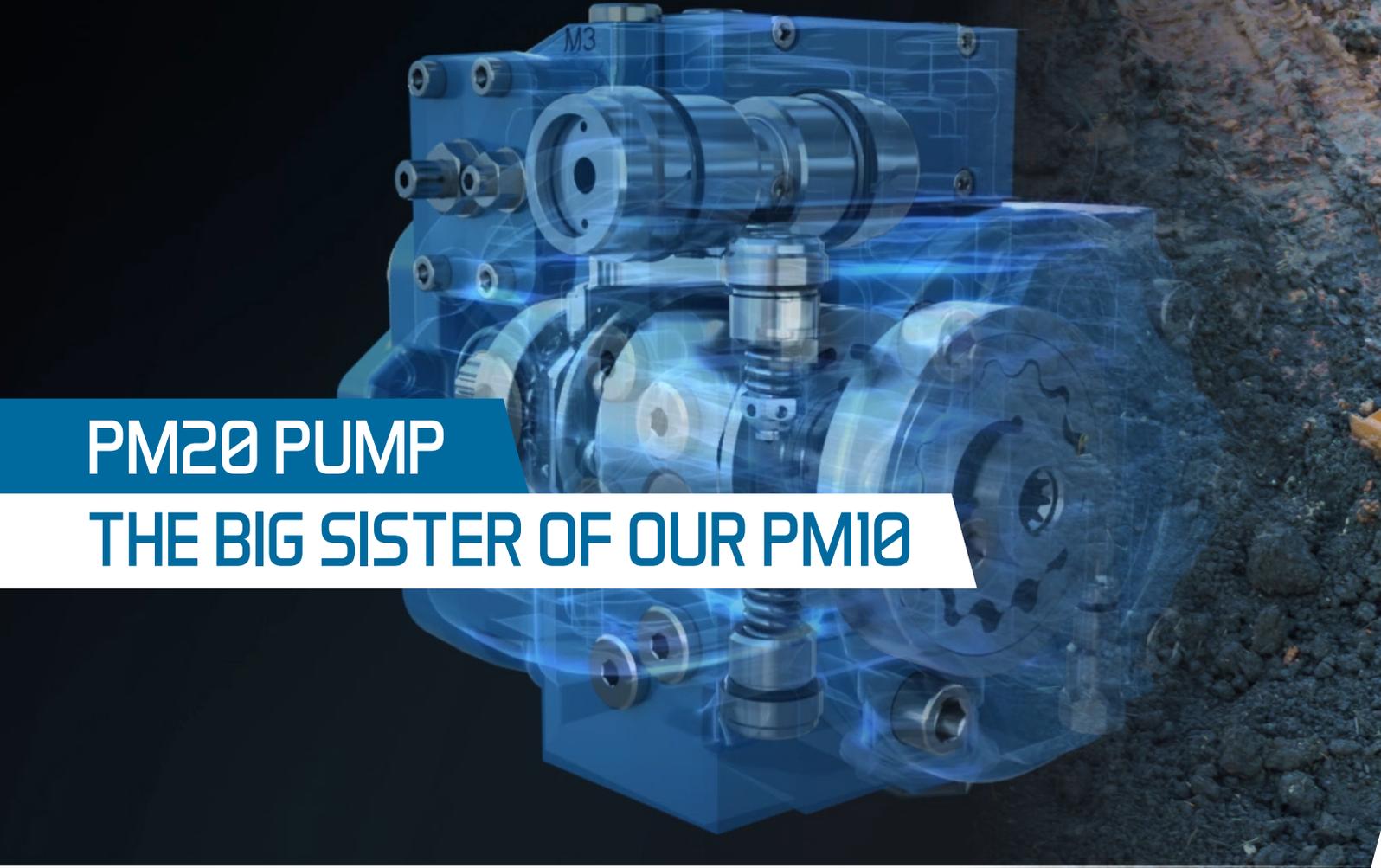
Poclain, in line with its social and environmental ambitions, has become a leader in this change and is transforming its current IT business model into a «green and sustainable» value chain.

For that, three actions have been initiated in 2022:

1. Introduce and maintain hardware and software suppliers who adopt an eco-responsible policy
2. Purchase second-hand hardware, computers and mobile phones when renewing equipment. This action starts in Q4-2022 by a proof of concept in our Brno site
3. Offer our employees the possibility of buying their professional computers or mobile phones at a competitive and preferable price. The guarantee service is provided by a third party. This offer is being introduced to Verberie site's employees before its roll out to all sites in 2023.

These actions are designed to support a circular economy that contributes to social, environmental and economic performances. They will lead to measurable improvements monitored by CSR indicators.

The measurement of the carbon footprint of our new digital activities is projected to occur in 2023. ▀



## PM20 PUMP

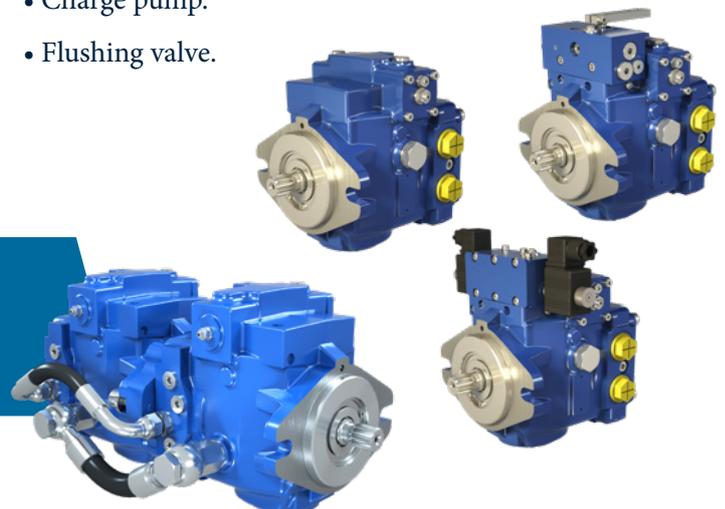
## THE BIG SISTER OF OUR PM10

Poclain Hydraulics produces a full range of products for a complete hydrostatic system supply. Our new PM20 is designed to provide more power and speed in work machines. We created this medium duty pump to meet new industry space requirements by making it practical and light at only 20kg.

Only slightly larger than our PM10, it is up to 30% faster and is a good answer for the propel drive of compact machines in the range of operating weights from 1,5 to 2,5 tons. The highly customizable pump is only 198 mm with the charge pump, while many of our competitors offer pumps that are 215 mm. This makes it easy and quick to install with a minimal disruption to normal operations. The PM20 is ideal for the construction and agricultural industries and is also aimed at the road building machinery segment.

The tandem version is only 414 mm long, has a max pressure of 370 bar, displacement ranging from 21 cm<sup>3</sup> to 28 cm<sup>3</sup> and offers more advanced controls compared to other models. It also has amazing options such as:

- Mechanical servo control with feedback.
- Hydraulic servo-control.
- Electric proportional servo with feedback.
- Charge pump.
- Flushing valve.



**FILIPPO BUZZONI**

Axial portfolio Manager  
at Poclain hydraulics



## REAL WORLD SUCCESS ON SKID LOADERS

Dynamic. Extreme. Tireless. Skid loaders work from dawn to dusk to collect, load and transport all types of material in a limited space with uneven and treacherous terrain. Poclairn Hydraulics has been dedicated to helping skid loader manufacturers perfect their machines throughout the prototyping phases to produce the best axial piston pumps for their needs.

The PM20 combined with our advanced radial piston cam-lobe motors has brought on a new era in small skid loader efficiency and safety. Additionally, our advancements in electronics has led to new controls that are most precise and reliable. The Electro-proportional servo control 12 / 24V is available with and without feedback and is used with the PM20 with many possible configurations for better process outcomes on many types of skid loaders.

## VISION FOR THE FUTURE OF THE PM20

Poclairn Hydraulics plans to continue to lead in the hydrostatic system supply sector through the utilization of our plant in Gaggio, Italy. It is a hub in the design and production of hydraulic pumps and built the PM20 to be the best performing medium duty pump in its range.

We are continuing to invest in this initiative by adding new production machines, such as a double table vertical machining center, to meet increasing customer demands leading to more effective production. The center offers exceptional cutting combined with a double pallet configuration that increases productivity. The entire system is designed for increased speed and accuracy, features powerful drives, heavy cutting capacity and unsurpassed stiffness to deliver exceptional cylinder barrel manufacturing.

As always, the goal of the Poclairn Hydraulics team is to offer to our customers the best quality and performance in all of our products. The future includes essential investments in our production processes, innovation and improvement of processes and enhanced communications with our customers to understand what they want and deliver it to or exceeding expectations.

Our new PM20 fills the gap between our well established PM10 and our recently introduced PM30 pumps and will contribute to enhancing our customers' machines performance. ▀

**ALES NOVAK**

Product Portfolio Manager  
at Poclairn hydraulics



# COMBO VALVES SAVE TIME, MONEY AND SPACE

**P**oclairn combo valves are designed to combine several power transmission functions in one single compact solution. Combo valves are designed for both medium-duty machine range (maximum pressure 420 bar) and heavy-duty range for more demanding machines (maximum pressure 500 bar). They bring several benefits to our customers.

## Possible Combo Valve Functions:

- Free-wheeling to engage or disengage a hydraulic motor or motors (VDF valves) – Assist Drive™.
- Traction control with flow divider, medium to heavy duty range (FD-M and FD-H valves).
- Electronically managed traction control valve (VMA valves).
- Exchange function to bleed hot oil from the low pressure side of a hydrostatic transmission circuit to be cooled, filtered or used as a source of oil for flushing pump and motor cases (VE valves).
- Pilot functions: Speed shifting valve and park brake control (KV, KVC valves).
- Directional control valves: For instance, diverter valves or valves to change the turning direction of some wheels (KV and KVHP valves) for side-way drive or zero-turning radius.
- Protection functions: high-pressure relief valves, serial protection valves, etc.
- Other functions as needed.

## How Long Does it Take to Design and Deliver a Combo Valve?

It all depends on the application, but it is not a long process (compared to new basic function development) as we combine existing functions to meet customer demand. Many combo valves already exist and can be quite easily customized to another application – typically it is free-wheeling function plus traction control with flow divider and an additional exchange function.

## Applications for Combo Valves

Our valves have been successfully used in several markets such as agriculture, construction and material handling machines; including harvesters, motor graders, fork-lifts and other machines; as well as various applications in the industrial market. ▽

## Benefits of Combo Valves

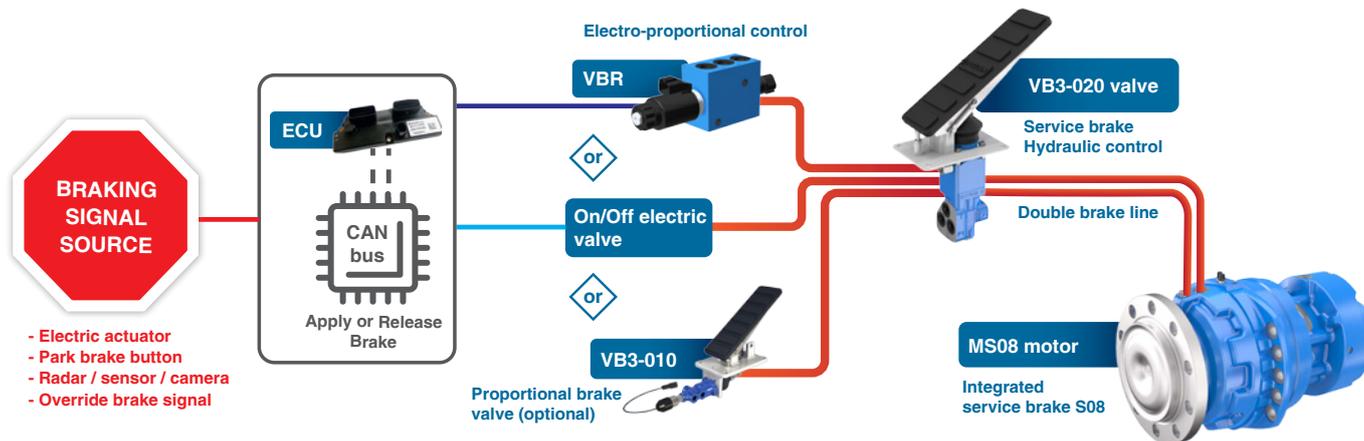
- Less hydraulic losses due to less fittings and piping.
- Less needed space on the machine – one combo valve instead of several valves connected together with hydraulic hoses.
- They come with decreased costs associated with the elimination of certain piping, hoses and other associated components (fixation elements).
- Lower risk of leakages – no piping between several components.
- They are easy and quick to install - saving time and man hours.
- They increase safety with fewer hoses under high pressure.
- Finally Poclairn combo valves make “clean machines” with less space needed for the installation and less connections.



Poclairn combo valves also combine all needed functions of the hydrostatic drive. They are designed as a standalone mount or to be seamlessly integrated on motors or pumps.

# LATEST ADVANCED SYSTEMS TO INCREASE SAFETY

Piloted brake valves allow override emergency braking and ease integration



Brake valves by Poclain Hydraulics are a globally well-established product line with innovative solutions to assure the best braking performance and operator experience for various worldwide markets. Our latest remote piloted braking components are also tailored to support more advanced and “intelligent” braking systems of the future, including use in autonomous and semi-autonomous machines.

## BENEFITS OF REMOTE PILOTED BRAKE VALVES BY POCLAIN

Remote piloted brake valves allow easy use of dynamic brakes for work/drive mode in machines, not applying park brakes.

They also provide redundancy control signals to increase overall safety by allowing override emergency braking and ease integration with other available supporting systems. Additionally, our brake valves are able to support mobile machine systems for obstacle avoidance, hill stop and go, automatic emergency braking and many more. They are designed to perfectly control brakes on axles, motors or on separate installations.

End users benefit from our braking systems with increased safety, ease-of-use and components that are future-needs compliant. Poclain piloted brake valves have been optimally designed for machine braking per weight, speed, market requirements and regulations.

## EASE OF USE / INCREASED SAFETY / INTEGRATED REDUNDANCY

When combined with Poclain Hydraulics motor brakes or other brake actuators, the benefits for end users can be seen in simple way of interconnectivity of components in efficient braking systems. The systems provide reactive brake control signals, are intelligent controls management ready (by various sources) and can also provide integrated redundancy for braking systems already inside existing components. ■



**PRIMOŽ PANGERCIC**

Valves portfolio Manager  
at Poclain hydraulics

# THE NEW GENERATION OF DRILLING A JOINT SUCCESS FOR TRACTO AND POCLAIN HYDRAULICS

**H**orizontal Directional Drilling (HDD) is an approved method for installing new infrastructure. Optical fiber for highspeed internet, water- or gas supplies in urban and rural areas are made with HDD to avoid conventional digging. This means less damage and also helps saving costs, time and energy compared to using an excavator. The new GRUNDODRILL JCS/ACS series from TRACTO sets a milestone in the power range of 130 to 300 kN pulling force with innovative features making it flexibly applicable in any type of soil.

Diverse ground conditions require different technologies for an effective work. The Jet Condition System (JCS) can be used for normal soils using the standard rods. The Poclain Hydraulics cam lobe motors are used here since they are tailor-made for this application in terms of speed, torque and power-range. This is nothing new and they were installed in previous machines as well. If the soil becomes hard and rocky, the All Condition System (ACS) comes into play. A co-axial twin-tube rod is now used for crushing the rocks, steering the

drilling head and flushing. Before introducing the new GRUNDODRILL series, complex gear-box systems had to be used to realize the co-axial drive. This was a costly, bulky and heavy solution which also required extra maintenance for servicing the gear-box oil.

The Poclain Hydraulics MS series always allowed the use of hollow shafts. For extra power, a special version of our MHP series is used here for additional speed and lifetime. Two of those hydrobases in a row allows the rotation of the co-axial twin-tube rods plus the additional passage for the flushing. This makes the whole machine layout unbeatable in terms of slimness and low weight.

The basic hydraulic components are from the Poclain Hydraulics standard MHP. However, the demanding application required some adaptation and alignment to fulfill TRACTO's needs. ▀

Drilling unit with Poclain Hydraulics high performance motor



*“The basic idea came from TRACTO. Our target was the elimination of the very special and bulky gear-boxes. We approached the application engineering of Poclain Hydraulics, located not too far from us in Pfungstadt, Germany. Several technical meetings were held but we found a promising direction after short time. Some adaptations needed to be done in detail, but most parts came off the shelf. Testing the prototypes with support of Poclain Hydraulics field technicians proved the performance in practice.”*





# NEW WHEEL LOADER GOES FASTER, SAVES MONEY

Poclair Hydraulics  
MG steerable wheel motor

**W**e at POCLAIN are proud to have a long standing professional relationship with KRAMER-WERKE, a leading manufacturer of wheel loaders, telescopic wheel loaders and telehandlers for the construction, agricultural, rental parks, municipalities and other industries. All the way back in 2007, the 5035 Compact Wheel Loader was born. But it was time for an update.

## ENTER THE 5040 WHEEL LOADER

One of the main desires from Kramer was to develop a version of the loader with increased speed. Thanks to our latest innovations, Poclair was able to deliver motors capable of taking the wheel loader from 20 kph up to 30kph. Customers had a desire for a quicker machine in order to do their work faster and reduce man hours. But the 5040 has many other amazing features:

- Steerable motors for better mobility and handling.
- Three steering modes (all wheel steering, crab steering, front wheel steering).
- Switchable motor that can run double speed.
- An advanced speed sensor with only two pins supporting the possibility to use a one controller design.
- Noise reduction for both driver and worksite comfort.
- An additional smart driving option, modern cabin design, improved console and better power rating.
- Increased diesel tank capacity of 60%.
- Eco-drive mode that can cut down the diesel engine speed from 2 600 rpm to 2 150 rpm.

In short, one of these machines can finish work faster, refuels less, saves man hours and can then be put into an Eco-drive to save fuel.

## THE RESULTS SO FAR

The 30 kph machine was introduced in 2021 and has reached already a sales rate of 40%. It is in high demand for the street sweeping and snow removal markets. This is especially true in Scandinavia because they want their plows to go long distances without refueling in order to get their work done faster. They have found the Kramer 5040's combination of increased tank capacity and improved machine efficiency gives them longer working time with more output. ▮

## FOR MORE INFORMATION

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### Martin Anders

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# OPTIMAL MACHINE THROUGH CUSTOMIZATION



**ALES NOVAK**  
Product Portfolio Manager  
at Poclain hydraulics



**P**ALFINGER is an international technology and mechanical engineering company and the world's leading producer and provider of innovative crane and lifting solutions. With over 12,600 employees, more than 30 manufacturing sites and a worldwide sales and service network of around 5,000 service points, PALFINGER creates added value from the challenges of its customers. PALFINGER is consistently continuing on its course as a provider of innovative, complete solutions that deliver increased efficiency and better operability, while leveraging the potential of digitization along the entire production and value chain.

## THE CHALLENGE

Palfinger came to us with the need for a truck-mounted forklift with superior performance combined with a well-structured layout of hardware components such as engine, drive train, hydraulic pipes, etc. And of course, they were looking to save on costs throughout it all. The main hydraulic drive consists of:

- three of our MS05 motors per machine;
- PM50 closed-loop pump;
- and traction control valve;

but all these hydraulic components are usually placed on different places on the machine and connected together by hoses. This was a drawback for a compact machine like a forklift, where weight has to be distributed in an optimal way.

## THE SOLUTION

In close partnership with PALFINGER, POCLAIN developed an innovative solution that combines the drive pump and assembled traction control valve block in a one-package solution. It was designed to be compact and highly efficient. Our team was also able to incorporate an optional directional control valve to give them the ability to create 4-way truck mounted forklifts by using the same base model. This resulted in less variety and high flexibility in their assembly and logistic processes.

Upon commissioning, the team at PALFINGER reported the new machine performed incredibly well and gradually increased their orders. The new machine also looks cleaner and more efficient just upon a simple visual inspection. You can see the new machines contain less pipes and connections, in addition to hydraulic losses reduction.

## TRACTION CONTROL BENEFITS

The traction valve is a 3-way flow divider that is engaged in rough terrains, but by-passed when not needed on flat areas. Additionally it contains some piloting functions and customizable functions that bring an all-in-one solution for several operations on the machine. The valve makes the machine capable of driving and transporting loads on high demanding terrains (slopes, mud, etc.).

## FLANGED VALVE BENEFITS

The POCLAIN flanged valve reduced the required number of fittings and hydraulic losses, as well as the overall pipe length bringing cost and space savings to the customer. As an added benefit, the pump combined a gear pump and main drive pump in a one-package solution. It used less assembly and could be painted in whole at once. The final product comes with a lower risk of leaks and was a great addition to what was ultimately called a "clean" and efficient machine. ▀

# AFTERMARKET REMANUFACTURING PROGRAM

In the last few years, we at POCLAIN have observed an increased interest from end users and distributors for remanufactured units.

Remanufacturing is «the rebuilding of a product to specifications of the original manufactured product using a combination of reused, repaired and new parts». It requires a controlled process to remanufacture worn components received under various states of disrepair. Components are replaced that may be degraded to the point where they cannot meet required performance or will not last as long as intended.

## REMANUFACTURED MOTORS & SUSTAINABILITY BENEFITS

Our Aftermarket Remanufacturing Program deviates away from old fashioned models wherein a product is produced, sold, used and has to be thrown away and replaced. POCLAIN focuses on a circular business model where a big portion of components of returned cores are remanufactured within a specifically controlled process. Worn components are replaced by genuine POCLAIN spare parts. All remanufactured units are 100% hydraulically and leak tested and repainted. They are then sold as new or «better than new» due to upgrade to latest design revision.

Many customers can benefit in choosing to buy remanufactured motors rather than purchasing new units. A remanufactured unit is ideal for motors that are nearing the end of their life cycle or failing to perform as well as they used to. In short, their benefits include:

1. Remanufactured product is sold with standardized warranty (depending on type of product).
2. Subsequent discount when you return the core to remanufacture.
3. It is especially beneficial when you need fast replacement on a broken machine in the field.
4. Buying remanufactured products decreases CO<sub>2</sub> emissions, reduces waste and saves precious raw materials.



**LENKA KOZIAKOVA**

Aftermarket Program Manager  
at Poclair hydraulics

## POCLAIN | *REMAN*

### POCLAIN REMAN PROGRAM

Our experience has allowed us to come up with remanufacture offer with preferred models ranging from MS size 05 up to 125, depending as well on application and usage of motor.

You can benefit from short lead-times and standardized warranty conditions once we establish your needs and develop a remanufactured solution.

The POCLAIN team has already had promising results in remanufacturing with MS35 motors for tunnel boring machines and MS05 for airport tractors. Our success has also allowed us to develop programs with global OEM's in need of remanufacturing.

Our Remanufacturing program complies with the POCLAIN Social Responsibility Charter, and we are a proud member of the European Remanufacturing Council. Please contact us to learn more about how our remanufacturing program can meet or exceed your needs.





**DANIEL FROC**  
Poclain Hydraulics  
Training Center Manager

# TRAINING CENTER EXPANDS TO GLOBAL RESOURCE

**O**ur world class Poclain Hydraulic Training Center (PHTC) is designed to provide the best and latest training for all of our current and upcoming technologies. We are proud of all we have accomplished with the PHTC and have recently expanded our capabilities.

## TRAINING FOR EMPLOYEES

Initially, the PHTC was designed for the training of our employees. Even though they come to us from the finest schools and organizations across the world, we at Poclain Hydraulics want to ensure our values and goals are taught, along with the cutting edge technological and hydraulic fundamentals for our hydraulic motors, hydraulic pumps, hydraulic valves, electronics components and our systems. Our trainers have over 20 years of experience and we have even expanded the program into several areas:

- Basics and fundamentals of hydraulic principles.
- How Poclain Hydraulics products work.
- How to maintain, repair and install products.
- Continuing education and self-training courses.
- New training center in China to relay trainings for Asia area.

## POCLAIN ACADEMY LMS (LEARNING MANAGEMENT SYSTEM)

The primary purpose of our LMS is to provide and simplify learning in our organization. We can keep our employee's knowledge up-to-date which allows students to learn at their pace, on their schedule and at their location of choice.

## TRAINING FOR CUSTOMERS

The PHTC has also expanded to educate customers across the globe. Their training begins with basics of hydraulic and goes all the way up to expert-level. Customer training can also include how to get the most benefits from our products, as well as DIY repairs if and when they need them. We also show them how to do common tasks, such as how to perform a specific operation on a Poclain Hydraulics motor or how to adjust settings for certain processes.

At the end of training for both employees and customers, we always do an assessment to see if they have learned what is taught, as well as how they felt about the PHTC as a whole. We have learned over the years that an essential component of positive feedback is to clearly define expectations and be sure all trainees have confidence in what they learned. As a result, the feedback has been positive.

## THE FUTURE OF THE PHTC

During COVID, we built a Digital Training Room into the PHTC, and it was so useful we kept it as an ongoing learning resource. It now allows for people from all over the world to learn what Poclain has to teach. Best of all, we can constantly update it with new products, technologies and much more. ■

# THE POCLAIN HYDRAULICS TRAINING CATALOG IS ONLINE!

Learn and grow your technical expertise with Poclain Hydraulics Training Center. Classes are available both in-person, on-site or via webinar. Read on to view the PHTC training catalog.



Poclain Hydraulics Training Center's (PHTC) technical courses help trainees acquire fundamental hydraulic knowledge, confidently define and select Poclain Hydraulics products & systems, and fine-tune a system.

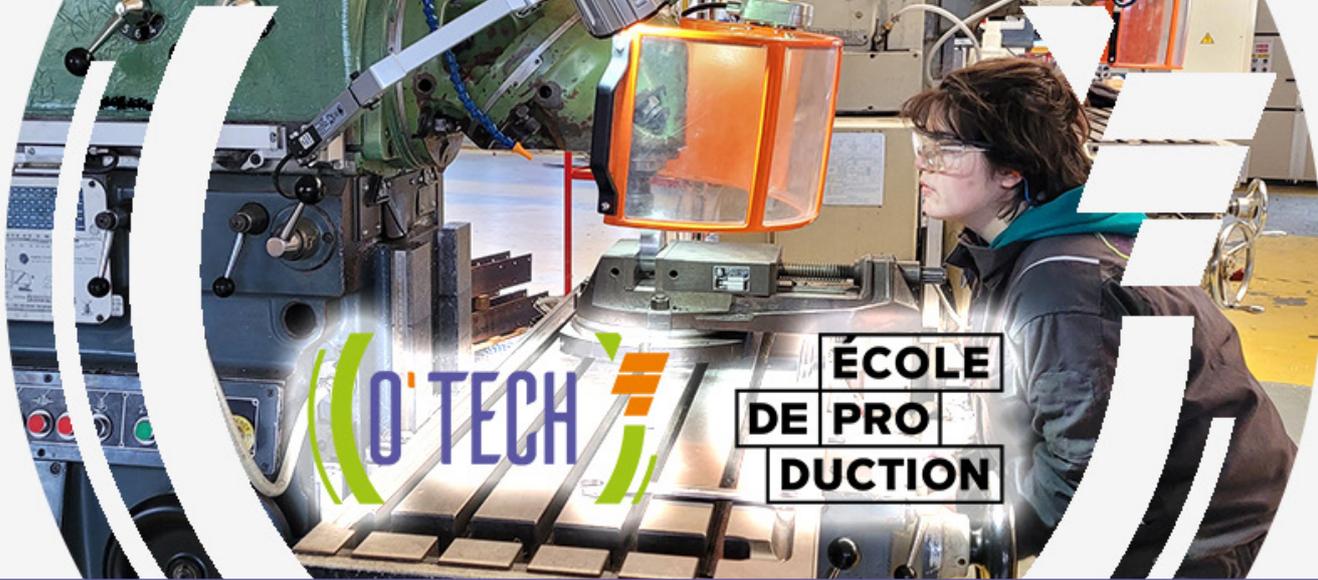
Learn and grow your technical expertise with Poclain Hydraulics Training Center. Classes are offered in-person at either your location or one of our PHTCs with many also available via webinar. The PHTC training catalogue gives you access to information on all available courses:

- course description
- training goals
- defined prerequisites
- teaching methods
- skills assessment



**Do you have a question or training need?  
Contact Poclain Hydraulics Training Center**  
PHTC\_Contact@poclain.com





# POCLAIN PARTNERS WITH O'TECH SCHOOL TO TRAIN STUDENTS FOR REAL WORLD

**In line with its mission and its values, POCLAIN encourages the integration of young people in difficulty into professional life and supports educational projects. The «O'TECH Production School» is the reflection of this commitment.**

The O'TECH Production School is also conveniently located near POCLAIN's headquarters in Compiègne. Its creation comes from a shared vision and partnership of committed local manufacturers including ourselves, SAFRAN, CMC (Constructions Mécaniques de Chamant) and the UIMM (Union des Industries et Métiers de la Métallurgie).

This school prepares young people, who fell out of the traditional school system, to obtain a state diploma and trains them to the professions of sheet metal work and machining.

The «O'TECH School of Production» opened its doors on September 15th 2021. The first class included 30 young individuals aged 15 to 17. Its clear success attracted many new candidates and the number of students jumped to 49 in 2022, including 7 girls.

The pedagogy is based on «Doing to Learn». The students spend 24 hours a week in the workshop making real parts for real customers. The students follow the national education referential in general subjects (French, mathematics, history-geography, science, etc.) and receive practical training related to their future profession. They very quickly put their knowledge to work for customers by producing high-precision parts, based on actual work orders, specifications and delivery deadlines to be met. To fulfill the demands, the students use their knowledge and skills, as well as rigor and their passion for a job well done.

Poclain makes available to «O'TECH Production School» the professional skills of some of its employees. Through a "skill sponsorship", one Poclain employee devotes a third of his time to the school to:

1. Develop its infrastructures,
2. Manage governance and public relations,
3. Respond to calls for projects,
4. Search for fundings: To date, more than 40 public (European funds) and private (corporate foundations) funding applications are open.

Other employees, from Purchasing, Quality, Prototypes, Human Resources... are also involved in transmitting their professional knowledge to the students or in hosting them during internships.

Just a year after its opening, a project to extend the premises is underway to accommodate a new classroom, offices, locker rooms and new machining and sheet metal working equipment.

This initiative offers young people a new future, involved in the industry as fulfilled citizens! 🇫🇷

<https://otech-ecoledeproduction.fr/>





# POCLAIN FOUNDATION TO LAUNCH IN 2022

**S**upported by the Bataille family, the POCLAIN Foundation project has achieved a major step. The definition of its legal framework has been completed as well as the organization of its governance, as well as plans for its international footprint.

The POCLAIN Foundation will uphold our organization's core values: People, Independence, Innovation and International. Our mission is to promote these values in enhanced ways in addition to our traditional economic activity of providing industry leading hydraulic and electro-hydraulic solutions. We will aim to contribute to the common good with a strong impact and local presence. Within the Group social community, it will be a hub for cohesion and will consolidate our worker's affectio societatis (the common will of people to operate within one entity).

Chaired by a member of the Bataille family, the operational tasks will be carried out by a manager based at the site in Verberie, France. This part-time role will be to welcome, assess and process the calls for projects, follow-up on donations and on skill-based sponsorships, handle the communication and the Poclain Foundation dedicated webpage. This person will coordinate and work closely with the local representatives of our various sites.

The Foundation is planned to go live at the end of 2022, and will be dedicated to strengthening relationships between the Group's employees and the shareholders, as well as continue our mission for a cleaner, more efficient world. ▀

**The foundation will sponsor projects related to:**

- **Education.**
- **Occupational integration.**
- **Promotion of the industry.**
- **Strengthening of the local social fabric and of the "living together".**



# POCLAIN HYDRAULICS SALES SUBSIDIARIES IN THE WORLD

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## More than 200 distributors worldwide

To find the nearest distributor go to  
our dedicated web page



[www.poclain-hydraulics.com](http://www.poclain-hydraulics.com)

