

POCLAIN MAG

#11

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Manitou & Poclain:
two leaders in partnership

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CreepDrive™
offering expands!



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EDITORIAL



OLIVIER LE MAIRE
CONSTRUCTION BUSINESS
MANAGER

“ To support this growth, Poclairn Hydraulics is continually pushing the limits in terms of innovation, production tool and geographical presence. ”

Since the first Expomat trade shows in the 1960s, largely developed by Poclairn Hydraulics and in particular its President and CEO Pierre Bataille, President of Expomat until 1975, INTERMAT has become one of the essential construction machinery exhibitions for players from Europe, Middle East and Africa.

The 2018 edition is particularly important as it follows a year of strong global growth and announces major projects. Europe is at the forefront, with the Grand Paris Express and its two hundred kilometers of public transport network including four new metro lines, railway sites in Germany, the United Kingdom, between France and Italy with the Lyon-Turin rail project, and the projected submerged tunnel between Italy and Austria. Africa and the Middle East are not left out, with motorway and infrastructure projects in Algeria, Qatar, Kenya and the United Arab Emirates, boosted by the 2020 Universal Exhibition in Dubai.

To support this growth, Poclairn Hydraulics is continually pushing the limits in terms of innovation, production tool and geographical presence.

Following the successful launch of High Performance motors and Medium Duty pumps, Poclairn Hydraulics pursues its ambition as a hydraulic transmission system designer and presents Intermat 2018 with the new generation Creepdrive™ offering, which combines superior performance with unmatched driving precision at low speed.

In this edition, we will also come back to the enhanced traction offer for trucks with our exclusive Addidrive system, our highly integrated steering (MG) solutions, our Twin-Lock traction control and high-power cooling solutions.

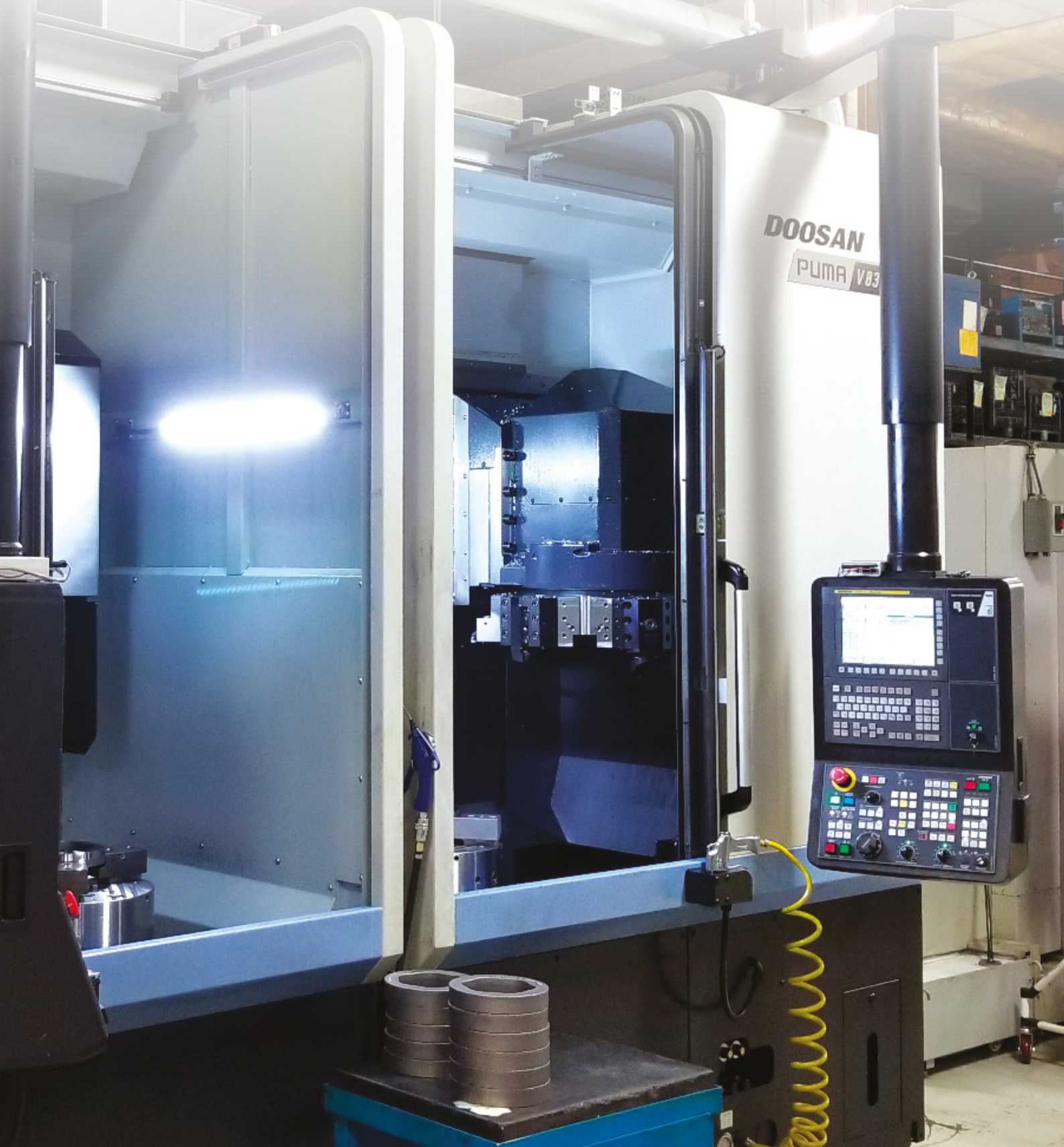
Innovation, at the heart of our values and serving our customers, also finds its full dimension in our new after-sales organization and our ability to support our customer's sales forces launch their machines.

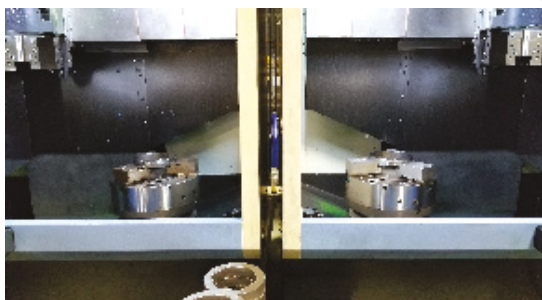
On the industrial front, Poclairn Hydraulics is doing its utmost to achieve its goal of a 20% permanent capacity reserve through a major investment plan including ambitious roadmap for robotization and growth of our factories in India and China.

Welcome to Intermat and visit the Poclairn Hydraulics booth!

ACCELERATE INVESTMENTS to follow the market growth

In these times of high demand, Poclain is making it a priority to increase available capacity to be able to respond to market growth.





**In the «manufacturing world»
the main capacity drivers are:**

- ◆ Closely managing the supply chain and the panel of suppliers
- ◆ Maintaining adequate capacity in terms of in-house machining, which means ensuring we have enough machines, a high overall efficiency of machines, and good maintenance performance (tracked by OEE, MTBF & MTTR: respectively overall equipment efficiency, mean time between failure, mean time to repair).
- ◆ Ensuring we have enough skilled machining operators (which is becoming more and more challenging)
- ◆ Maintaining good assembly capacity (enough assembly lines, sufficient capacity with our end of line test benches)
- ◆ Implementing an efficient ERP system to manage the orders and priorities.

Poclair's strategy is to keep 20% available capacity in comparison with the three-year forecast.

In this article, we will focus on the key machining processes for radial piston motors and emphasize the huge effort underway at Poclair to generate this extra capacity.

For radial piston motors, the core processes that we usually do not subcontract are the production of pistons, cylinder blocks, cam rings and valve plates.

For these parts, Poclair runs a pool of about 200 installations of machining, heat treat, surface treatment and assembly in six plants worldwide involved in production of radial piston motors.

Every year, in addition to a continuous improvement plan in safety and quality, we launch new investments to maintain our equipment in good condition (replacement investment), to increase our capacity (capacity investments) and for productivity.

Some of the most recent investments include multi-axis machining centers, paint lines, and heat-treating processes. Another trend is the automation of machining processes. Recently we invested in robots that are involved at several steps of the machining process and in new automated machining cells. Altogether, Poclair intends to double the current number of robots in the next three years. Over a cycle of two years (mid 2017 – Mid 2019), Poclair will have invested over 30 Million in the acquisition of new machines.





POCLAIN HYDRAULICS SERVICE

Service culture throughout the life cycle of your product

Patrick Daimé is Director of After-Sales at Poclain. In a business environment where demand has reached historically high levels, Poclain's teams are posting a five-point increase in satisfaction rate. This is in part due to our strong service culture and agility that allows us to react quickly to potential field issues. The quality of after-market service and the customer relationship is a central element for loyalty. We keep track of our customer performance and make a point to anticipate the services of tomorrow.

In early 2017 you rolled out the spare parts platform at Poclain Hydraulics Brno, Czech Republic. How does this fit into Poclain's after-sales strategy?

Patrick Daimé: Before January 2017, several European production sites and sales subsidiaries managed their own spare parts. Today they keep a stock that allows them to make repairs as they come in; as soon as it falls below the safety-stock level, Brno replenishes it. We opted for this new organization to eliminate redundancies and focus the expertise of our teams in one place. This location makes the most sense as it is the Brno plant that produces the greatest variety of motors in the Group. SAV (Service Après-Vente or After Sales Service) France teams are then able

to focus on complex repairs, Flash repairs, training and personalized services. This is part of our move to step-up our commitment to our customers with specialized teams and optimized processes.

What are the after sales services offered by Poclain today?

After-sales encompasses two standard activities: repair management supported by our Return Material Authorization (RMA) process. We receive the product, assess it, repair it and manage the warranties. The second activity deals with spare parts, which is more like trading. We take orders, handle calls and inventory, package and ship parts. We also offer services that meet more specific

customer demands. Such as the Flash Program that guarantees the manufacturer will receive its repaired motor in 48 hours maximum. Then there is the Reman program (reconditioning) for recurring customers, which allows them to replace a broken motor with a remanufactured motor that we repaired and tested on the bench. The customer replaces his motor in a short time and at a cost less than a new motor. We also update the installation and technical documentation and repair manuals of our products with exploded views and spare parts lists. Behind the scenes, after-sales training is important for both our subsidiaries and our authorized repair centers. We regularly hold trainings around the globe several times a year to keep technicians who work on Poclairn products up to date on the latest techniques and best practices. We also allocate significant resources to create and update our installation and maintenance manuals.

Poclairn is growing in the Middle East and Asia. How are you managing after-sales service in these areas?

We are working to recruit new repair shops in these underserved areas, which we will integrate into Poclairn's certified repair center network after training and contractual agreement. Currently we are certifying a center in the United Arab Emirates and others in Asia.

In the digital age, customers are demanding more transparency and data sharing. How does this translate into after-sales?

- ◆ We are continuing to roll-out an EDI (Electronic Data Interchange) project

- ◆ We are working on a customer portal project to facilitate the accessibility of relevant technical information and order taking slated for go-live in 2020. Currently, our Spares 2 portal gives customers who want it access to exploded views and spares lists.

With the Poclairn Véhicules division you are moving into the truck and commercial vehicle market. Do they have different aftermarket requirements?

These markets have very detailed requirements: warranty treatment, packaging, responsiveness, supply chain, documentation, collaboration very early on in projects ... This led us to adapt our organization to satisfy our customers throughout the development and life cycle of our products. Poclairn offers white-label packaged spare parts, or even custom-made packaging. This appeals to the manufacturers of on-road vehicles as well as the off-road leaders. These options allow them to attach their logos on our packaging and to manage stock replenishment.

The internet opens the door to counterfeit products. Sites like Alibaba offer parts, complete motors, and photos that look like the originals. How can customers protect themselves from fraudulent products?

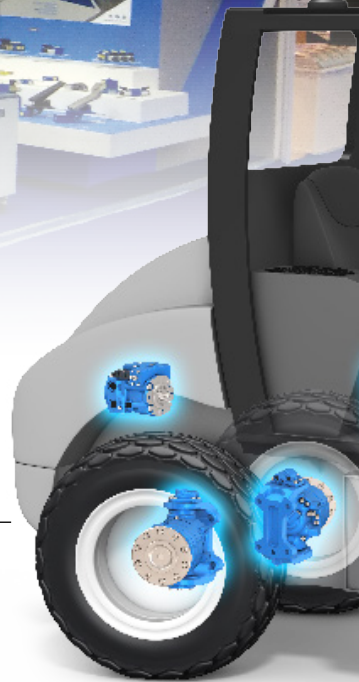
Thanks to our network of certified repairers, our customers have easy access to experts who have mastered our technology and can source guaranteed original parts. If a customer chooses a repair center outside our network, we cannot guarantee the product. Customers need to be careful about the professionals they contact. The list of our approved centers is available on our website poclairn-hydraulics.com.





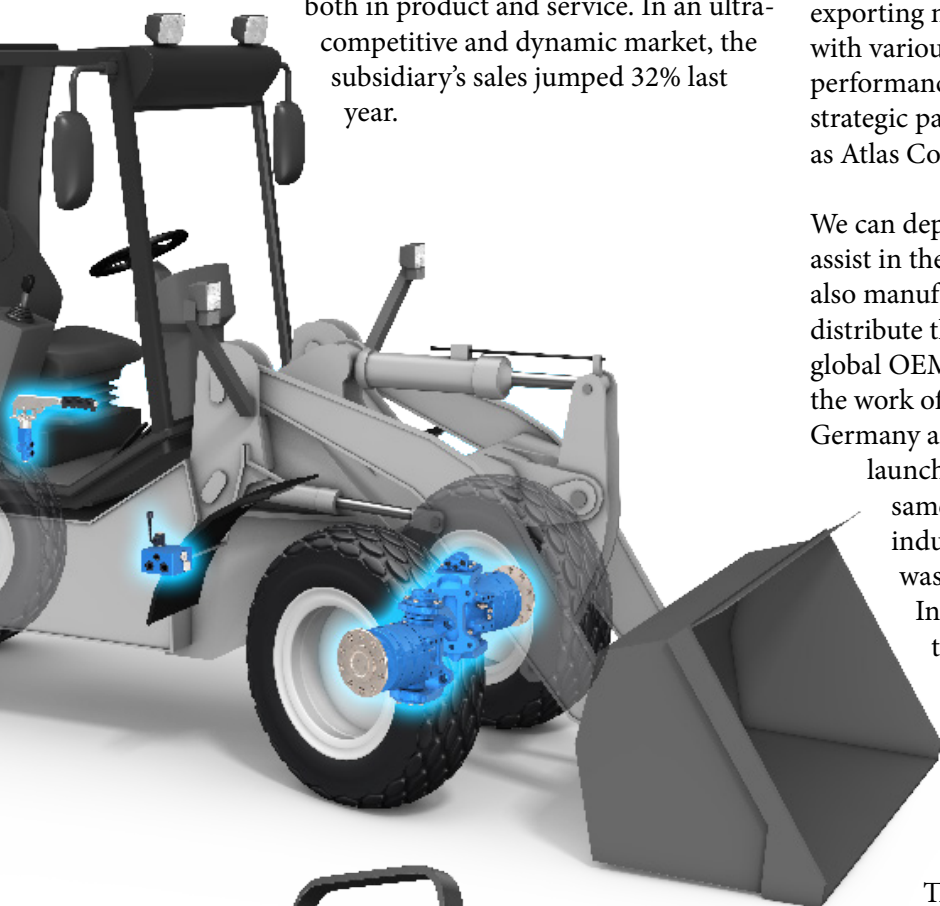
PONDICHERRY Strategic location for global growth

With a GDP growth of 7.8% in 2017, the Indian economy is doing very well. The construction market is booming, boosted by their ambitious road network investment project, which aims to build 40 kilometers of road per day, including both adding new roads and widening existing roads. As a result, machines such as backhoes, excavators, mobile cranes, skidsteers and Poclain's flagship application, compactors, are on the rise.



Established in the territory since 1970, Poclain is a recognized brand. Apart from the fact that the name Poclain is so engrained in India's language that it is used in place of the word «excavator», similar to the way Kleenex or Escalator has modified language. The story goes back to the days when Larsen and Toubro, Poclain's historical Indian distributor, manufactured and licensed Poclain excavators.

Poclain is today synonymous with quality, both in product and service. In an ultra-competitive and dynamic market, the subsidiary's sales jumped 32% last year.



A market dominated by world leaders

World leaders dominate the construction machinery market. They manufacture and often design their machines in India, both to satisfy the preference of customers for the «Made in India» mark and to serve several nearby countries, including those in the Middle East. India has indeed become a real hub for manufacturing and exporting machines to a number of countries with various levels of customization and performance. In this context, Poclain is a strategic partner for major manufacturers such as Atlas Copco, Volvo, Caterpillar and CNH.

We can deploy our expertise in India to assist in the new machine design, we can also manufacture our products locally and distribute them worldwide. To support our global OEMs we can for instance coordinate the work of our application engineers in Germany and India to equip a machine for launch jointly in both areas with the same or different configurations. Our industrial establishment in Pondicherry was key for our development in India. It was also key in our ability to equip Dynapac compactors and Atlas Copco mining machines, Volvo compactors and pavers, Caterpillar and JCB skid steers, and CNH and JCB compactors amongst others.

The Indian construction machinery market also includes local builders, who trust Poclain as a hydraulic expert including ACE, Apollo, Apollo Techno, L & T and Escort among others.

Volvo's new DD90B tandem roller, exhibited at the Excon show in Bangalore last December and equipped with two MSE08 motors, is a good illustration of our worldwide deployment with Volvo. We developed the transmission in India for the domestic market and neighboring countries. We also equip Volvo excavators with turret swing drives in France and Germany and we supply motors to Volvo rollers in the USA and Germany.

WHAT'S NEW AT OUR SUBSIDIARIES

Poclain Hydraulics is back at the CTT tradeshow in Moscow - June 2018

Poclain Hydraulics is excited to present its new range of High Performance components to CTT visitors. This range addresses OEMs' need to increase productivity and quality, reduce design and ownership costs, as well as increase the value of their machinery and help them to advance in the areas of technology and differentiation.



The High Performance offering is based on a new set of components, exclusively developed from a viewpoint of unequalled individual performance. The new heavy-duty PW pump design is based on six major design drivers: quality, energy efficiency, compactness, durability, power density and precision. The latest SD-CT ECU offering contributes to the safety of the machines and provides our customers with software features that add to the comfort and efficiency of their machines.

Our new medium-duty pumps' design easily integrates into a wide variety of machines. The PMe's on-board ECU can withstand the harshest environments, including close proximity to the combustion engine. The ECU is pre-wired and pre-programmed. After shipping, the system is ready to be connected to the driving devices (e.g. the travel pedal, joystick, brake pedal) and is ready to use. For example there is no need to calibrate the currents to reach minimum and maximum pump stroke, as these are factory set. This reduces development costs and shortens time to market.

Beyond these benefits, the new generation of MHP motors complements the many solutions presented at CTT and enables us to offer our customers a set of innovative components that will constitute the best-performing hydrostatic transmission systems.

It is this combination that enables us to offer our customers hydrostatic systems with high added value that meet current and future market expectations.

Since 2011 when Poclain began to pursue a presence in Russia, and the inception of the Poclain Hydraulics subsidiary in 2016, we became closer to Russian customers in both the agriculture and construction markets. Along with high-end components for hydrostatic transmissions, we provide commercial, engineering and service support. Poclain application engineers are able to provide the necessary customer support at each stage of machine development: from the initial design to prototype commissioning and industrialization. Our Certified Repair Center Hydroflex is located in Moscow and serves to minimize machine downtime in case of any field failure during a machine's lifetime. There is a target to establish more CRCs in other areas by 2020 – south and east of the Russian Federation.

Currently the Russian market needs advanced and reliable hydraulics, and we are proud to grow the variety of machines with Poclain Hydraulics products in different industries.

Poclain Hydraulics Spain attended the FIMA agricultural show end of February

This Ag machinery exhibition takes place in Zaragoza, Spain, every two years. In this venue, nearly 1,300 exhibitors came to show their products and 240,000 visitors attended the event between February 20th and February 24th, 2018.

Following a deep economic crisis, Spain is now enjoying a market recovery as demonstrated by the high attendance at the show.

This was the first time that Poclain Hydraulics participated with a display booth, which drew lots of attention. Over 98 visitors came to our booth to discuss our products and systems with our local team. Among them,

we had existing customers as well as interesting prospects with estimated high potential. It's now time for the local team to work with all these leads and opportunities discussed during the show.

Albert ESCURA
Subsidiary Manager
Spain, Portugal, South Africa



MANITOU & POCLAIN: two leaders in partnership

Manitou and Poclair share a very similar history. Both French-owned companies made a name for themselves in the fifties when they designed the machines that made them famous: the all-terrain forklift for Manitou and the hydraulic excavator for Poclair. Both are highly innovative international companies.



Today, both brands are world leaders in their field; Manitou leads the off-road fork-lift trucks and telehandler markets and Poclain that of the low-speed-high-torque motor. Over the years Poclain and Manitou have collaborated on several projects. Since 2004, twenty-seven thousand Poclain components equipping a total of twelve thousand Manitou machines have been supplied. MC18 all-terrain forklift truck, launched last November, is the latest project incorporating a Poclain transmission; it has been a great success since its launch and attests to the winning partnership of these two leaders.

The MC18 all-terrain masted forklift truck: compact performance

With 1.8 tons of capacity, the model differentiates itself from competing models in more than one aspect: ground clearance, speed of movement, total cost of ownership and sound level. Versatile, compact and easy to handle, it is well suited to specific applications where pallet handling in tight spaces is common, particularly in oyster farming, arboriculture and orchards. The all-terrain transmission, two or four-wheel drive, and compact design allow it to move in difficult areas. Julien Hiltzer, Manitou Industrial Forklifts Manager, shares the initial feedback: «The MC 18 all-terrain truck, thanks to its attractive design and performance, appeals to our dealer network and attracts customers. The machine is very easy to use, and it is seeing great success thanks to its performance, design and high level of comfort.»

Poclain transmission: a key differentiator

In 2015, the Poclain Research Department was involved in the development of the MC18 during the project-planning phase. «Poclain has partnered with us on other product lines for a long time. It was natural

that this collaboration become part of our continuous improvement and product development approach. This is real team work for the long-term,» explains Julien Hiltzer. The specifications included max speeds of 25 kph, frequent shift between two and four wheel-drive modes, ground clearance of 30 centimeters, and an engine power output of only 26 kW. «The trend is towards machines that pollute less, consume less, and cost less to end-users, while maintaining the same performance. We focus our efforts on optimizing all energy flows, including those of the components we integrate.»

Poclain has designed a transmission comprised of MS motors for the front axle and steerable MG wheel motors on the rear axle, for the four-wheel drive model. A multifunctional valve providing the clutch, brake control, and traction control completes the solution. Given its strengths, the low-speed high-torque technology naturally made more sense than high-speed motor and mechanical gearbox or other off-road solutions. These best-in-class motors reduce the amount of power needed from the engine therefore reducing consumption. They also allow for removal of mechanical axles for a better ground-clearance capacity and optimal compactness. Beyond design, durability and reduced maintenance help bring down the total cost of ownership of the machine.

The Manitou-Poclain co-design of the MC18 gives the machine an clear competitive advantage that Manitou highlights in its commercial documentation. The manufacturer calls out the results of its field tests: a gain of 12% on fuel consumption in two-wheel drive mode and a noise level six decibels lower than the competition. The successful machine embodies the success that can be achieved by two partners with the same drive for excellence.



20TH ANNIVERSARY for Twinlock system

Grégoire is a leading manufacturer of self-propelled and pull-behind grape harvesters. It is based in France, closed to the World-famous town of Cognac and is part of the SDF group. Same Deutz Fahr. The large majority of their machines are equipped with Poclair Hydraulics wheel motors and transmission controllers.

Grégoire has been using the unique Poclair Hydraulics Twinlock system for more than 20 years. This robust hydraulic traction control system combines the advantages of a serial connection between the front and the rear motors (for speed and traction) to those of a parallel connection between the pumps and the four traction motors (for torque).

While keeping the Twinlock advantage, Grégoire is now launching their latest generation of grape harvesters named GL7 and GL8 with an upgraded transmission and the following features and benefits:

- ◆ A larger speed range (extended from 25 kph to 30 kph) reached with a bigger pump (130cc) and the use of the latest “High

Performance” MHP motors in the rear wheels that feature a higher ratio “small vs large” displacement;

- ◆ A fuel efficient transmission thanks to the use of MHP motors in the rear and of the new “high flow” two speed, symmetrical valving motors in the front (both featuring new valving covers with lower pressure drops at high speeds); and also thanks to the new Poclair CT200 controller equipped with the «EcoDrive» software features.
- ◆ In road mode, the software always seeks to reach the lowest engine speed possible that still provides the required speed and power. It allows the engine





speed to decrease from 2100 RPM to 1850RPM at maximum road speed. Beyond the fuel consumption reduction, Ecodrive lowers the noise in the cabin and notably improves driving comfort.

- ◆ In work mode, the operator selects a constant engine speed, but the software will temporarily raise this speed if the needed power requires higher rpms. The driver can then keep his focus on harvesting without worrying as much about driving the machine on steep slopes.

- ◆ A new 4WD high speed mode provides more controllability to the vehicle in high speed mode (prior generation was only 2WD in road mode)
- ◆ The controller now connects to an acceleration joystick. The vehicle accelerates as long as the joystick is pushed. Once the operators reach the desired speed, they can release the joystick, which comes back to central position but maintains the vehicle speed. Some of the work mode-specific features allow for very good controllability of the machine during maneuvers.
- ◆ As with the prior version, the Poclair Hydraulics controller takes care of basic transmission monitoring tasks such as power limitation, anti-stall, and cruise control.





SALES FORCE TRAINING FOR OUR CUSTOMERS: a new service to accompany new machine launches

Since 2005, Poclain Hydraulics' heavy duty truck offering has consistently evolved. Now with a presence at many European manufacturers, more than 20,000 vehicles use Poclain Hydraulics' hydraulic hybrid transmission to ensure good torque distribution in all conditions. This solution increases the efficiency and safety of trucks used in construction, forestry, municipal applications, agriculture or heavy transport, and makes them more economical and environmentally friendly.

The heavy duty truck market is a fairly conservative market where it takes time to evaluate and adopt new technology. Our customer's sales teams benefit immensely from training and additional guidance when launching this solution to their customers. With this in mind, Poclain Hydraulics now offers a co-marketing service that supports manufacturers' sales networks and helps them to become operational quickly.

In 2016, Iveco, a truck and utility vehicle manufacturer, chose to equip its new Stralis X-Way worksite range with the AddiDrive

solution. This type of vehicle spends 90% of the time on the road and 10% of the time off-road. The machine is very versatile and depending on the application, it can be configured as an «off road» vehicle to work in severe conditions or as standard truck to carry high payload.

We met with Eric Léger, Head of Commercial Training at Iveco, to get his opinion on the partnership with Poclain Hydraulics and the benefits of Addidrive, marketed under the name Hi-Traction for this manufacturer's vehicle range.



What applications do you target with the Hi-Traction option?

Logging applications are one example. It is a vehicle that is on the road 95 to 98% of the time but also

needs to go up to 200 meters into the forest to load logs. These 200 meters are sometimes very complicated for a 100% on-road vehicle. The Hi-Traction option allows the driver to easily overcome these difficulties. In the agricultural field, milk collection trucks are also a target. In this type of application, 99% of the time things go well but the day when there is a rut, Hi-Traction can be the lifeline.

Are there other solutions equivalent to Hi-Traction on the market?

To my knowledge, no. All manufacturers work with the Poclain Addidrive solution: MAN, Mercedes, Renault Trucks, Volvo and several bodybuilders. We chose this solution, not because it is original, but because it is the best available today to enable on-road-type vehicles to continue their course off-road or in adverse conditions in a safe way.

Poclain has been heavily involved in the training of your salespeople.

What motivated this decision?

We focused a lot on training, because the Stralis X-Way marked the re-entry into

a market that we had left for years. Our salesforce was no longer familiar with this class of vehicles, for these markets. So we hosted a bodybuilder's forum last October, exhibiting vehicles and inviting experts from the world of equipment manufacturers, including Poclain of course. We took the format of a show and also organized small group workshops to promote interactivity. Poclain's participation was crucial because a hydraulic «4x4» solution was quite new: our salesmen met and talked with experts who trained them to use a dedicated pitch. They were given figures to support the profitability of Addidrive, despite its additional cost compared to a two-wheel drive version. A two-wheel drive solution is certainly less expensive to purchase, but it is more expensive to use, especially because of the faster wear of tires and operating costs in case of vehicle immobilization. They also demonstrated the benefits of Hi-Traction over a mechanical 4x4: superior payload, lower fuel consumption, better driving accuracy and a lower center of gravity.

How did the sales teams respond to the Hi-Traction training?

They loved it! I only had positive feedback on the organization, the site and the quality of the speakers who came to speak about their job. They felt better prepared to sell.





CREEPDRIVE™ offering expands!

Poclain Hydraulics is bringing even more value to our customers by strengthening our full systems offering. We are leveraging our efforts through a strategic restructuring of our organization in order to focus on system solutions. Our CreepDrive™ offering, with a new dedicated motor and pumps, all from our High Performance range of products, is a perfect example of our strategic focus. The expanded CreepDrive™ offering will address the needs of a wider range of applications. It is being introduced at INTERMAT Paris in April 2018 and will be available for sales starting autumn of 2018.

The CreepDrive™ system, a true hybrid mechanical-hydraulic transmission from Poclain Hydraulics, 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 system is disengaged, the vehicle is able to drive at normal on-road speeds with no mechanical transmission efficiency losses.

The complete CreepDrive™ line-up contains two different sizes of motors, a range of pumps and the plug & play control kit including the CAN bus communication.

The new motor called CDM20 provides up to 2,4l of displacement with two speeds (possibility to switch from full to half displacement). Considering the gear reduction ratio in the rear drive axle differential, the CDM20 can provide an overall torque ranging from 50 000 to 100 000 Nm (36 000 to 72 000 ft.lbf). Other new features include a reinforced shift cylinder as well as an extremely robust design. This new motor rounds out the existing motor range by offering twice the speed and three times as much torque. Despite this significant performance improvement, the motor length has only increased by 50 mm (2 inches) and remains lighter than comparable

products to meet the needs and requirements of modshops.

Integration into a wider range of vehicle applications, including medium commercial vehicles where constant speed and accurate positioning are essential, is now easier. CreepDrive™ removes the added stress on braking and clutching experienced with trucks working at low speeds as well as the additional maintenance required to keep those systems working properly. Replacing friction braking with hydrostatic braking acting 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.

Also, 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. Applications include: solar energy farm glass cleaning (see picture), road maintenance & road marking/stripping, bridge inspection, rail track maintenance, airport & road sweepers, mulching/chipping, snow cutting, suction dredging, and slinging amongst others.

Contact your local Poclair Hydraulics dealer for more information and sizing for your vehicle. The full CreepDrive™ system will be on display at the Poclair Hydraulics Intermat booth in Hall 5A - Stand F046.

Operational tips

To enable the hydrostatic ground drive, the vehicle brake is applied and the mechanical transmission is set to neutral while the engine PTO is engaged to drive the pump that supplies flow to the hydraulic motor. A switch located in the cab engages a pneumatically controlled mechanical clutch, which sets the mechanical transmission to neutral and engages the hydrostatic transmission.

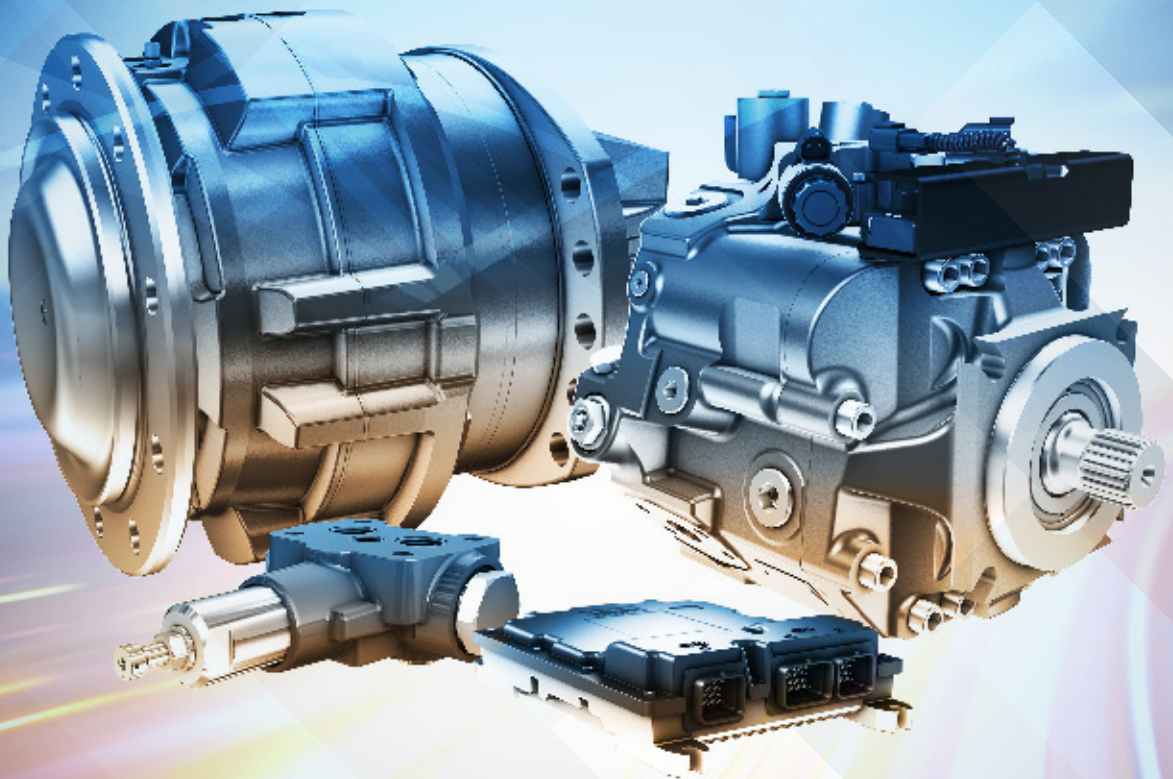
The driver sets the engine speed to the desired working rpm and, after releasing the brake, moves the joystick in the desired direction.

Consistent low working speeds (0,2 - 7mph) are achievable in both forward and reverse directions. When traveling at on-road speeds, the PTO clutch is disengaged and the mechanical transmission works at appropriate speeds.



**SELECTION
GUIDE**

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HOT NEWS FOR COOLING SYSTEMS

Cooling meets stage V

Being closer to our customers is one of the main targets for the Poclain group. To make it even easier, Poclain is extending the distribution and system integration network in Germany. One of the most experienced mobile hydraulic system integrators in Germany, SAUER-BIBUS, based in Neu-Ulm, and Poclain Hydraulics have agreed to jointly develop the mobile hydraulic network to provide the best and most efficient systems for our customers.

“*After one year of successful cooperation between Poclain Hydraulics and Sauer-Bibus we can see the first synergy effects: A high power fan-drive pump with the benefits of a close-loop circuit.*”

With a team of more than 50 employees, Sauer Bibus is known for their customized solutions and the ability to follow special requests for even small batches.

With the new Diesel-Engine-Generation and Stage V Emission level, the requirements of cooling systems are increasing. The demand for thermal stability and smart controllability leads to a big challenge for machine manufacturers. To help our customers efficiently fulfill this demand, Poclain Hydraulics and Sauer-Bibus are presenting a new fan-drive pump.

The new pump for fan-drives takes the PM10 pump as a basis, and tunes it with a special control.

This control leverages the PM10 variable pump closed loop features and allows variable displacement and reverse mode for cooler cleaning.

With the proportional control, the fan motor speed adjusts to the needed cooling performance and follows the demand of hydraulic-oil, air and water thermal management.

It guarantees fast heat-up of the combustion engine by stopping (0 rpm) the fan, if cooling is not needed.

In addition to the mentioned functions, a “fail-safe” state is integrated. This ensures maximum pump-displacement in the case of error, like with a broken wire, which is mandatory for fan-drive-systems.

The fan drive integrates all needed functions into one control block, which helps reduce the number of components and weight.

The control-block mounts on the Poclain Hydraulics pump housing. This configuration leads to a reduction of noise and vibration. It also allows a rated pressure-level up to 350 bar and guarantees satisfaction over the lifetime of the product.

This high power-density also makes it possible to downsize the fan-drive motor.

In a time of limited fossil resources and increasing requirements on power and efficiency, the new fan-drive pump helps to minimize losses to cool the water, oil and air systems.



IHC FUNDEX Equipment:

“ We are working together with Poclair for more than 45 years now, satisfactorily. Poclair has assisted us a lot with their technical know-how during the innovations we made to our rotary heads in the last couple of years. Out of a lot of experience we can say that the Poclair motors are reliable and durable, which are in parallel with our vision. ”



LOYALTY STORY :

IHC FUNDEX Equipment customer for more than 45 years

IHC FUNDEX Equipment (part of IHC IQIP) is a Dutch company located in the historical town of Goes, famous for its picturesque harbor with old stone quays.

The nature of the Dutch environment (flat land very close to sea level) dictates the need for deep foundation using piles (for the construction of many works (buildings, bridges, railways...). This is the origin of the expertise gained by IHC FUNDEX. IHC FUNDEX is a reliable partner for their multifunctional drilling and piling solutions all over the world. Many of the piles are now being drilled rather than piled (with Hydrohammers®). Among the reasons for this shift in the technique being employed are an increasing number of urban construction projects, where there is less space and more restrictions on the levels of vibration and noise. In addition, longer piles are required, due to the large scale of the buildings and to avoid the removal of contaminated soil. This is where Poclain comes into play.

There are various drilling methods to install the piles thanks to the multifunctional capabilities of the IHC FUNDEX rigs. One method uses only a casing, another is the Continuous Flight Auger with inner concrete pipe (and opening hatch at its end) or with casing and hollow auger (double drilling). The foundation piles reach depths higher than 40 m and diameters up to Ø 1500mm.

Irrespective of which drilling method is chosen, the drilling rig requires a drilling table rotary head, whose main job is to install the casing or drill the augers into the soil. Once the concrete has been pumped inside the casing, or via the inner through pipe of the auger, the rotary head also contributes to pull up the auger or the casing (except with “lost casing” techniques: in this case the casing stays in the ground). The IHC FUNDEX FDE rotary heads are equipped with a pull down function to provide the necessary force to install the piles.

A big advantage of the IHC FUNDEX Drilling Equipment is the maximum torque of 500 kNm along the entire leader length. IHC FUNDEX relies on Poclain Hydraulics for all their torque providing hydraulic motors used on the rotary heads. In fact, they have been a Poclain Hydraulics customer for more than 45 years. Poclain provides them with large size direct drive shaft motors for use on their rotary heads. Most popular set ups include 4x MS25, 4x MS35 or 4x MS50 (5 l displacement each) providing torque to a gear ring built in the rotary head. Recently IHC FUNDEX even built a rotary head with 6x MS125 (15 l displacement each (see picture).

These rotary heads operate with an open loop circuit at high pressure (max 310 bars); the hydraulic motors’ speeds can reach up to 90 rpm. The motors have dual displacement; combining operation of some or all motors in large or small displacement, four different levels of speed can be reached with four motors. The overall logic used is a constant power logic: if pressure is low, speed is increased and vice versa. The latter is a very big advantage for the operators and their perception of the machine.

The constant power logic is definitely a tough application, but it is a tribute to the Poclain motors’ reliability and capacity to meet the challenges of pressure peaks, the high power transmitted by the motors, and the high average pressure. Special care must be taken for the drain sizing, pilot lines’ and the motors’ case pressure due to the long distance between the rotary head (when at the top of the mast at the start or the end of a job) and the IHC FUNDEX FPP power pack.



Supreme International

Over 20 years ago, Supreme International built the first vertical feed mixer in North America. Since that day, one component has remained consistent with them, and that is the Poclairn MS Series motors. Supreme now realizes over \$80 million in global sales and supplies products to the dairy and livestock industry. Joel Huberdeau Offshore Manager at Supreme oversees the top dairies in the world and explains the number one reason for our long history: the reliability of the Poclairn motors. Joel explains cows never take a day off, so therefore neither does his equipment!

Supreme's largest customers are located in Saudi Arabia and are very well equipped with both stationary and vertical truck mounts. These dairy farms located in the middle of the Arabian Desert milk over 100,000 dairy cows and therefore need very reliable products capable of performing in some of the harshest environments. The Poclairn MS series motors directly couple to the feed screws and deliver the low-speed and high-torque needed to mix the feed and the high speed needed for clean

out of the mixers. The MS motors high load capacity carry the heavy augers with ease, yet are more compact on the bottom end compared to the competitors' gearboxes. The bottom line is that the Poclairn motors meet these every day challenges and deliver the necessary food to keep the production of milk at a high level.

Joel explains that Supreme is not the cheapest but simply the best, much like the Poclairn products we supply!



GOLD COUNTRY HYDRAULICS

Steerable wheel motors deliver differentiation

Gold Country Hydraulics specializes in hydraulic repair and design as well as in building fruit harvesting equipment. They are located in Northern California, with locations in both Chico and Orland, CA, and their offering includes a number of different shakers, receivers, and bin carriers. Gold Country Hydraulics strives to provide farmers with access to top-of-the-line, machines that offer many of the same features as custom-modified commercial orchard equipment. The benefits that their shakers and receivers bring farmers include improved durability, decreased cost per hour to run, and increased acres per hour. Terry Tompkins of Gold Country Hydraulics recently shared his experience with Poclair Hydraulics' products and their role in helping Gold Country deliver these benefits.





MG05 vs Gearbox and Wheel Motor Design

In looking to deliver these added benefits for their customers, Gold Country decided to improve the design of their axles in order to slim down the machine and give it a shorter turning radius. After examining their options, they decided to move away from a gearbox and wheel motor design in favor of Poclair Hydraulics' MG05 steerable wheel motor. This solution allowed them to reduce the width on their shakers/receivers and bin carriers. When compared to a gearbox and wheel motor design, Poclair Hydraulics' MG05 steerable wheel motor offers a durable and significantly more compact design, as well as precise steering accuracy. "It's taken our steer radius down by 30% and taken our space savings up. In other words if you built an axle, it would be say 6' long, and then you add another 18" to either side to get to the wheel center. A lot of that was too wide for what we were doing, so we had to use other means." Terry Tompkins, Gold Country Hydraulics Director shared, "[The MG05] could take anywhere from 12-15 inches out of an assembly, which made things a lot better for us."

By combining three components (gearbox, motor, and brake) into one, the MG05 allows for closer wheel centers and a slimmer machine than would be possible with an axle design. This translates to a smaller turn radius and increased productivity for the customer.

Reduced Maintenance

When evaluating the purchase of a new machine, total cost of ownership has a strong influence on the purchase decision for farmers. Reducing maintenance is key to reducing the total cost of ownership, and increasing

machine up time. The MG05 combines three components to reduce the possible points of failure, and to eliminate the need to service gearboxes or brakes. "The durability has been excellent on most of what we do – gets our hours of production way up without problems, we don't have gear oils to mess with and there's no service – you don't have to service that piece." Terry continued, "Maintenance guys are starting to like this part more and more because it's outlasting their gear boxes, probably 2:1 and they just don't have to deal with servicing it, it either works or it doesn't." In terms of increasing machine durability, the MG05 offers a few features that set it apart.

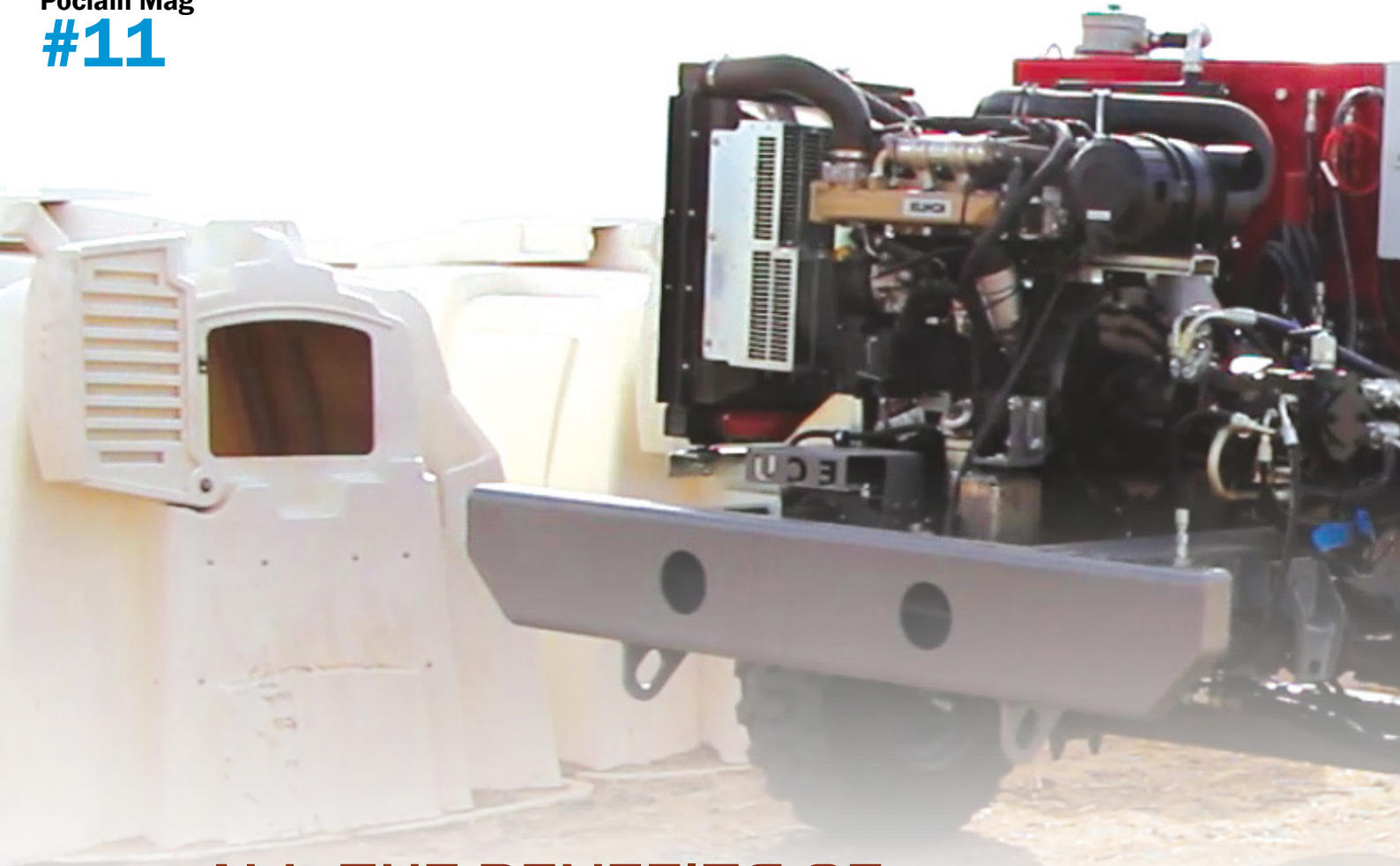
Rigid plumbing that does not turn with the motor means less wear and tear on the hoses. The MG05's built in camber angle not only improves steering ability, but also reduces tire wear. Additionally, the forged casting steering frame provides the sought after ruggedness that is so important in agricultural applications. Terry goes on to share, "It [the MG05] is actually a stronger part because it's forged and cast"

Eased Production

The MG05 reduces fabrication time and installation cost by eliminating the need to fabricate an axle and reducing the number of pieces that need to be installed. It also frees up space to streamline design and engine placement. Gold Country Hydraulics reported a space savings of 25% realized with the MG05. With a 6500 psi rating, there is no need to make sacrifices to power to save space. "[The MG05] has allowed us to put 10lbs in a 5lb bag and still have room to work. It's a space saver, big time space saver."

Poclair Service/Support

Throughout the design and production process, Poclair Hydraulics and their local distributor have partnered with Gold Country Hydraulics to help ensure the success of their machines through heavy testing on-site as well as remotely. The collaborative relationship between Gold Country Hydraulics and Poclair Hydraulics has allowed for improvements in design that bring more benefit to the customer. Terry finished by saying: "Wherever we're going, we're hoping that Poclair goes with us."



ALL THE BENEFITS OF Poclair Hydraulics in one package

In summer of last year, Poclair Hydraulics launched the Drive Solutions program. The program offers over 200 pre-validated, easy-to-install, hydraulic drive system kits consisting of hydraulic wheel motors, a pump and valves. Drive Solutions deliver quicker than many other options on the market, and they are easy to install with clear installation documentation. The system contains options for both non-steerable and steerable wheel motors that deliver a more robust solution along with the added design freedom and space saving seen when eliminating the need to design and incorporate a mechanical axle.

Our system configurator allows us to determine the best system configuration for a proposed machine. By entering basic data and necessary features of a proposed machine such as steerable vs. non-steerable motors or the need for traction control, we are able to quickly propose a full, pre-validated drive system offering for two-wheel, three-wheel, four-wheel drive and four-wheel drive parallel systems. Currently only available through Poclair Hydraulics North American distribution network, our Drive Solutions kits deliver to the distributor in 15 business days, along with clear hydraulic diagrams and pipe sizes, while the

distributor provides the pipes and tank. With the current highly competitive environment in many end markets, effectively prototyping and getting a new machine to market quickly can be a make-or-break factor in successfully taking a new machine to market. One example by the experience of one of our first Drive Solutions customers: Hatfield Manufacturing, Inc.

Michael Grave from Spencer Fluid Power was the distributor handling the project, and was willing to give us a little insight into what it is like to incorporate a Drive Solutions kit into a new machine.



Can you tell us a little bit about Hatfield and their project? What does the machine do, and what were the goals of the project?

The goals of the project are to increase efficiency at the dairy and decrease labor costs. This machine is a water distribution machine for calving operations in the dairy industry. In the dairy industry, they need to distribute food and water to many rows of calf huts. This particular machine is for the water and milk distribution. With Hatfield's new machine, instead of requiring multiple people to drive a tractor/wagon with a hose on a pump, and someone to run the pump on the wagon, this machine serves as a self-operating machine. One operator can distribute the water or milk to the calves as he drives.

Why did Hatfield Manufacturing decide to use a Drive Solutions kit as opposed to a mechanical or a custom hydraulic system?

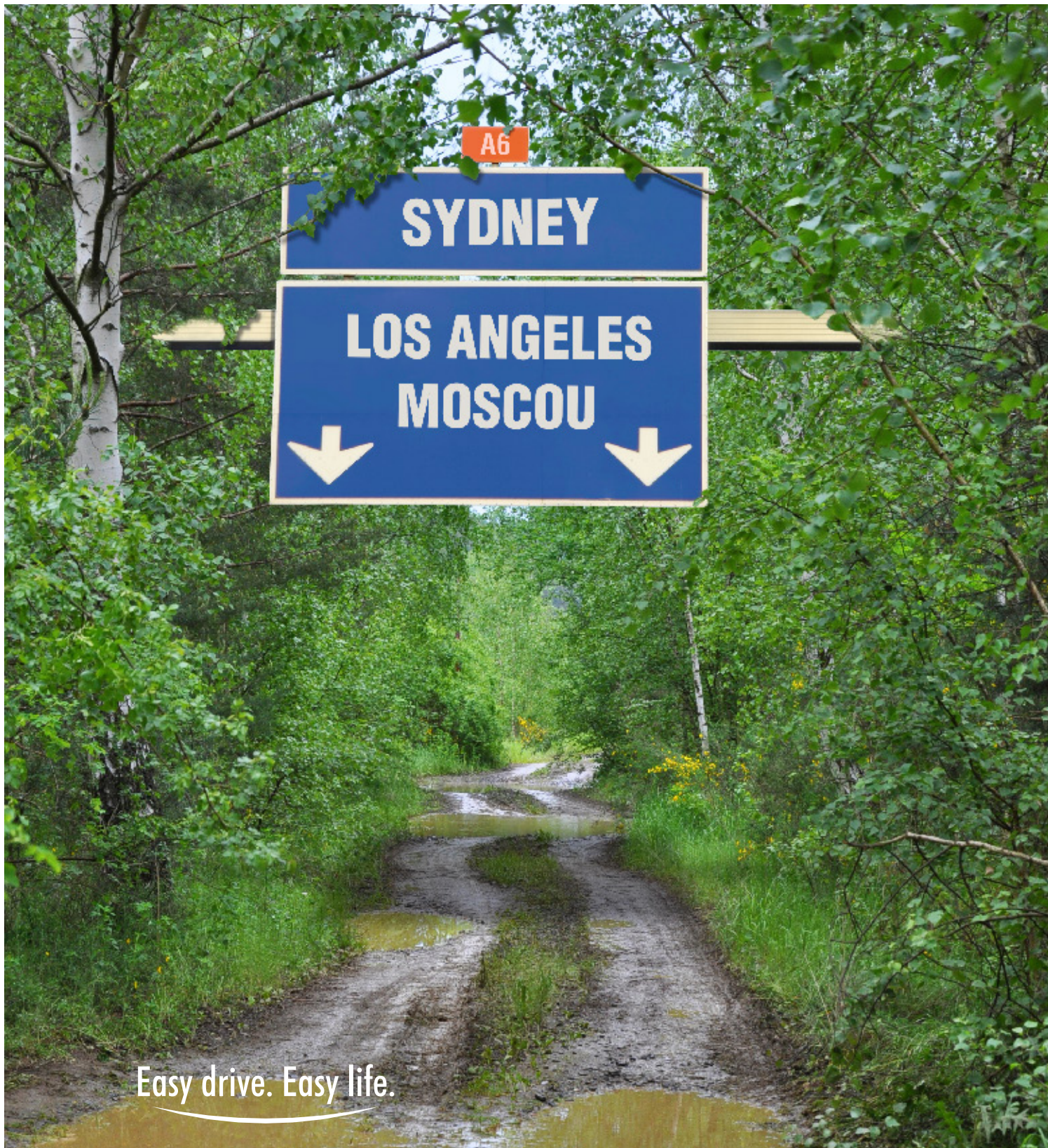
At the very beginning, there was a conversation of do we really want to run hydraulic motors and not do a standard drive system and things like that, but with the lead times and the whole kit package it became almost too good of a deal not to do. You get one package, one part number, and you don't have to deal with multiple vendors with multiple lead times. Three weeks and it's there. It shows up quick. There are just a lot of benefits to the Drive Solutions package.

Did Drive Solutions ease any hurdles involved in the development of this machine?

The machine really started from scratch off an idea, so there is a lot of "up-in-the-airness" about what it will end up looking like or weighing. At the beginning, we just [had] some good ballparks. Poclair and their Drive Solutions eased some difficulties. Mainly the fact that if we can get a ballpark weight, we can calculate what we need as far as motors, pump, flow divider, and speed switch. The [Drive] Solutions package provided us with a schematic that we could follow as well as how to plumb the system, which was very handy.

It included line-sizing recommendations, what filters to use and described where they should be located in the system. In addition, delivery—having a three-week ship time was beneficial. We looked at doing gear drives and an axle drive system and there was just a lot of headaches using multiple vendors: one for the drivelines, one for the variable speed motor, another for the pump and then there were long lead times. This solution really helped moving the machine forward.





Easy drive. Easy life.

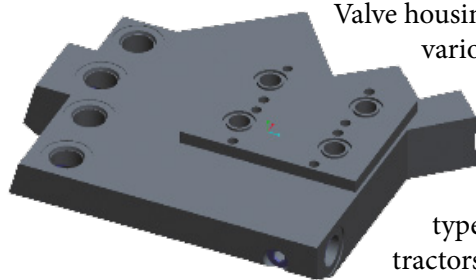
MTC System (Mechanical Traction Control)

- + Limited-slip differential
- + Specific under body protection
- + Increased ground clearance
- + "All Road" tires



HOW POCLAIN TECHNICAST CAN ADD VALUE to your machined casting's needs

Valve housings



Valve housings are used in various applications in construction and agricultural machines such as excavators, type loaders, sprayers, tractors etc. Usually valve housings have many fine channels inside to distribute the fluid. Due to demanding applications, these channels should be free from burrs or sand. Many OEMs source this component by using a ductile iron or steel block and fully machine it. This process is associated with high cost due to machining time involved in creating the channels and arriving at final surface finish and drillings. Many customers take this easy but costly path of production due to their fear of porosity from castings or unawareness of other process.

With 50 years of experience designing and producing complex cold core castings, Poclain Technicast has used its expertise in working with customers to arrive at cost reduction of 30 percent from original cost by completely transforming the manufacturing process.

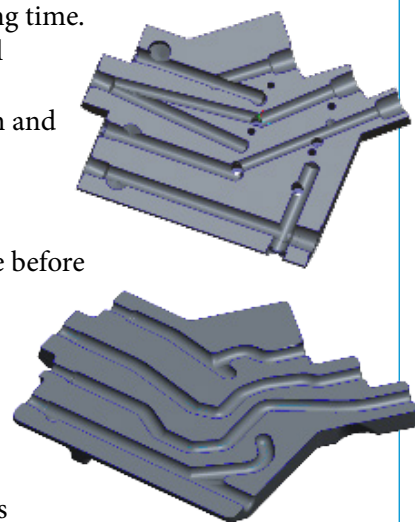
How ?

At Poclain group, its passionate employees are at the center of any transformation.

Eric Creyssac is a design engineer who is proud to have 30 years of foundry experience. His passion is redesigning parts and process to improve cost. Recently, Eric worked with one of our customers who was making a part by complete machining. He and the sales team partnered with this customer to develop a plan to produce the part in two steps with 30% cost reduction.

The first step was to produce the raw castings with channels using the cold cores and 2nd step was to do final machining. This two-step process when compared to the earlier process of only machining a ductile iron block has resulted in reduction of parts weight by 2 kg and reduction of machining time. This has resulted in overall savings of 30% giving the desired outcome on design and cost to our customer.

The team extensively uses design simulation software before pouring to reduce the risk of porosities. When a customer works with Poclain Technicast, they are confident about the outcome, as they know that Poclain Technicast has experience of 50 years in producing complex castings for respected OEMs in construction equipment industry.



*Part Before
and After the
transformation of
process*

About Poclain Technicast

In July of 2015, Poclain Hydraulics acquired Grandry Technologies, a foundry company in Sablé France, and renamed it "Poclain Technicast" as part of its plan to integrate fully into Poclain's structure and growth strategy.

This foundry has a rich history of providing quality products, specializing in producing highly cored complex castings for construction machines and components. As a part of Poclain, Poclain Technicast's high quality, reliable castings are now available on a larger scale through its global sales and logistics office in France and USA and via Poclain's global network in 18 countries. Poclain Technicast's team of account managers speak English, French, German and Hindi. They are excited to discuss how they can create value for your machined castings need!

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To find the nearest distributor go to our dedicated web page
www.poclain-hydraulics.com/en/contact-us/distributors



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