HALL 5A – BOOTH F046

PRESS RELEASE

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Poclain Hydraulics will be exhibiting at the INTERMAT tradeshow in Villepinte from 23 to 28 April 2018, hall 5A - Stand F046.

For any additional information, or to receive high definition photographs of our products, please contact our press department: press@poclain-hydraulics.com
POCLAIN HYDRAULICS  
WORLDWIDE EXPERT IN HYDROSTATIC TRANSMISSIONS

POCLAIN HYDRAULICS has become the world expert in hydrostatic transmissions based on high performance cam-lobe radial-piston motors. This expertise has led to its expansion in fast growing niche markets, such as mobile machinery used in agriculture, construction, public works and material handling.

Poclain Hydraulics combines its components within their hydrostatic transmission systems. Its combined expertise in hydraulics, electronics and mechanics, along with its understanding of customers’ applications, enables it to design, manufacture and offer high added value solutions that meet present and future market expectations.

The intelligence of its systems, namely its experience and competence in electronic control systems, enables the constant use at the optimum operating point of the customer machine. This guarantees the best performance while minimising fuel consumption.
MHP MOTORS NOW AVAILABLE IN 5 SIZES

Whether in ag, construction, material handling, mining, marine or industrial, oems strive to increase productivity and quality, reduce design and ownership costs, as well as increase the value of their machinery. To address the oems’ needs and help them advance regarding technology and differentiation, poclain has designed the new range of high-performance transmissions.

The MHP motor design is the result of many years of design and validation. It sets a new standard in the cam-lobe motor principle in terms of performance, reliability and fuel consumption. The MHP series is available in five sizes: the MHP11, MHP13, MHP17, MHP20 and MHP27; their displacements range from 0.9 liters (55 cu.in) to 3.5 liters (214 cu.in) per rev. They boast unprecedented speed and power levels, two key requirements that increase machine performance. The MHP motors are qualified to operate up to 500 bar (7250 psi). Poclain Hydraulics engineers were able to maintain the features of the cam-lobe technology, which has been the foundation of Poclain’s reputation for the last thirty years.

The new modular range is made of three sub-assemblies:

• The torque module: it converts the power from hydraulic to mechanical
• The valving: it integrates the displacement selector and the boosted hydrostatic brake
• The bearing support: it bears the external loads and incorporates the range of parking and dynamic brakes
MHP sub-assemblies:

The torque module integrates all the design and manufacturing expertise Poclain Hydraulics has accumulated since the first generation of motors in 1958. New design software enabled engineering to develop and characterise the module parts precisely. The validation tests confirmed the simulations, which forecasted over 50% increase of performance levels regarding speed and transmissible power. Meanwhile, the MHP motors maintain high-efficiency levels in each displacement.

The key feature associated with the Poclain Hydraulics technology is to provide near stable efficiency regardless of displacement. The MHP does just that, exceeding 90% overall efficiency over a broad operating range, in reduced as well as full displacement and at a maximum speed of 250 revolutions per minute. Valving In its simplest version with a fixed displacement motor, the valving cover provides large inlets and outlets on a single flat surface. Thus the pressure drops in the connectors and hoses are limited, and additional blocks are easily mounted directly onto the motor. In the MHP series, the nominal ratio between full and smallest reduced displacement for a given motor size is either 3 or 4 depending on the models.

The cam-lobes are individually connected to the high-pressure circuit of the pump to enable multiple displacement shifts. With a motor consisting of eight lobes, each one is connected to the high-pressure circuit to obtain the maximum displacement. Only two lobes remain connected to render a quarter of the displacement. The other six lobes are fed by the low-pressure circuit of the pump. The MHP 20 and 27 integrate eight lobes, which are grouped by two or three lobes. The sizes 11, 13 and 17 integrate six lobes grouped two by two.

The more sophisticated valving versions feature the same flat connecting surface and provide several displacement ratios to meet the application requirements. The valving unit is available in a number of different configurations allowing for a wide range of displacement ratios:

- Symmetrical twin displacement with a nominal ratio of 2.67 (3/8) for sizes 20 and 27 and 3 (2/6) in sizes 11, 13 and 17.
- Three displacements with two configurations for the MHP 20 and 27: 8/5/3 or 8/5/2 active cams. For sizes 11, 13 and 17, the ratios are 6/4/2.
- Four displacements with an 8/6/4/2 configuration, only available in sizes 20 and 27.

The valving unit can also integrate optional functions such as an integrated exchange valve, speed monitoring, and boosted braking. Boosted braking is available with the two and four displacement versions. It allows for reinforced hydrostatic braking capabilities.
of the vehicle by using all of lobes of the cam while braking, even when the motor is operating in the smallest displacement.

Bearing support is designed to withstand the high external load and efforts that are associated with increasing machine speed and tire load capacity. The bearing support can integrate a disc brake between the two rows of conical bearings.

The wet brake discs are contained in a sealed housing and operate as a parking brake (negative) and/or dynamic brake (positive). The braking capacities in terms of torque and power have been upgraded. The dynamic brakes are flushed and activated by a dual control that secures the braking system efficiently and economically. The dynamic and parking brakes share the same interfaces and enable mounting on a four wheel drive machine using the same attachments on the chassis and the wheel rim. The MHP’s parking and dynamic brake replace the Dyna+ solution, with higher braking torques and lower weight (from 10 to 20 kilograms less depending on the motor size).

They are completely interchangeable with Dyna+ for the rim and chassis mount as well as for the control pressure. Machine validation Poclain Hydraulics puts a high emphasis on testing its new motors and runs a fleet of vehicles to validate the performance levels and the functionalities of its products. The MHP was no exception and was tested on a self-propelled sprayer chassis with the following configuration:
At the front: MHP11, twin displacement, boosted brake and S17 dynamic braking.
with dual control
At the rear: MHP20, three displacements with an 8/5/2 ratio and a P27 parking brake
PW96 tandem pump VB220 braking power unit CT300 controller
The vehicle weighs 12 metric tons and can reach 60 km (37 miles) per hour in travel mode and go up grades above 30%.
It uses all the operator assistance functions, such as smooth and automatic speed shift, EcoDrive and electronic traction control.
Several customers, as well as our sales team, have witnessed the sprayer operate on our Verberie test track.

Our latest tests focused on measuring the performance of the brakes when hot, in compliance with the new EU2015/68 regulation. The goal of the test is to measure the drop in braking efficiency when they are used intensively. The brakes are monitored in a « type 0 » test setting (very severe deceleration from max. speed to 0 speed) at the beginning and at the end of the test, then with a series of twenty « type 1 » brake actuations (at intermediate speeds).
The tests were successful and confirmed the braking capabilities of the wet disc technology used in the MHP motor design.
The PMe Medium Duty Pump With Electronic Control:

Safety, accuracy and performance: those are the features of the new PMe pump, which integrates a set of sensors and an embedded Electronic Control Unit (ECU), the SmartDrive CT 30. It derives from the PM model and is available in two sizes, 30 and 50. The PMe is available with electro-proportional servo control with or without mechanical feedback, depending on the degree of accuracy requested.

The PMe is designed to be easily integrated into a wide variety of machines. The PMe’s on-board ECU can withstand the harshest environments, including 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. It reduces development costs and shortens time to market.

The associated electronic devices are delivered already plugged onto the pump and wired to the ECU. The factory-installed harnesses are tested at the end of the assembly line prior to delivery. The two integrated CAN Buses allow configuring, machine diagnosing and information sharing with other machine components (e.g. engine, displays, hydraulic components).

Among the many pre-defined software functionalities included in the PMe packages,
the speed control loop is available for specific applications that need constant driving speed, a pre-requisite being two speed sensors in the wheels.
The PMe pump can also be used as a slave unit via CAN Bus. The CAN message redundancy ensures the safe control of the pump. The electronics performs an accurate pump control thanks to a factory pre-set calibration. The PMe can also provide the plugged sensors’ physical and electrical values (temperature, pressure, speed) via CAN Bus to the master ECU.
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.

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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.
STRAIGHT FORWARD DESIGN INTEGRATION FOR COMPACTORS

Customers demand a rugged machine that delivers high efficiency with low ownership costs. “The hydraulic components of the machine are pivotal components of the drive and vibration functions representing around 20% of its overall price. We understand that the OEMs require not only high quality and performance, but simple, straight forward design integration with competitive pricing. Our 30 years of experience in compaction along with our continuous drive to innovate and improve allows us to deliver on those requirements.” stresses Olivier Le Maire, Poclain Hydraulics Platform Business Manager for Road Machinery.

As engine emission standards become more stringent, compactor OEMs must design machines capable of reaching the same performance levels, while consuming and emitting less. A consequence of the new emissions standards is that engines must be equipped with bulky anti-pollution devices, such as the Diesel Particle Filter. Integrating these devices into the machine is challenging due to space constraints. In order to free space for a larger engine on soil compactors, the experts at Poclain Hydraulics have worked to design an easy-to-integrate, high quality performance, space-saving solution that replaces the rear axle with two MS wheel motors while using Poclain TwinLock circuit for permanent traction control without additional electronic devices. We also offer another economical solution with hydraulic traction control. The traction control between front and rear can be managed by twin pumps, one to drive the front motor and the other to drive the rear motors.

A simple Poclain Hydraulics FD-M2 antiskid valve controls the traction between the left and right motors. The motors and their radial piston technology can operate at maximum 450 bar / 6,525 PSI and cover a broad displacement range, from 172 to 30,000 cc (10.5 to1,830 cu.in/rev.).

Thanks to their high torque low speed technology, these motors drive the wheel directly, without requiring a gearbox. The space freed between the rear wheels allows the OEM to lower the engine and the center of gravity of the machine for a safer and more stable machine on steep grades. This in turn makes transfers between sites easier and gives the operator more rearview visibility.

The reduction of machine length also optimizes the machine for export, allowing for a more compact and easy fit into shipping containers. As for asphalt rollers, priority is given to the quality of compaction and of the asphalt finish, while optimizing the number of passes the operator needs to make. This requirement is easily met when the front and rear vibration frequency are independently managed.

Speed management of the fixed displacement motors is possible using two pumps mounted on the transmission pump and coupled to the engine. The three-pump and engine assembly must be integrated under the cab and across the asphalt roller, so compact design of this assembly is key.

Consequently, Poclain Hydraulics has developed the new PM pumps, a range of ¾ duty pumps operating at 400 bar / 5,800 PSI maximum pressure. They tolerate
a higher pressure than medium duty pumps and are more compact than heavy duty pumps. They deliver the optimum compromise between compactness and pressure level. Thanks to their compact design, an assembly comprising of three Poclain Hydraulics PM pumps is easily integrated into an asphalt roller for transmission and vibration.

Driving the drum poses another set of constraints: the motor must be compact, robust and capable of withstanding high radial loads due to the vibrations and tough working conditions. The Poclain Hydraulics MS and MK motors meet these requirements handling accelerations up to 20 g. Direct coupling to the drum improves weight distribution, eliminates backlash and provides smoother operation at low speed when compared to high speed motor and gearbox assemblies. For 8-14 ton rollers, the 18 size MS motor and its compact bearing support is robust and long-lasting. With a compact bearing support that is directly mounted to the drum, it is available in displacements ranging from 1 to 2.8 l (61 to 170 cu.in/rev) and provides a braking torque up to 19,000 Nm. Moreover Poclain Hydraulics has recently launched a high-volume, cost-effective production line program exclusively dedicated to our MS18 motors.

As for the walk-behind rollers with independent drive and vibration systems, compact size and cost-effective integration are the primary requirements. Poclain Hydraulics has designed the PMV0, a variable displacement pump (7 to 17 cc, 0.4 to 1.3 cu.in/rev) with a drive-through shaft, which enables assembly in line with the engine, the transmission pump and the vibration clutch.
HIGH FLOW «BIG» HYDRAULIC MOTORS

The MS83 and MS125 High Flow motors integrate new valving design, which reduces the pressure drop by over 50% and directly increases their efficiency during operation, even at low speeds.

At comparable output levels, the machine’s overall energy consumption is reduced and users benefit from significant energy savings.

Pressure Loss Reduction

Designed with four hydraulic ports, the MS83 and MS125 High Flow motors also provide superior torque and up to 50% higher speed, even for the most heavy duty of applications. Machine manufacturers who are looking for performance will find in these new hydraulic motors a way to enhance their value proposal for end users by combining energy savings with higher productivity.

Maximum Speed Increase

* For same speed of 55 rpm, pressure drops are reduced by 50% and for same pressure drops reachable speed can be increase by 50% in the case of a MS125 motor with 12 500 cc displacement (760 cu.in)

All these efforts to optimize performance have been carried out without compromising on the size, so these motors can meet the dimensional constraints of the application. Their compactness and reduced diameter facilitate their integration and help machine manufacturers reduce development time.

Customer benefits:
- Direct drive
- High power
- High torque
- High efficiency

Typical application examples:
- Shredders
- Marine Winches
- Industrial Applications (Rolling devices, Mixers, Injection moulding machines, etc.)
- Mining Applications
- Tunnel drilling

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A VALVE DEDICATED TO INDUSTRIAL APPLICATIONS

The CORAC valve is a Cross-Over Relief and Anti-Cavitation valve than can be flanged on Poclain’s largest motors (MS83, MS125 & MI250). Today available with flows from 200 to 1000 liters per minute (can be more on demand) and with a max pressure of 350 bar, this valve provides an effective protection to circuit components exposed to high cyclical loads and long pipes.

The development of the CORAC valve reinforces Poclain Hydraulics’ position as a system provider for industrial applications. The combination of the CORAC valve with our largest motors provides a highly efficient hydraulic system in line with industrial requirements.

The CORAC valve, which is an assembly of standard valves, is yet another example that Poclain Hydraulics is expert in creating an all-in-one valve that performs all the necessary functions in one compact block.
MEDIUM DUTY PUMPS

As the PM50, the PM30 pump is designed specifically for medium duty applications. It is efficient, user-friendly and economical. Our medium duty pumps meet all customers’ expectations in terms of productivity, comfort, reliability and efficiency and are well suited for the most demanding markets such as mowers, wheel loaders, compactors and aerial work platforms.

**Designed for performance and comfort:**
End users can now take full advantage of performance and comfort when using their machines. The new range of PM hydraulic pumps provides all the necessary monitoring for any machine available on the market. Each unit, whether equipped with mechanical, hydraulic or electro-proportional control, has been redesigned with special emphasis on detail and efficiency. With the aim of further improving the working environment of the driver, particular care has also been taken to reduce noise levels. With these pumps, machines can comply with present and future regulatory requirements in terms of comfort, safety and performance.

**Designed to last:**
Reliability and durability are of utmost priority to end users. Designed to meet the highest quality standards and tested in severe conditions, both on test benches and on site, the new range of PM hydraulic pumps will for sure exceed your reliability requirements and thus reinforce your brand image as well as customer satisfaction.

**Designed for easier integration:**
Technical solutions imposed by the new anti-pollution standards reduce the space available in the engine compartment. The PM hydraulic pumps feature a reduced axial length and fully integrated additional functions such as exchange and anti-stall, resulting in an extremely compact design. This compactness offers Poclain Hydraulics’ customers more flexibility in the design of their machines.

**Designed for energy savings:**
End users are now very concerned with the total cost of ownership of their machines and pay particular attention to fuel consumption costs. This is why each component of our new PM range has been designed to increase the overall pump efficiency and thus contribute to reach the energy consumption levels expected by the markets.
The electro-proportional servo-control with feedback system on PM50 pumps is an opportunity for customers to design machines that offer optimal driving comfort. Thanks to its technology, the «Q control» enables an extremely accurate control of acceleration ramps, but also eliminates any sudden jolts when accelerating or braking.

The feedback system corrects displacement variations caused by varying pressure encountered in a system during a working cycle. The speed of the machine is thus maintained whatever the movements and variations in pressure, which again increases its accuracy.

The user will be able to move with ease and position their machine with precision.

This control is perfectly suited to cutter-type applications, harvesting machines, finishing machines, sweepers, etc.
STAGE V REGULATION: Engines Between 19 And 37 kW (25 – 50 HP) Impacted

The next stage of EU emission standards comes into force in 2019 and 2020 for off-highway diesel engines across the power spectrum. Machines for Construction, Agriculture, and Material Handling will all be in the scope of the new standard.

One of the most impacted power ranges will be the engines between 19 and 37 kW (25 – 50HP). Many of them will require technology such as common rail fuel systems and exhaust after treatment devices such as Diesel Particles Filter or and SCR. In short, OEMs will have to:
- Adapt to tighter space constraints to install exhaust after treatment devices.
- Manage the additional costs linked to these new devices.
- Integrate the higher Total Cost Of Ownership (TCO) due to higher maintenance costs on Stage V engines mainly for Rental.

It is apparent that the engines between 19 and 37 kW will be the most impacted since their level of particulates emission will have to go from 0.6 down to 0.015 g/kWh, implying the usage of a Diesel Particles Filter.

One of the possible ways to minimize the impact of this regulation is to downsize the diesel engine used on the machine below the 19 kW threshold. When this is possible, it has to be done without sacrificing machine performances.

To make this change possible, Poclain Hydraulics has been improving the efficiency of a great part of its hydrostatic transmission offering over the last five years. Hydraulic loss reduction opens the door for diesel engine downsizing without compromising the machine performances.

First, the higher efficiency of Cam-lob technology versus high speed motor with gearbox brings a first gap in this quest of highly efficient hydrostatic transmissions. The recent development of HighFlow™ motors, such as MS02, MS05 and MS08 HF reinforces this benefit, offering higher productivity with lower energy consumption. At constant speed, hydraulic losses of HighFlow™ motors are reduced by 50% compared to the classic MS motors.

Second, the Poclain Hydraulics pump offering provides opportunities to further reduce hydraulic losses from the transmission. As a matter of fact, the brand new PM range (PM50, PM30 and PM20) has been designed with higher volumetric and mechanical efficiency. In addition to this, the higher pressure capacity (up to 400 bar instead of 350 bar) is opening new doors to overall hydrostatic transmission downsizing. Last, but not the least, electronic control of hydrostatic transmissions gives more possibilities to ICE downsizing without sacrificing machine performances. For example, Electronic Anti-Stall or EcoDrive™ software functionalities will help end users to get the maximal productivity out of a downsized engine machine.

To summarize, Poclain Hydraulics is ready to help its customers to face Stage V challenges. Thanks to brand new product offer, changes will be almost unnoticeable from a performance and cost perspective.
DRIVE SOLUTIONS: Poclain Hydraulics in one package

In summer of last year, Poclain 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 Poclain 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.


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THE GROUP IN A FEW FIGURES

Corporate information
- Head Office: Verberie (France).
- CEO: Laurent Bataille.
- Independent share-holding for the most part family-held.

Human resources
- more than 2000 people throughout the world,
- more than 65% people out of France,
- more than 4% of payroll dedicated to training.

Production and logistics
- 10 production units:
  - France – Verberie (60), Marnaz (74), Etupes (25), Sablé-sur-Sarte (72)
  - USA – Sturtevant,
  - Czech Republic – Brno,
  - Slovénia – Žiri, ISO 9001:2008,
  - India – Puduchery,
  - Italy – Gaggio di Piano,
  - China – Shanghai.

Sales
- 23 sales subsidiaries: Brazil, Canada, China, Czech Republic, England, France, Finland, Germany, Holland, India, Italy, Ireland, Japan, Korea, Russia, Singapore, Slovenia, Slovakia, South Africa, Spain, Sweden, Thailand and United States.
- more than 180 distributors worldwide,

R&D and Innovation
- 250 people in R&D worldwide.
- Over 6% of sales invested in R&D.
- More than 330 patents registered worldwide.

More information
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