

Simplified Solutions

Bosch Rexroth offers flexible specification options for components in agriculture, off-highway and construction markets

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The hydraulics market is very mature, according to Terry Hershberger, mobile hydraulics technology leader, Bosch Rexroth. So mature, in fact, changes occurring from an innovation standpoint come in smaller and smaller increments on the hardware side. Today, it's all about bundling components in new ways and focusing on advancements in electrohydraulics and sensor technology.

This is the road map for component technology in the agriculture, off-highway and construction sectors in 2026. Large and small OEMs are building machines with smaller components that consume less energy, offer user-friendly controls/software and provide high degrees of automation.

Innovations in agriculture machinery come in small increments today.



Bosch Rexroth presented similar themes during ConExpo-Con/Agg earlier this year. “Our Electronic Open Circuit (eOC) is a great example of this. It’s not a brand-new technology, but it gives us the ability to control our components in a more simplified way,” Hershberger said.

The electrohydraulic eOC pump with a swivel angle sensor and pressure sensors is one of the central components in the eOC architecture. Combined with an ECU and the other components of the system it provides the control of the setpoint values for torque, pressure or flow. In combination with eOC software, characteristics in system dynamics and power control can be set, changed and combined—all

with the notion of simplifying the system technology.

“Today, we really have a solid understanding of the interaction of all the components in electronic flow management, for example, Anything needing dynamic control and coordination such as an excavator are good candidates for this simplified solution. These were part of the many discussions we had at ConExpo-Con/Agg,” he said.

Next Level Flexibility

Hershberger shared some of these technologies with *PTE* during a post-show recap including the MPR radial piston motor, the MCR-F motor for wheel drives, RS valves, eLION motors, HMI for mobile machines, compact hydraulic solutions and more.

“A smaller, more compact design is the main feature of our MPR radial piston motor. Whether you’re talking about conveyor systems, ground drive systems, etc., this motor fits very well into areas where customers are downsizing and optimizing their construction equipment,” Hershberger said.

The Bosch Rexroth MCR-F is a compact, robust radial piston hydraulic motor specifically designed for direct wheel drive applications in mobile machinery. Operating in a radial piston design principle, it delivers high starting torque, mechanical efficiency, and smooth low-speed performance in open or closed circuits.

Additionally, Bosch Rexroth valve technology continues to expand with larger sizes and more scalable product portfolios. Rexroth Flow Sharing (RS) valves are optimized for electro-hydraulic actuation and ready for operator assistance functions targeting applications in areas such as construction, material handling and forestry.

The eLION product line continues to gain traction with technologies to manage thermal output and deliver optimal conditions for critical battery and electronic components performance. The flexibility of these drives, for example, enables higher power densities and noise optimization for high-speed electric motors.

Easy integration, sensor-based monitoring and several strategies for drive solutions round out the key capabilities. Bosch Rexroth’s knowledge of construction equipment is a huge advantage during the design phase of the eLION platform.

“We’re seeing a push towards simplifying component design in this area as well,” Hershberger said. “Now we’re mixing and matching with traditional hydraulic power transfer or now with electronic technology and letting customers select the best drive solutions for their particular applications so they can select the products they need without getting bogged down in the details.” This is the impetus for ‘Simplified Solutions.’

The expanded HMI portfolio hints at making machine operation as efficient and safe as possible. This includes joysticks, foot pedals, power brakes and other products that can be selected. They provide intuitive component control and offer unique capabilities based on each individual machine.

“Trade shows like ConExpo are so important to meet face-to-face with our customers and have conversations about the obstacles they’re currently facing in these markets. There were plenty of discussions on utilizing electrified solutions and specifying smaller and more compact components for future machine designs,” Hershberger said.

Facing 2026 Industrial Challenges

Localization is as important today as it has been, however, tariffs, global economic uncertainties and the need to have service and support as close as possible to your customer base is imperative. Hershberger said these are the areas Bosch Rexroth is looking at today in the mobile machine market.

“Electrification discussions have slowed. It’s happening in some areas faster than others and we’re seeing the price of diesel and fuel in general fluctuate regularly. How many hours of operation will you get with electrified solutions? You know exactly what you’re going to get with a fuel





The eLION product line manages thermal output and delivers optimal conditions for critical battery and electronic components. (Image: Bosch Rexroth)

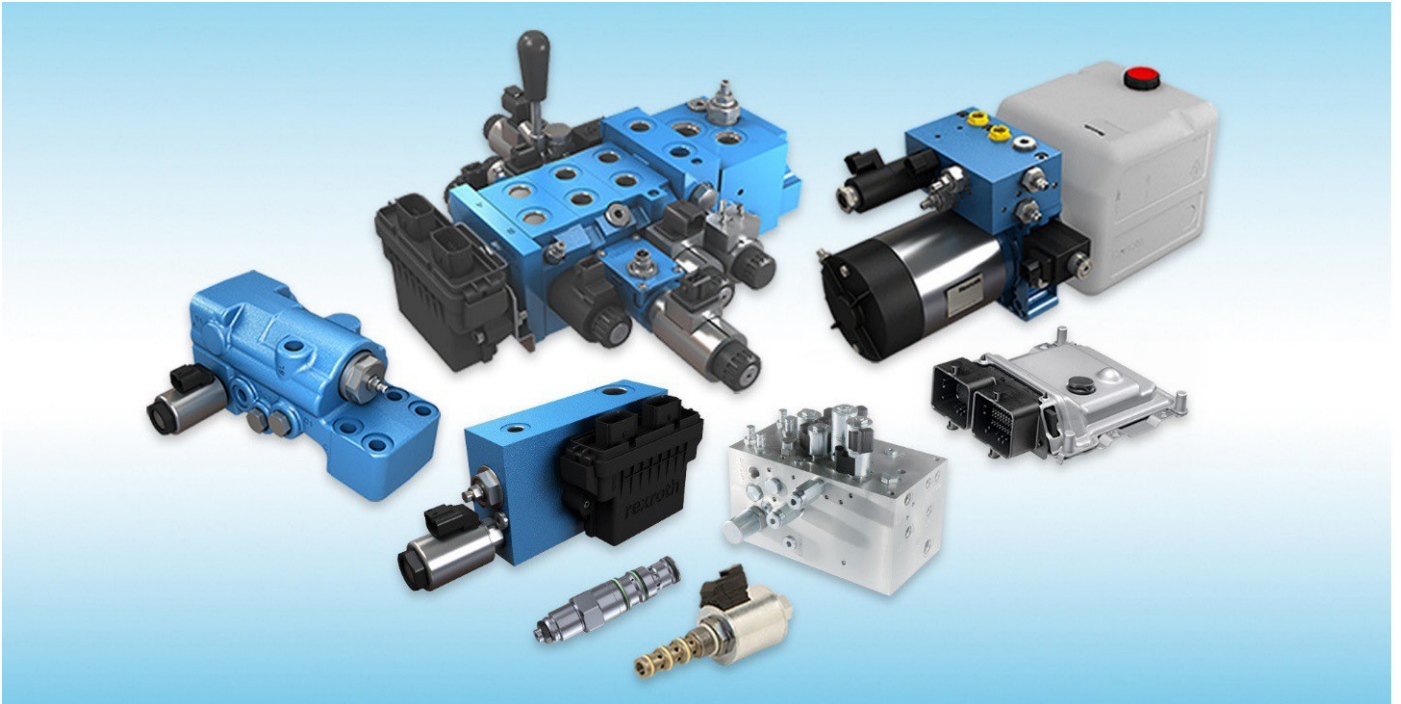


One of the key questions engineers face in agriculture applications today is whether or not to move to electrification or stay with traditional technologies.

tank on the machine, so navigating which types of machines, industries and use cases can benefit from electrification continues to be evaluated,” Hershberger said.

Range anxiety, space limitations and modernizing old technology will continue to keep engineers up at night. How big a battery will you need to put in this equipment today especially if it’s impossible and impractical to refuel when you’re out in the field?

“What is being done differently today? Hershberger continued. “Do customers want to buy the machines or rent the machines? How experienced are the operators? How much automation is being considered? Do we move to electrification or stay with traditional technologies? We need to keep up with all the trends



With the acquisition of Hydroforce, Bosch Rexroth has expanded its range of compact hydraulic components and systems. (Image: Bosch Rexroth)

and keep the lines of communication open with our customers.”

Smaller and lighter components continue to be an integral aspect of mobile hydraulics in overall optimization.

“For instance, the big valves control those large movements and functions but there are smaller flow demand functions that need to move at the same time that must be coordinated in the full system. We’re providing *tomorrow’s* system solutions today with our Simplified Solutions. The concept is really about providing the solutions—from a little support to a lot of support—that the customer decides. With the trend of more compact, energy efficient vehicles and the ability to provide technology in a smaller but effective package, the support is critical,” Hershberger said.

The acquisition of Hydroforce in 2022 has also been beneficial for these markets. Bosch Rexroth offers a wider range of compact hydraulic components and systems, HydraForce focuses on mechanical and electrical cartridge valves and hydraulic integrated circuits (HIC).

Compact hydraulics is particularly valuable due to the high-power density. The world market for these

systems has been growing continuously and this helped shape the Compact Hydraulics Business Unit. The move broadened the company’s hydraulics offering for existing and new customers, expanding global reach and providing growth opportunities.

Market Needs

So, what are customers looking for today on mobile machines? Hershberger cites a growing plug-and-play market where torque factors into every conversation.

“We can continue to grow in these markets with the diverse line of products we’re highlighting at trade shows like Con-Expo. It’s still about function but more and more the ideal fit of the components within the system. This is very critical. When we place optimized components as part of the machine solution and provide new functionality, we’ll continue to be successful.”

Cybersecurity is another big ask in 2026. “The accuracy of the sensors is so critical in this equipment. Nobody wants a machine that can easily be hacked or be in a position where valuable machine data is stolen,” he said.

Availability of chips used to be a greater challenge, but Bosch’s history with its own chip production certainly makes it easier to address these issues.

“The ability to provide our own sensors and that deep engineering knowledge gained from similar applications has been good for us,” he added. “You want to have sensors all over your machine because you’re providing all the vital feedback.”

Bosch Rexroth will continue to diversify its product portfolio by adding motor frame sizes, extending motor range and being flexible with the components they’re releasing. In addition, Bosch Rexroth plans to expand and develop new technologies for electric actuators.

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