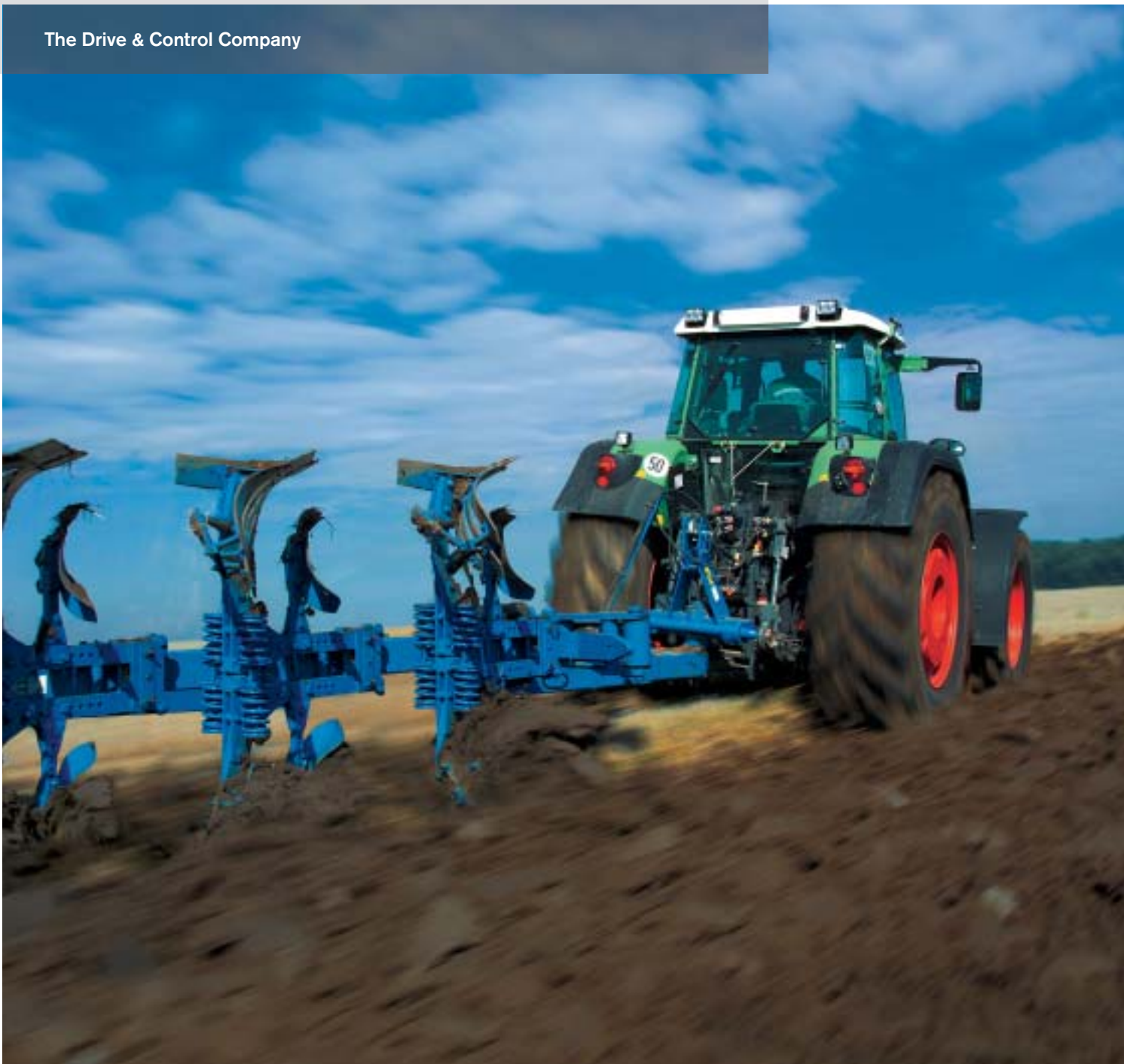


# Drive and Control Systems for Tractors

The Drive & Control Company



## The Tractor Project – a Question of the Right System

Traveling new roads demands flexibility. As unique as your tractor system is, so diverse are the possibilities for designing its hydraulic and electronic equipment. With Rexroth's modular system, all roads are open to you. A visible plus in flexibility and the quality that is typical for Rexroth – these cannot fail to impress, whatever the job in hand. Just put us to the test!





**No one can fool us when it comes to mobile hydraulics**

Over 10,000 products in the field of axial piston pumps, external gear pumps, mobile control systems and mobile electronics provide us with a broad range of system solutions. Our Rexroth SB23 valve concept is known and respected in this sector due to its modular design. It is an excellent example of our incomparable spectrum of components, modules and system solutions in the technological field of mobile hydraulics. Internationally acclaimed awards bestowed upon our customers for drive and function provide proof that our products and systems are among the best the market has to offer for tractors.

**Benefit from our experience**

At Bosch Rexroth, we have been working with hydraulics for 50 years. Our internationally renowned electronic-hydraulic hitch control EHR has been setting standards for 25 years. When it comes to electronics, we and our colleagues at Bosch set the highest standards. It is not by chance that Bosch has stood for expertise in all things automotive for over 100 years. Where could you get more than this?

**Put your trust in us**

System development is a highly complex task – now you can rely on a partner who has already proven his expertise in countless successful projects. Put your trust in Rexroth!

## The Partner for your Tractor Project: Rexroth

Traction machine, implement carrier, tool: with its enormous scope of functions and capacities, now as ever, the tractor remains the central piece of equipment in agriculture. Combining the right functions in a tractor is a genuine challenge for the manufacturer and an economic necessity for the farmer.

### **Systems and modules – the Rexroth System grows with your tasks**

In order to carry out such a diversity of tasks, diverse possibilities are required. A compact design and many options for expansion are prerequisites for reacting flexibly to customer requirements. And we pay particular attention to this aspect in the development of our components. With its modular system, Rexroth offers flexible and economical concepts for valves, pumps and electronics, for every combination of application and function – from the small multi-purpose tractor to the powerful tow crop models.

### **Expertise is the key**

A tractor's success is influenced to a considerable extent by the quality and performance of its systems. Only a supplier with an appropriate technological background, experience with applications and expertise in providing advice in the field of agricultural technology can be a partner in the development of the tractor system. Our many years of experience in the use of mobile hydraulics speaks for itself. Our Tractor Application Center has its own proving ground. Close cooperation between engineers from the fields of hydraulics and electronics guarantees that all our developments satisfy real requirements. From project planning system solutions in the tractor through developmental work to the commissioning into service of the finished product: with our project and development engineers, your requirements are in the best possible hands.





**Quality and durability – power and load-bearing capacity**

You don't have to go at full throttle 24 hours a day – but you can. Increasing performance whilst protecting natural resources is a matter of course for us. And we achieve this with improved efficiency, optimized drives, reduced weight, less noise and reusability. The farmer expects maximum quality and reliability from his tractor. Our components have to demonstrate their durability and load-bearing capacity on our test benches in durability tests under permanent load, with millions of load changes and in realistic ambient conditions. For this we employ vibration benches and salt spray, climatic, hot and cold chambers. Our component production is governed worldwide by the same standards as used by Bosch in the automotive sector and is certified to DIN EN ISO 9001:2000.

**A service partner – worldwide**

To be everywhere for our partners, that goes without saying – for us, at any rate. From Bosch Rexroth as a manufacturer with a worldwide presence, you can expect services that are both comprehensive and unique, and which leave no wish unfulfilled. From the complete documentation of our components to the training of your service personnel, with us you can obtain everything from a single source – all over the world.



**A partner with system – Rexroth**

A system requires flexibility from all those involved both in the process and in the technology – from application specialists and development engineers, components and subsystems. The great number of system solutions in the tractor commonly found today does not require an army of parts suppliers, but one reliable partner. Only in this way can all-embracing teamwork be achieved. Work with Rexroth.  
[www.boschrexroth.com/addresses](http://www.boschrexroth.com/addresses)

## Rexroth Components

Everything that makes your tractor mobile can be found in our Rexroth product range. Starting with basic equipment through complete system solutions to high-tech devices – we offer the world's broadest and deepest range of drive and control solutions. Practically all our components for hydraulic drives, mobile control systems and mobile electronics can be combined just as your wishes dictate.

### **Axial piston machines – compact and powerful**

The task of our axial piston pumps is to generate pressure and flow in an energy-efficient manner and to regulate them in a well-targeted manner. In order to ensure that this is so, our range includes numerous types, sizes and actuation systems. Through-drives enable pumps to be combined directly one after the other in a great many ways, thereby allowing the formation of compact drive units. [www.boschrexroth.com/axial-piston-pumps](http://www.boschrexroth.com/axial-piston-pumps)

### **External gear pumps – a tried and tested principle**

Rexroth's external gear pumps achieve their high degree of efficiency by their pressure-sensitive gap sealing and high-precision production technology. Here, it is possible to combine several pumps in one drive train. Our cut-in pump is especially compact and economical. Here, two pump stages are connected to one another via the valve section for the cut-in function. The second pump only cuts in when demand is heavy, ascertained by means of a load sensing signal. And in our low-noise Silence pumps, the dual flank concept enables flow pulsation to be reduced by up to 75 %. [www.boschrexroth.com/gear-pumps](http://www.boschrexroth.com/gear-pumps)

### **Mobile electronics from the expert**

The requirements facing mobile electronics in the tractor are extreme. Vibration, shock, cold, heat and electromagnetic radiation are sources of interference to which the system must be resistant. For this reason, we only use components that conform to stringent Bosch quality requirements. The cooperation between Bosch and Rexroth enables us to offer from a single source everything an electronic control system needs. From draft, position, angle, pressure and rotational speed sensors to electronic control units for central and subsystems, as well as joysticks, pedals and operator controls. Furthermore, Rexroth offers software for systems and components. The CAN bus system developed by Bosch and already known from the field of automotive electronics serves as the central, reliable communication channel between the control and the various system solutions. [www.boschrexroth.com/mobile-electronics](http://www.boschrexroth.com/mobile-electronics)

Axial piston pump A10VNO



External gear pump in multiple combination



Draft sensor



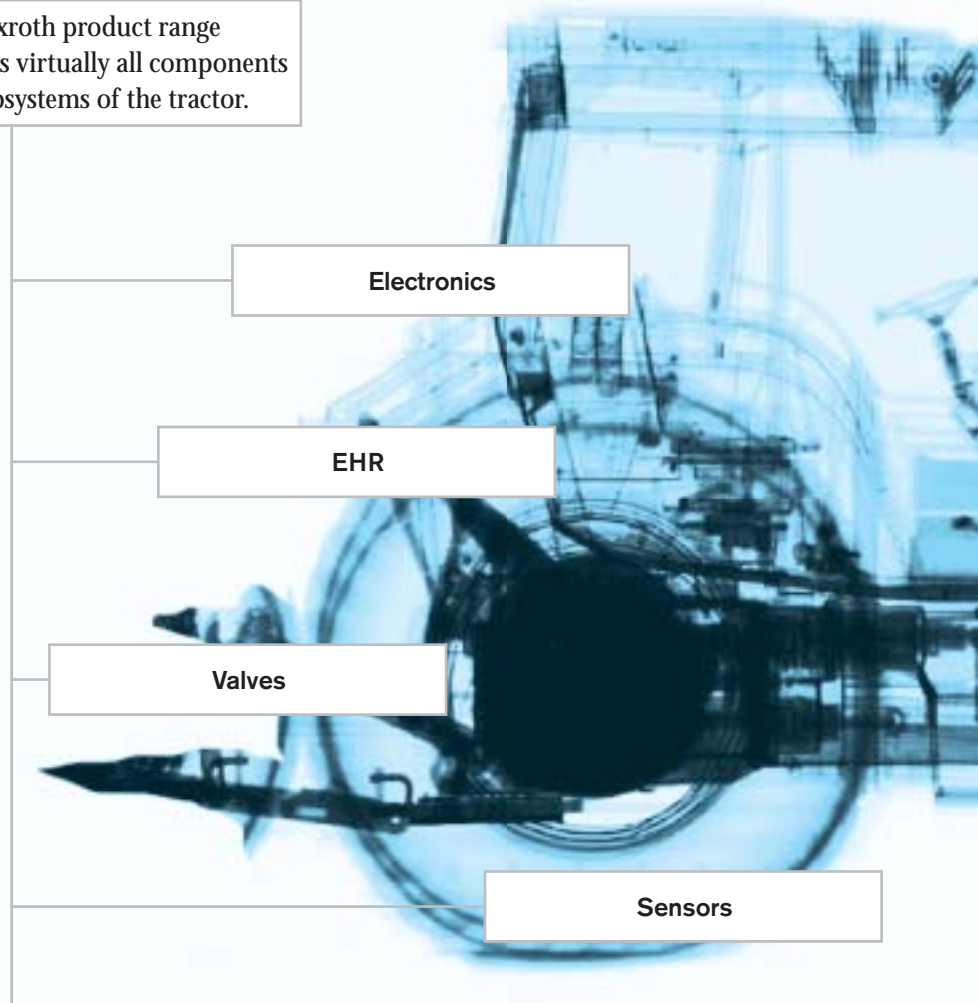
## The Rexroth System for Tractors

To improve and extend the functions of the tractor, to ensure its robustness and durability – that is our task. This is why Rexroth develops and supplies maximum quality in the world's most comprehensive product range for mobile hydraulics.

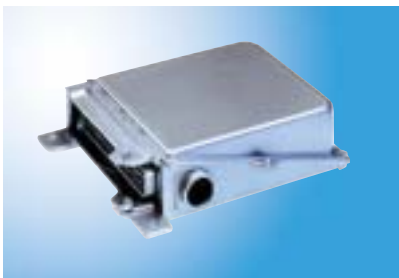
### Valves and control blocks – a module full of ideas

Our directional, control, servo solenoid and priority valves can be extended and combined with each other as desired. The modular principle provides an economical opportunity to combine functions, with the minimum of pipework and little required space. Our servo solenoid and directional control valve blocks are linked and supplied as a made-to-measure total system that is ready to install and boasts functions to match our customers' individual wishes. The EHS and EHR-OBE electronic-hydraulic controls incorporate electronics, hydraulics and CAN bus capability in a single compact module. Numerous auxiliary equipment such as pressure compensators, kick-out, check valves and shock valves are other options that are available.  
[www.boschrexroth.com/control-blocks](http://www.boschrexroth.com/control-blocks)

The Rexroth product range includes virtually all components and subsystems of the tractor.



Electronic control unit EHR D/C



Control block SB23 vertically stacked



We really get to grips with the requirements facing the tractor. From our analysis of what is actually attainable, we have derived our vision of system diversity – the Rexroth system for tractors, individually adapted to suit your particular requirements.

Thanks to this unique product diversity, Rexroth is able to offer numerous possible solutions.

CAN bus

Steering

Pumps

Braking systems

**Hydrostatic steering systems – sure to find the right way**

Increased axle loads and the resulting kinematic conditions lead to ever higher steering pressure. We respond to this challenge with a steering system that is the most rich in variants on the market. Whether open or closed-center, with standard or special emergency steering function – Rexroth's LAG modular steering system will provide the right module for every necessity. [www.boschrexroth.com/power-steerings](http://www.boschrexroth.com/power-steerings)

**Hydraulic power brake system – equal to every pressure**

Immediate availability on startup, sensitive modulation, low operating forces and reduced space requirements are characteristics that are gaining in importance in the field of automotive braking systems. The compact Rexroth LT17, with its dual-circuit brake valve and integral accumulator charging valve, and the Rexroth trailer brake valve, take this into account. [www.boschrexroth.com/powerbrakes](http://www.boschrexroth.com/powerbrakes)

Courtesy of Smiths Heimann

Brake units LT



Steering unit LAGZ



# The Rexroth EHR – more than just a Hitch Control

A key function in tractors is to transmit the machine forces and convert them to work in the fields in an economical, soil-friendly manner. Here, our hitch control comes into its own. Today, it forms part of standard tractor equipment. It provides the farmer with numerous useful functions for mastering his tasks with economy and comfort.

## Integrated systems for greater comfort

Bosch Rexroth leads the market as a parts supplier, manufacturer and developer of the EHR system. This necessitates the use of tried and tested components such as the control unit, servo solenoid valve, operator controls and sensors. When successfully combined, the individual elements result in a sturdy, user-friendly unit, that still works reliably even many years later.

## With on-board electronics to the mechatronic unit

The latest technology is constantly being integrated in the components of the Rexroth EHR. The introduction of on-board electronics (OBE), for example, combines the servo solenoid valve and electronics to form a mechatronic unit – a heart and brain, so to speak, for the electrohydraulic hitch control.



Control block with hitch control valve EHR23-OBE

## Rexroth EHR – functions with precision

The EHR offers all the typical possibilities of an electronic hitch control:

- The position control holds attached implements at the preselected hitch height in every driving situation.
- The draft control maintains the required force constant for the implements working in the soil.
- The mixed control guides the soil-working implements at the ideal working depth for the respective ground characteristics, in accordance with the set proportion of tractive effort and position.
- The pressure control meters the bearing pressure, e.g. of packer rollers, so that the soil can be compacted in the best possible manner.
- The external control enables the position of the implements attached to the hitch to be maintained with precision, by scanning the ground with a sensor.
- The slip control uses a radar sensor to record speed over the ground, and compares it with the drive speed. If these values differ, the implement is raised as accordingly, preventing wheel spin.
- The active ride control reduces the shaking of the tractor in transport mode.

## The Secret of our Success – Experience and Innovation

Perfection can be achieved by continually improving things that are already good. We run Application Centers for different areas of mobile hydraulics, such as construction machines, agricultural and forestry machines, materials handling and commercial vehicles. Thanks to the all-embracing teamwork of our application engineers, Rexroth can enjoy a concentration of technological know-how that is unique in the world.

### **System capability is a prerequisite**

A high-quality function system does not automatically result from the combination of high-quality components. At our Tractor Application Center, we make this perfect interplay into a reality. A new development can only be included in our range if it works together with various other components at one hundred percent.

### **Innovations for the tractor**

Technologies and requirements are undergoing constant change. Adaptations and innovations are the order of the day. At Rexroth, we are equipped to deal with this. Our broad product range for the various areas of mobile hydraulics ensures that we are always one step ahead of new trends. Power brake systems in the tractor are on the rise. In construction machines, however, they are state of the art, and the use of Rexroth is extremely widespread here. Our expertise covers many branches – you, too, can benefit from it.





**The present in our hand – the future in our sights**

In the future, open and closed-loop control organs with intelligent signal processing will assist with the generation and control of hydraulic power in the tractor. The challenges for these components lie in the provision of economical and sturdy signal converters, such as pilot valves, solenoids and sensors. In the tractor system, the challenges arise in the networking of individual functions and subsystems to create a high-quality complete system. Here, the ability of parts suppliers and tractor manufacturers to combine different technologies with one another in the optimum way will be the definitive factor for success. With our experience and commitment, we are well prepared for this task.



Control block SB23-EHS2



**A reliable system that you can trust**

We are proud of our many years of partnership with our customers. Many innovative tractor systems have resulted from it and will continue to do so in future. Together with our customers, we want to take up the leading positions in the world market. Rexroth is looking forward to the challenge – you can challenge us, too!

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