



BOSCH

Invented for life

Power Steering Systems and Components



Automotive and Light-duty Steering Applications

Robert Bosch Automotive Steering (formerly ZF Lenksysteme) is the world's leading manufacturer of steering systems. The parts offered to the Independent Aftermarket benefit from that knowledge and competence, giving our customers peace of mind when fitting Bosch steering components.



Hydraulic Steering

Electric Steering

Pumps



Hydraulic Power Steering

HPS and EHPS

Automotive and Light-duty

Hydraulic systems are a classic example of robust steering systems utilized in millions of vehicles worldwide.



Compact dimensions, low weight and **reliable performance**

are the main advantages of hydraulic systems.

Function

Bosch hydraulic steering systems are manufactured with quality and reliability in mind. They provide dependable driver assistance by delivering a highly accurate output at any speed – when it matters the most. These proven systems have evolved with added functions – such as Servotronic and Active Steering – continually leading the way with the latest technology.

System Advantages:

- ▶ Low complexity
- ▶ Compact dimensions
- ▶ High reliability
- ▶ Proven system

Common Applications

From compact vehicles to light duty commercial vehicles from the 1970s – present. Electric Hydraulic Power Steering (EHPS) is commonly fitted to the MINI Cooper and some GM applications.

Replacement Parts

Steering Gear: Rack & Pinion, Servotronic®, Active Steering®



Pumps: Mechanical (single- and dual-circuit)



Electric Hydraulic Power Steering



EHPS offers the hybrid solution of fuel-saving electric power on demand, with a proven and robust hydraulic steering rack.

Electric Power Steering EPS

Automotive and Light-duty

This system uses an ECU controlled electric motor in place of a conventional hydraulic system. Control and steering assistance are powered by an electric current.



-10%

fuel consumption and CO₂ emissions

compared with a hydraulic steering system in a two-liter gasoline engine passenger car, with an average fuel consumption of 30 MPG in urban traffic only.

Up to **20%**

weight reduction

compared with conventional steering systems in the compact class. Servolectric® achieves this savings, in part, by reducing the number of components in the steering system.

Function

Based on the steering signal recorded by the torque sensor, the ECU calculates the optimum steering assistance and forwards this information to the electric motor, which provides the necessary force.

System Advantages:

- ▶ Power on demand = improved MPG
- ▶ Oil free – no maintenance required
- ▶ Additional comfort and safety functions
- ▶ Diagnostic capable
- ▶ Improved safety with possibility of added functions (e.g., Evasive Steering Support, Traffic Jam Assist, Parking Maneuver Assist)

Replacement Parts

Servolectric® EPSc

Column type gear



Servo unit on the steering column is specifically for vehicles with low steering effort: entry-level sub-compact to mid-sized vehicles.

Common Applications

Compact mid-sized vehicles with a steering

axle load of up to 2,200 lbs

Servolectric® EPSdp

Dual pinion type gear



Servo unit on a second pinion provides the ideal electric power steering solution for mid-sized vehicles.

Common Applications

Mid-sized vehicles with an

axle load of up to 2,640 lbs

Servolectric® EPSapa

Axis parallel type gear



Provides the ideal electric power steering solution for vehicles with very high steering effort.

Common Applications

Mid-sized vehicles, SUVs and light-duty commercial vehicles with an

axle load of up to 3,500 lbs

Medium and Heavy-duty Commercial Steering Applications

Robert Bosch Automotive Steering (formerly ZF Lenksysteme) is the world's leading manufacturer of steering systems. With decades of experience, we offer products that fulfill every specified requirement for medium and heavy-duty (HD) trucks and busses.



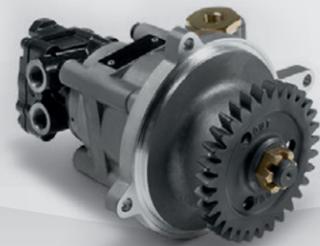
Steering Gearboxes



Pumps

Bevel Boxes

Shafts



Steering Gear RB-Servocom®

Medium and Heavy-duty Commercial

RB-Servocom® is a reliable and compact recirculating-ball power steering gear.



High reliability

evident in its rugged design – proven 11 million times in all markets and applications.

Function

Ball and nut steering system assisted by hydraulics to deliver precise and reliable steering output. RB-Servocom® offers the best power-to-weight ratio of all hydraulic block steering systems.

System Advantages:

- ▶ Proven and reliable design
- ▶ Dual circuit system that meets statutory requirements for busses and HD vehicles
- ▶ Compact design with high output for heavy loads

Common Applications

RB-Servocom® is fitted to a wide range of American and European heavy-duty applications from 1985 – present.

Replacement Parts

RB-Servocom® Gearboxes



Best power-to- weight ratio

of all hydraulic block steering systems.

Pumps: Mechanical (single circuit)



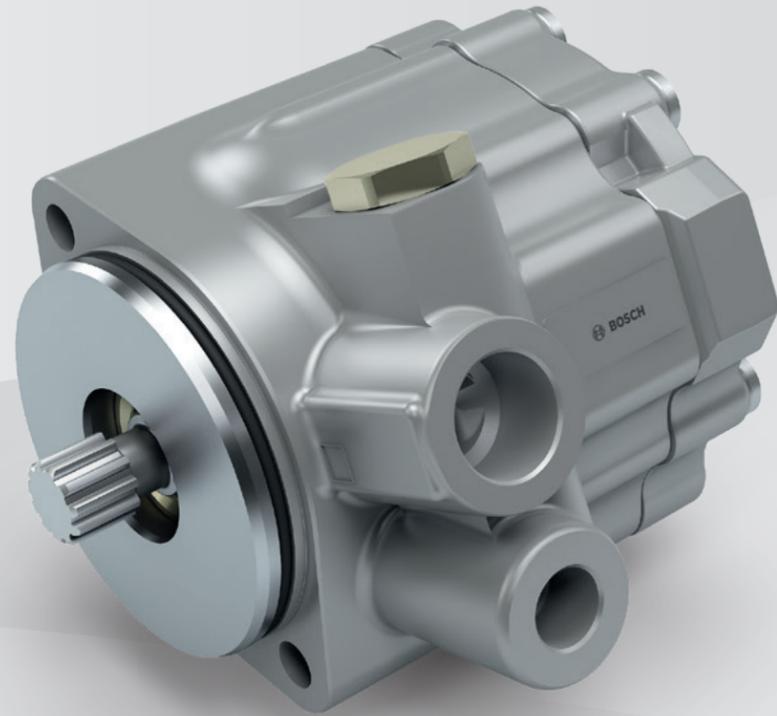
Mechanical (dual circuit)



Steering Pumps

Heavy-duty Commercial

Steering pumps are the heart of any hydraulic power steering system, delivering high-pressure fluid to the steering gear or cylinder.



Up to **50%**

lower power consumption with Varioserv compared to a standard pump.

Up to **30%**

lower system temperature with Varioserv compared to a conventional power steering pump.

Function

Delivers power steering fluid to the steering gear or cylinder at high pressure with a continuous uninterrupted volume.

System Advantages:

- ▶ Reliable and proven design
- ▶ Delivers the required pressure for the most demanding applications
- ▶ Multiple pumps can be used for extra safety, both engine- and road-wheel powered

Common Applications

A wide variety of HD applications across American and European brands.

Replacement Parts

Vane



Average fuel savings of 20% – 40%

This hydraulic steering pump is used in commercial vehicles due to its high efficiency, compact, low-weight design and adaptability to individual circumstances.

Varioserv



Reduced CO₂ emissions and fuel consumption

Varioserv features a hydraulically moveable cam ring, with a variable displacement pump that makes an essential contribution to the energy savings of hydraulic steering systems. Depending on the pump speed, the pump displacement is adjusted to the required oil flow.

Tandem



Produces two independent volume flows

The tandem pump is a combined vane pump and gear pump. The housings are connected and both systems are driven by the same shaft, but produce two independent volume flows. For example, the vane pump feeds the power steering system while the gear pump pumps the fuel.

Radial



High maximum pressure level of 200 bar

The constant flow direction of the radial pump – when driven in a clockwise or counterclockwise direction – enables it to be used mainly as a path-dependent emergency steering pump for commercial vehicles.

Supporting Steering Parts

Heavy-duty Commercial

Steering systems rely on a combination of parts working together to consistently provide comfortable and safe driving conditions.



Robust alloy housing

Lightweight design, yet tough enough for demanding driving conditions.

Function

Bevel boxes, shafts and columns direct the steering input from the driver to the steering gear.

System Advantages:

- ▶ High-quality original products
- ▶ Heavy duty – built for demanding conditions
- ▶ Designed to deliver safe driving conditions without compromising on driver comfort

Common Applications

A wide variety of heavy-duty applications across American and European brands.



Replacement Parts

Bevel Gearboxes



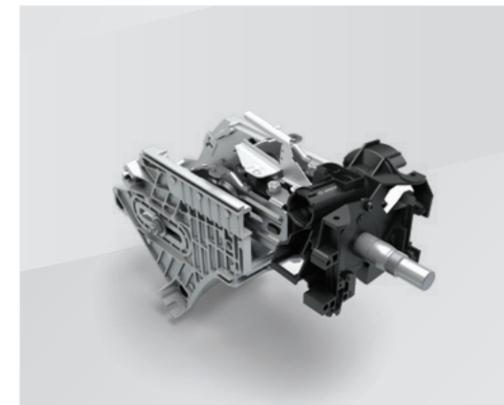
Used where a direct connection between the column and gear is not possible. They commonly divert the steering input by 90° but special variants also exist.

Shafts



An important link between the steering wheel and steering gear, designed to absorb all the movement for driver comfort.

Columns



Connects the steering wheel with the steering shaft and offers a full adjustment of height and tilt for driver comfort.

Automotive Competence from a Single Source

Benefits of Bosch Components

OE Equivalent Replacement

Bosch steering components are designed to offer an exact fit solution without the need for modifications or adjustments to carry out the repair. We want to help technicians do the job right first time around.

100% Fully tested—Out-of-the-Box Performance

We pride ourselves in testing our units prior to packaging to ensure that all of our steering parts perform from the minute they are installed, without disappointment. Together – with our customers – we want a “fit and forget” repair, with peace of mind and complete driver satisfaction.

Original Quality

All components offered to the aftermarket both new and re-man are tested to the original quality specifications without compromise. Safety and reliability are paramount, especially with steering.

Cost Effective Options with Bosch Re-Man

Bosch Exchange (BX), commonly known as re-man, is a range of cost-effective replacement parts that offer improved performance utilizing remanufactured housings. All internal components are replaced with new and original parts and then tested to new specifications. This offers enhanced performance at a reduced cost to the customer and the environment.



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