Steering systems

Servotwin®

PRODUCT BENEFITS

- Enables semi-automated driving
- Relieves stress on the driver
- Fuel savings
- Active steering return
- Speed-dependent steering assistance
- High damping of pavement effects
- Modular lightweight electric servounit

1. Steering spindle connection
2. Electric motor
3. Control unit
4. RB-Servocom®
5. Worm gear
6. Sensor unit
reduced driver exertion

Thanks to lower steering forces when maneuvering and parking in conjunction with active steering return, driver exertion is reduced noticeably.

semi-automated driving
for greater safety and more convenience

−0.6 l/100 km

compared to conventional dual-circuit steering systems (depending on application profile)

TASK
The Servotwin® electrohydraulic steering system for heavy commercial vehicles is the result of the innovative combination of the RB-Servocom® recirculating ball-gear power steering system with an electronic control unit. The system offers speed-based steering assistance with active return as well as a variety of driver assistance functions. The electrical circuit replaces the previously needed second hydraulic circuit for commercial vehicles with two steered axles.

FUNCTION
Servotwin® consists essentially of two components: the timetested RB-Servocom® ball-gear power steering system and a platform-based combination of an electric motor with control unit and worm gear. The ball-gear power steering system provides most of the steering assistance. Its design is based on the principle employed in a classic hydraulic power steering system. Here, an oil circuit and a power cylinder provide the hydraulic steering assistance for the steering wheel motions of the driver. Using an electric motor and worm gear, an additional turning moment can be applied to the input shaft of the RB-Servocom® in parallel to the steering wheel’s moment. In this way, the manual force needed for steering can be varied depending on the driving situation. The mechanical connection from the steering wheel to the steering linkage is preserved. A turning motion of the steering wheel and the applied steering moment are sensed by turning angle and torque sensors and transmitted to the electronic control unit (ECU). By taking other vehicle parameters into account – for instance, speed and load – the ECU determines the required additional steering moment and actuates the electric motor. On the basis of the specific driving situation, the electric motor assists the steering motion by adding or subtracting a steering moment and in this way electronically optimizes the process of steering. The steering feel can thus be optimized for the driver at any time through the additional, electrically generated steering moment. To protect the steering system against overload when the wheels are turned to the full-lock position, an electronic stop can be freely programmed. In addition to comfort functions and driver assistance functions (e.g. side wind compensation, lane keeping function, traffic jam assist) Servotwin also enables automated driving functions in heavy commercial vehicles by connecting the steering system with the on-board electronics.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Model size</th>
<th>8298</th>
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<tbody>
<tr>
<td>Steering axle load</td>
<td>5,500 – 8,500 kg</td>
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<tr>
<td>Hydraulic torque (η = 0.9)</td>
<td>7,050 – 8,294 Nm</td>
</tr>
<tr>
<td>Electric torque</td>
<td>65 Nm</td>
</tr>
<tr>
<td>Max. oil pressure</td>
<td>185 bar</td>
</tr>
<tr>
<td>Max. oil delivery rate</td>
<td>25 dm³/min</td>
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<td>Dry weight</td>
<td>49 kg</td>
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1. Piston
2. Sector shaft
3. Housing
4. Steering spindle connection
5. Worm
6. Ball chain

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