

Better on the Road
All Along the Line.
DIWA Efficiency Package





Saving Fuel. Minimizing Emissions. Increasing Availability.

Lower fuel consumption, reduced complexity, higher driving comfort, increased economy and availability, lower maintenance costs ... there are many good reasons for the Voith DIWA, and another one has just been added: The DIWA Efficiency Package!

More than just a transmission

Combined with the topography-dependent gear-shifting program SensoTop and DIWA SmartNet, DIWA proves how much more efficiency can be gained from a drive with a perfectly adapted system: This also applies to traffic concepts with high service frequency such as “Bus Rapid Transit” (BRT), where only the most advanced drive technology manages to achieve the required efficiency.

DIWA.6 automatic transmissions

The proven principle, newly interpreted: Lower complexity and assembly requirements for manufacturers, lower consumption and fewer emissions during operation.

SensoTop

The series-installed gear-shifting program for optimum gear-shifting points at all times – depending on topography, load condition and acceleration.

DIWA SmartNet

The telemetric system for continuous condition monitoring of the transmission. For maximum availability and cost efficiency.



Advantages of the efficiency package

- + Lower fuel consumption
 - + Lower noise- and CO₂-emissions
 - + Lower repair- and maintenance costs
 - + More comfort and safety for passengers and drivers
 - + Maximum availability due to online-condition monitoring
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DIWA.6 automatic transmission



DIWA.6: Lower Consumption, Fewer Emissions.

Modern combustion engines are becoming ever more efficient and clean. And this trend is accelerated by the Euro 6 norm, which will become effective in many countries from 2014. With DIWA.6 Voith responds to rising requirements: The newly designed housing helps to meet stricter requirements on noise emissions reliably. The intelligent start-up management and the need-based reduction of the operating pressure decrease consumption by up to 5%!

Higher efficiency = lower consumption

The need-based reduction of the operating pressure is a decisive DIWA.6 advantage: Full operating pressure is established only when it is really needed. Consequence: The transmission efficiency increases.

Lower consumption = less CO₂

For engines with higher torques there is an additional converter design. A newly configured torsional vibration damper allows gear shifts at even lower speeds. Your advantage: Lower consumption and fewer CO₂-emissions.

Fewer vibrations = lower noise emissions

The newly designed transmission housing has been made stiffer by targeted ribbing. It reduces vibrations – and thus noise emissions. Another important contribution is made by the optimized operating strategy. DIWA.6 is fully prepared for the stricter rules on noise emissions specified in Euro 6.

Performance data DIWA.6 transmission

Types		D 824.6	D 854.6	D 864.6	D 884.6
Input power P_{1max}	[kW]	200	240	290	320
Input torque M_{1max}	[Nm]	800	1 250	1 600 ¹	1 900
Input speed n_{1max}	[min ⁻¹]	2 500	2 500	2 500	2 200
Retarder braking torque M_{BR}	[Nm]	1 800 ²	2 000 ²	2 000 ²	2 000 ²
Transmission mass (dry) incl. retarder	[kg]	approx. 329	approx. 334	approx. 339	approx. 344
Max. vehicle weight	[t]	15	28	28	34 ³

¹ 1 700 Nm under certain conditions

² Maximum value, depending on retarder configuration

³ Depending on axle ratio



- 1 The “smaller” DIWA 854.6 can in future be used for engine torques up to 1 250 Nm – the citybus torque range that used to be reserved for the “larger” DIWA 864.5.
- 2 DIWA.6 is optimized for operation in Euro 6 vehicles.

Starting intelligently = saving comfortably

DIWA.6 combines automatic shift into neutral (ANS) with an intelligent start-up management: It prevents starting against the active service brake. With the optimized ANS function, the transmission can stay in neutral for longer – this saves fuel! And starting on level routes is more comfortable so that the driver can effortlessly join moving traffic.

The new DIWA.6 convinces by

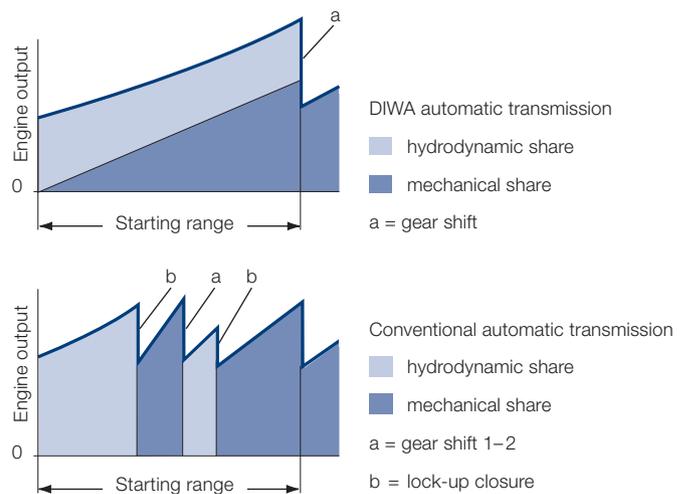
- + Lower consumption due to intelligent start-up management, reduced operating pressure as well as optimized converter and torsional vibration damper
- + Lower noise emissions due to new housing and optimized operating strategy
- + Lower complexity due to higher torque limits

The proven DIWA power split principle

allows stepless starting and braking across a speed range, where other transmissions require two to three gear shifts. Result: Up to 50% fewer gear shifts, higher driving comfort – and significantly lower wear in the driveline.

Reduced wear and higher comfort become visible

with the stepless DIWA starting range



Fuel-Efficient Driving with SensoTop: Optimum Gear-Shifting Points in Any Situation.

Level route or hilly terrain? Heavy or low load? Where other manufacturers exclusively rely on driving dynamic calculations, the inclination sensor provides additional and precise information about the topography of the route – so that SensoTop can steplessly adapt the gear-shifting points in any situation – for maximum fuel efficiency.

Up to 7% less consumption

Depending on the topography and the vehicle operation, SensoTop reduces fuel consumption by 2% to 7% compared with conventional gear-shifting programs.

Savings potentials that significantly reduce your operating costs. At the same time, SensoTop makes an active contribution to a cleaner environment because CO₂-emissions are effectively reduced.

Higher safety

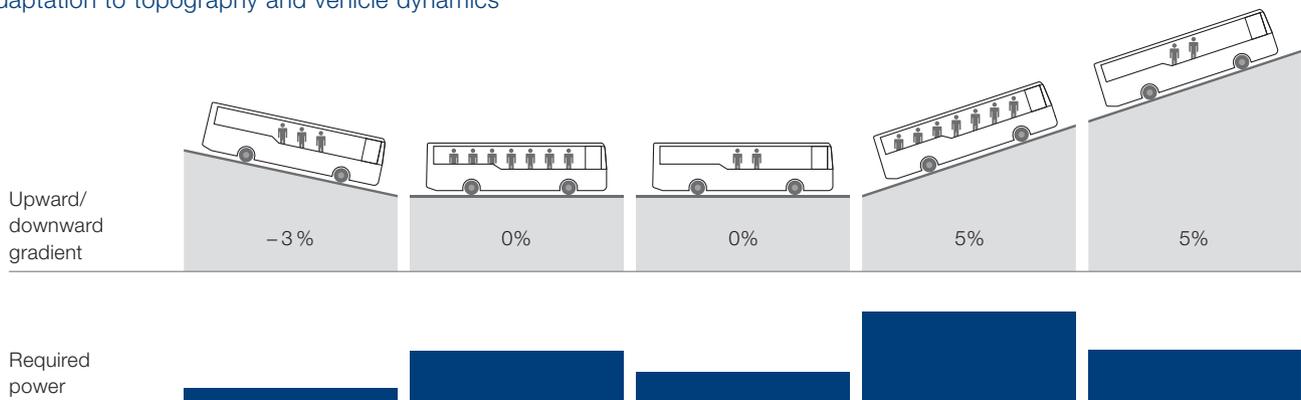
SensoTop also increases the safety of passengers and drivers. The gear-shifting strategy avoids gear hunting at upward gradients and allows comfortable start-ups.

The SensoTop advantages at a glance

- + Optimum gear-shifting points thanks to a clever combination of maintenance-free inclination sensor and driving dynamic calculations
- + Low noise levels due to low engine speeds
- + Higher passenger safety due to more comfortable start-ups
- + No gear hunting in demanding topographies

Lower fuel consumption with SensoTop

Adaptation to topography and vehicle dynamics



With DIWA SmartNet Always in the Picture: Telemetrics for the Driveline.

Monitoring the driveline online and accessing transmission data: DIWA SmartNet makes it possible. The telemetric system helps operators to combine high vehicle availability with low service and maintenance costs. Because it allows permanent insight into the essential operating parameters of the transmission.

Worldwide, over 2000 buses are on the road with DIWA SmartNet

A GSM terminal, for example the DIWA SmartBox, periodically transmits the data by GPRS to an Internet server. There they are automatically evaluated and stored across the entire operating time of the bus. Diagnostic tools like ALADIN allow further analysis.

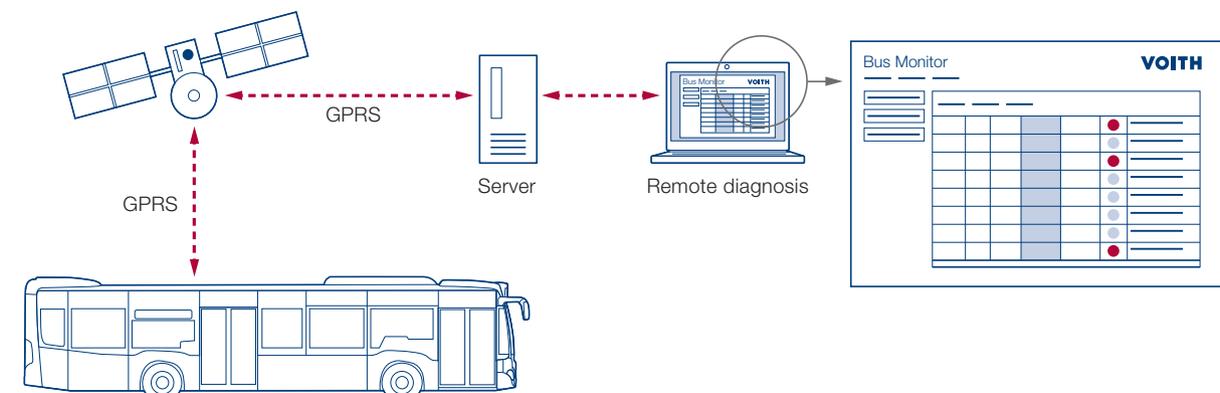
DIWA SmartNet says it with data

and is the ideal basis for preventive transmission maintenance. DIWA SmartNet automatically evaluates transmission data, either integrated into existing on-board computer systems or as a stand-alone solution. Any irregularities can thus be identified at an early stage. Irregularities automatically generate an SMS or an e-mail. This allows preventive maintenance, reduces downtimes and prevents unscheduled vehicle stand-stills. Result: Maximum availability of your buses.

SmartNet at a glance

- + Continuous monitoring of the DIWA transmission
- + Automated data evaluation through Internet portal
- + Analysis and remote diagnosis of all important vehicle data
- + Fast identification of irregularities
- + Higher vehicle availability due to faster diagnosis and preventive maintenance strategies

Monitoring all transmissions – DIWA SmartNet



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