

Media Release

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Voith SmartServices Optimize Vehicle Use and Maintenance of Buses

- **Real-time support for drivers regarding their driving behavior**
- **Analysis and display of important parameters enable predictive transmission maintenance**
- **Innovation impulses from the newly established Group Division Digital Solutions**

Heidenheim, Germany: With the DIWA SmartNet telemetry system, Voith offers bus operators a fast and easy overview of operationally relevant vehicle data as well as the possibility of optimizing their vehicle use. The newest version of the platform has been extended with new product families. "SmartAssist" informs the driver in real time about his driving behavior in regard to fuel consumption, provides tips for possible improvements and supplies appropriate reports for fleet management that can be retrieved at any time. In addition, "SmartMaintenance" uses a simple traffic light display system to provide constant monitoring of the transmission and enable predictive and thus cost saving maintenance. Supported by strong innovation impulses from the newly founded Group Division Digital Solutions, the new Voith Mobility Service solutions are already being performance-tested by a number of operators.

Besides the personnel costs, almost 90% of the operating costs in public transport are for fuel and maintenance. For increasing the profitability of the vehicle fleet, it is thus essential to start with precisely these two parameters. Acquiring and evaluating the relevant operating data in order to react promptly to deviations from the desired values is a crucial requirement for this process. SmartServices from Voith is the ideal solution for that purpose. It is based on the established DIWA SmartNet, which

acquires the operating data and provides information on the use of the vehicle and the condition of the transmission. The information generated from this data can be made available directly in the bus and to the operator. Voith is addressing both of these points with its new SmartAssist and SmartMaintenance solutions and supports both drivers and fleet management with a comprehensive optimization approach.

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SmartAssist: Improved Performance through Driver Assistance

Green, yellow, red: With these traffic light colors SmartAssist evaluates the driver's driving style and gives him feedback in real time via an app. With added brief comments on potential improvements, he can respond immediately and adjust his driving style to optimize the fuel consumption of his bus. The calculations are based on the measured speeds in conjunction with the topography and the duration and intensity of acceleration and braking processes.

After the trip has concluded, the driver receives summary feedback about the trip. SmartAssist provides fleet management with reports focusing on the fuel savings achieved. Vehicle-based and driver-based scorecards enable the implementation of targeted incentives in consolidation with the drivers. These can include a share of the operating cost savings paid as a bonus, for example. This can then serve to enhance the effects achieved.

SmartMaintenance: Intelligent Monitoring of the Driveline

Voith offers fleet management the constant monitoring of the transmission with SmartMaintenance. The system identifies critical parameters and thus creates the conditions for predictive and optimal maintenance of the transmission, matched to the relevant conditions. At the highest level, SmartMaintenance also uses the traffic light logic in order to combine information on the condition and the temperature of oil and transmissions across the entire fleet. For more extensive information, detailed analyses of the parameters as well as the entire operating and service data of the gearbox control unit are available in the monitoring portal at all times and can be used for upcoming workshop visits or to obtain more in-depth information.

SmartMaintenance provides automated recommendations to support operators with predictive maintenance of their transmissions. That avoids unnecessary vehicle downtime and costs. Aside from the incalculable damage to the company's image, these costs can rapidly add up to

thousands of euros as a result of downtimes, towing costs, replacement vehicle rental or contractual penalties.

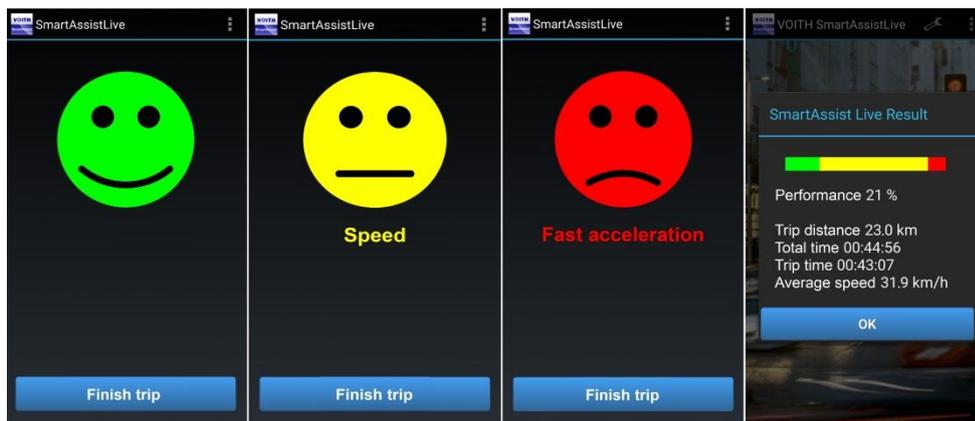
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Voith Turbo, a Group Division of Voith GmbH, is a specialist for intelligent drive solutions. Customers from highly diverse industries such as oil and gas, energy, mining and mechanical engineering, ship technology, rail and commercial vehicles rely on advanced technologies from Voith Turbo.

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Voith sets standards in the markets for energy, oil & gas, paper, raw materials, transport & automotive. Founded in 1867, Voith employs around 20,000 people, generates €4.3 billion in sales, operates in over 60 countries around the world and is one of the largest family-owned companies in Europe.*

*Without the discontinued Group Division Voith Industrial Services.



Voith SmartAssist informs the driver in real time and in easily understood terms about driving behavior that can be improved.

SmartAssist Scorecard, week 2016-XX													VOITH	
Driver	Rank	Performance	Fuel consumption	Mileage	Average Topography	Average Speed	Stops	Brakings	warm up > 5 min	Standstill on route > 2 min	cool down > 1 min	Measurement period	Days	
[ID]		[%]	[l/100km]	in period [km]	Total [km]	[%]	[km/h]	[-km]	[-km]	[%]	[%]		[#]	
7356	1	53.7	46.9	665	60.365	0.8	21.4	1.2	6.7	6.7	15.1	4.2	2016-04-07 - 2016-04-14	7
7342	2	48.6	41.5	617	106.034	0.9	23.7	1.0	6.0	16.3	12.2	6.1	2016-04-08 - 2016-04-15	7
7202	3	47.8	37.4	554	106.609	0.8	30.7	0.9	5.0	0.7	25.1	3.7	2016-04-10 - 2016-04-15	5
7252	4	47.1	43.2	1.724	355.151	1.0	20.7	1.9	8.4	2.9	24.2	2.3	2016-04-07 - 2016-04-14	7
7415	5	46.9	44.4	752	33.613	0.9	19.8	0.8	5.2	3.3	37.2	3.2	2016-04-07 - 2016-04-14	7

For an objective evaluation, SmartAssist also considers factors such as topography, vehicle type and traffic situation.

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