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Mercedes-Benz Powertrain

Trucks & Buses.

Mercedes-Benz

Welcome to the technology leader.

Global leader. In technology and efficiency.

Efficiency

Integrated Powertrain

The Powertrain represents a major part of the production costs of a truck. In terms of running cost of ownership, one substantial factors is fuel consumption – making this a decisive key buying criteria. To make our Powertrain components even more fuel efficient and more eco-friendly, we continue to develop our engines, transmissions and axles on an ongoing basis.

Global Performance

Global Powertrain

Global Powertrain represents the integration of all global locations and relevant functions along the entire value-added chain. Our close cooperation within our global network ensures that we can achieve synergy effects for our customers and our company.

Intelligence

Intelligent Powertrain

The exchange of data streams between the Powertrain components and the vehicle ensures perfect synchronisation and therefore superb efficiency with minimal wear and tear.

Global leader.
In technology and efficiency.

We produce innovative and reliable engine systems, transmissions and axles to globally uniform quality standards. These Powertrain components are used across all commercial vehicles divisions and brands of Daimler Trucks & Buses.

Seamless efficiency.

The result of the perfect combination of engine system, transmission and axles is maximum efficiency made by Mercedes-Benz Powertrain. The continuous development of our Powertrain components with innovative technologies make it possible to achieve the maximum out of the ever more precious fuel while reducing emissions to a minimum at the same time – an important contribution for your company and for the environment.

Eco. Logical.

Our current Powertrain generation with innovative and fuel saving technologies sets new standards in economic efficiency. We continue to develop our internal combustion engines to be the leader implementing environmental regulations to reduce emissions. Our alternative Powertrains, such as the gas engine, are particularly convincing due to their significantly lower exhaust emission and noise reduction while having same performance as a Diesel powered engine.

Power is our strength.

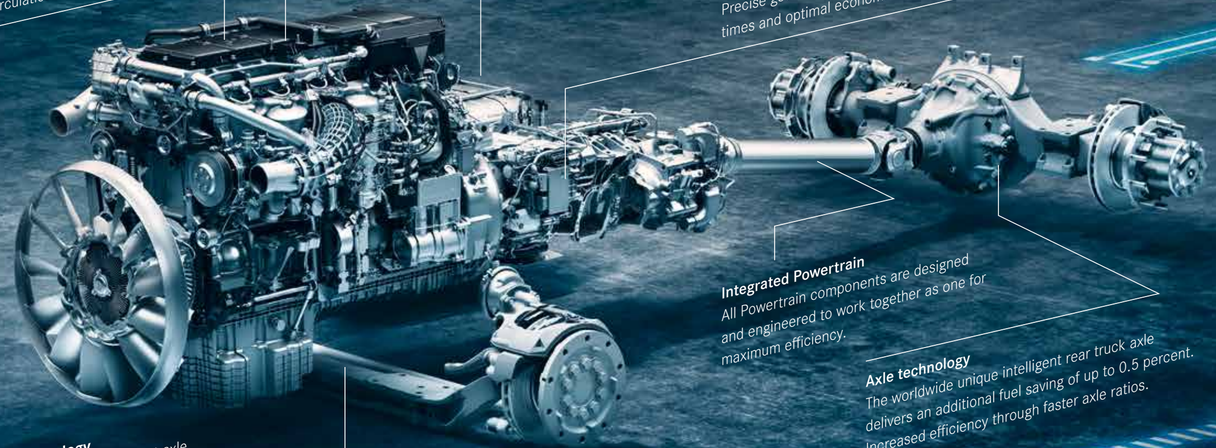
Heavy-duty Powertrains require technologically proven components which can withstand and master the toughest working conditions through power, reliability and robustness. The Turbo Retarder Clutch allows the driver a powerful, sensitive and wear-free start-off and allows particularly precise manoeuvring in difficult terrain. To safely master steep declines the powerful engine brake with up to 475 kW provides an enormous brake force minimizing wear on regular brakes. For occasional off-road use, the Hydraulic Auxiliary Drive (HAD) provides all-wheel drive at the touch of a button delivering additional traction when needed, without sacrificing on high payload and an optimum Powertrain.

Intelligent connectivity.

The intelligent connection between the individual Powertrain components and the vehicle results in maximum efficiency with minimal wear. In addition to the conventional cruise control the additional Predictive Powertrain Control (PPC) system factors in the vehicle's GPS position and the geographic surrounding into an optimal vehicle speed calculation. The system pre-selects for an upcoming incline or descent the perfect engine speed, the right gear and axle ratio to achieve the most efficient and best possible traction on the road.

Integrated Powertrain: in perfect harmony.

When driving fun and fuel economy pull together: with the Mercedes-Benz Integrated Powertrain, the engine system, transmission and axles are from the start engineered to achieve maximum fuel efficiency, perfectly tailored to one another during testing and manufactured to the highest quality standards in our own Powertrain production plants. The result: an optimally synchronised Powertrain that provides maximum fuel efficiency, maximum economic efficiency and exceptional driving dynamics. The intelligent New Final Drive axle with active oil management completes the second generation of the Daimler Trucks Integrated Powertrain.



Engine technology
Fuel savings due to improved injection, turbocharger and optimised exhaust gas recirculation.

Engine technology
Most efficient 4- and 6-cylinder in-line engines.

Exhaust aftertreatment
Reduced CO_2, particulate matter and nitrogen oxide emissions.

Transmission technology
Reduced friction losses, lower required oil capacity and enhanced robustness.

Transmission technology
Precise gear selection, short shift times and optimal economic efficiency.

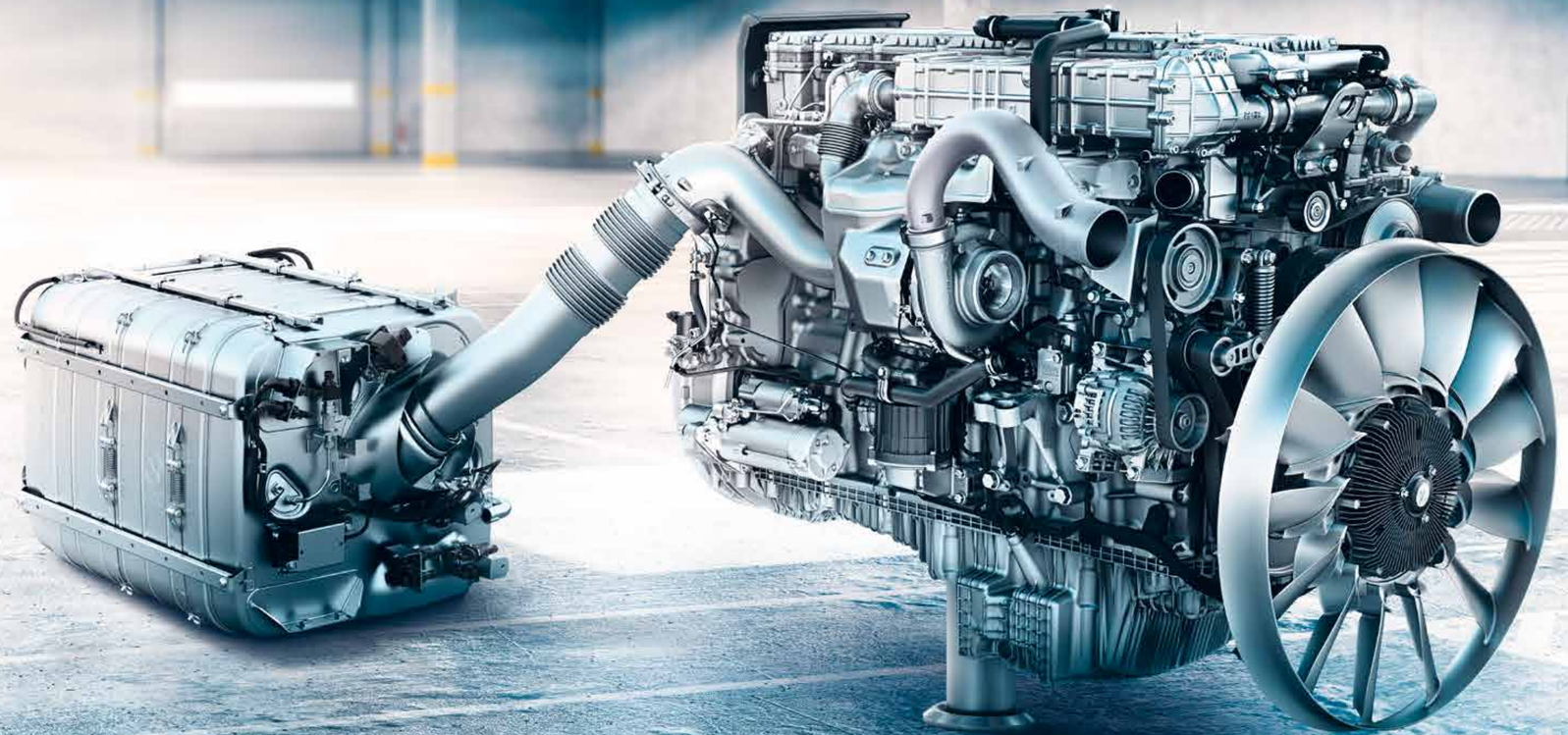
Integrated Powertrain
All Powertrain components are designed and engineered to work together as one for maximum efficiency.

Axle technology
The worldwide unique intelligent rear truck axle delivers an additional fuel saving of up to 0.5 percent. Increased efficiency through faster axle ratios.

Axle technology
Robust and light-weight front axle for any application.

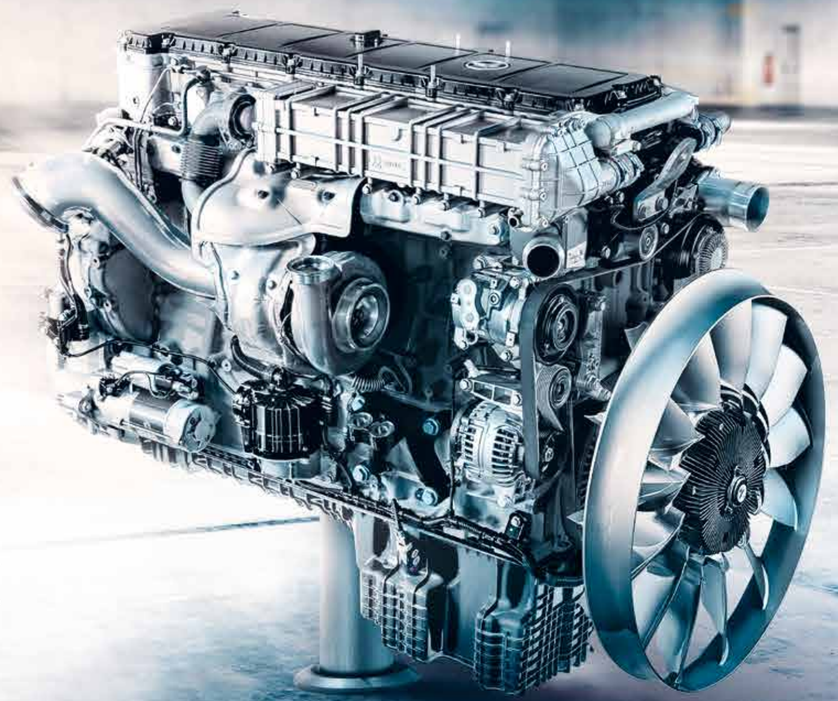
Our strategy: More power. less emissions.

The 4- and 6-cylinder Euro VI engines from Mercedes-Benz impress with consistently low fuel consumption, reduced CO_2, particulate matter and low nitrogen oxide emissions. The overall system is trimmed for superior efficiency already during the design and engineering phase. As an example, the intelligent combination of selective catalytic reduction (SCR), cooled and controlled exhaust-gas recirculation (EGR) as well as a diesel particulate filter (DPF) reduces emissions to a fraction of previous emission standards. The globally proven engine and aftertreatment system for engine displacements between 5.1 to 15.6 litres has an output range between 115 kW and 460 kW – and is thus suited for virtually any commercial vehicle application.



Latest-generation engine technology.

The Mercedes-Benz engine systems are configured for uncompromising performance, economic efficiency and set standards for truck and bus engines on a global basis. Due to numerous technical innovations, the current 4- and 6-cylinder in-line engines from Mercedes-Benz provide fuel savings of up to 3 percent compared to the previous generation. The 6-cylinder in-line engines are distinguished, depending on the model series, by a robust design with sturdy steel pistons, two overhead camshafts with high-efficiency gear train, an asymmetric turbocharger or turbo-compound technology as well as powerful engine brakes and the one-of-a-kind X-Pulse common-rail injection system with pressure booster. The asymmetric injection and combustion as well as the exhaust gas recirculation were also optimized to design the engines systematically for low fuel consumption and improved exhaust gas quality.

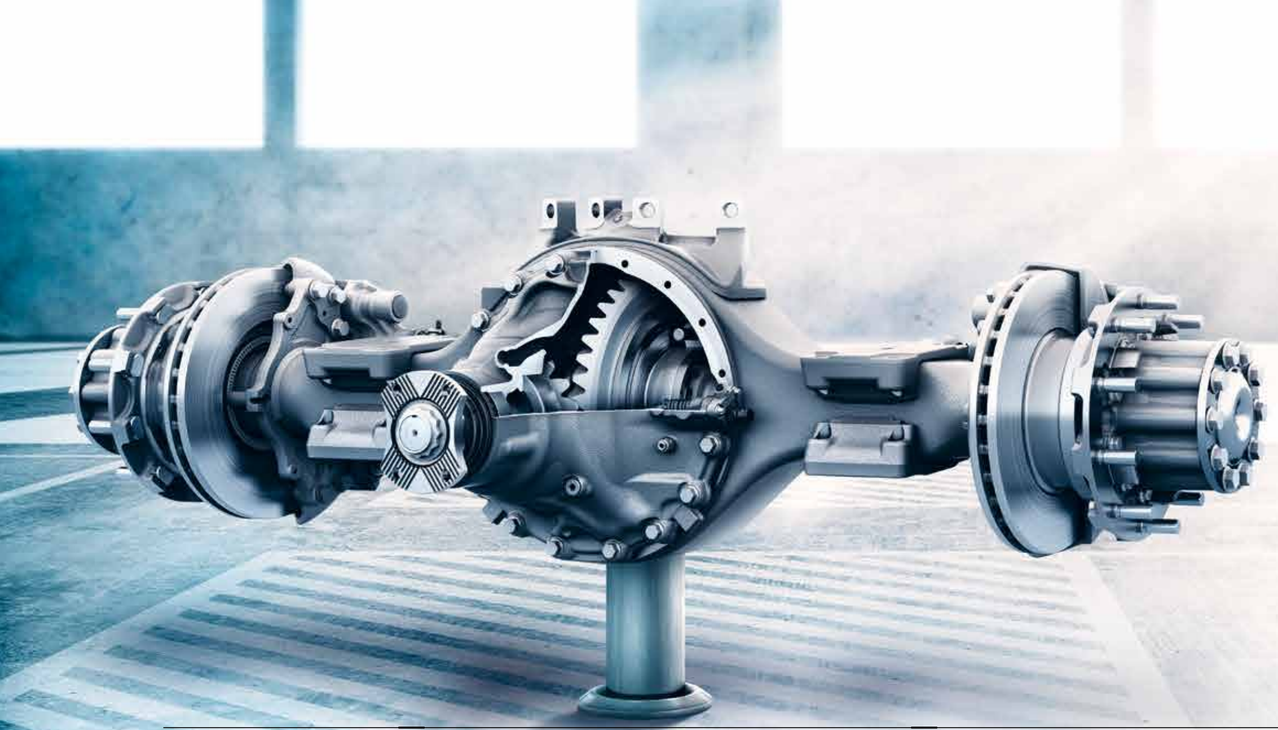


X-Pulse injection system	Increase of the maximum rail pressure to 1,160 bar and of the maximum injection pressure to 2,700 bar.	Optimised piston crown geometry and increased compression ratio for significantly reduced fuel consumption.
Exhaust gas recirculation	Advancements of the asymmetric forced induction for fast boost pressure build-up of with simultaneous reduction of NO_X emissions.	Continuously variable exhaust gas recirculation flap centrally integrated in the exhaust manifold for precise exhaust distribution over the entire engine map and effective thermal management.
Asymmetric turbocharger	Asymmetric turbocharger with outstanding efficiency, manufactured in-house. Improved forced induction for fast build-up of boost pressure with simultaneous reduction of NO_X emissions.	Fixed turbine geometry for maximum reliability and durability.

Shift to efficiency.

The Mercedes-Benz transmission technology is characterised by precise gear selection, short shift times, high ride comfort, long operating life and optimal economic efficiency – On-highway and Off-road. The perfectly paired engine and transmission system, in conjunction with the high level of electronic integration to the vehicle, results in optimal gear selection and thus exceptional economic efficiency. The transmission product range from 6 to 16 gears can be combined with a variety of powerful retarders and power take-offs. The wear-free Turbo Retarder Clutch combines the functions of a hydrodynamic start-off clutch and a primary retarder in a single component – designed for severe applications. The low weight and lower oil filling capacity, along with the significantly reduced friction losses, all contribute to the added efficiency of the Mercedes-Benz 12-speed transmission.

Reduced fiction losses	Up to 50 percent lower friction losses due to the superfinish production process of the tooth flanks in the splitter box.
	Increase of the transmission efficiency to almost 100 percent – for higher efficiency.
Dog-type shift mechanism	A dog-type shift mechanism in the change-range group provides faster gear changes with increased robustness.
Transmission oil	A reduced transmission oil capacity by up to 30 percent in combination with a low-viscosity transmission ensures lower churning frictions losses.



The most efficient way of putting power on the road.

Apart from the engine system and the transmission, a perfectly Integrated Powertrain also includes the axle. Whether in terrain, on the construction site or on the road – thanks to a broad range of technically superior and robust front and rear axles, axle systems from Mercedes-Benz provide optimal solutions for commercial vehicles with axle loads between 3.5 and 32 tonnes. In each case, the heavy-duty drum or disc brakes are designed specifically for the particular application. The worldwide unique intelligent truck axle with active oil management in the final drive reduces the overall fuel consumption by up to 0.5 percent. The system actively regulates the oil level at the ring gear depending on speed, torque and temperature to reduce friction and parasitic loss.

Intelligent oil management

Active oil management minimises the swirl of liquid at the ring gear, thereby reducing friction losses.

Low friction losses

Reduced hypoid offset lowers friction losses and reduces fuel consumption.

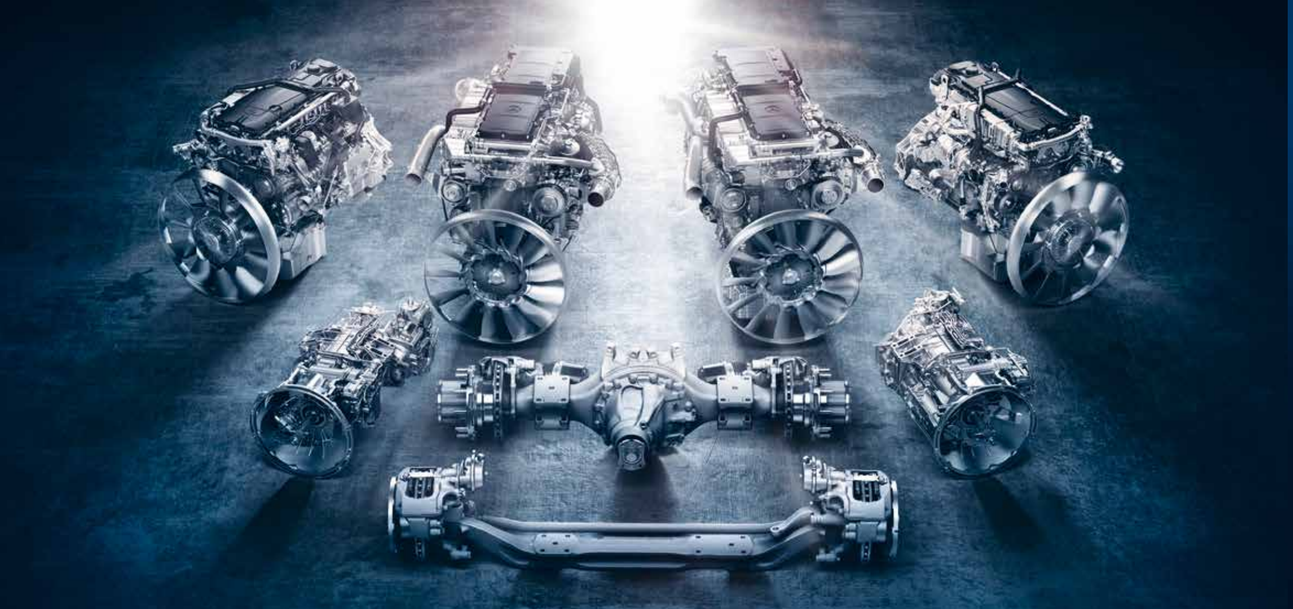
Final drive ratio

Increased efficiency with a faster axle ratio for fuel efficient driving.

High level of refinement and maximum ride quality – supported by various possible final drive ratios.

Expert know-how.

The Integrated Powertrain from Mercedes-Benz is the result of more than 120 years of development and manufacturing experience. Our innovative and industry leading Powertrain technologies are used all over the world in Mercedes-Benz vehicles as well as other brands under the umbrella of Daimler Trucks & Buses. A significant milestone was reached in 2018 with the production of the one-millionth heavy-duty engine from the current platform within the Global Powertrain network.



Network of expertise.

Today, Global Powertrain not only embodies efficient Powertrains, but also the integration of all manufacturing locations and functions. All production plants operate to the highest quality standards and deliver technically superior products. Intelligent platforms, uniform standards and the close cooperation in the integrated production network ensure maximum synergies and Powertrain expertise.

Powertrain locations

The future starts now.

As technology leaders, it is our expectation and clear aspiration to remain in this position and thus to shape the future of transportation consisting of electric powered trucks and buses. The challenge, now more than ever, is to find a balance between sustainability and business case for our customers – this can only be achieved with technically innovative products and tailor-made mobility solutions. This is why we have now launched our electrified commercial vehicle initiative. The ePowertrain provides a quiet and emission-free distribution transport in the eActros and sustainable, emission-free passenger transport in the eCitaro. Going forward, there will be a mix of Powertrain technologies to suit a wide range of different applications. The varying requirements demand the co-existence of various advanced Powertrain solutions.

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ENGINES

Type	Cylinder	Displacement [litres]	Power [kW]	Torque [Nm]	TRUCK	BUSES
OM 934	L4	5.1	115. 130. 155. 170	650. 750. 850. 900	x	
OM 934 LA	L4	5.1	115. 130. 155. 170	650. 750. 850. 900		x
OM 936	L6	7.7	175. 200. 220. 235. 260	1000. 1100. 1200. 1300. 1400	x	
OM 936 LA	L6	7.7	175. 200. 220. 235. 260	1000. 1100. 1200. 1300. 1400		x
M 936 G	L6	7.7	222	1200	x	x
OM 470	L6	10.7	240[1], 265. 290. 335[1]	1700. 1800[1]. 1900. 2100[1]. 2200[1]	x	x
OM 471	L6	12.8	310[1]. 330[1]. 350. 375. 390[1]	2100[1]. 2200[1]. 2300. 2500. 2600[1]	x	x
OM 473	L6	15.6	380. 425. 460	2600. 2800. 3000	x	

TRANSMISSIONS

Type	Ratio	Forward gears	Max. input torque [Nm]	TRUCK	BUSES
G 70 - 6S	5.94 - 0.74/8.00	6	750	x	x
G 71 - 6S	9.20 - 1.00/9.20	6	700	x	x
G 90 - 6S	6.70 - 0.73/9.20	6	1000	x	x
G 141 - 9 CPS	14.57 - 1.00/14.57	9	1400	x	
G 230 - 16 CPS	14.19 - 0.83/17.17	16	2300	x	
G 231 - 16 CPS	17.00 - 1.00/17.00	16	2300	x	
G 260 - 16 CPS	11.72 - 0.69/16.99	16	2600	x	
G 140 - 8 PowerShift 3	9.29 - 0.79/11.82	8	1400	x	
G 211 - 12 PowerShift 3	14.93 - 1.00/14.93	12	2200	x	
G 230 - 12 PowerShift 3	11.67 - 0.78/14.96	12	2400	x	
G 281 - 12 PowerShift 3	14.93 - 1.00/14.93	12	2800	x	
G 330 - 12 PowerShift 3	11.64 - 0.78/14.90	12	3300	x	
G 280 - 16 PowerShift 3	11.72 - 0.69/16.99	16	2800	x	
G 280 - 16 TRC	11.72 - 0.69/16.99	16	3000	x	
G 330 - 12 TRC	1.64 - 0.78/14.90	12	3300	x	
GO 190 - 6 CPS	6.70 - 0.73/9.18	6	1900		x
GO 230 - 6E CPS	6.53 - 0.80/8.16	6	2300		x
GO 250 - 8 PowerShift 3	6.57 - 0.63/10.38	8	2500		x

[1] Output level only available for trucks.

RETARDER

	TRUCK	BUSES
Secondary water retarder	x	x

AXLES

Type [front axles]	Tyre size [inches]	Axle load [t]	TRUCK	BUSES
F 3.5 - F 4.4	17.5	3.5 - 4.4	x	x
F 5.3 - F 6.1	19.5/20/22.5	5.3 - 6.1	x	x
FD 346 - FD 360	20/22.5	4.7 - 6	x	
FO 7.5	22.5	7.5		x
F 7.5 - F 8	20/22.5	7.5 - 8	x	x
F 9	20/22.5/24	9	x	x
FD 233 P	20/22.5/24	7.5 - 9	x	
FT 233 P + FD 233 P	20/22.5/24	18	x	

Type [rear axles]	Tyre size [inches]	Axle load [t]	TRUCK	BUSES
R 325	17.5	6 - 8.3	x	
RO 325	17.5	6 - 8.3		x
R 390	19.5/20/22.5	9.2-11	x	
RO 390	19.5	10		x
R 440	22.5	13	x	
RO 440	22.5	11.5 - 13		x
R 485	22.5	13	x	
R 233 P - R 300 P	20/22.5/24	13 - 16	x	
RT 233 P + R 233 P - RT 300 P + R 300 P	20/22.5/24	26 - 32	x	
RT 390 + RT 390 T	22.5	20	x	
RT 440 + R 440	22.5	20 - 26	x	