## Mercedes-Benz Powertrain



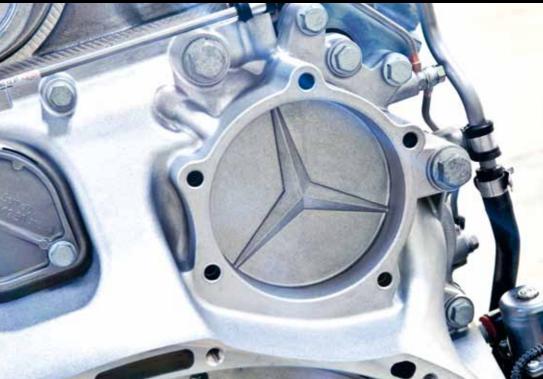
Portfolio Bus EURO VI.



Welcome to the Mercedes-Benz Powertrain.
Leading in technology and efficiency.







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## Going the extra mile. Mercedes-Benz Powertrain.

Mercedes-Benz Powertrain offers outperforming and individual engineered powertrain components: engine systems, transmissions and axles – each will provide our customers with the **highest durability and quality at the same time.** 

Together, they compose an even more sophisticated, technologically advanced and with regards to efficiency, unbeatable powertrain.

Let's develop together the best individual solution for your success.







$$1 + 1 + 1 > 3$$

## Benefits for you.

### Integrated powertrain:

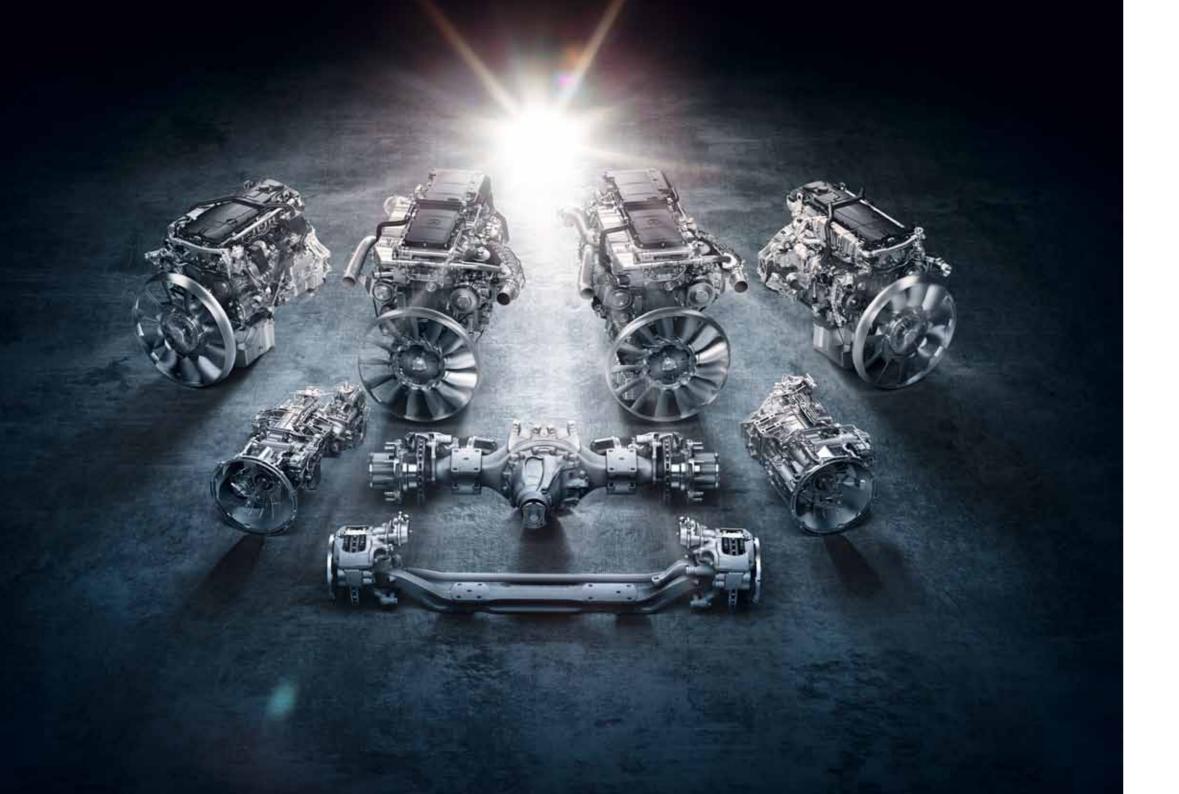
- ✓ Reduces integration efforts
- ✓ One Key Account Manager as main contact partner
- One system supplier for your individual powertrain solution
- ✓ One contractual partner

### All powertrain components:

- Premium Mercedes-Benz quality standards due to the production on our high volume production lines
- Overall robust and reliable powertrain solutions provide a long lifetime for your powertrain components
- ✓ Leads to an optimized system setup due to common electric and electronic architecture (EE architecture) for efficient interaction of all powertrain components
- One electronic tool for end of line commissioning and diagnosis requires less training for your engineering group and after-sales team
- ✓ High invest in Mercedes-Benz R&D assures state-of-the-art quality

### Benefits for your customers.

- Provides optimized fuel efficiency by specially composed powertrain solutions
- Ensures robust and reliable performance in every scenario of operation
- Minimizes downtimes as our worldwide After-Sales network covers warranty and policy from one source
- ✓ Synchronized maintenance intervals and repair worldwide via our one-stop shop logic for the complete powertrain
- ✓ Increases the resale value of the vehicles due to the highest quality standards offered by Mercedes-Benz
- ✓ Higher Driver comfort due to the high integration of all assistent systems and features



# Our Powertrain-Solutions: TCO reduction at its best.

There are many factors in operating a bus or a coach that cost money. More than a third of these can be influenced. A cost factor of up to 30 % can be attributed to energy consumption. Bringing together the very latest innovative engine technology, our engine systems are designed with a rigorous focus on environment conservation, effectiveness and performance.

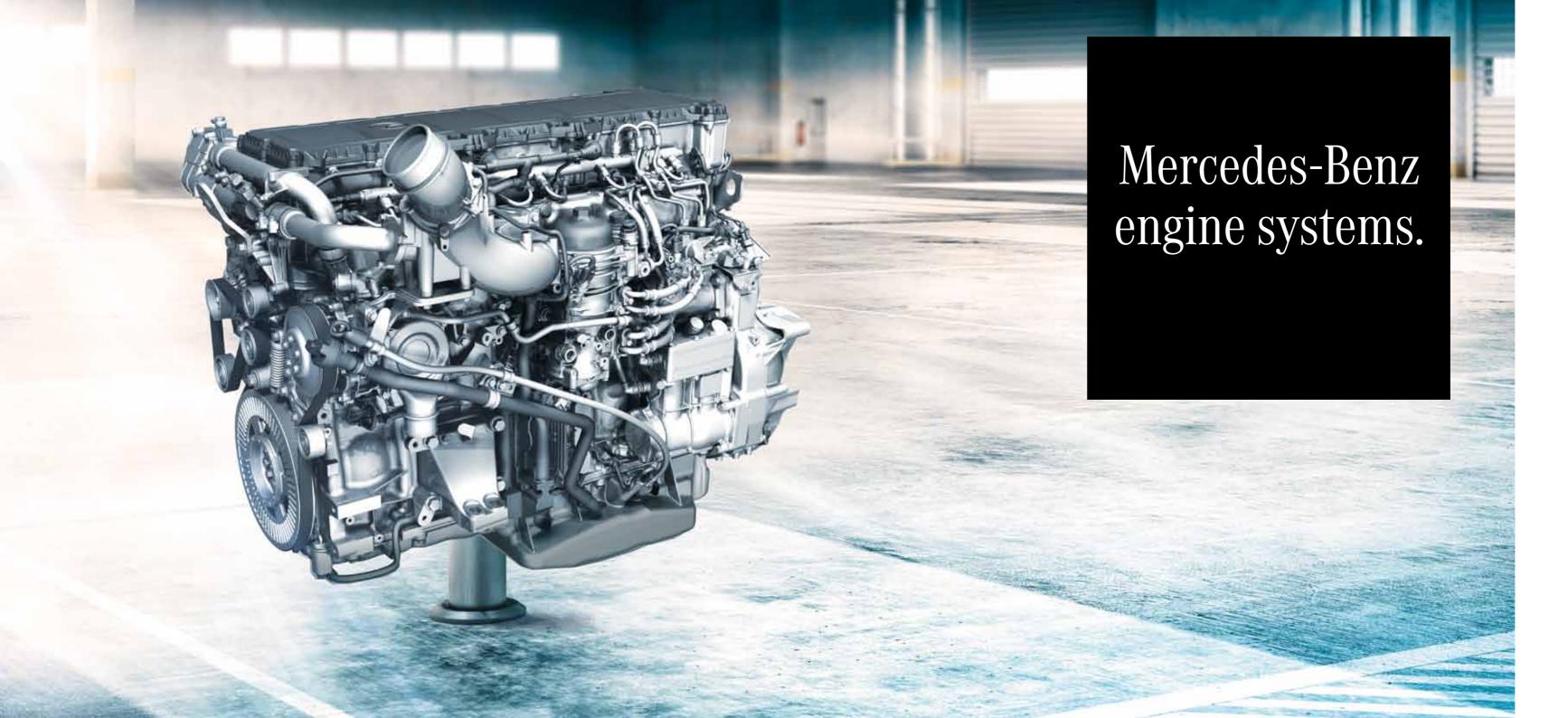
The benefits for our customers are:

- low fuel consumption
- · long engine life
- · extended maintenance intervals

Our engine systems deliver a spontaneous response, impressive power output and the smoothest running characteristics. Based on these characteristics our engine systems in all series are ideal for short radius distribution, construction site transport and long distance haulage.

With our BlueEfficiency Power engine systems we not only comply with the ambitious Euro VI standards, but also set new benchmarks for power, consumption and weight. The lower consumption and improved power delivery can be attributed to the highly efficient combustion strategy of the engine systems, supported among other things by the X-Pulse common-rail high-pressure fuel injection system.

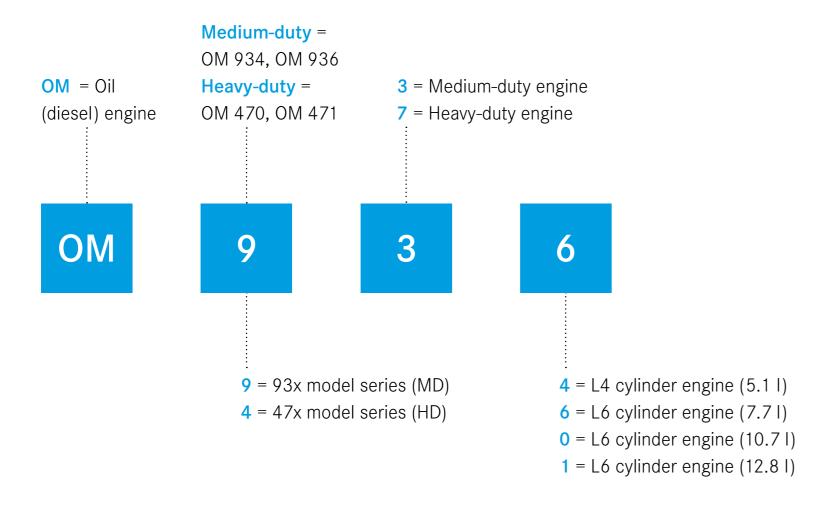




# OM 93X and OM 47X model series.

Outstanding design and efficiency. Specifically developed to comply with the EURO VI emission standard.

## Derivation "Nomenclature" - engine systems.

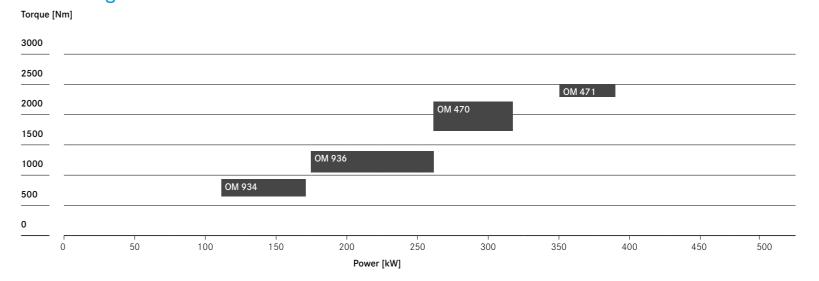


## Engine systems for EURO VI.

### Portfolio of EURO VI engine systems for buses

Model series	Туре	Cylinder	Displ. [liters]	Power range	e [kW]									
OM 93X Medium-	934	L4	5.1	115 130	155 170									
duty	936	L6	7.7		175	200	220 235	260						
OM 47X Heavy-	470	L6	10.7					265	290	315 335				
duty	471	L6	12.8								350	375		
			1	00		200	)		30	00			400	

### Power range





## Performance. Even in challenging environment.

### Your product benefits for medium-duty engine systems:

- 4- and 6-cylinder diesel engines in an in-line arrangement with cooled exhaust gas recirculation
- · Displacement of 5.1 and 7.7 liters
- Output of 115 up to 260 kW
- Advanced combustion system to minimize fuel consumption
- Common rail injection system up to 2400 bars and multiple injection
- Tailor-made charging system with 1- and 2-stage turbochargers

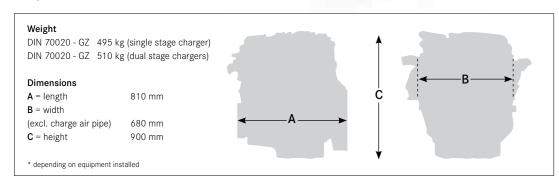
- Future-proof valve timing gear
   with 2 overhead camshafts and 4-valve technology
- Powerful and dynamic engine brakes with up to 300 kW brake power
- · Multiple power take-off options
- "One box" exhaust after-treatment with SCR and DPF
- Engine Stop Start option and LIN alternators available for even lower fuel consumption

## OM 934

Arrangement: In-line 4 Displacement: 5.1 l



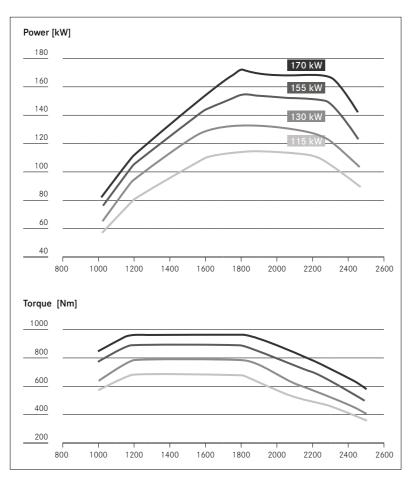
### Weight and dimensions\*



### Rated power and maximal torque

Rated power	[kW/hp]	115/156	130/177	155/211	170/231
at engine speed	[rpm]	1800	1800	1800	1800
Maximal torque	[Nm]	650	750	850	900
at engine speed	[rpm]	1200 - 1600	1200-1600	1200-1600	1200-1800

### Performance

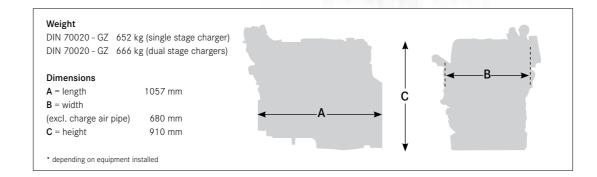


## OM 936

Arrangement: In-line 6 Displacement: 7.7 l



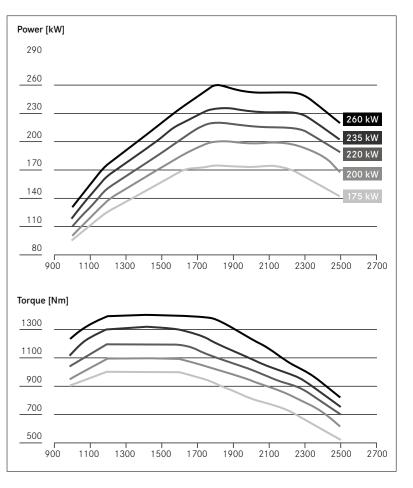
### Weight and dimensions\*



### Rated power and maximal torque

Rated power	[kW/hp]	175/238	200/272	220/299	235/320	260/354
at engine speed	[rpm]	1800	1800	1800	1800	1800
Maximal torque	[Nm]	1000	1100	1200	1300	1400
at engine speed	[rpm]	1200-1600	1200-1600	1200 - 1600	1200-1600	1200 - 1800

### Performance



Rated power	[kW/hp]	175/238	200/272	220/299	235/320	260/354
at engine speed	[rpm]	1800	1800	1800	1800	1800
Maximal torque	[Nm]	1000	1100	1200	1300	1400
at engine speed	[rpm]	1200 - 1600	1200-1600	1200-1600	1200-1600	1200 - 1800

## Axle



## Always giving 100%.

### Your product benefits for heavy-duty engine systems:

- 6-cylinder diesel engines in an in-line arrangement with cooled exhaust gas recirculation
- Displacement of 10.7 and 12.8 liters
- Output of 265 up to 375 kW
- Special combustion system to minimize fuel consumption
- New engine generation combines higher performance with lower fuel consumption
- **Common rail injection system** up to 2700 bars and unrestricted choice of injection process

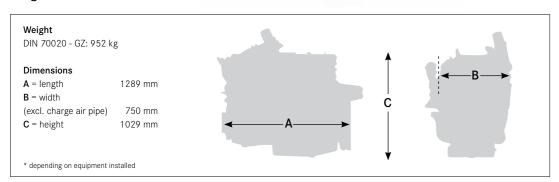
- 1-stage turbocharger with asymmetrical turbine geometry
- Future-proof valve timing gear
   with 2 overhead camshafts and 4-valve technology
- · Powerful and dynamic engine brakes
- · Additional **power take-off** options
- "One box" exhaust after-treatment with SCR and DPF

## OM 470

Arrangement: In-line 6 Displacement: 10.7 I



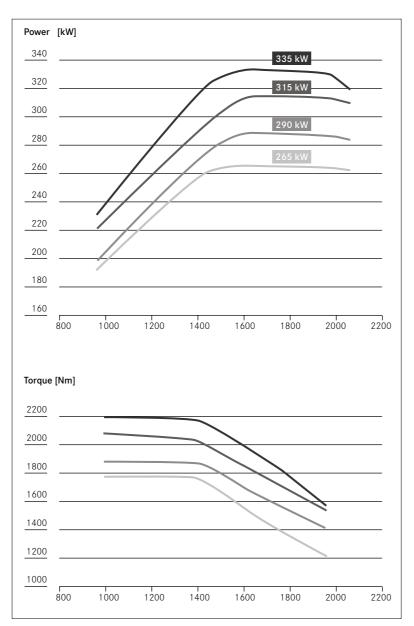
### Weight and dimensions\*



### Rated power and maximal torque

[kW/hp]	265/360	290/394	315/428	335/456
[rpm]	1600	1600	1600	1600
[Nm]	1700	1900	2100	2200
[rpm]	1100	1100	1100	1100
	[rpm]	[rpm] 1600 [Nm] 1700	[rpm] 1600 1600 [Nm] 1700 1900	[rpm] 1600 1600 1600 [Nm] 1700 1900 2100

### Performance

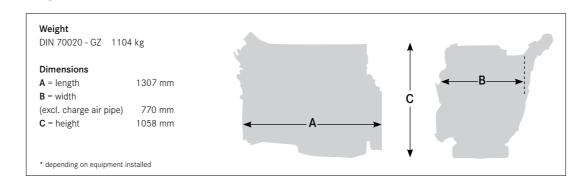


## OM 471

Arrangement: In-line 6 Displacement: 12.8 I



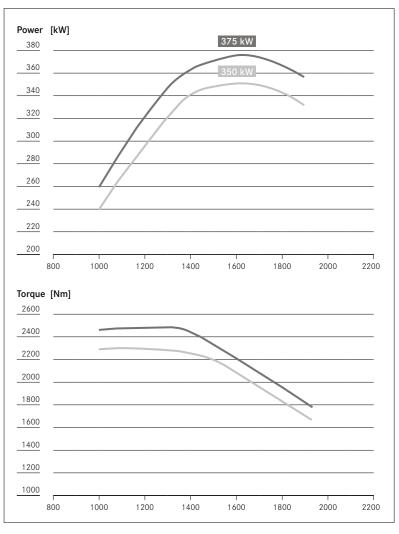
### Weight and dimensions\*



### Rated power and maximal torque

Rated power	[kW/hp]	350/476	375/510	
at engine speed	[rpm]	1600	1600	
Maximal torque	[Nm]	2300	2500	
at engine speed	[rpm]	1100	1100	

### Performance



## Clean from start to finish.

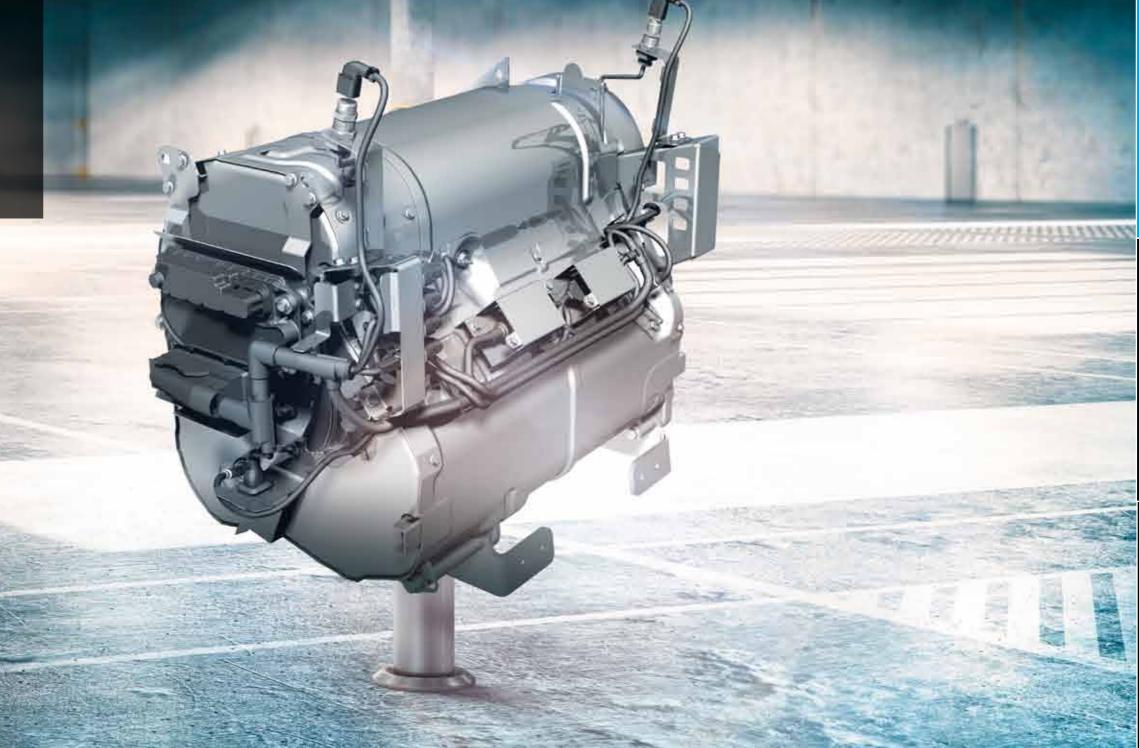
### Your product benefits for the after-treatment system:

- Low exhaust back pressure
- Significant NOx reduction at a broad range of exhaust gas volume flows and exhaust gas temperatures
- Maximum possible soot burn-off in the diesel particulate filter (DPF) by means of automatic regeneration
- In addition, adaptive regeneration of the DPF in all relevant driving cycles
- Large capacity for ash storage in the DPF to make maintenance intervals as long as possible

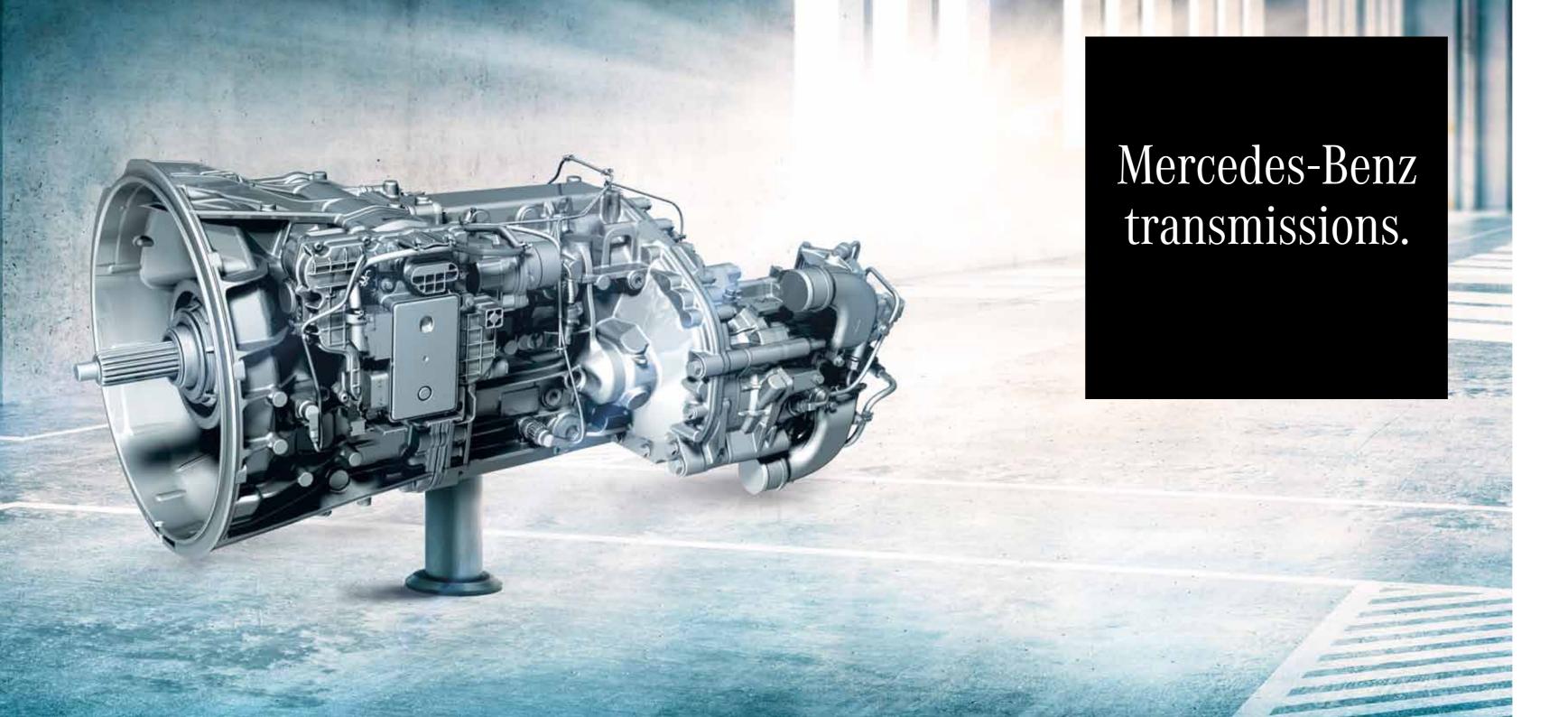
- Small installation space and low weight
- Long service lifetime, adapted to the engine's service lifetime
- Consistent common parts strategy
- Many different **variants** for exhaust gas inlet and outlet
- Metering of AdBlue<sup>®</sup> without compressed air; very low AdBlue<sup>®</sup> consumption

In view of the high requirements stipulated by the EURO VI emission standard, Mercedes-Benz has developed cooled exhaust gas recirculation (EGR), particulate filters and SCR technology for its generation of engine systems.

This has already proven to be a winning combination in its use in commercial vehicles of Daimler Buses and Buses. Together, the systems results in an extremely efficient exhaust after-treatment.



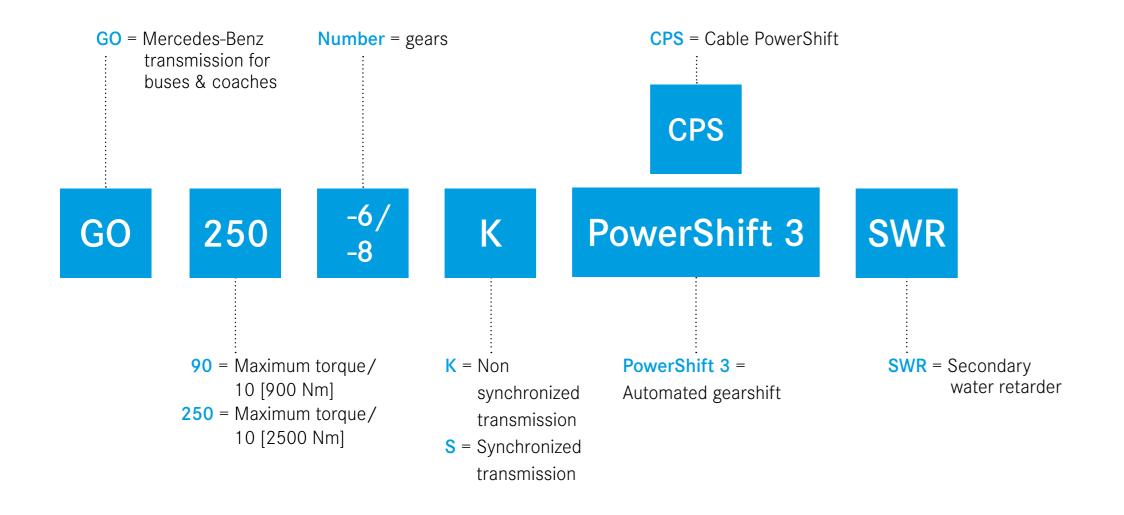
EURO VI exhaust after-treatment system.



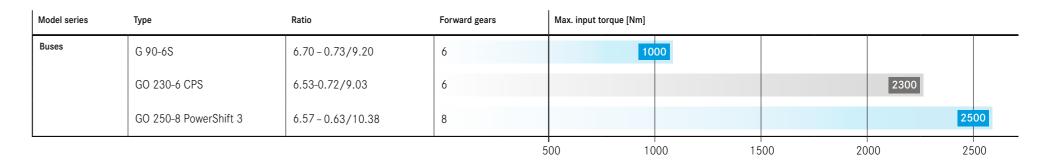
Reliable transmissions for a wide range of applications.

## Derivation "Nomenclature" - transmissions.

24



## Transmissions for EURO VI engine systems.



### Meaning of symbols:

Manual shifted transmission

Transmission for buses and coaches

Fully automated manual transmission



## Our transmission product portfolio: Smooth operation in every situation.

Our range of service extends from 6-speed to 8-speed automated manual shifted transmissions for buses and coaches. All transmissions are manufactured on a large scale by Mercedes-Benz buses and coaches and are engineered to meet the highest standards of technology and quality.

Meeting the demands of our customers is the focus of our work. We feel committed to advancing the design of our systems in a consistent and innovative way in-line with market and customer requirements.

Our know-how is based on decades of experience in the manufacturing and development of buses and coaches transmissions. This manufacturing expertise distinguishes our transmissions today particularly by three features:

- Very smooth running characteristics
- Low weight
- Extreme durability

In the future, we will continue to further develop our innovative products focused on customer-oriented applications.

### Axk



## Redefining efficiency.

### Your product benefits of transmissions for buses & coaches:

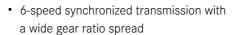
- 6-speed and 8-speed automated shifted manual transmissions
- Resilient from 900 Nm to 2500 Nm max. input torque
- Gear ratio spread from 9.03 to 10.38
- Permissible max. gross combination weight (GCW) up to 28.5 t
- · Secondary water retarder available for heavy-duty
- Bus specific degressive gradation characteristics for high driving comfort

- Quiet running characteristics and long service life through optimized gear set geometry and high-precision processing technologies
- Long service intervals and low operating costs due to a fuel-efficient design optimized for specific operating condition
- More comfortable vibration characteristics due to an integrated engine suspension

## G 90-6S





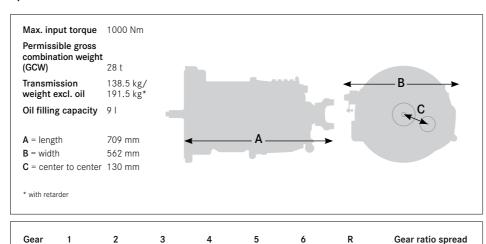


- SAE 2 or SAE 3 clutch housing available
- Overdrive configuration
- · Hydrodynamic retarder can be adapted



### Specifications and dimensions

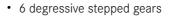
6.696 3.806 2.289 1.480



1.000 0.728

## GO 230-6 CPS





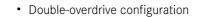
- Overdrive configuration
- · Pneumatically supported cable power shift
- All components optimized specifically for use in buses
- Secondary water retarder can be adapted

## GO 250-8 PowerShift 3





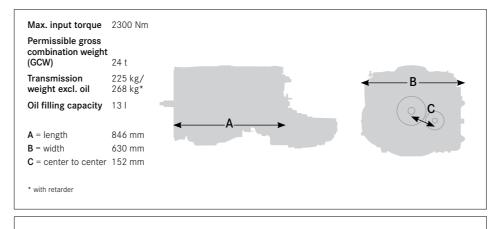
- 8 degressive stepped gears
- 8-speed none synchronized transmissi with a wide gear ratio spread



Secondary water retarder can be adapted

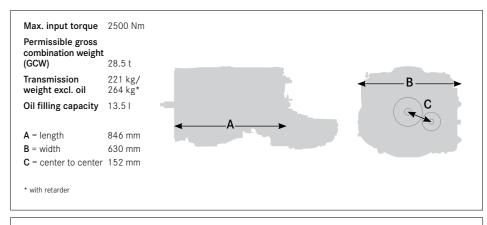


### Specifications and dimensions



Gear	1	2	3	4	5	6	R	Gear ratio spread
Ratio	6.528	3.711	2.238	1.443	1.000	0.732	6.136	9.03

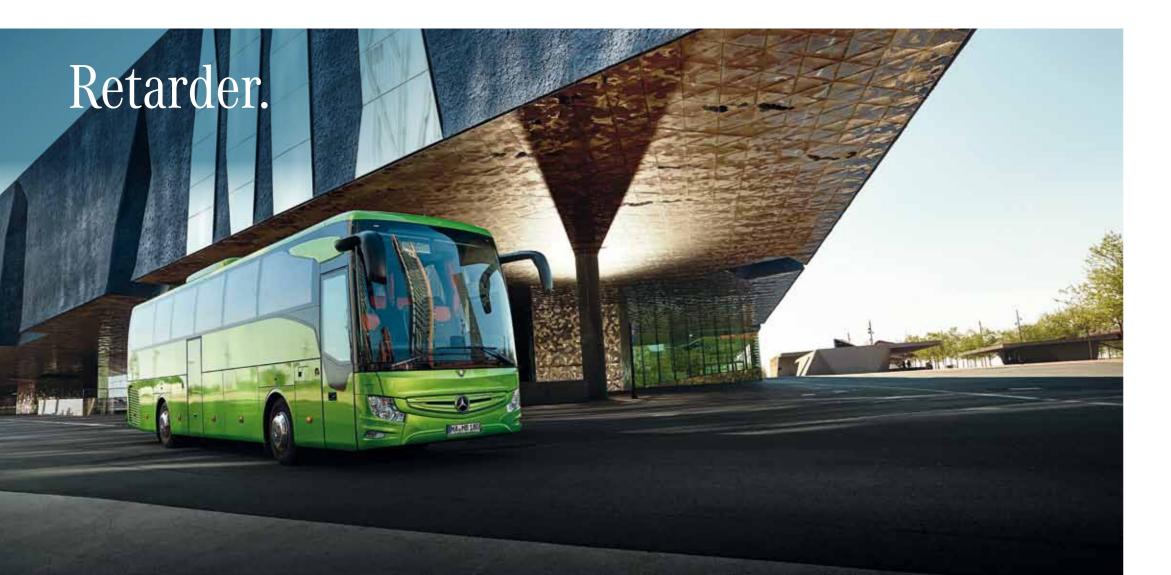
### Specifications and dimensions



Gear	1	2	3	4	5	6	7	8	R 1	R 2	Gear ratio spread
Ratio	6.571	4.158	2.748	1.739	1.259	1.000	0.797	0.633	6.176	3.909	10.38

The integrated secondary water retarder offers a high braking torque in combination with a compact, weight-saving design. The weight advantages of the new retarders are 43 kg (SWR) compared to previous oil retarders. The braking power of the retarder is also independent of selected gear or current engine speed.

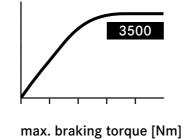
A gear change does **not** result in **any interruption** in the retarder braking action and the retarder braking power depends only on the current driving speed. The braking power can be controlled precisely in **five stages** using the right hand control stalk on the steering column. In addition to the engine brake, the retarder provides a **maximum braking torque up to 3500 Nm**.

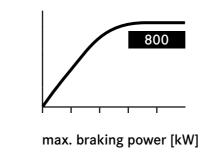


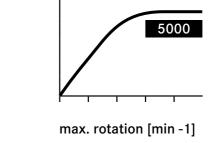
## Secondary water retarder

### Your product benefits:

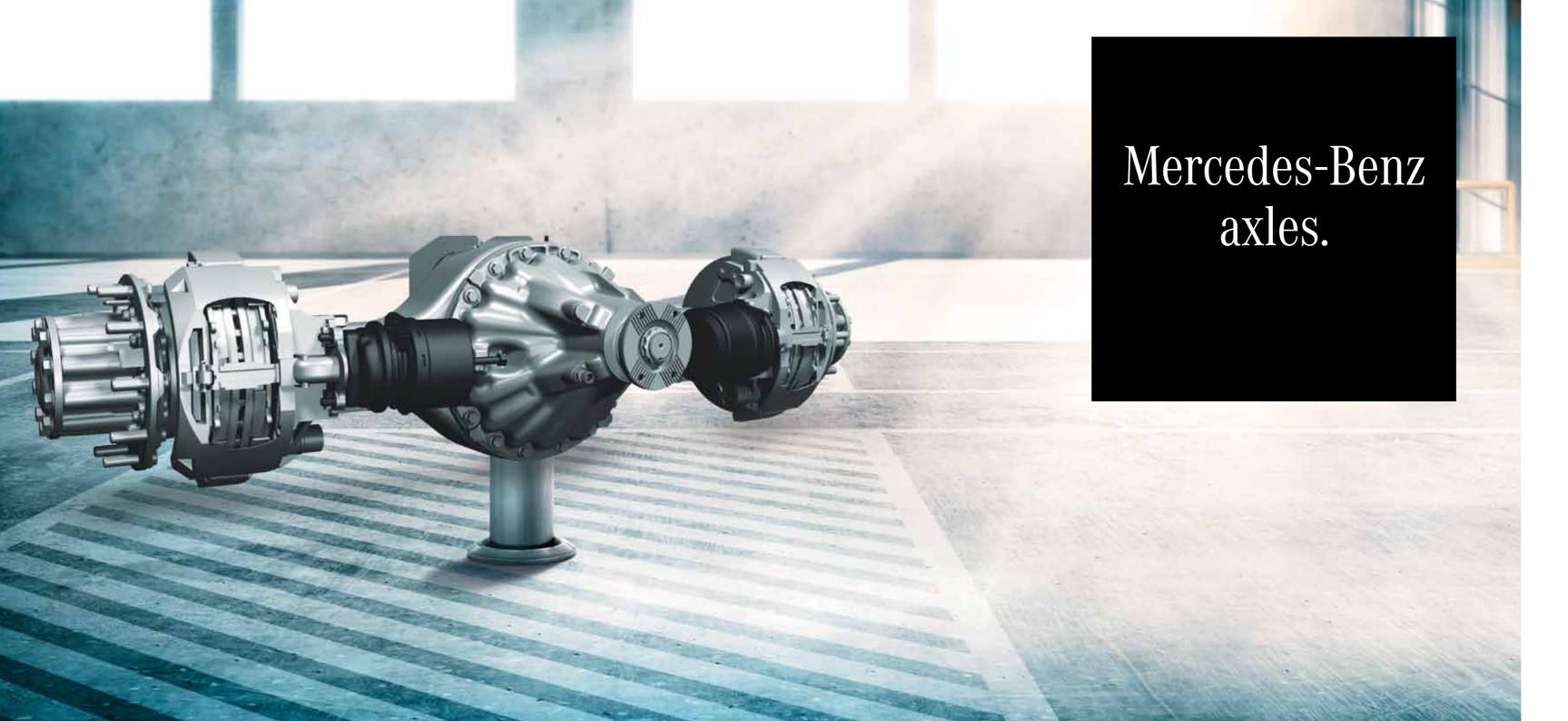
- · Reduction of friction by axial rotor displacement
- No heat exchanger required since the cooling water is used as the operating medium directly
- · Compact unit requires only **minimal installation space**
- Freedom from maintenance for reduced vehicle service costs
- · Significantly lighter than comparable hydrodynamic retarder
- · Increased comfort through low noise emission
- · Integration into the vehicle management
- · Between 20-30% higher **constant brake power** than current oil retarders











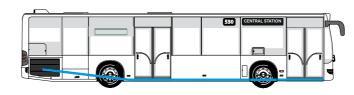
Reliable axles for every application.

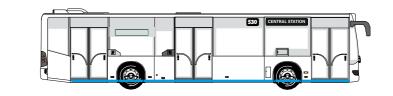
## Vehicle classification for buses.

## Low floor Chassis







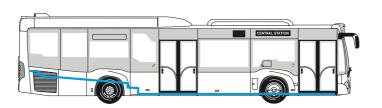


Low entry Chassis





City buses (and intercity buses)



City and intercity buses

# High floor Chassis



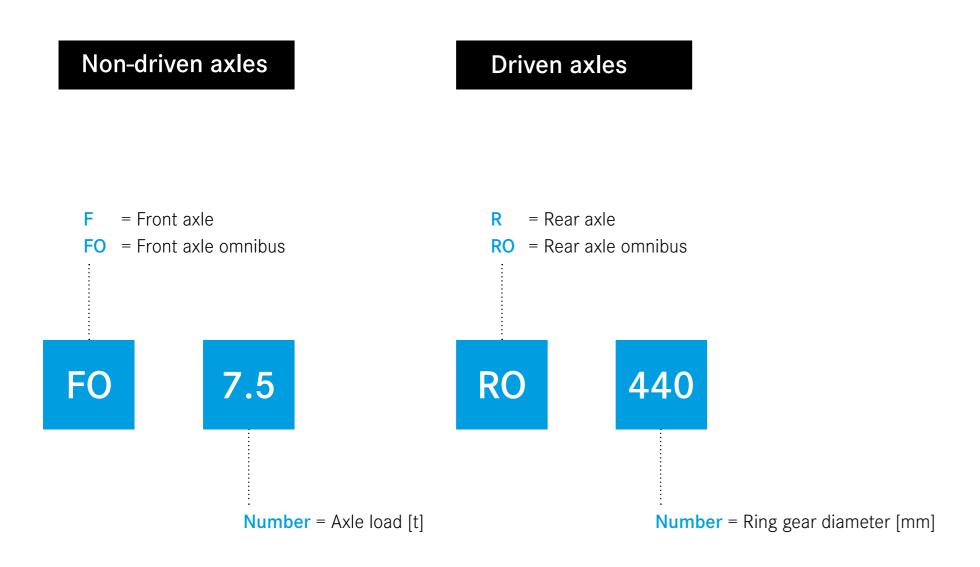




Coaches, intercity and transfer buses

Mercedes-Benz axles | Portfolio

## Derivation "Nomenclature" - axles.



## The right axle for every application.

Axle portfolio: front and rear axles.

	Vehicle category	Front axles*	Wheel-end size [inches]	Axle load [t]				Rear axles	Wheel-end size [inches]	Axle load [t]		
-	Minibus (7 m)	F 4.1 – F 4.4	17.5	4.1-4	1.4			R 325*	17.5		6.2-8.3	
- Company	Midibus (8 – 10 m)	F 5.3 - F 6.1	19.5		5.3-6.1			R 390*	19.5			11
	City bus/coach (12 m)	FO 7.5	22.5			7.5						
		F 7.5 - F 8	22.5			7.5-8	l	R 440*	22.5			11.5-13
		F9-F9.5	22.5				9-9.5	RO 440*	22.5			11.5-13
				4	1 6	5 8	3				5	10

<sup>\*</sup> only applicable with front engine configuration

For further applications see truck axle portfolio

### Meaning of symbols:

Axles for minibuses



Low floor chassis



Front axles

Rear axles

Axles for city buses & coaches

Axles for midibuses



Low entry chassis



High floor chassis



# The most efficient way of putting power on the road.

Our product range consists of various axle systems which are highly suitable for nearly all bus categories from minibuses through to coaches, in urban areas or overland.

We use our customers' experience, their requirements and demands as an essential precondition for the development of new axle technologies. Our innovative state-of-the-art engineering and our quality-driven plants in Germany give our axles outstanding performance in:

- Durability
- Fuel efficiency
- Quiet operation

Top vehicle manufacturers around the world trust on the outstanding quality and performance of our axles and the reliability of our services. We are one of the world's biggest producers of commercial axles and we want to share our experience and technology with you.

Convince yourself and discover the advantages of Mercedes-Benz axles.



## Reliability at high level.

### Your product benefits for front axles:

- · Wheel-end sizes from 17.5 to 22.5 inches
- · Axle loads from 4.1 to 9 t (per axle)
- Gross vehicle weight rating (GVWR)from 6.5 to 26 t
- · Longer lifetime and easy maintenace

- · Additional payload due to weight-optimized design
- · Left or right hand drive applications possible
- Maintenance-free wheel hub

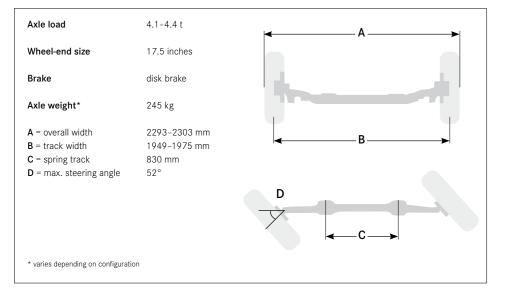
## F 4.1-F 4.4





- Steered rigid axle with forged front axle beam
- Recommended for minibuses

### Data and dimensions

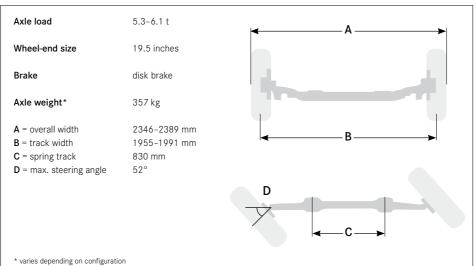


## F 5.3-F 6.1



- Steered rigid axle with forged front axle beam
- Recommended for midibuses

### Data and dimensions



## FO 7.5













- Steered rigid axle with forged front axle beam
- Low-floor option owing to a large drop
- Recommended for city buses and coaches

### Data and dimensions

Axle load	7.5 t	<b>◄</b> A — — —
Wheel-end size	22.5 inches	
Brake	disk brake	
Axle weight*	430 kg	
A = overall width	2495 mm	
B = track width	2101 mm	<b>←</b> B →
C = spring track	1094 mm	
<b>D</b> = max. steering angle	55°	
		D
* varies depending on configuration	on	



## F 7.5-F 8



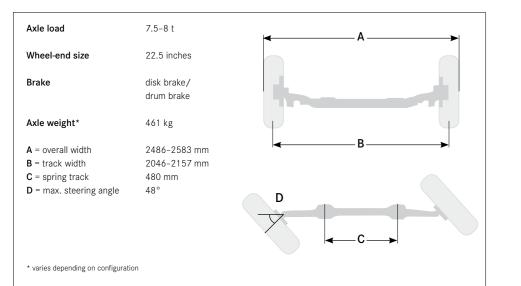






- Steered rigid axle with forged front axle beam
- Recommended for city buses and coaches

### Data and dimensions



## F 9-F 9.5



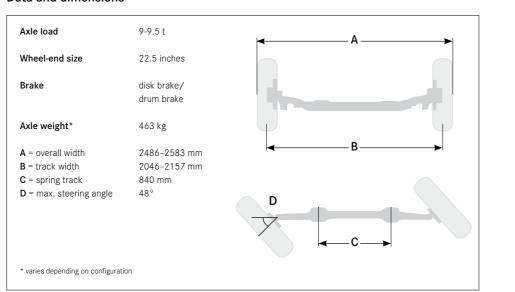






- Steered rigid axle with forged front axle beam
- Recommended for city buses and coaches

### Data and dimensions







## Comfort and safety in every situation.

### Your product benefits for rear axles:

- · Wheel-end sizes from 17.5 to 22.5 inches
- · Hypoid driven
- Ring gear diameter from 325 to 440 mm
- Axle loads from 6.2 to 13 t (per axle)
- Gross vehicle weight rating (GVWR) from **6.5 to 26 t**
- · High fuel efficiency
- Easy maintenance and long oil change intervals

- Long lifetime and quiet operations due to optimized gear set design
- Additional payload due to weight optimized design
- Adaption to the transport task through numerous ratio variants
- · Maintenance-free wheel hub
- · **Applicable** for front and rear engine

## R 325

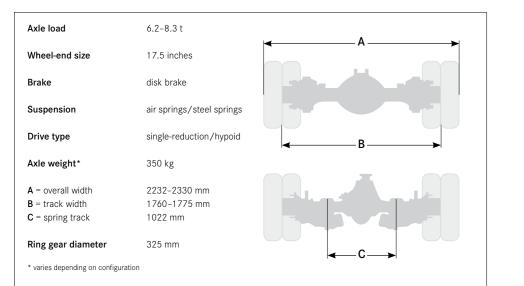






- Fabricated axle housing
- Recommended for minibuses
- For front engine coniguration

### Data and dimensions



## R 390





- Fabricated axle housing
- Recommended for for medium-duty application
- For front engine coniguration

### Data and dimensions

11 t	^
19.5 inches	A
disk brake/drum brake	and the same
air springs/steel springs	
single-reduction/hypoid	В
541 kg	
2350-2489 mm	
1756-1840 mm	
1022 mm	
390 mm	
	19.5 inches disk brake/drum brake air springs/steel springs single-reduction/hypoid 541 kg 2350-2489 mm 1756-1840 mm 1022 mm

## R 440/RO 440











- Fabricated axle housing
- Recommended for category city buses and coaches
- With R 440 for front engine configuration
- With RO 440 for rear engine configuration

### Data and dimensions

Axle load	11.5-13 t	Λ
Wheel-end size	22.5 inches	<u> </u>
Brake	disk brake	
Suspension	air springs	
Drive type	single-reduction/hypoid	<b>→</b> B →
Axle weight*	683 kg	
A = overall width	2419-2482 mm	
B = track width	1802-1804 mm	
C = spring track	930/940 mm	
Ring gear diameter	440 mm	





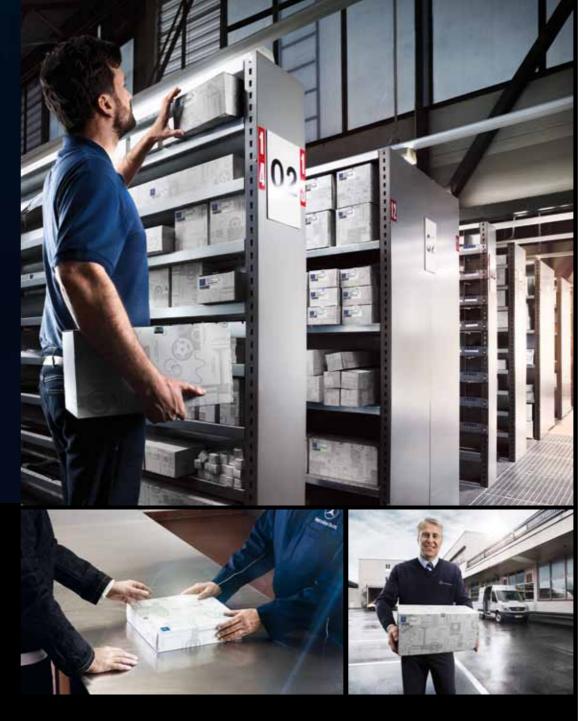


## Our Global Mercedes-Benz Service Network.

Optimizing customer support while minimizing downtimes of your truck and bus is highly relevant for us. Enjoy the advantages of our network with more than 2,400 authorized Mercedes-Benz Truck Service Centers worldwide.



Your next Service Center: Dealer Locator Online



## Spare parts supply.

We will ensure spare parts availability for many years after your initial investment. Your vehicle only can deliver top performance if it's kept in shape at all times. It is only the use of high-quality GenuineParts that ensures that the explicit and implied warranty is maintained.

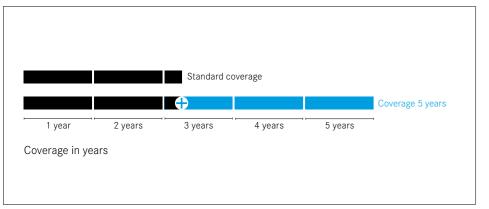
For our price sensitive customers we also offer a large portfolio of Genuine Remanufactured Parts - for saving costs but on the same quality level.

## Extended Warranty. We believe in our quality.

Our extended coverage program takes you to a higher level. Mercedes-Benz Powertrain engine system owners enjoy an overall coverage, which can be extended to 5 years and therefore adds even more value to your engine system.

Benefit from five years of manufacturer's coverage for your powertrain components – our new coverage program with 500,000 km and 300,000 Stop-Starts: 5 years of manufacturer's coverage for your powertrain components.

### Coverage types



## Extended Warranty your advantages\* at a glance:

### Integrated Powertrain:

- 5 years coverage
- ✓ Up to 500,000 km
- √ 300,000 Stop-Starts
- ✓ After treatment system covered
- ✓ Alternator + starter + accessories covered
- ✓ Crankshaft radial sealing rings covered
- ✓ Electronic control units covered
- ✓ Valid in matured markets

\*With Mercedes-Benz workshops only; with original parts only; not with B20.

## More than products.

Our perfectly matched powertrain delivers you the best possible performance and fuel savings, while maintaining low overall operating costs. The perfect combination of engine systems, transmissions and axles yields in the greatest possible efficiency and the best quality made by Mercedes-Benz Powertrain. We tailor Mercedes-Benz Powertrain component configurations to the needs of our customers for sales in the on-highway segment.

If you have technical questions, would like additional information or wish to request installation drawings, please do not hesitate to contact our sales team:

Sales External Customers
Daimler Truck AG
001-E206
70546 Stuttgart/Germany

aggregate-info@daimler.com www.mercedes-benz.com/powertrain



## Index.

ENGINES					TRUCK	BUSES
Туре	Cylinder	Displacement [litres]	Power [kW]	Torque [Nm]		
OM 934	 L4	 5.1	115. 130	650. 750	x	
OM 934 LA	L4	5.1	115. 130. 155. 170	650. 750. 850. 900		Х
OM 936	L6	7.7	175. 200. 220. 235. 260	1000. 1100. 1200. 1300. 1400	Х	
OM 936 LA	L6	7.7	175. 200. 220. 235. 260	1000. 1100. 1200. 1300. 1400		X
OM 470	L6	10.7	240¹. 265. 290. 315. 335	1700. 1800¹. 1900. 2100. 2200²	Х	X
OM 471	L6	12.8	310 <sup>1</sup> . 330 <sup>1</sup> . 350. 375. 390 <sup>1</sup>	21001. 22001. 2300. 2500. 26001	Х	Х
OM 473	L6	15.6	380. 425. 460	2600. 2800. 3000	Х	

TRANSMISSIONS			TRUCK	BUSES	
Туре	Ratio	Forward gears	Max. input torque [Nm]		
G 90 - 6S	6.70 - 0.73/9.20	6-8	1000	x	x
G 141-9 CPS	9.75 - 1.00 / 14.57	8	1400	X	
G 260-16 CPS	11.72 - 0.69/17.11	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	2100	X	
G 230-12 PowerShift 3	11.67 - 0.78/14.93	12	2300	X	
G 281-12 PowerShift 3	18.83 - 1.00/14.93	12	2800	X	
G 330 - 12 PowerShift 3	11.64 - 0.78/14.93	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	11.64 - 0.78/14.93	12	3300	X	
GO 230 - 6E CPS	6.53 - 0.73/9.03	6	2300		X
GO 250 - 8 PowerShift 3	6.57 - 0.63/10.38	8	2500		Х

RETARDER	TRUCK	BUSES
Secondary water retarder	x	X

AXLES			TRUCK	BUSES	
Type [front axles]	Wheel-end size [inches]	Axle load [t]			
F 4.1-F 4.4	17.5	4.1 - 4.4	x	x	
F 5.3 - F 6.1	19.5	5.3 - 6.1	X	X	
FD 346 - FD 360	19.5	4.7 - 6	x		
FO 7.5	22.5	7.5		X	
F 7.5 - F 8	22.5	7.5 - 8	X	X	
F9-F9.5	22.5	9-9.5	x	X	
FD 233 P	22.5	7.5 - 9	X		
FD 233 P + FT 233 P	22.5	18	x		

			TRUCK	BUSES
Type [rear axles]	Wheel-end size [inches]	Axle load [t]		
R 325	17.5	6.2 - 8.3	X	X
R 390	19.5	11	×	X
R 440	22.5	13	X	X
RO 440	22.5	11.5-13		X
R 233 P - R 300 P	22.5	26.8 - 32	×	
RT 233 P + R 233 P - RT 300 P + R 300 P	22.5	26 - 32	X	
RT 390 + RT 390 T	22.5	20.5	X	
RT 440 + R 440	22.5	26	X	

<sup>&</sup>lt;sup>1</sup> Output level only available for trucks. <sup>2</sup> Output level only available for buses.



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