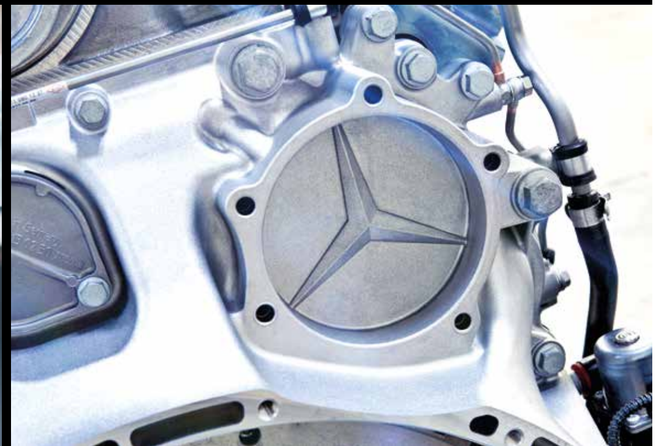
Mercedes-Benz Powertrain

Portfolio Bus EURO VI.

Mercedes-Benz

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



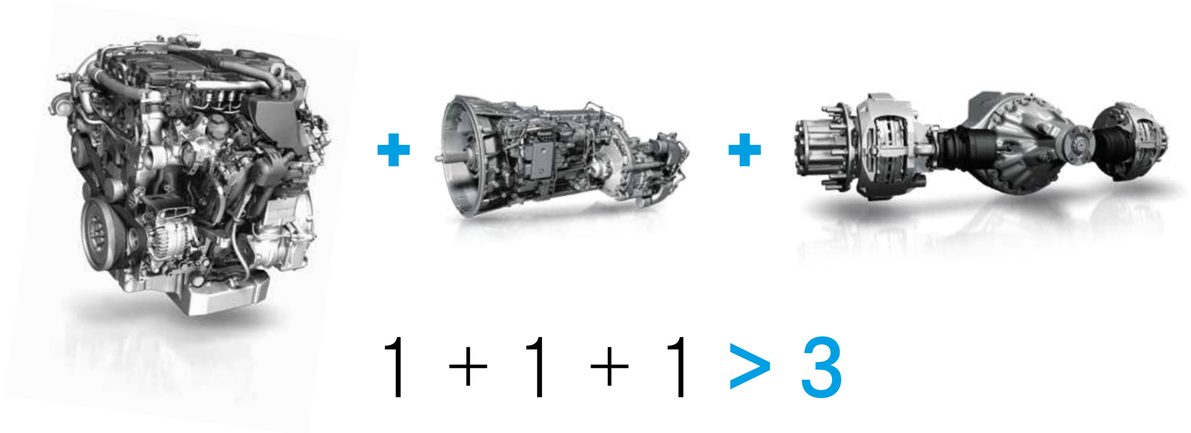
Content

Going the extra mile. Mercedes-Benz Powertrain.

Mercedes-Benz Powertrain offers outperforming and individual engineered aggregates: 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:

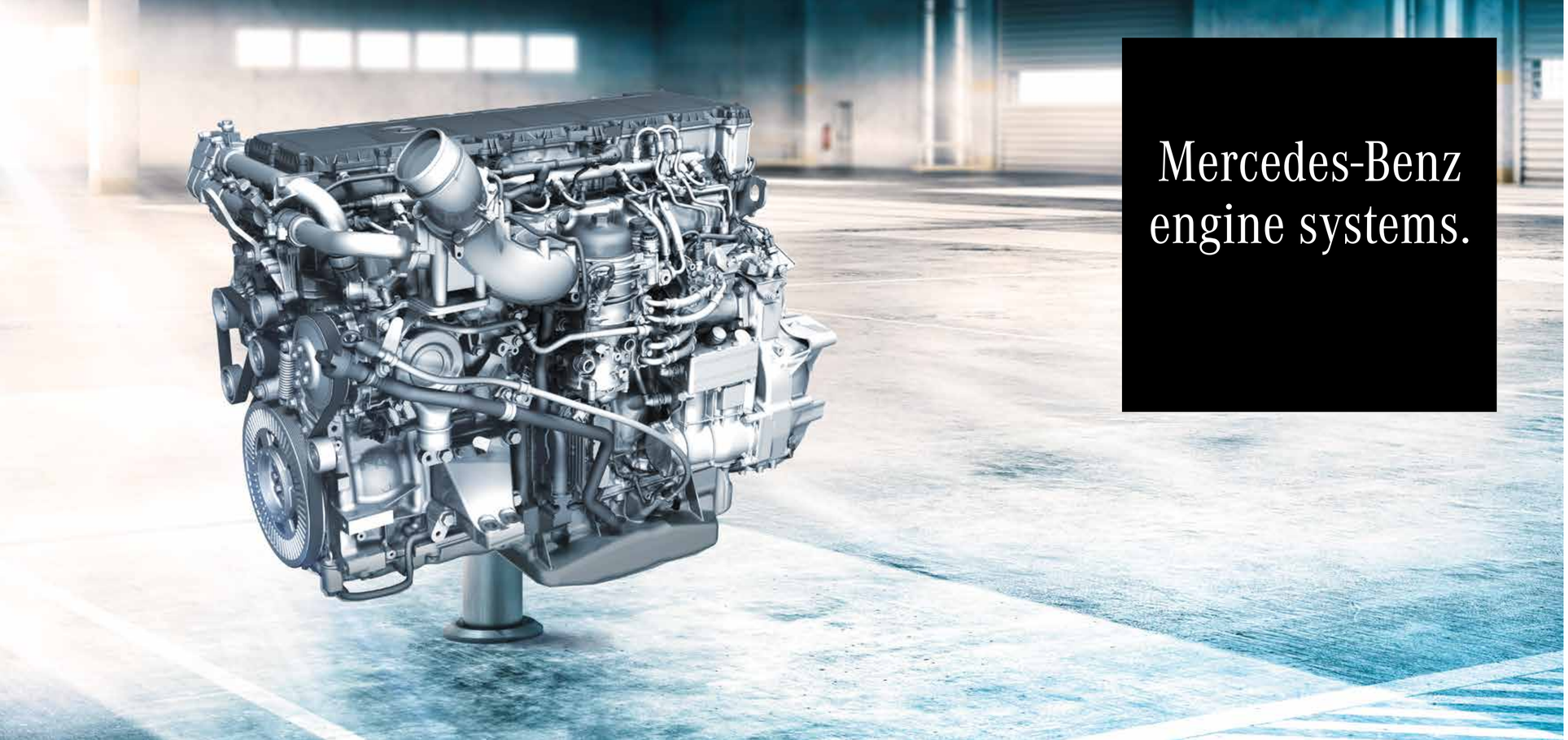
- ✓ Reduces integration efforts
- ✓ One Key Account Manager as main contact partner
- ✓ One system supplier for your individual powertrain solution
- ✓ One contractual partner

All aggregates:

- ✓ 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 aggregates
- ✓ Leads to an optimized system setup due to common electric and electronic architecture (EE architecture) for efficient interaction of all aggregates
- ✓ 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.**

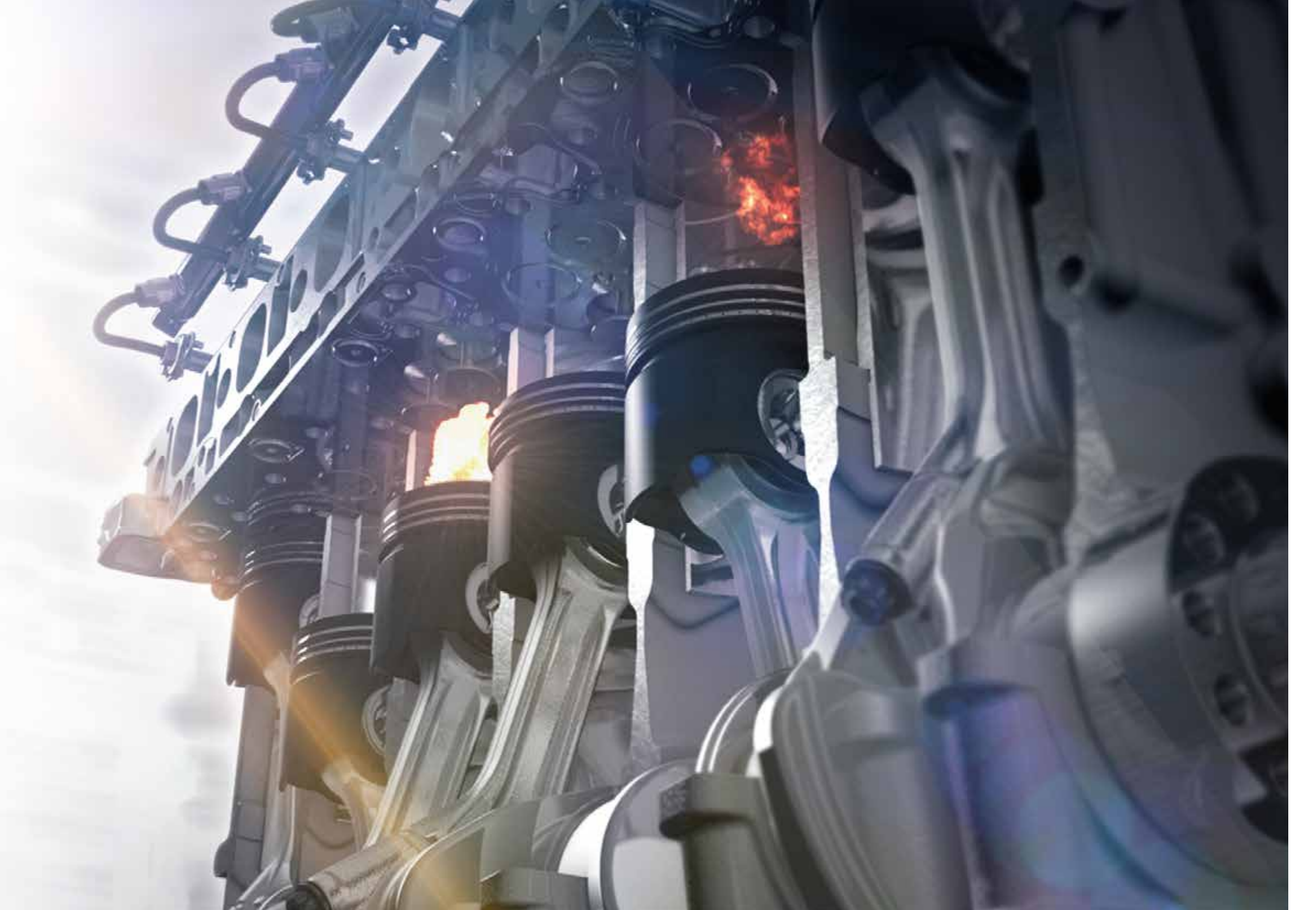
- ✓ Provides optimized fuel efficiency by specially composed powertrain solutions
- ✓ Ensures robust and reliable performance in every scenario of operation
- ✓ Increases the resale value of the vehicles due to the highest quality standards offered by Mercedes-Benz
- ✓ Minimizes downtimes as our worldwide 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



Mercedes-Benz engine systems.

OM 93X and OM 47X model series.

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



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

With our BlueEfficiency Power engines 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 engines, supported among other things by the X-Pulse common-rail high-pressure fuel injection system

Derivation "Nomenclature" – engines.

OM = Oil (diesel) engine

Medium-duty = OM 934, OM 936

Heavy-duty = OM 470, OM 471

3 = Medium-duty engine
5-7 = Heavy-duty engine

9 = 93x model series (MD)
4 = 47x model series (HD)

4 = L4 cylinder engine (5.1 l)
6 = L6 cylinder engine (7.7 l)
0 = L6 cylinder engine (10.7 l)
1 = L6 cylinder engine (12.8 l)

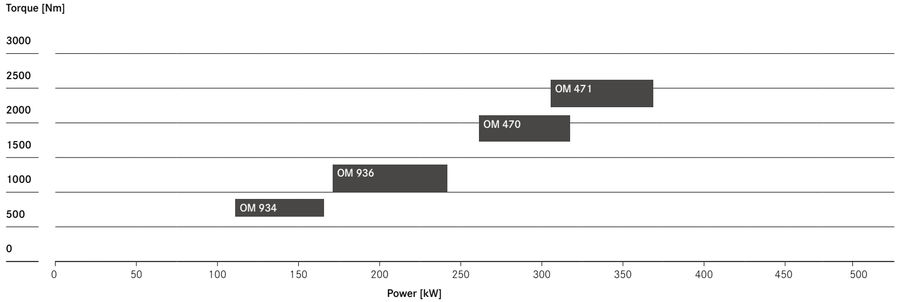
Engine systems for EURO VI.

Portfolio of EURO VI engines for buses

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

100 200 300 400

Power range



Medium-duty engine systems.

Performance. Even on challenging terrain.

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
- **Special 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

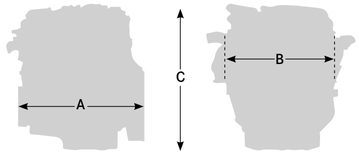
OM 934

Arrangement: In-line 4
Displacement: 5.1 l

Weight and dimensions*

Weight
DIN 70020 - GZ 495 kg (single stage charger)
DIN 70020 - GZ 510 kg (dual stage chargers)

Dimensions
A = length 810 mm
B = width
(excl. charge air pipe) 680 mm
C = height 900 mm

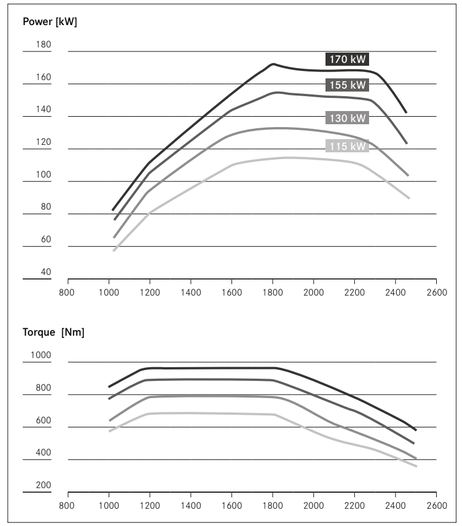


* depending on equipment installed

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



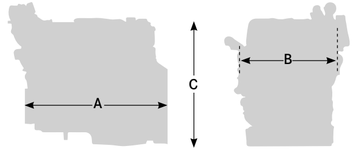
OM 936

Arrangement: In-line 6
Displacement: 7.7 l

Weight and dimensions*

Weight
DIN 70020 - GZ 652 kg (single stage charger)
DIN 70020 - GZ 666 kg (dual stage chargers)

Dimensions
A = length 1057 mm
B = width
(excl. charge air pipe) 680 mm
C = height 910 mm

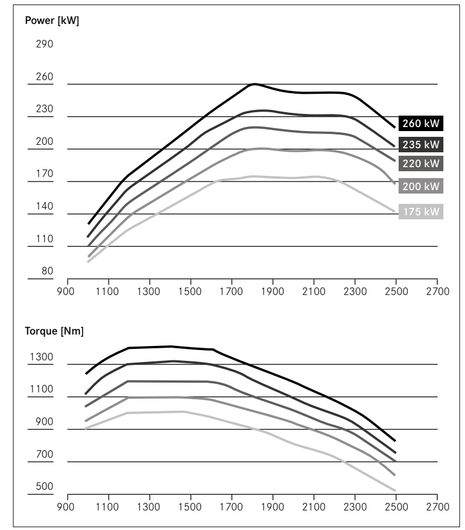


* depending on equipment installed

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	1200–1600

Performance



Heavy-duty engine systems.

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 to 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

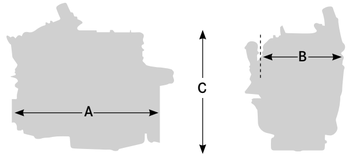
Arrangement: In-line 6
Displacement: 10.7 l

Weight and dimensions*

Weight
DIN 70020 - GZ: 952 kg

Dimensions

A = length	1289 mm
B = width (excl. charge air pipe)	750 mm
C = height	1029 mm

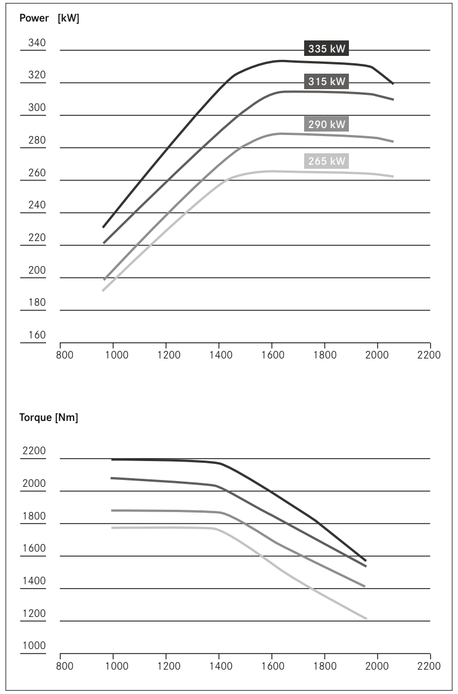


* depending on equipment installed

Rated power and maximal torque

Rated power	[kW/hp]	265/360	290/394	315/428	335/456
at engine speed	[rpm]	1600	1600	1600	1600
Maximal torque	[Nm]	1700	1900	2100	2200
at engine speed	[rpm]	1100	1100	1100	1100

Performance



OM 471

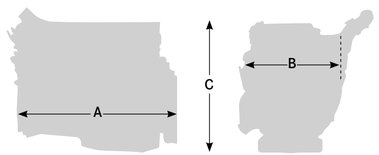
Arrangement: In-line 6
Displacement: 12.8 l

Weight and dimensions*

Weight
DIN 70020 - GZ 1104 kg

Dimensions

A = length	1307 mm
B = width (excl. charge air pipe)	770 mm
C = height	1058 mm

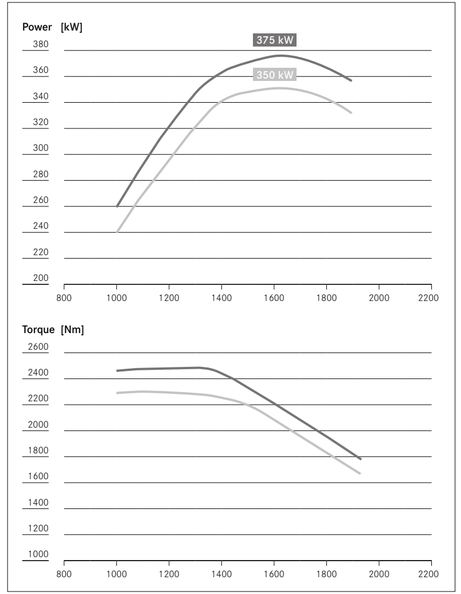


* depending on equipment installed

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.

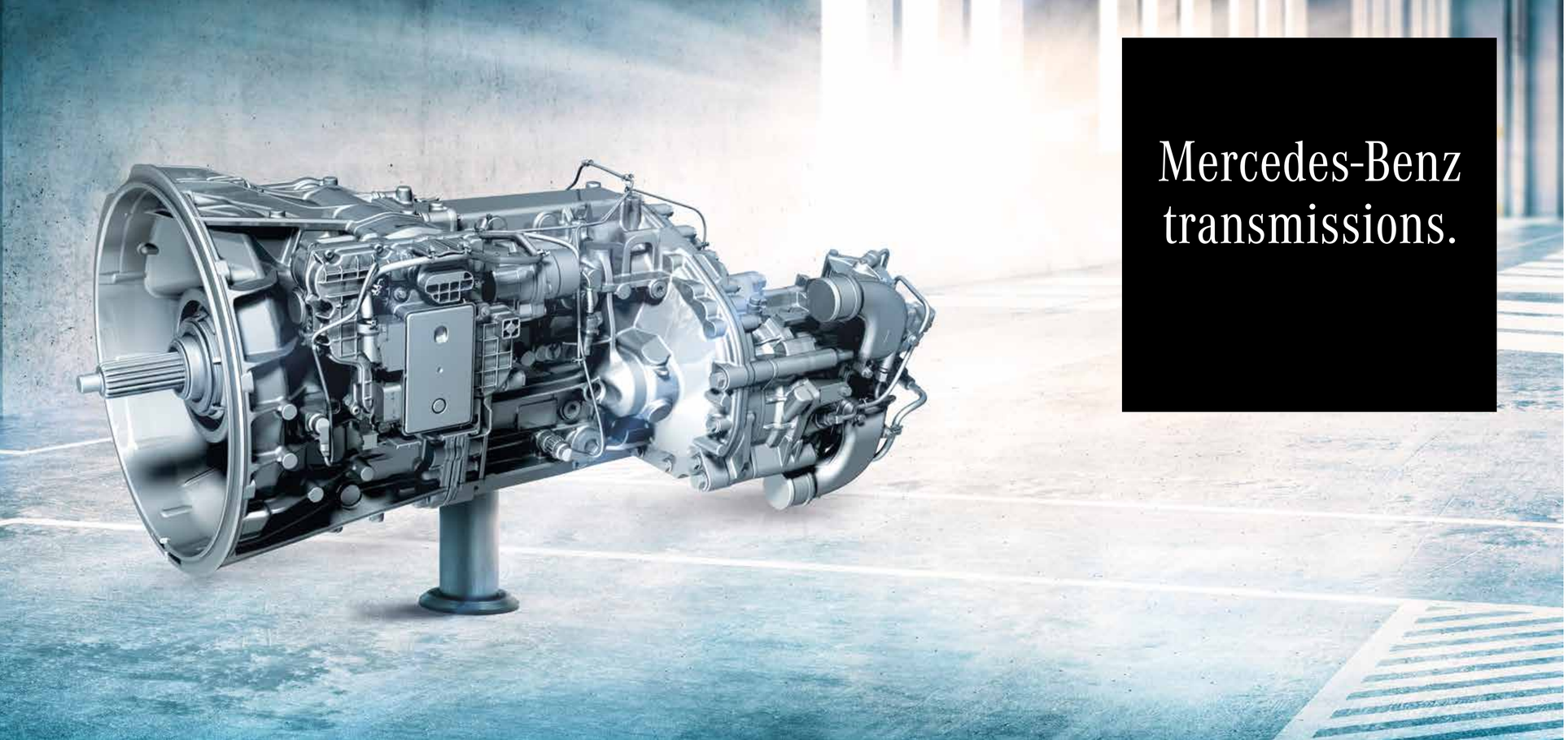
Your product benefits for the after-treatment system:

- 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©** without compressed air; very low AdBlue© 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 new generation of engines.

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

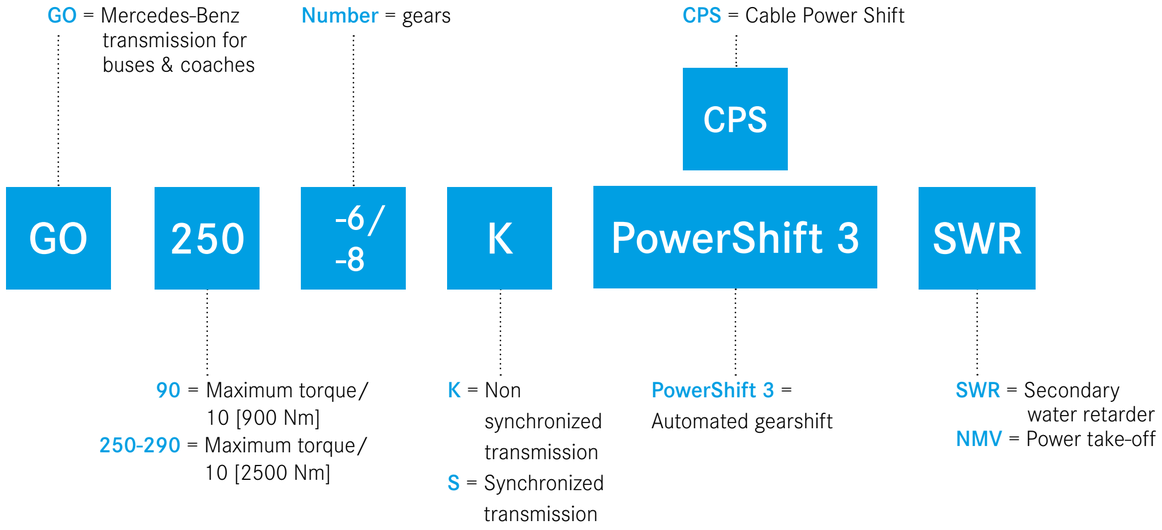
EURO VI exhaust after-treatment system.



Mercedes-Benz transmissions.

Reliable transmissions for a wide range of applications.

Derivation "Nomenclature" – transmissions.



Transmissions for EURO VI.

Model series	Type	Ratio	Forward gears	Max. input torque [Nm]
Buses	G 90-6S	6.70 – 0.73/9.20	6	1000
	GO 230-6 CPS	6.53-0.72/9.03	6	2300
	GO 250-8 PowerShift 3	6.57 – 0.63/10.38	8	2500

500 1000 1500 2000 2500

automated & manual automated manual

Meaning of symbols:

MT Manual shifted transmission

AMT Fully automated manual transmission

Transmission for buses and coaches

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 future, we will continue to stand for innovative products focused on customer-oriented applications.

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

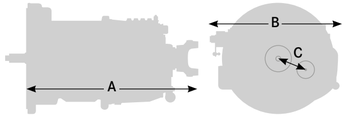
AMT

- 6-speed synchronized transmission with a wide gear ratio spread
- SAE 2 or SAE 3 clutch housing available
- Overdrive configuration
- Hydrodynamic retarder can be adapted

Specifications and dimensions

Max. input torque	1000 Nm
Permissible gross combination weight (GCW)	28 t
Transmission weight excl. oil	138.5 kg/ 191.5 kg*
Oil filling capacity	9 l
A = length	709 mm
B = width	562 mm
C = center to center	130 mm

* with retarder



Gear	1	2	3	4	5	6	R	Gear ratio spread
Ratio	6.696	3.806	2.289	1.480	1.000	0.728	6.294	9.20

GO 230-6 CPS

MT

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

Specifications and dimensions

Max. input torque	2300 Nm
Permissible gross combination weight (GCW)	24 t
Transmission weight excl. oil	225 kg/ 268 kg*
Oil filling capacity	13 l
A = length	846 mm
B = width	630 mm
C = center to center	152 mm

* with retarder

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

GO 250-8 PowerShift 3

AMT

- 8 degressive stepped gears
- 8-speed none synchronized transmission with a wide gear ratio spread
- Double-overdrive configuration
- Secondary water retarder can be adapted

Specifications and dimensions

Max. input torque	2500 Nm
Permissible gross combination weight (GCW)	28.5 t
Transmission weight excl. oil	221 kg/ 264 kg*
Oil filling capacity	13.5 l
A = length	846 mm
B = width	630 mm
C = center to center	152 mm

* with retarder

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

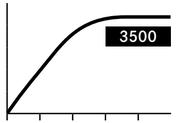
The **integrated secondary water retarder** offers a **high braking torque in combination with a compact, weight-saving design**. The weight advantages of the new retarders are 43 kg (SWR) compared to previous oil retarders. The braking power of the retarder is also independent of selected gear or current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

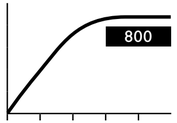
Secondary water retarder

Your product benefits:

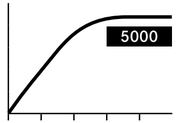
- **Reduction of friction** by **axial rotor displacement**
- **No heat exchanger** required since the cooling water is used as the operating medium directly
- Compact unit requires only **minimal installation space**
- **Freedom from maintenance** for reduced vehicle service costs
- **Significantly 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



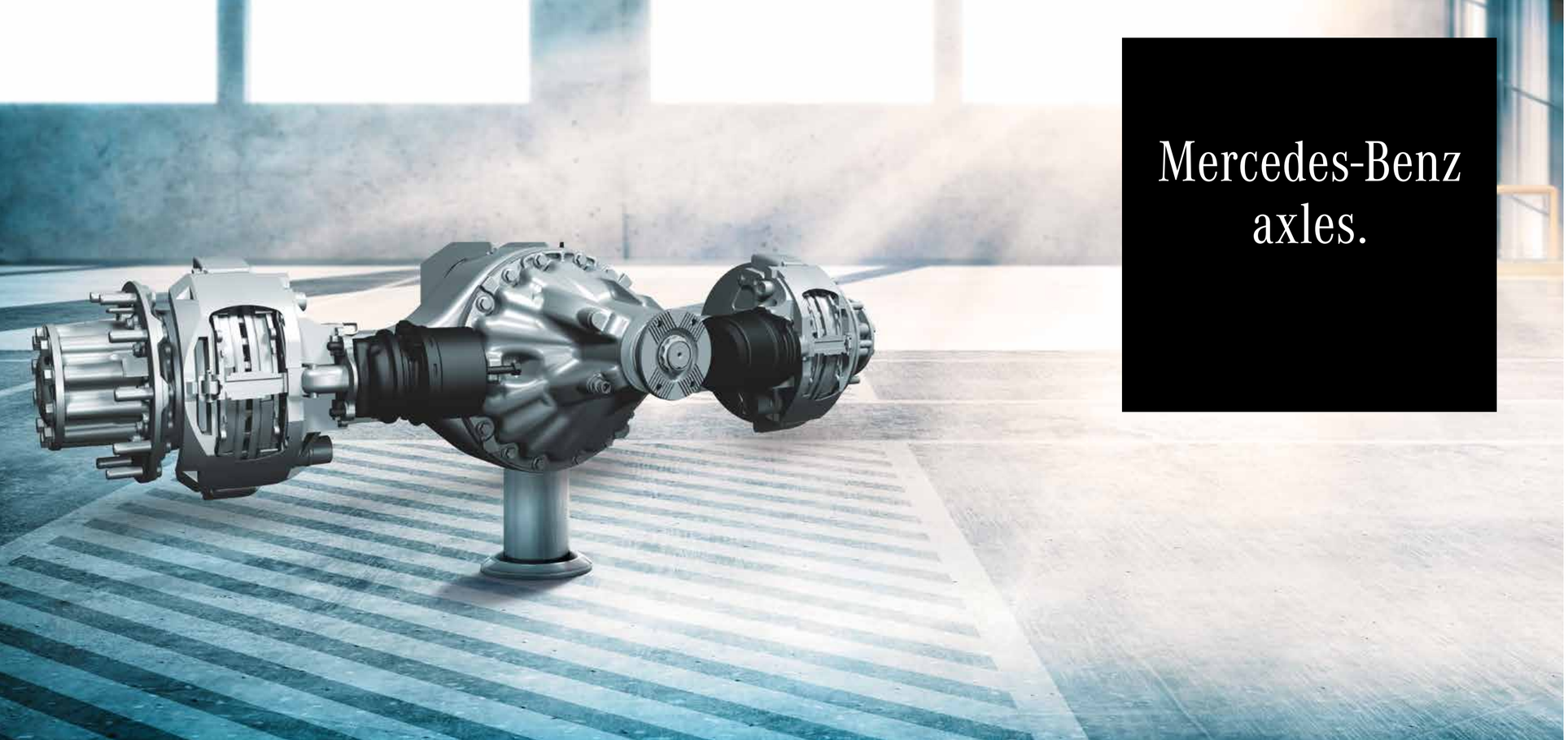
max. braking torque [Nm]



max. braking power [kW]



max. rotation [min -1]



Mercedes-Benz axles.

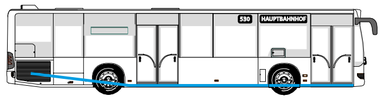
Reliable axles for every application.

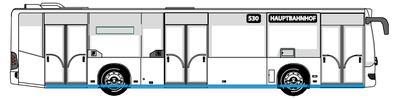
Vehicle type and the fitting axle application from plant Kassel:

Low floor Chassis*

* not available in plant Mannheim

LF

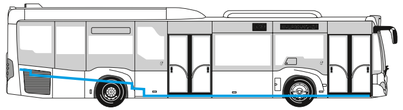




City buses (and intercity buses)

Low entry Chassis

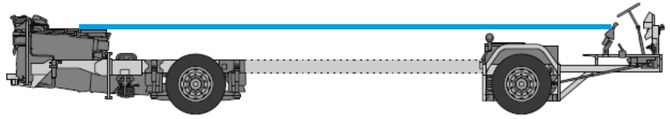
LE

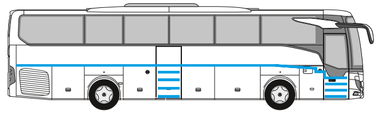


City and intercity buses

High floor Chassis

HF





Coaches, intercity and transfer buses

Derivation "Nomenclature" – axles.

Non-driven axles

F = Front axle
FO = Front axle omnibus

FO

7.5

Number = Axle load [t]

Driven axles

R = Rear axle
RO = Rear axle omnibus

RO

440

Number = Ring gear diameter [mm]

The right axle for every application.

Axle portfolio: front axles and rear axles.

	Vehicle category	Front axles*	Tire size [inches]	Axle load [t]	Rear axles	Tire size [inches]	Axle load [t]
	Minibus (7 m)	F 4.1 – F 4.4	17.5	to 4.4	R/RO 325	17.5	6 – 8.3
	Midibus (8 – 10 m)	F 5.3 – F 6.1	19.5/20/22.5	5.3 – 6.1	R 390*	19.5/20/22,5	9.2 – 11
	City bus/coach (12 m)	FO 7.5	22.5	7.5			
		F 7.5 – F 8	20/22.5	7.5 – 8	R/RO 440	22.5	11.5 – 13
		F 9 – F 9.5	20/22.5/24	9 – 9.5			

4 6 8 5 10

* only applicable with front engine configuration

For further applications see truck axle portfolio.

Meaning of symbols:

FA Front axles

RA Rear axles

Axles for minibuses

Axles for midibuses

Axles for city buses & coaches

LF Low floor Chassis

LE Low entry Chassis

HF High floor Chassis

Our axle product portfolio: Efficiency on demand.

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:

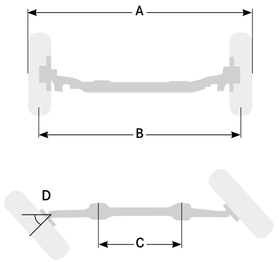
- Tire sizes from **17.5 to 22.5 inches**
- Axle loads from **3.5 to 9 t** (per axle)
- Gross vehicle weight rating **(GVWR) from 6.5 to 24 t**
- **Longer lifetime** and **easy maintenace**
- **Additional payload** due to weight-optimized design
- **Left or right handed** applications possible
- **Maintenance free** wheel hub

F 4.1–F 4.4

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

Data and dimensions

Axle load	to 4.4 t
Tire size	17.5 inches
Brake	disk brake
Axle weight*	245 kg
A = overall width	2293–2303 mm
B = track width	1949–1975 mm
C = spring track	830 mm
D = max. turning angle	52°



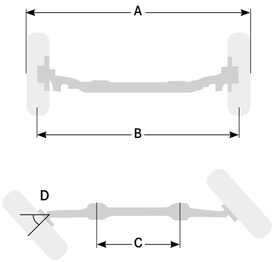
* varies depending on configuration

F 5.3–F 6.1

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

Data and dimensions

Axle load	5.3–6.1 t
Tire size	19.5/20/22.5 inches
Brake	disk brake
Axle weight*	357 kg
A = overall width	2346–2389 mm
B = track width	1955–1991 mm
C = spring track	830 mm
D = max. turning angle	52°



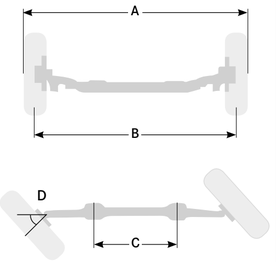
* varies depending on configuration

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
Tire size	22.5 inches
Brake	disk brake
Axle weight*	430 kg
A = overall width	2495 mm
B = track width	2101 mm
C = spring track	1094 mm
D = max. turning angle	55°



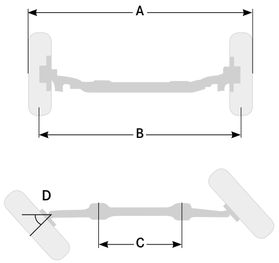
* varies depending on configuration

F 7.5-F 8

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

Data and dimensions

Axle load	7.5–8 t
Tire size	20/22.5 inches
Brake	disk brake/ drum brake
Axle weight*	461 kg
A = overall width	2486–2583 mm
B = track width	2046–2140 mm
C = spring track	840 mm
D = max. turning angle	52°



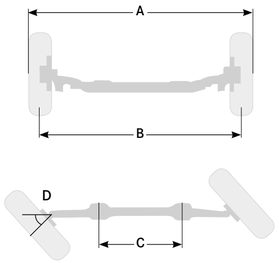
* varies depending on configuration

F 9-F 9.5

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

Data and dimensions

Axle load	9–9.5 t
Tire size	20/22.5 inches
Brake	disk brake/ drum brake
Axle weight*	461 kg
A = overall width	2486–2583 mm
B = track width	2046–2140 mm
C = spring track	840 mm
D = max. turning angle	48°



* varies depending on configuration

Rear axles.

Comfort and safety in every situation.

Your product benefits for rear axles:

- Tire sizes from **17.5 to 22.5 inches**
- **Hypoid** driven
- Ring gear diameter from **325 to 440 mm**
- Axle loads from **6 to 13 t** (per axle)
- Gross vehicle weight rating (GVWR) **from 6.5 to 24 t**
- **High fuel efficiency**
- **Easy maintenance** and long oil change intervals
- **Long lifetime** and **quiet operations** due to our 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 configuration

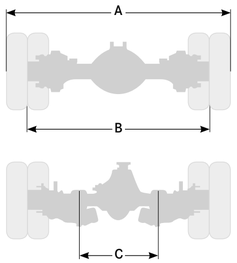
R/RO 325

RA

- Fabricated axle housing
- Recommended for minibuses

Data and dimensions

Axle load	6–8.3 t
Tire size	17.5 inches
Brake	disk brake
Suspension	air springs/steel springs
Drive type	single-reduction/hypoid
Axle weight*	350 kg
A = overall width	2232–2330 mm
B = track width	1760–1775 mm
C = spring track	1022 mm
Ring Gear Diameter	325 mm



* varies depending on configuration

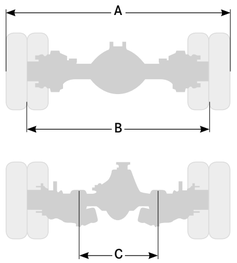
R 390*

RA

- Fabricated axle housing
- Recommended for for medium-duty application

Data and dimensions

Axle load	6–8.3 t
Tire size	17.5 inches
Drake	disk brake
Suspension	air springs/steel springs
Drive type	single-reduction/hypoid
Axle weight**	350 kg
A = overall width	2232–2330 mm
B = track width	1760–1775 mm
C = spring track	1022 mm
Ring Gear Diameter	325 mm



* only applicable with front engine configuration
** varies depending on configuration

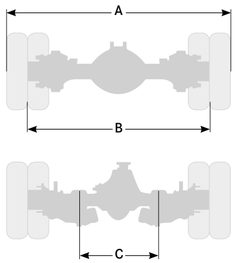
R/RO 440

RA LE

- Fabricated axle housing
- Recommended for category city buses and coaches

Data and dimensions

Axle load	11.5–13 t
Tire size	22.5 inches
Drake	disk brake
Suspension	air springs
Drive type	single-reduction/hypoid
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



* varies depending on configuration

Service benefits at a glance.

Application engineering consultancy service

Our experts will help you to select the right aggregates, components to create a customized solution that suits your application specific requirements. Our experts provide you installation manuals for mechanical and electronical integration of our components. As part of the release process we optionally run an installation inspection.

Customer training

Uniquely tailored training courses can be held in Germany and other countries to ensure that you receive the necessary expert knowledge in regards for installing, operating, and maintaining your aggregate in accordance with our high standards.

The following topic areas are handled on a need-to-know basis as part of our customer training courses

- Control units in the architecture
- Electrical interfaces
- Electronic interfaces
- Basics of assemblies
- Control unit functions
- Diagnostics interface
- Basics of the diagnostics tool
- Practical applications of the diagnostics tool

Service network

Optimizing customer support while minimizing down-times 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.

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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.

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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:

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