

DIESEL
MONOBLOCK

CYLINDER

[2][4][6] [HYBRID
SYSTEMS]



VEHICLE ENGINES

COMPETENCE THROUGH EXPERIENCE

Sustainable propulsion and power generation solutions based on future-driven technologies are the corporate focus of STEYR MOTORS. A strong innovative spirit and in-depth engineering knowledge, tracing back to the former Steyr Daimler Puch group, are cornerstones of the enterprise's success.

Since the management buyout in 2001, the company has established a worldwide reputation for being an expert in engineering and manufacturing of high-performance diesel engines and hybrid systems. STEYR MOTORS provides powerful solutions for use on land and at sea, i.e. for the marine industry, for special land and amphibious vehicles and for industrial use. The product range includes diesel engines and diesel-electric solutions as well as highly-specialized engineering services for specific requirements. Great importance is placed on quality management in every step of the production and service chain. As a result, the company consistently passes stringent quality audits and certification procedures.

After a remarkable expansion of production and engineering capacities in 2015, STEYR MOTORS has reached the next milestone on its corporate roadmap. In the course of 2017, a series of Monoblock Common Rail engines was launched, successfully managing the balancing act between performance and sustainability. Further steps towards environmentally-sound solutions are about to be completed by the company in the near future.



LIGHTWEIGHT POWER PLAYERS

We specialize in designing engines and gensets, providing one of the best power-to-weight ratios on the market. Though lightweight and compact, STEYR MOTORS' products are also very robust and provide remarkable performance. While downsizing became a trend in the common industry over recent years, STEYR MOTORS has always focused on small and lightweight solutions with high power density and with the same durability and reliability as heavier products competing in the same power range.



CERTIFIED & PROVEN

More than 50 patents out of 33 patent families and numerous industrial property rights prove STEYR MOTORS' innovative capabilities and engineering expertise. Additionally, several certificates verify that our products and procedures meet the highest quality standards.

STEYR MOTORS' outstanding product durability is achieved by a unique technical design, as well as by comprehensive quality assurance. Components of selected suppliers, seamless monitoring throughout the production and sophisticated final examinations of every single engine are vital to this process. Customer service requests are also quickly and reliably seen to by a dedicated contact person.

RECIPROCATING-PISTON INTERNAL COMBUSTION ENGINE WITH MASS BALANCING DEVICE

SINCE 2012

The invention relates to a reciprocating-piston internal combustion engine having at least one engine cylinder and at least one piston oscillating therein, and having at least one balancing mass which is driven in an oscillating manner by a crankshaft via a crank throw and a compensating connecting rod, and which is guided in a translatory fashion by means of a linear guide assigned in each case to the respective balancing mass. The linear guide is formed by at least two guide elements, which are spaced apart from one another, for the balancing mass.

A bearing for articulately connecting to the compensating connecting rod is formed on the balancing mass in a central portion between the two mutually spaced apart guide elements. A mass balancing system is thereby created, which ensures as high a degree of running smoothness as possible, in particular as low a level of vibration as possible, and which at the same time can be realized in as cheap and practicable manner as possible.



US 8,746,200 B2



AT 509 820 B1

POWERING SUSTAINABLE SOLUTIONS WITH PASSION

Outstanding performance is a result of best-in-class people acting like owners and aiming to always exceed the customers' expectations. STEYR MOTORS pursues this guiding principle by combining passion, an innovative spirit and target-orientation, thus providing one-step-ahead solutions that stand out in terms of functionality, sustainability, quality and cost-effectiveness.

We strive for excellent results and create best value for our partners by shaping the ideal solution for vehicle, marine and industrial applications in the shortest time possible and with the most efficient use of resources. This empowers our customers to being in-time to market with competitive products and services.

EFFICIENT TECHNOLOGIES FOR THE FUTURE

The product portfolio of STEYR MOTORS includes diesel engines and diesel-electric solutions for a wide range of applications in the marine, vehicle and industrial business sectors. Our future engineering strategy continues to focus on diesel and hybrid solutions complying with leading industry standards, such as the ISO 9001:2008 certification. However, it also focuses on the environmental impact, targeting reduced fuel consumption and emissions.

The development of eco-friendly e-machines and hybrid systems, projects with synthetic fuel and connectivity (IoT) applications are just some examples for future-driven projects based on STEYR MOTORS' corporate strategy.

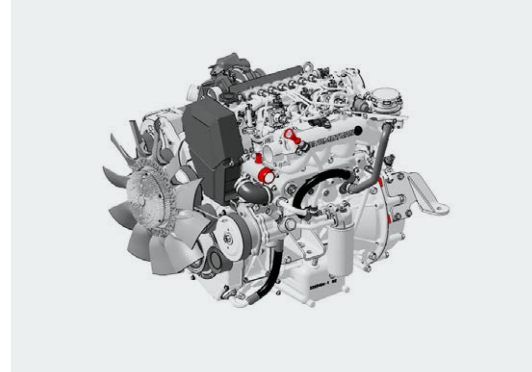
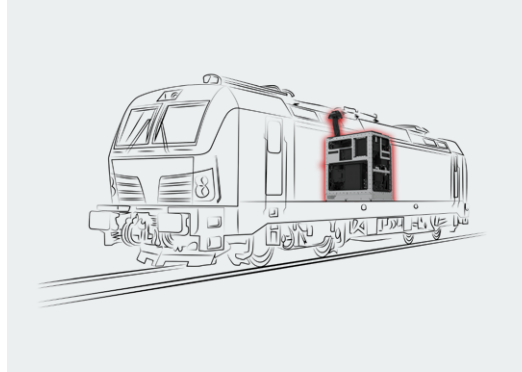
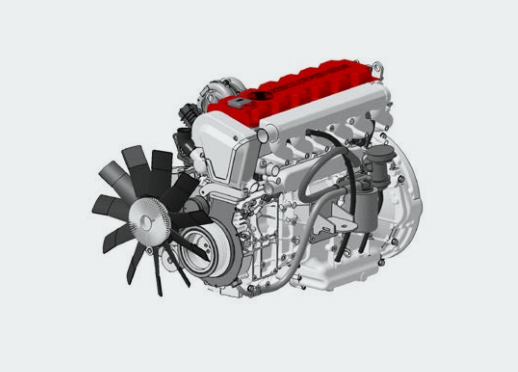
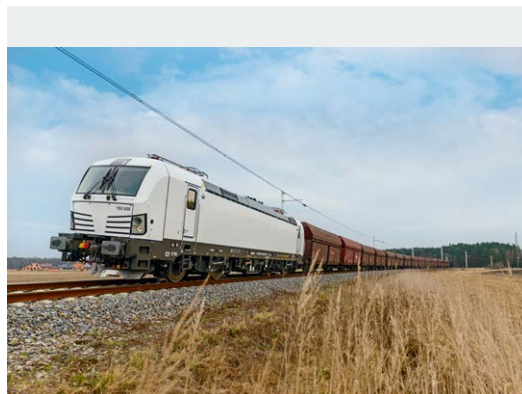


FUTURE-DRIVEN ENGINEERING

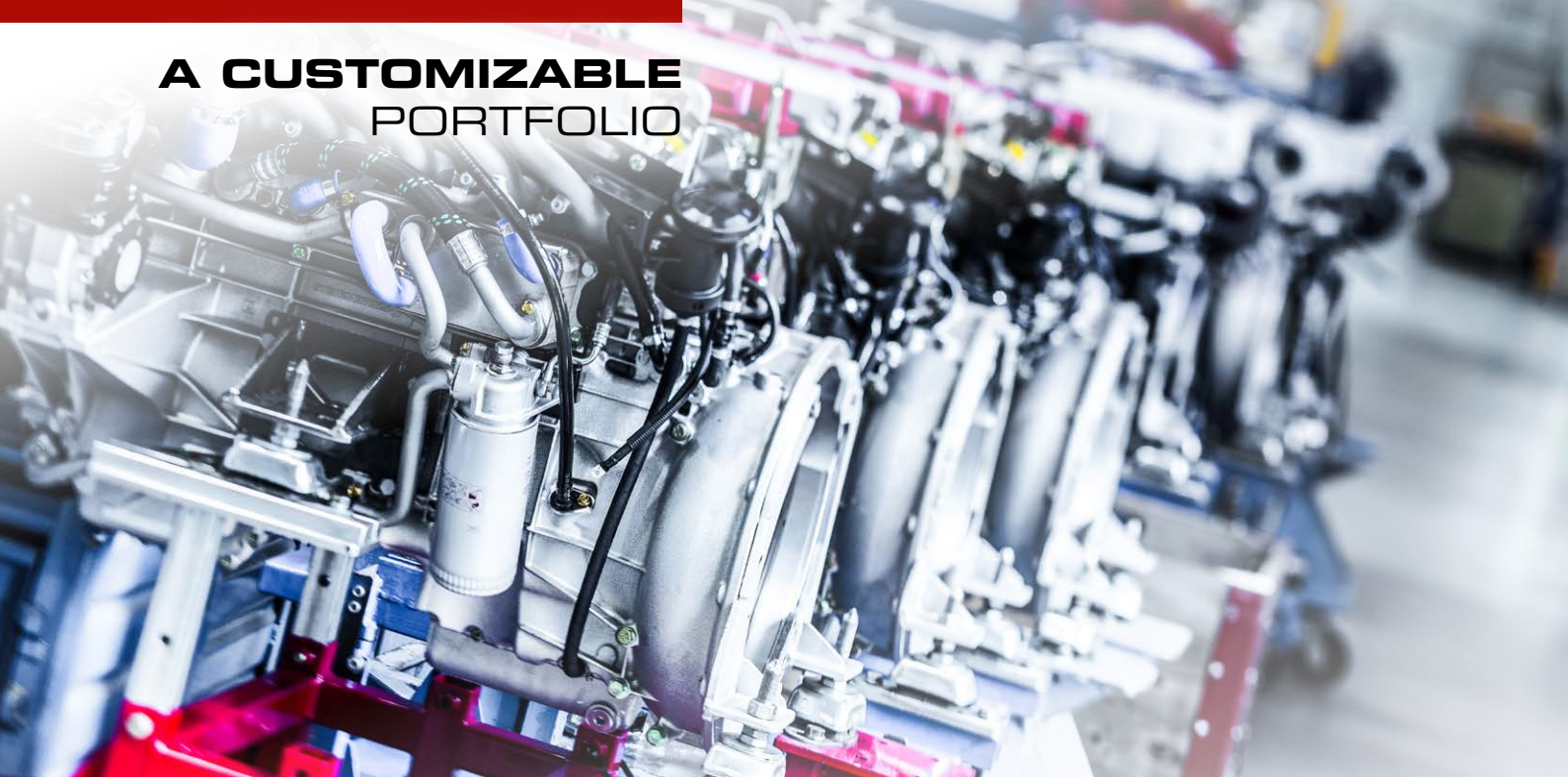
STEYR MOTORS is the ideal partner for efficient on-road solutions as well as for off-road applications, mastering even challenging ambient conditions and operational requirements. We draw on an extensive pool of experience and a very skilled team of engineering experts which enables us to shape the future of mobility.

In all our R&D projects, we ensure best functionality and practicability, including, for instance, the reliable operation of our engines in desert heat as well as arctic cold or the compatibility with varying fuel types and qualities. A prime example is the Zero South project, which relies on two uniquely modified hybrid-electric Polar Traverse Vehicles (PTVs) using STEYR engines powered with synthetic fuel as APUs.

Besides our globally renowned diesel expertise, we have also gathered plenty of experience with hybrid solutions for over 10 years now. STEYR MOTORS' projects are varied and always perfectly matched to our customer's demands. Examples range from powerful two-cylinder APUs and range extenders to hybrid drive systems for boats and amphibious vehicles, as well as a compact but remarkably strong diesel power module for an electric locomotive.



A CUSTOMIZABLE PORTFOLIO

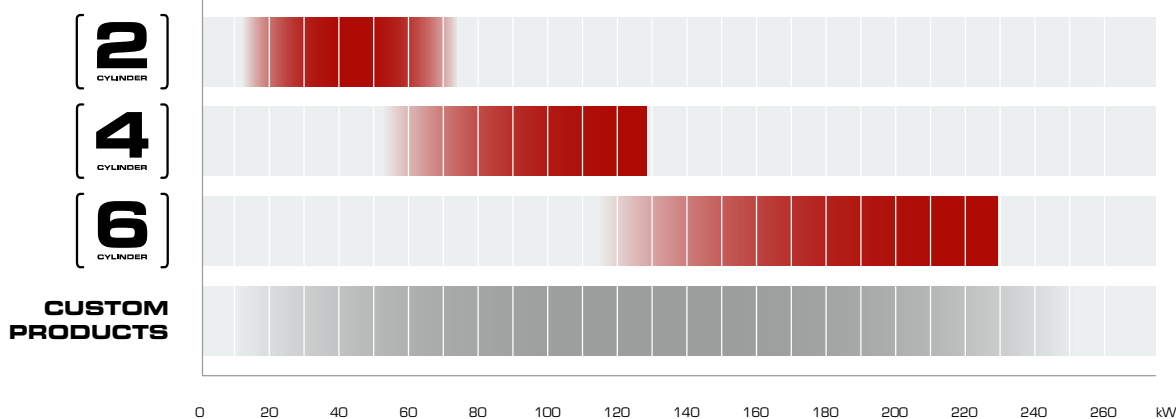


PERFORMANCE THAT EXCITES

From small and compact power packs to efficient 4- and 6-cylinder diesel engines – STEYR MOTORS' main product range from 12 to 225 kW covers the propulsion of light to heavy vehicles and applications such as gensets, auxiliary power units and range extenders. The portfolio is topped off with sophisticated features like multifuel capability, emergency drive systems or fast and easy interchangeability of APUs. New products and features are added to the portfolio on a regular basis, ensuring cutting-edge technology to meet the strictest demands.

INTELLIGENT CUSTOMIZATION

Decades of experience in engineering and manufacturing enable STEYR MOTORS to develop and produce customer-specific solutions in the most efficient way. By combining proven technology with application-specific enhancements, our customer receives the ideal product to fit real-life requirements in the shortest possible time frame. One of our extraordinary skills in this regard is creating unique custom power packs which include a reliable combustion engine, a powerful e-machine, cooling and aftertreatment systems as well as all auxiliary components in a highly compact design.

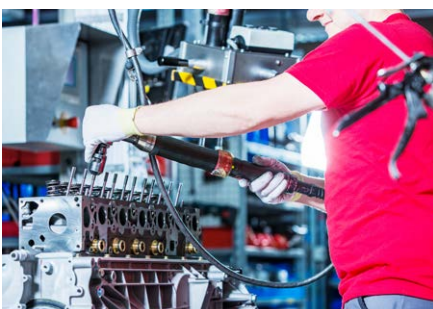
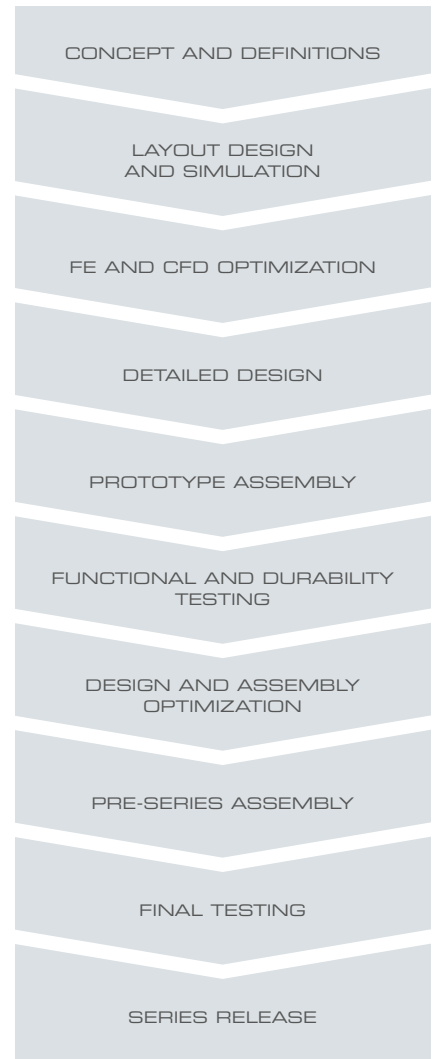


TEAMED UP TO EXCEL

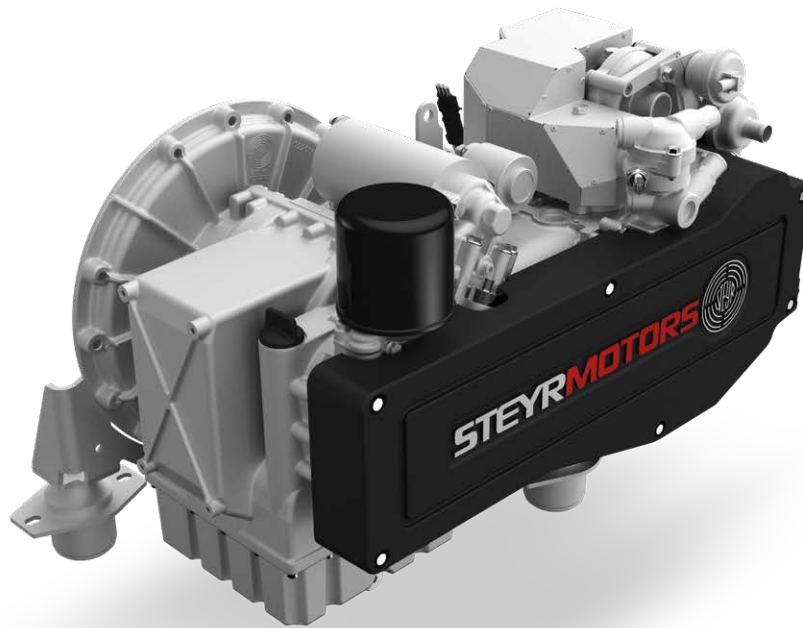
EXCELLENCE REQUIRES EXPERTS

Each customer and project has its own specifically assembled STEYR MOTORS team based on the know-how required for the individual assignment. We place great importance on a skilled project team combining expertise as well as flexibility and innovational spirit. A dedicated project manager accompanies and advises the customer during all project phases in order to ensure top-class solutions that meet the customer's demands.

STEYR MOTORS frequently invests in continuing education and an excellent working environment including state-of-the-art engineering equipment. From concepts and layouts to the series production of a customized solution, the skilled R&D team of STEYR MOTORS ensures that the agreed features and definitions are turned into a high-quality product. Throughout the entire development and product process, each engine is thoroughly tested and accompanied by a detailed technical documentation to guarantee the highest level of customer satisfaction.



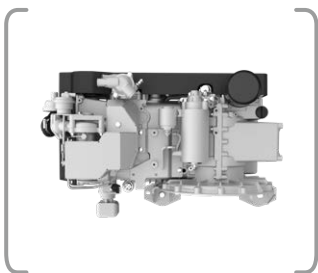
M12 SERIES 2-CYLINDER ENGINES



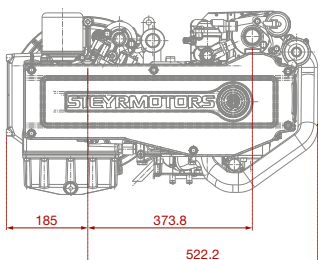
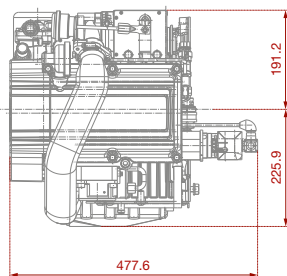
2
CYLINDER

SMALL IN SIZE – GREAT IN PERFORMANCE

The M12 series is set up on a striking combination of Monoblock and a horizontal parallel twin piston configuration. The result is a reliable, compact and powerful assembly for propulsion and power generation purposes. Featuring a patented mass balancing system, being turbo-charged (single stage, waste gate) and intercooled, smooth operation and fuel efficiency are enhanced. Its small dimensions and light weight allow easy installation as well as removal of the engine even in the smallest compartment spaces.



The series is available in Unit Injection (UI) and Common Rail (CR) variants, equally capable of managing challenging off-highway and efficiency-conscious applications likewise. Time and again, the patented UI System has proven its robustness in rough ambient conditions incl. extreme temperatures, dust, uneven terrain and high altitudes. Even with different fuel types reliable operation is granted, thanks to the system's multifuel capability.



The M12 CR, on the other hand, is suitable for application as range extender in electric-driven vehicles, being optimized to run different types of generators. The advanced Common Rail injection system was particularly designed for STEYR engines, keeping the engine's renowned robustness and a selected multi-fuel capability.

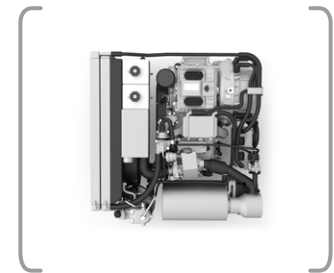
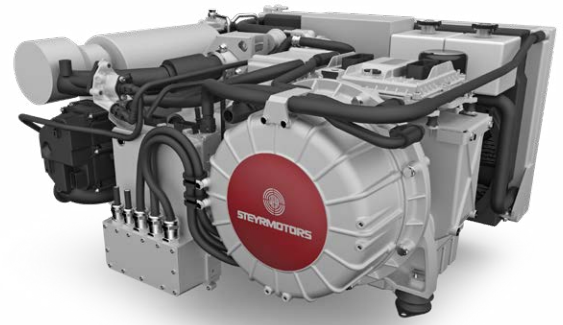
COMPACT SOLUTION FOR IMPORTANT TASKS

Besides propulsion systems the M12 series was successfully realized as Auxiliary Power Unit (APU), in combination with DC & AC generators, CVT transmissions as well as hydraulic pumps. Additionally, the modular engine concept allows customization to application-specific performance, installation, interchangeability and emission requirements.

M12 CR REX – A COMPACT POWER PACK

The combination of the M12 CR with an e-machine has proven as a very attractive range extender solution for electric applications. It increases the driving range, ensuring higher flexibility, and providing dynamic performance while guaranteeing smooth and stable operation. Moreover, the M12 CR REX is lighter and more easily transportable than typical range extender solutions and, consequently, helps to reduce weight if the power unit is not needed and temporarily removed.

Thanks to the extremely compact assembly of engine, e-machine, aftertreatment system, radiators, fans and all peripheral components – optionally including acoustic insulation – the M12 CR REX is also well suited as a diesel-electric power pack for independent power supply, e.g. by using it as a portable genset or trailer-mounted genset.



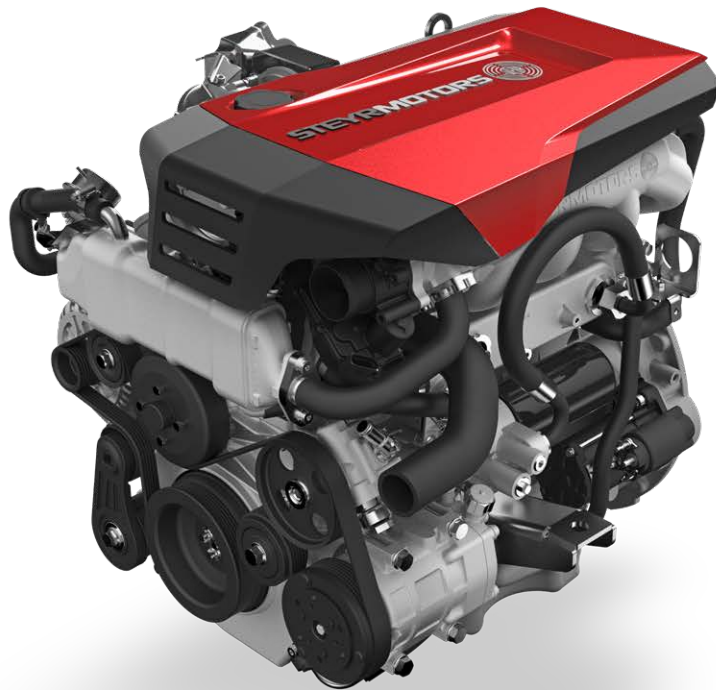
FEATURES

- 2-cylinder diesel engine combined with e-machine
- Nominal voltage range: 300 - 400 VDC
- Power output (electrical): 36 kW
- Compact and lightweight: 870 x 855 x 470 mm, 222 kg
- State-of-the-art Common Rail system for highest efficiency
- Different models available, compliant up to Stage V

	M12 UI	M12 CR
NUMBER OF CYLINDERS	2 in-line, horizontal	
INJECTION SYSTEM	2-stage Unit Injector	Common Rail
DISPLACEMENT (LT)	1.06	
RATED POWER (KW @ RPM)	26 @ 3050	up to 40 @ 3000
MAX. TORQUE (NM @ RPM)	95 @ 2550	136 @ 2550
MIN. FUEL CONSUMPTION (G/KWH)	240	218
DRY WEIGHT (KG)	104	90

M14 SERIES

4-CYL COMMON RAIL



4
CYLINDER



A COMMON RAIL WITH UNCOMMON ABILITIES

Passenger cars, light commercial, off-road and amphibious vehicles – the STEYR M14 CR is most versatile in its application. The series features robust and state-of-the-art components, enabling operation in tough ambient conditions while enhancing efficiency and NVH (noise, vibration and harshness).

The underlying Monoblock design allows for an unrestricted flow of coolant which enhances the engines resilience and at the same time provides a superior power-to-weight ratio. Fuel consumption is further improved with the advanced Common Rail injection system, even allowing for operation with varying fuel qualities. Based on an oil lubricated fuel pump even a selected multifuel capability is granted and the maintenance process is optimized.

PERFORMANCE AND EFFICIENCY HAND IN HAND

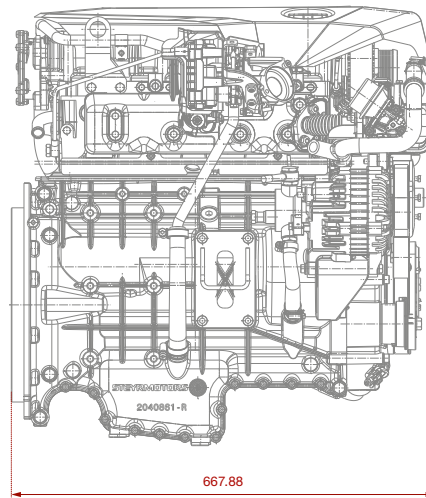
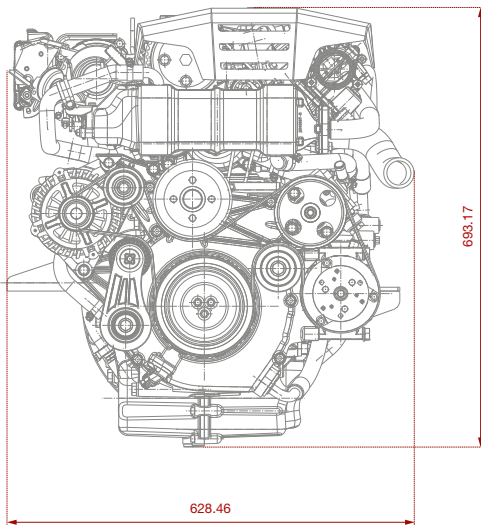
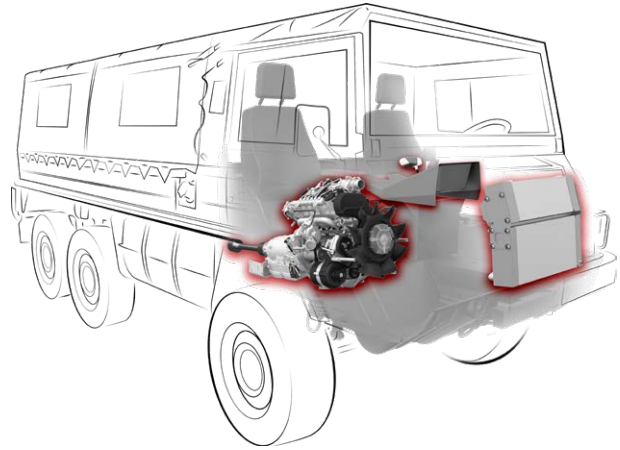
Refraining from downsized and universal solutions, STEYR MOTORS strives to find systems that satisfy real-world demands. Following this rightsizing approach, the engine's performance corresponds to the operational profile, while emissions and maintenance requirements are reduced. Based on a modular engine concept, further front-end accessories are available and configurations are easily adapted to meet your specific requirements.

FEATURES

- Lightweight Monoblock design with excellent water cooling
- Advanced Common Rail Technology
- Improved efficiency for higher range and/or lower fuel consumption
- Enhanced performance, highest robustness and durability

REPOWERING

The multitude of variations along with the compact design, make the M14 Series highly attractive for the repowering of valuable and well-used vehicles. A unique repower pack has already been assembled for the truly legendary Pinzgauer and Puch G. The set includes the M14 Common Rail with an NAG 1 transmission, cooling package, cable harness and other components. Well-adjusted, the vehicles' performance, efficiency and driving experience were improved considerably.



M14 CR	
NUMBER OF CYLINDERS	4 in-line, horizontal
INJECTION SYSTEM	Common Rail
DISPLACEMENT (LT)	2.1
RATED POWER (KW/HP)	85/116 - 120/163
MAX. TORQUE (NM)	300 - 340
MIN. FUEL CONSUMPTION (G/KWH)	210
DRY WEIGHT (KG)	205

M16 SERIES 6-CYLINDER ENGINES



6
CYLINDER



ONE CONCEPT – PLENTIFUL SOLUTIONS

Compared to other engines in this performance class from 135 to 225 kW, the M16 series is remarkably compact and lightweight in its design. The Monoblock is the proven basis and is key when it comes to the engine's durability and power-to-weight ratio. Made from highly tensile materials and optimized for an unrestricted flow of coolant, its robustness and resilience are increased enormously. Thus, maintenance intervals are extended significantly.



The 6-cylinder series offers a vast potential for variation, including surrounding housings, manifolds and auxiliaries as well as injection equipment. The proven Unit Injector (UI) system is appreciated worldwide for its reliability, particularly in challenging ambient conditions. Its well-known multifuel capability allows operation with various jet fuels and derivatives like JET A-1/JP-8, F-34, F-35, F-54, F-63 or F-65, in addition to standard diesel EN590.



Especially designed for STEYR engines, the Common Rail injection (CR) maintains its impressive durability and even provides selected multifuel capability. Supreme fuel efficiency and smooth operation are the most striking characteristics of the M16 CR. The oil-lubricated fuel pump is a particular highlight, allowing operation with varying fuel qualities, while additionally enhancing the maintenance process.

Both engine types are available with single or sequential charging systems and direct intercooling along with many variations for oil sumps, front-end accessory drives, and transmission flanges.

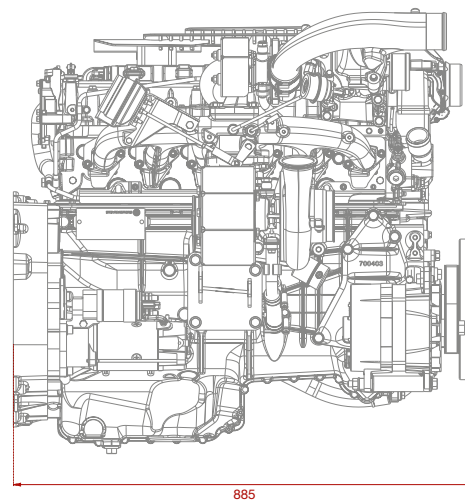
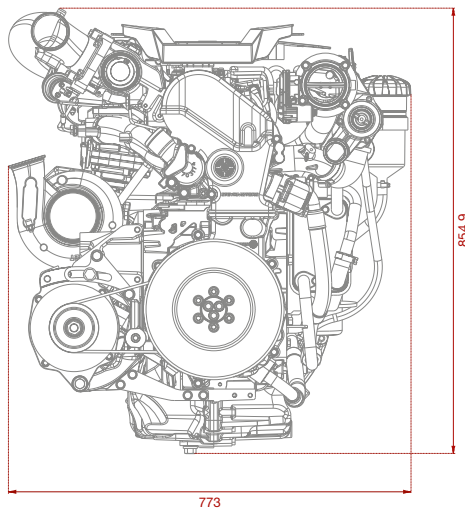
**SOPHISTICATED DESIGN
FOR A BIG RANGE OF TASKS**

Medium-duty vehicles, light protected vehicles, utility task vehicles, all-terrain vehicles or even hybrid trolley busses and special purpose aggregates – due to its adaptability the M16 series is suitable for an extensive range of applications.

Providing a similar form factor across a wide power range, the engine series is also highly attractive for fleet operators. Additionally, many interchangeable parts can be used over various models, thus supporting lean logistic practices.

FEATURES

- Monoblock design
- 6-cylinder DI diesel engine
- Unit injector or Common Rail Injection
- Sequential charging or single-stage intercooled charging
- (Selected-) Multifuel capability



	M16 UI	M16 CR
NUMBER OF CYLINDERS	6 in-line	
INJECTION SYSTEM	Unit Injector	Common Rail
DISPLACEMENT (LT)	3.2	
RATED POWER (KW/HP)	135/184 - 225/306	160/218 - 225/306
MAX. TORQUE (NM)	450 - 680	500 - 680
MIN. FUEL CONSUMPTION (G/KWH)	205	203
DRY WEIGHT (KG)	260 - 285	

FUTURE-DRIVEN PROPULSION SYSTEMS

FEASIBLE FOR EXTRAORDINARY APPLICATIONS

Throughout all classes of vehicles, there is a strong trend towards electrification of propulsion and power systems emerging. STEYR MOTORS has already built extensive competences in electrification of powertrains and state-of-the-art infrastructure to address this increasing demand for compact and efficient diesel-electric systems. Auxiliary Power Units, Gensets and Range Extenders have already been successfully realized on various performance levels. Thanks to our vast experience, we can make new projects into a reality at brisk turnaround, from light commercial, to off-road and heavy duty industrial applications.



RELIABLE AND COMPACT POWER SOURCE FOR HEAVY TASKS

Though usually big in size, even heavy duty vehicles are limited in space they have available. Both on rail as well as on road, STEYR MOTORS managed to integrate sophisticated diesel-electric solutions in very small compartment spaces, incl. e.g. cooling, power electronics, 6-cylinder engines and e-machines.

DIESEL POWER MODULE

- 180 kW ICE, 160 kW electrical power
- Compact module 1 x 1.3 x 1.7 m
- Two voltage levels 1800 V / 3600 V DC
- Emission Level Stage III B



RANGE EXTENDER FOR LIGHT COMMERCIAL VEHICLES

Especially within urban areas e-mobility picks up speed enormously and also commercial vehicles are urged to follow suit. Equipped with a STEYR 2-cylinder Range Extender, the vehicle's flexibility and reliability can be maintained, as this can continue to operate regardless of the charging level.

RANGE EXTENDER

- Nominal Voltage 300 – 400 VDC
- Electrical Power Output 36 kW
- Small packaging dimensions 870 x 855 x 470 mm
- Emission Level Euro V, Stage V, Tier 4 capable



ELECTRIC POWER IN DUST, MUD, SNOW

An increasing amount of onboard electronics, reliability of fuel supply, efficient and quiet operation are key factors for state-of-the art off-road applications like all-terrain vehicles (ATV), light tactical vehicles (LTV) or utility task vehicles (UTV). Range Extenders and APUs based on STEYR technology provide the maximum reliability for operation in challenging ambient conditions, in addition to their well-known multi-fuel capability.

AUXILIARY POWER UNIT (APU)

- M12 Unit Injector
- Rated Power 26.4 kW @ 3600 RPM
- Electric Power Output up to 20 kW
- Emission Level Stage III A



ENGINE PORTFOLIO

STEYR MOTORS strives for the highest levels of functionality and performance, particularly focusing on sustainable solutions to satisfy current and future demands and regulations. The portfolio is constantly extended, ensuring innovative systems that perform beyond expectation.



	MODEL	INJECTION SYSTEM	DISPLACEMENT (LT)	CHARGING SYSTEM
2 CYLINDER				
M12 UI	M12UI 26VTI	UNIT INJECTION	1.06	TCI
M12 CR	M12CR 40VTI	COMMON RAIL	1.06	TCI
4 CYLINDER				
M14 CR	M14CR 85VTI	COMMON RAIL	2.10	TCI
	M14CR 110VTI	COMMON RAIL	2.10	TCI
	M14CR 120VTI	COMMON RAIL	2.10	TCI
6 CYLINDER				
M16 UI	M16UI 135VTI	UNIT INJECTION	3.20	TCI
	M16UI 160VTI	UNIT INJECTION	3.20	TCI
	M16UI 180VTI	UNIT INJECTION	3.20	TCI
	M16UI 200SCI	UNIT INJECTION	3.20	SCI
	M16UI 225SCI	UNIT INJECTION	3.20	SCI
M16 CR	M16CR 160VTI	COMMON RAIL	3.20	TCI
	M16CR 180VTI	COMMON RAIL	3.20	TCI
	M16CR 200SCI	COMMON RAIL	3.20	SCI
	M16CR 225SCI	COMMON RAIL	3.20	SCI

* target value

PARTICULARLY
DEVELOPED FOR
VEHICLE
APPLICATION

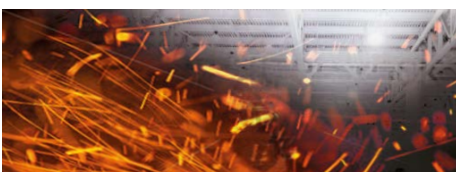
RATED POWER (KW/HP)	RATED SPEED (RPM)	MAX. TORQUE (NM @ RPM)	MIN. FUEL CONSUMPTION (G/KWH)	DRY WEIGHT
26/35	3050	95 @ 2550	240	104
40/54	3000	136 @ 2550	218	90
85/116	3600	300 @ 1800	210	205
110/148	3800	320 @ 1800	213	205
120/163	3800	340 @ 1800	204	205
135/184	3800	450 @ 2000	205	260
160/218	3600	500 @ 2000	205	260
180/245	3600	550 @ 1550 - 2550*	205	275
200/272	4000	610 @ 1550	205	285
225/306	4100	680 @ 2000	205	285
160/218	3600	500 @ 1800	203	260
180/245	3600	550 @ 1550 - 2550*	203	275
200/272	4000	610 @ 1550	203	285
225/306	4100	680 @ 2050	203	285



STRONG BASIS FOR NEW CHALLENGES

All engines of STEYR MOTORS are based on a well-proven Monoblock design, capable of meeting the strictest demands in operational reliability. Durability, safety and robust cooling behavior were the guidelines of the design and have resulted in an unrivalled product range of compact and lightweight high-performance diesel engines.

The STEYR Monoblock is a highly efficient single casting made from a special, high tensile alloy. Its key characteristic is a modular, compact design allowing for effective cooling through an unrestricted flow of coolant. The elimination of cylinder head warping and the reduction of mechanical and thermal forces within the Monoblock material lead to significantly improved durability and robustness of STEYR MOTORS' engines. Furthermore, due to the lack of cylinder head bolts and anchoring threads, the Monoblock design enables shorter, slimmer and more lightweight solutions.



VEHICLE

On-highway as well as off-road, and even in extreme ambient conditions, STEYR engines are the first choice when it comes to challenging requirements for a wide range of vehicles but also for auxiliary power units and custom power packs.

MARINE

STEYR marine engines are particularly designed and built for the use at sea and on inland waterways. Numerous certificates prove the engines' outstanding qualities for both commercial and pleasure applications.

ENGINEERING

In addition to our vast know-how and engineering expertise in the field of internal combustion engines, e-machines and hybrid systems, STEYR MOTORS provides a variety of testing services for engines and components.

INDUSTRIAL

Whether in logistics, agriculture or construction, there are many fields of application for STEYR MOTORS' engines and innovative power packs. Make every single kilowatt count with a solution that fits real-life demands and significantly increases efficiency and productivity.

SELECTED APPLICATIONS



- 1** LTV/ATV ENGINES
e.g. THALES HAWKEI
- 2** LTV/ATV ENGINES
e.g. KMW/RMMV AMPV
- 3** HYBRID SYSTEMS
e.g. NEOMAN Trolleybus
- 4** DIESEL-ELECTRIC GENERATORS
e.g. KMW LEOPARD 2
- 5** LTV ENGINES
e.g. BAE HÄGGLUNDS BV206
- 6** LTV/ATV ENGINES
e.g. UROVESA VAMTAC S3
- 7** AUX. DIESEL AGGREGATES
e.g. SIEMENS VECTRON
- 8** LTV/ATV ENGINES
e.g. GDELS MOWAG DURO I



See more applications on our website or contact us for further references.



VEHICLE ENGINES



MARINE ENGINES



INDUSTRIAL ENGINES



ENGINEERING



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