



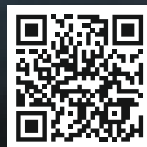
Marine Commercial, Yacht

SERIES 4000 M05

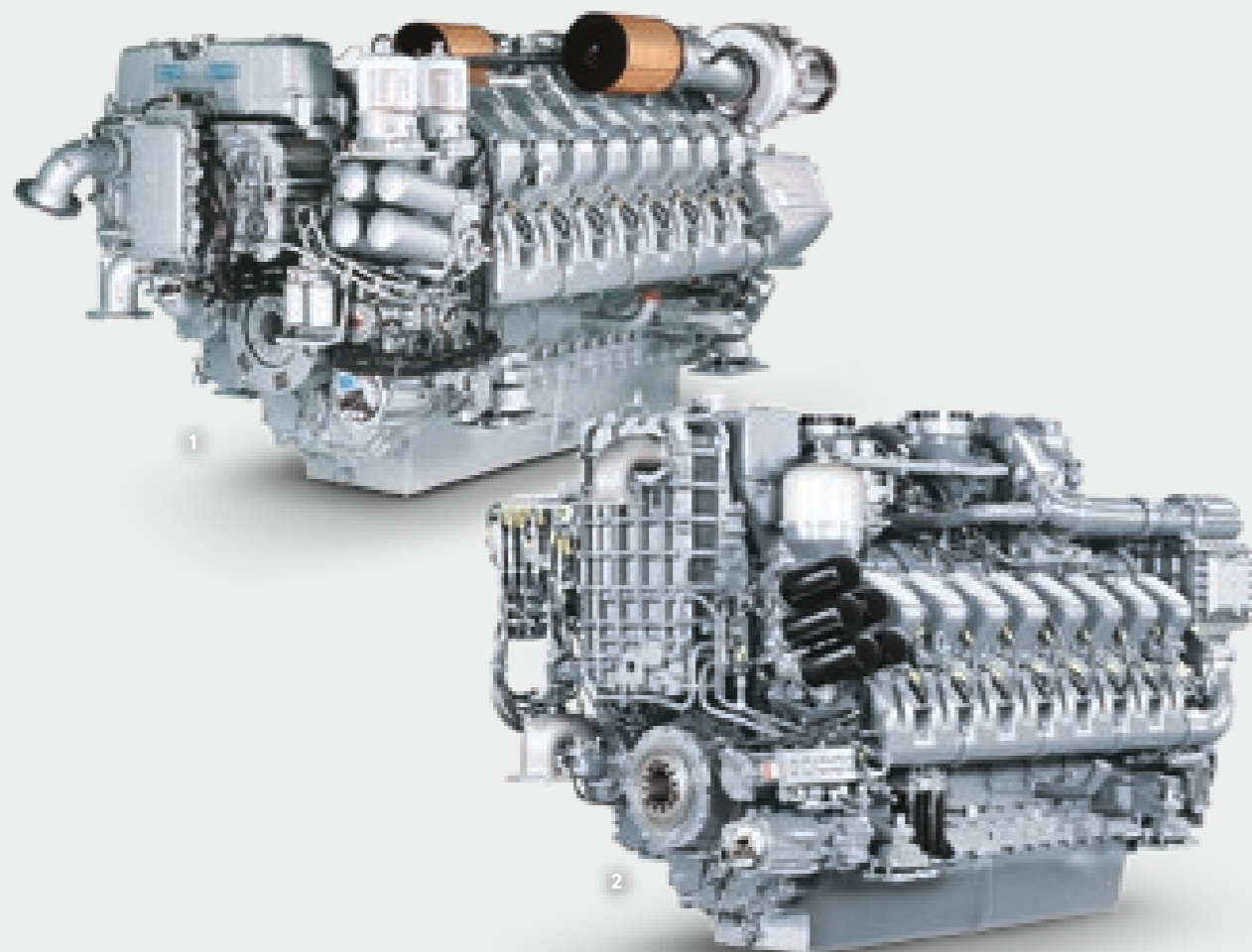
IMO II/IMO III/EPA TIER 4



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A Rolls-Royce
solution

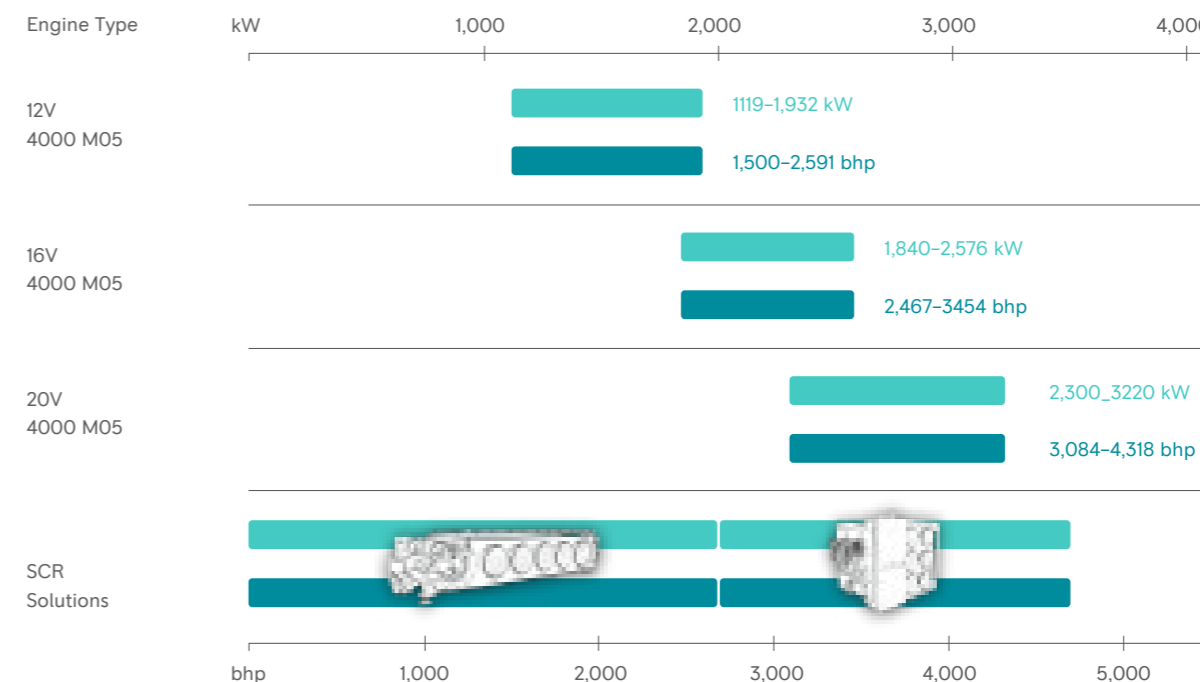
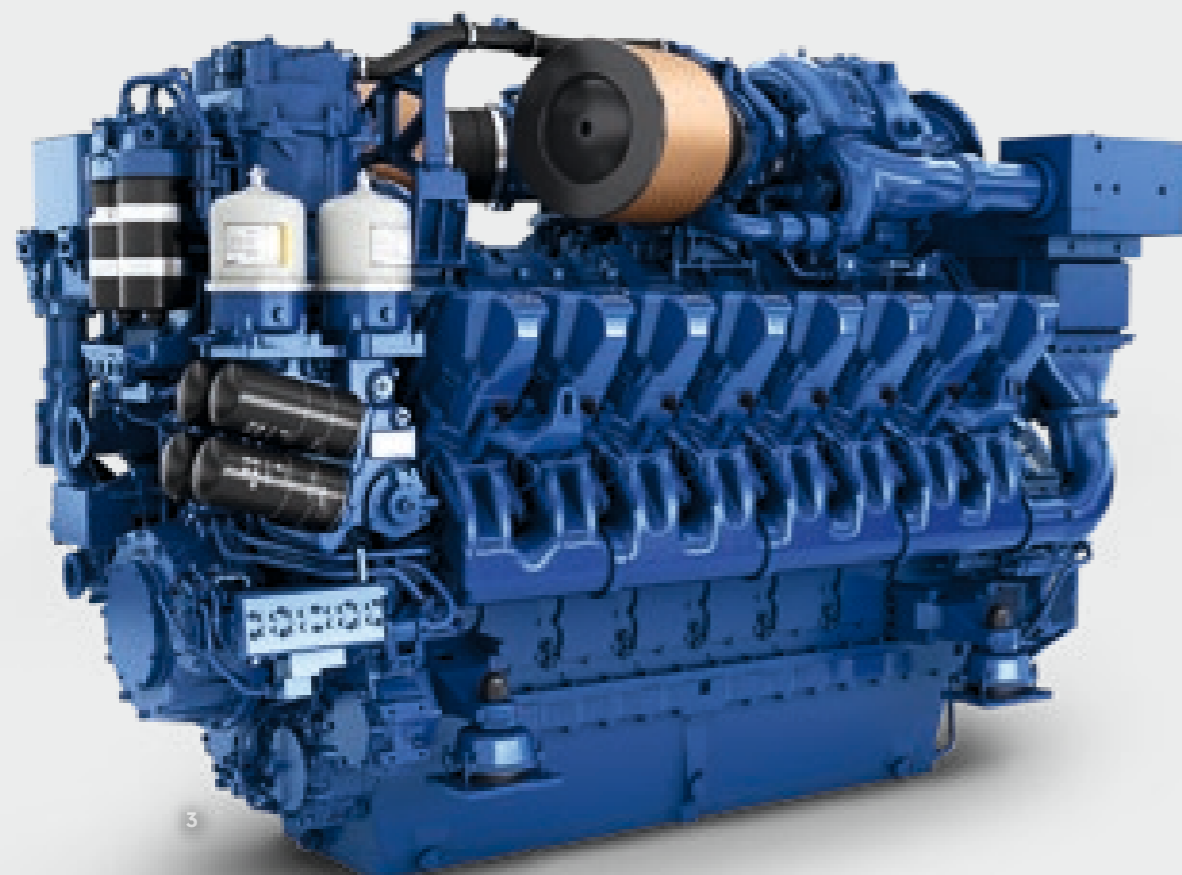


A LONGTIME PROVEN MARINE ENGINE - THE NEW SERIES 4000 M05.

More than 20 years ago, in 1996 the first Series 4000 marine engine was presented at SMM exhibition in Hamburg. Since then, the Series 4000 is trusted in numerous applications.

With more than 37,000 Series 4000 engines sold worldwide we gained experience from more than 180,000,000 operating hours which were directly fed into the development of the next generation of our marine workhorses. As an expert for tough applications like mining, oil&gas, rail and marine, we were always ready to go the next

step - ahead of everyone else. This is just as true today, as it was in 1996 when we introduced the first high speed diesel engine with common rail fuel injection. In 2016 we will be presenting the only high-speed diesel engine for tough workboat applications capable of up to 3220 kW (4318 bhp).



- 1 16V 4000 M00 - year 1996
- 2 16V 4000 M03 - year 2007
- 3 16V 4000 M05 - year 2016



IRONMEN engines to meet IMO II/III and EPA Tier 4 emissions regulations.

LEGENDARY. SINCE 1996.

The new Series 4000 M05

Our Series 4000 M05 for commercial marine applications is the latest marine engine of the powerful Series 4000 family. When designing the Series 4000 M05 we kept three topics always in our mind: Life-cycle-costs, performance and ease of maintenance.

We used our legendary IRONMEN engines as a basis but finetuned it with high attention to detail to maximize durability, performance and efficiency. Some examples: we changed the alloy of the piston ring to reduce wear. We also relocated fuel filters to grant optimal serviceability. Additionally the air filters are now integrated in the outline of the engine which makes the Series 4000 M05 even more compact. We used advanced simulation of the combustion process to reduce particulate matter inside the engine which makes the need for an additional DPF redundant. Only SCR is needed to fulfill IMO III and EPA Tier 4 emissions regulations.

Our experience and understanding of systems

We help customers to design and integrate the engine/SCR combination into their vessel design. During the design phase of any given individual propulsion- and onboard power generation systems, our engineers provide you with expertise and support that is unique anywhere in the world. No other company can match our reliable track record of offering complete propulsion solutions, spanning everything that's needed. It's this expertise that we gladly make available to you.

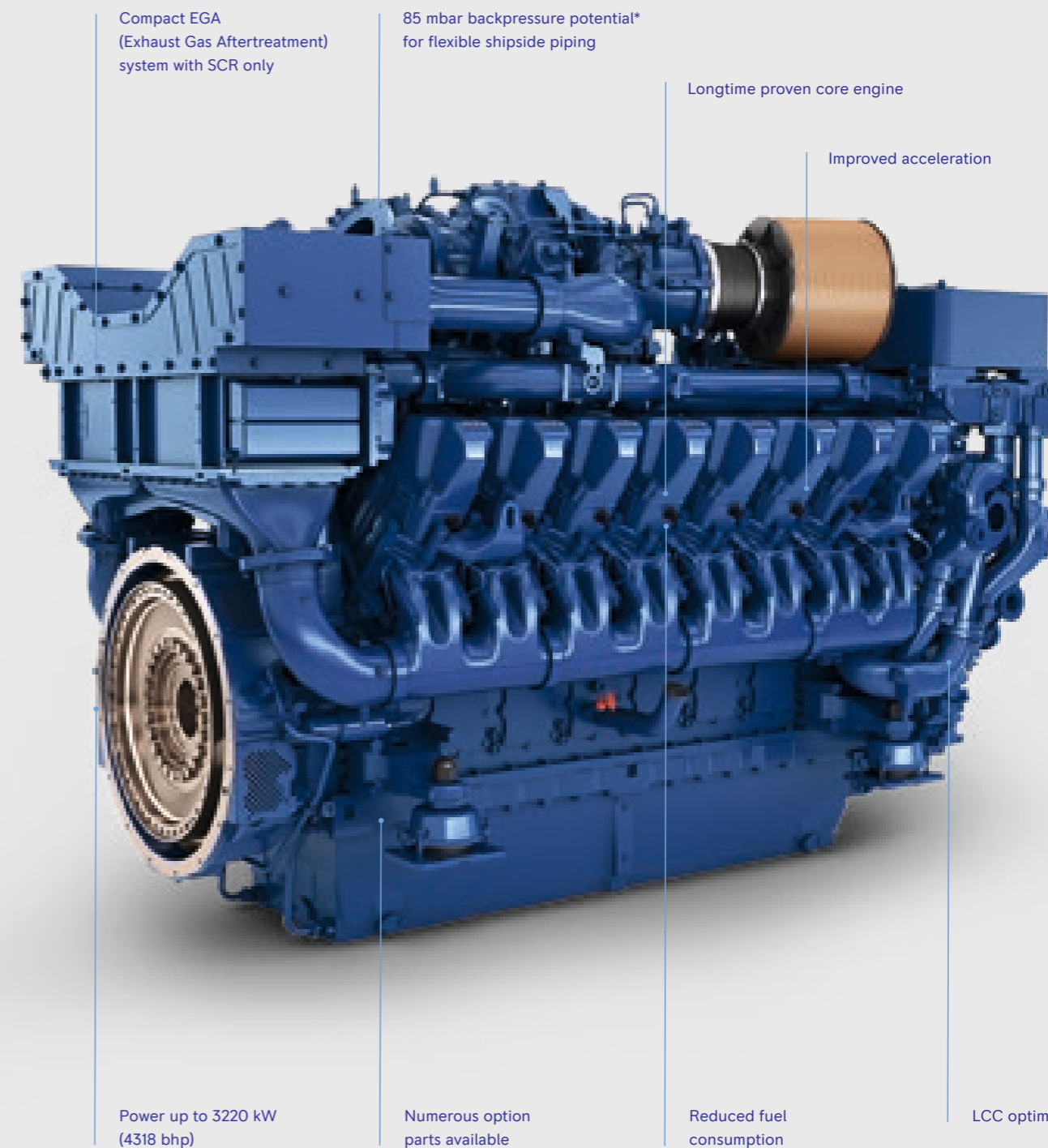
Range of diesel engines for main propulsion, on-board power generation and electric propulsion:*

Engine model		12V 4000 M05	16V 4000 M05	20V 4000 M05
Power Range	kW	1119 – 1932	1840 – 2576	2300 – 3220
	bhp	1500 – 2591	2467 – 3454	3084 – 4318
Rated Speed	rpm	1500 – 1800	1500 – 1800	1500 – 1800
Dry Weight (engine only)	kg (lbs)**	8000 (17637)	9300 (20500)	11600 (25575)
Displacement	l (cu in)	57.2 (3491)	76.3 (4656)	95.4 (5822)
Emissions Legislation***		IMO II / IMO III / EPA Tier 4		

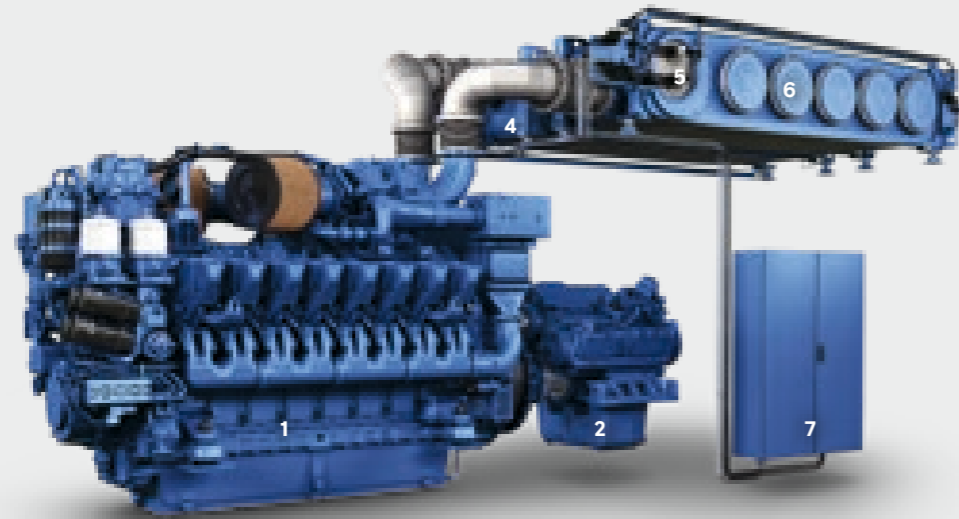
* for detailed information please see datasheet

** without coupling

*** IMO III/EPA 4 with SCR; IMO II mode available if operating outside emission controlled areas



* after SCR-System



LOW EMISSIONS. MAXIMUM FLEXIBILITY.

SCR solution

As installation space is always restricted inside the engine room, the inhouse developed airless SCR (Selective Catalytic Reduction) solution from us is compact and maintenance friendly. Besides easily accessible doors for replacement of the SCR catalysts, the system also features an integrated mixing pipe and dosing units. The integrated mixing pipe and DEF (Diesel Exhaust Fluid) dosing allows the shipyard highly flexible pipework between the engine and the SCR box. Additional space to fit the exhaust gas aftertreatment is reduced to a bare minimum. Amonia slip is prevented under all operating conditions by a closed loop regulated control system.

Besides the exhaust emissions related features, our SCR system also reduces noise.

SCR - the ideal solution for the marine world

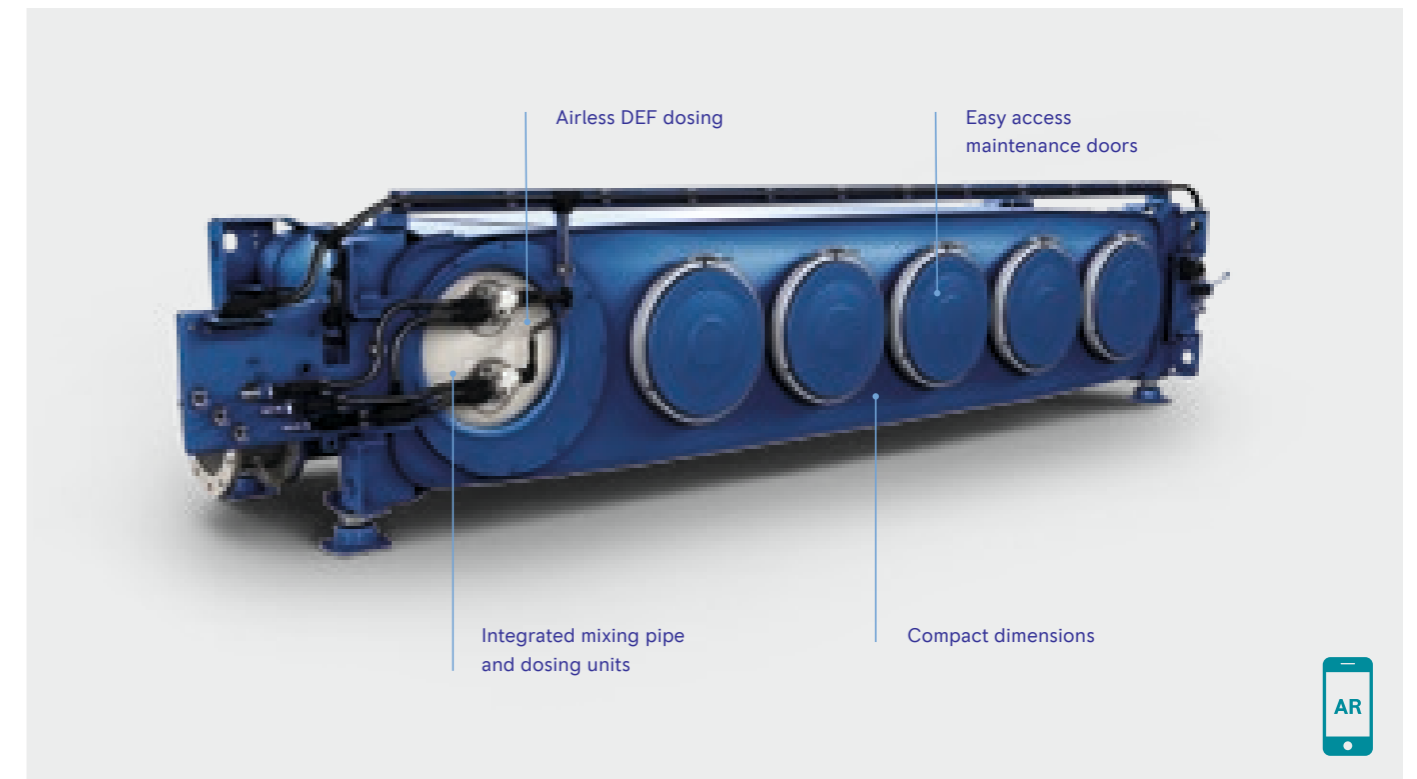
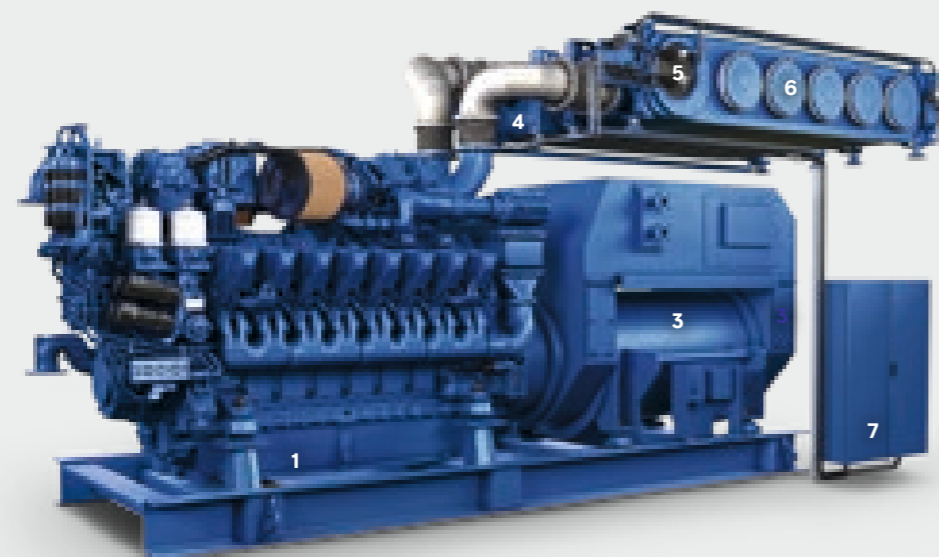
When using EGR (Exhaust Gas Recirculation) technology, the quality of the fuel is essential. Fuel with more than 15 ppm sulfur will lead to the formation of sulfur acid in the EGR cooling process. Sulfur acid will cause substantial engine failures over time. As many vessels operate worldwide, especially in the offshore service and supply business, we evaluate SCR as the preferred solution to maintain reliability of our engines and the safety of your vessel and crew. SCR technology allows operation with lower fuel quality.

Developing all major key technologies inhouse like, SCR, EGR, turbocharging and common rail fuel injection, means we are able to shape the ideal solution to meet IMO III and EPA Tier 4 emissions regulations. We treat EGR as the ideal solution for applications like mining or oil&gas onshore, but within the marine world we are convinced that SCR technology grants much higher availability and component lifetime.



Diesel mechanic propulsion solution or generator set with SCR box

- 1 Diesel engine
- 2 Gearbox
- 3 Generator
- 4 Mixing pipe
The integrated mixing pipe allows highly flexible piping between the engine and the SCR box and saves installation space.
- 5 Dosing units
The two DEF dosing units work airless and are integrated in the design of the SCR box.
- 6 Maintenance doors
The maintenance doors allow easy replacement of the SCR catalyst.
- 7 Cabinet
The cabinet houses the monitoring and control units as well as the DEF pumps.



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