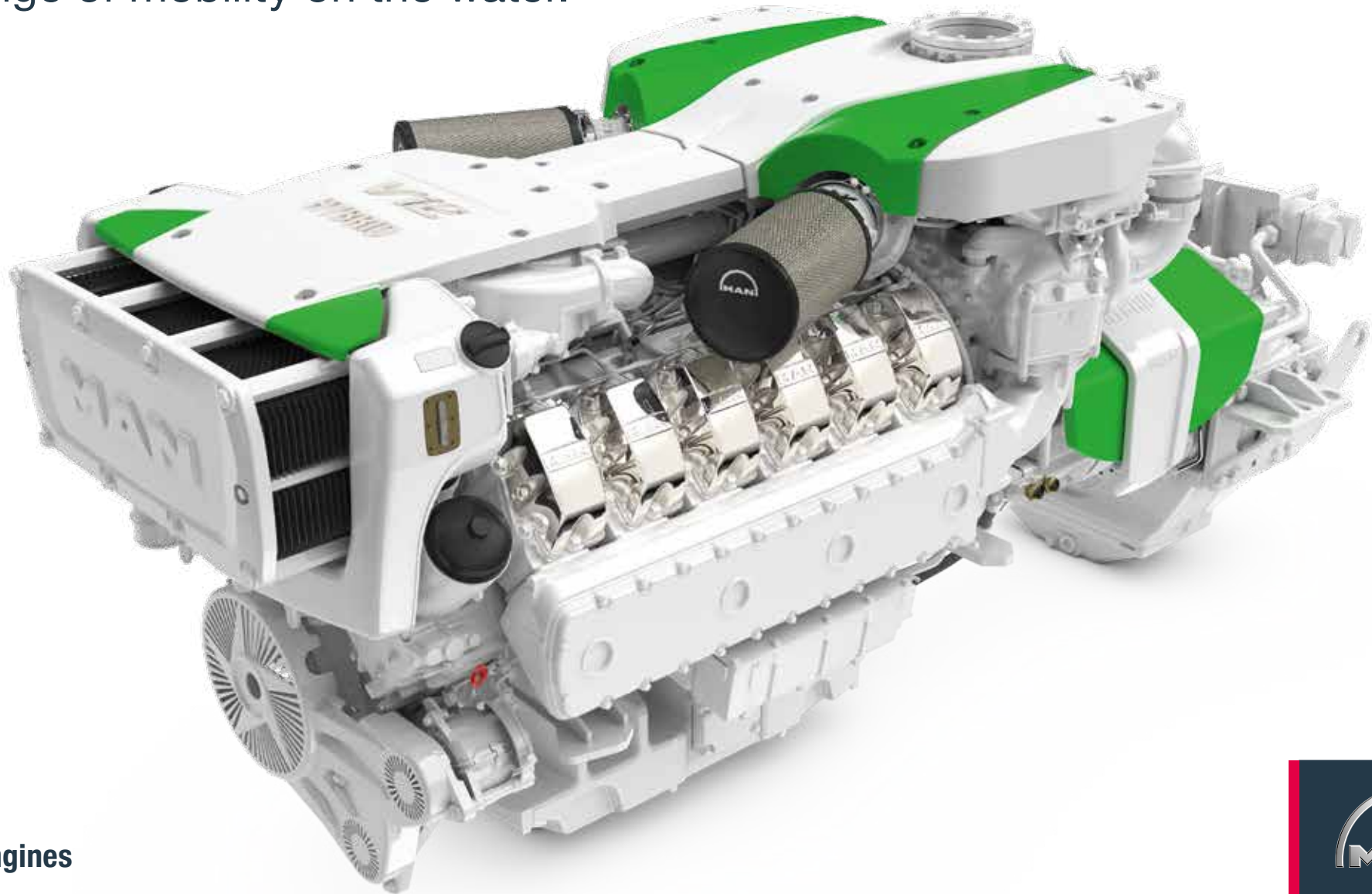


MAN SMART HYBRID EXPERIENCE.

Change of mobility on the water.



MAN Engines



A SINGLE SYSTEM SUPPLIER.

Perfect solutions from a single source: With the MAN Engines marine hybrid system, we are expanding the possibilities for designing marine propulsion systems. Our hybrid system is the solution for a wide variety of drive needs. Whether for yachts or workboats.

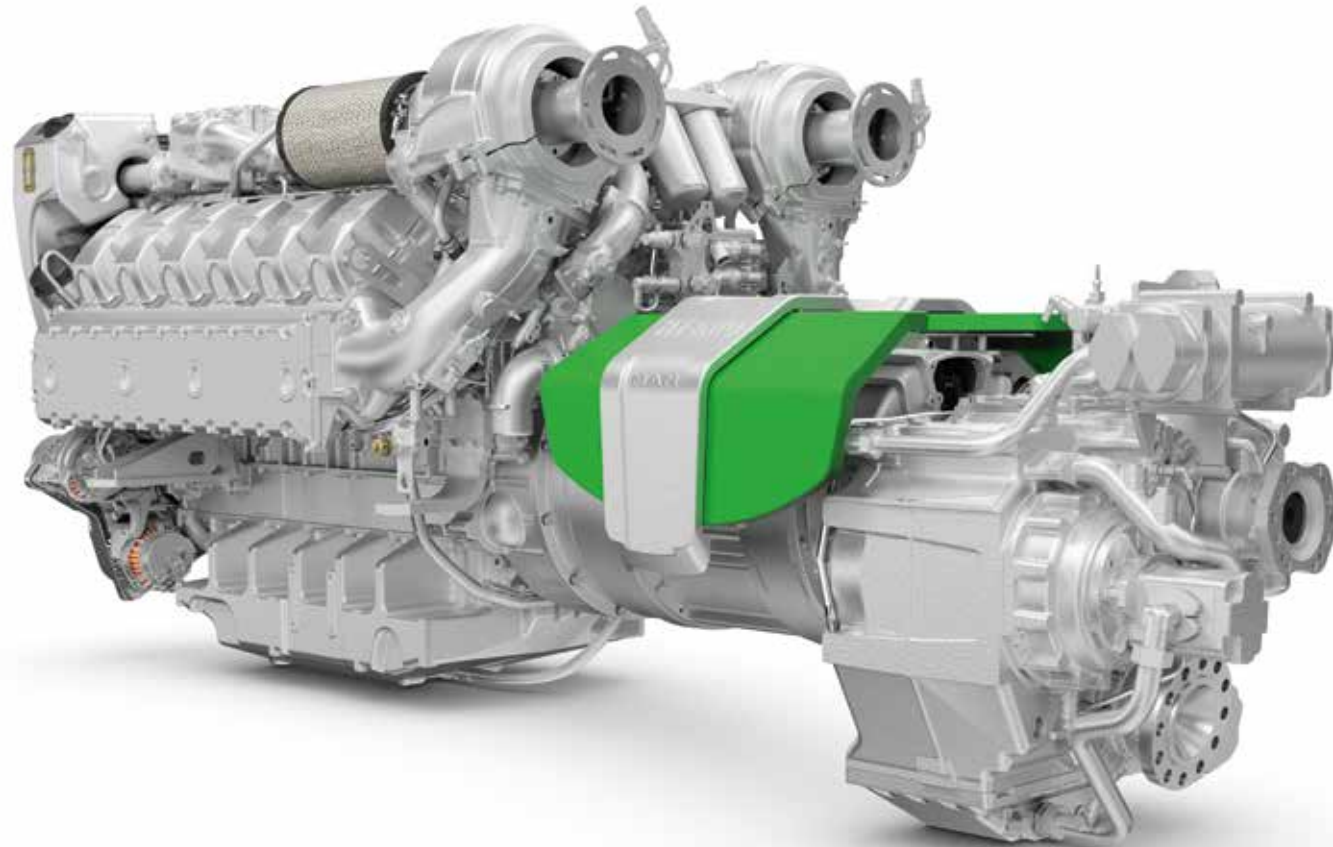
MAN Smart HYBRID Experience always offers the best drive solution. Through the versatile combination options with diesel engines and electric motors and components such as batteries and/or on-board gensets, the degree of hybridisation of the MAN Smart HYBRID Experience can be flexibly designed and optimised.

**LOW EMISSION AND ULTRAQUIET:
MAN SMART HYBRID EXPERIENCE.**

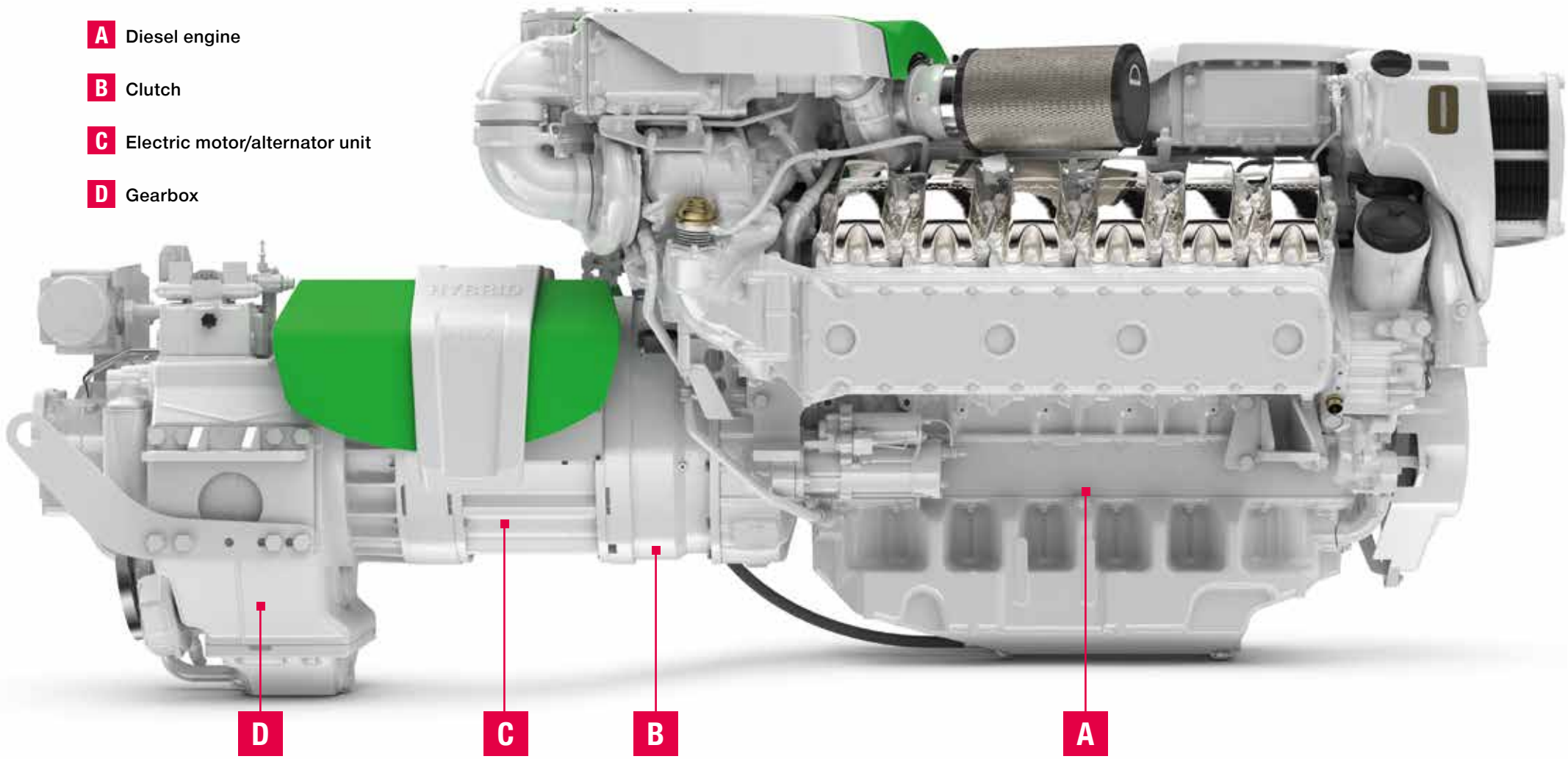
MAN HYBRID – THE DRIVE SYSTEM OF THE FUTURE.

Every yacht is a statement and every work boat is the expression of an individual requirements profile. This makes it all the more important for the beating heart of a yacht or boat – the drive system – to perfectly match your personal needs and wishes. With the hybrid system from MAN Engines, we meet your specific demands and can always offer you the ideal solution.

This is because, in addition to choosing the important and necessary operating modes for your application, you can also individually adapt the overall system to your needs. The MAN hybrid system is based on a modular concept. Its versatility makes it possible to combine the MAN main engines from all V12, V8, and i6 (D2862, D2868, and D2676) series with high-torque electric motors.




- A** Diesel engine
- B** Clutch
- C** Electric motor/alternator unit
- D** Gearbox



OPERATING MODES.

Select. Confirm. Done.

Hybrid driving couldn't be easier or more convenient: With the MAN Smart HYBRID Experience, you can switch between all operating modes without interrupting power. The MAN Smart HYBRID Experience automatically adjusts the engine speeds between conventional and electric drive modes. All you have to do is select the operating mode and confirm it. It can be that simple when the best of conventional drives is combined with batteries.

 Please scan and find out more about our numerous operating modes!



Benefits

- Individually configured operating modes
- Components matched to the respective mode
- Intuitive user interface
- Intelligent automatic synchronisation of the speeds of the conventional and electric drives
- Smooth shifting
- Fast response time in every operating mode



Zero-emission mode

No emissions and ultraquiet – in zero-emission mode, the energy for propulsion and electrical power consumption is provided exclusively by the battery. The battery can be charged in three ways:

- Land connection in the harbor
- Onboard generator sets
- Main drive engines

Benefits

- No noise or exhaust gas emissions
- No vibrations
- Access to emission control areas



Boost mode

In boost mode, the combustion engines and battery-operated electric motors work together and complement each other. If power is needed, the electric motor provides energy from its power reserves. Boost mode therefore offers the highest power density and permits maximum power output.

Benefits

- Maximum power combined with the advantages of a hybrid and zero-emission drive system



Diesel mode

In classic diesel mode, the drive energy is provided by the conventional diesel engine or diesel engines in multi-engine systems. In this mode, the electric motor runs without any function and no power is generated.

Benefits

- Established drive system
- Long range
- Accustomed flexible driving styles ranging from economical to sporty



Diesel-electric mode

In diesel-electric mode, the electrical power supply and drive power are provided by the battery and/or the available onboard generator sets. This saves fuel and reduces the load on the engine.

Benefits

- Low noise and exhaust gas emissions
- Low vibrations
- Efficient operation (low fuel consumption)



Cross-over mode

In cross-over mode, both drivelines are operated in different operating modes in a two-engine system. Here, one driveline operates in diesel mode, while the electric motor functions as a generator and supplies the electric power for the ship. In the second driveline, the diesel engine is disengaged so that the electric machine receives its energy from the first diesel engine. It operates in motor mode in this case and provides the drive energy.

Benefits

- Very economical operation
- Long range
- Low vibrations
- Extended operating time before service (TBO)



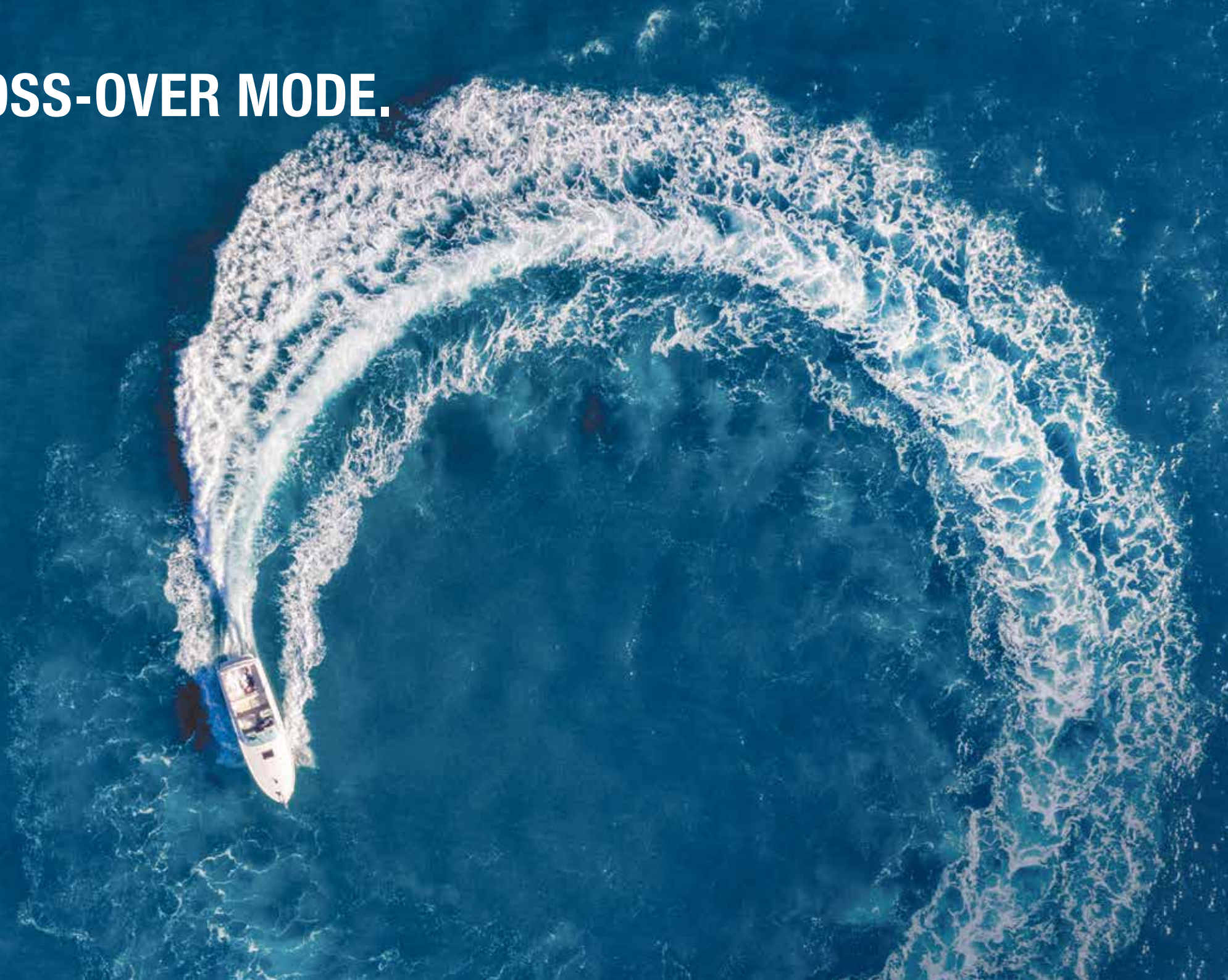
Hotel mode

In comfortable hotel mode, the power supply is provided only by the battery, and the diesel engines are switched off. The innovative technology ensures that power consumption is possible for an extended period without diesel engines. Independently of this, the batteries can be charged in parallel via a charging connection.

Benefits

- No noise or exhaust gas emissions
- No vibrations
- Full operational readiness without engines

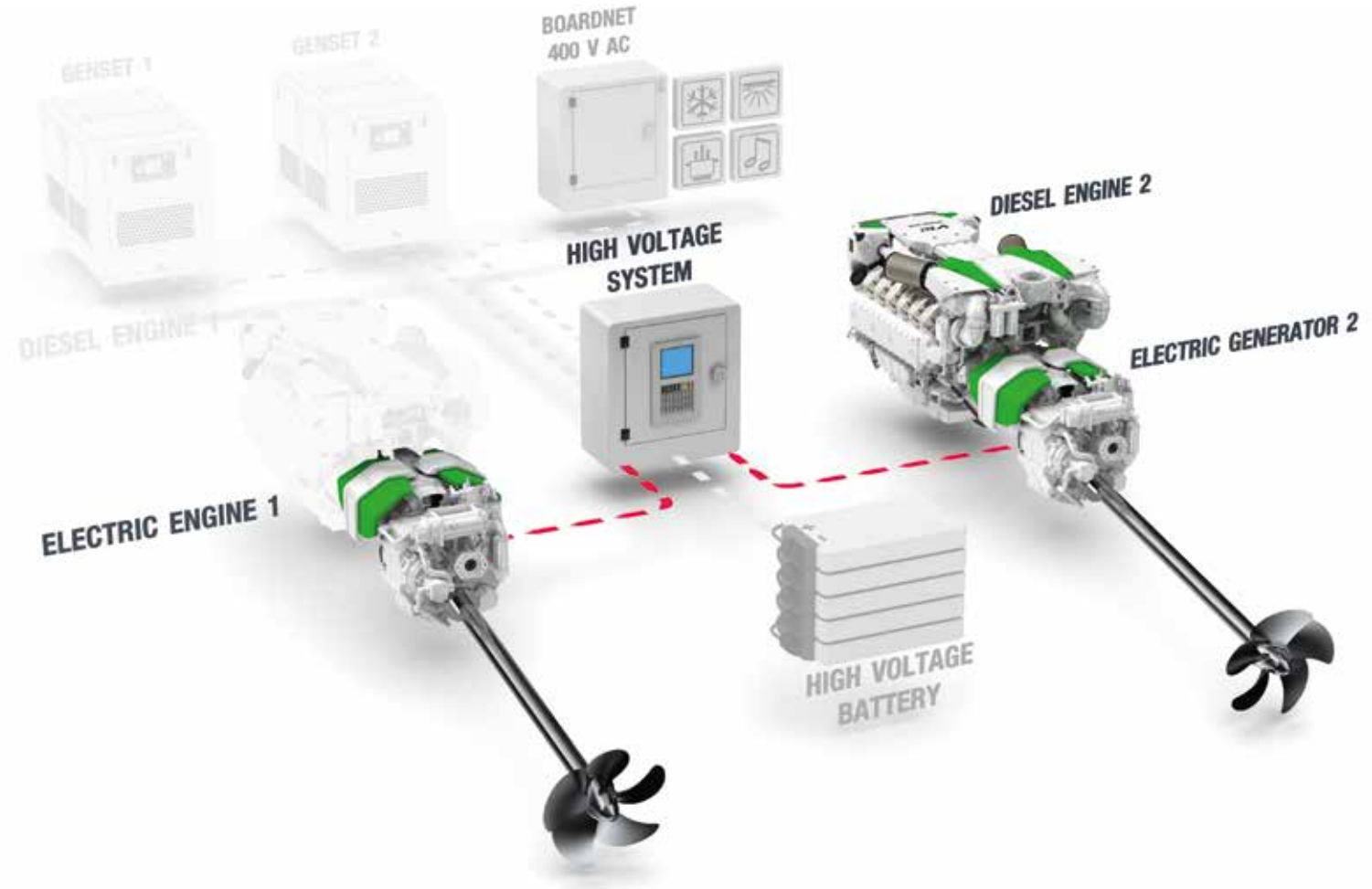
CROSS-OVER MODE.



Use different operating modes and maximise the economic benefit

In a two-engine system cross-over mode, both drivelines are operated in different modes. While one driveline is in diesel mode, the electric motor operates as an alternator and provides the electrical energy for the ship. In the second driveline, the main diesel engine is disengaged so that the e-motor receives its energy from the first diesel engine. It operates in motor mode and thus provides the drive energy.

Visible: All components for power generation
Partly visible: Optional components for power generation
Not visible: All components that are not needed for power generation



UNIQUE HYBRID DRIVE SOLUTIONS FOR YACHTS.

The hybrid system from MAN Engines allows you to experience unlimited freedom on the oceans and enjoy the advantages offered by the optimal combination of powerful combustion-engine technology with quiet and highly efficient electric drive systems. No matter which configuration you finally choose, whether performance, comfort, or efficiency, you always benefit from reduced emissions, lower vibrations, ultraquiet operation and sustainably increased efficiency and dynamic response together with plenty of comfort.



Performance – Pure emotion and untamed power.

Would you like a little more? No other 12-cylinder engine offers a higher power density than the MAN V12-2000. Thanks to the modular design, all V8 and i6 engines can be easily combined with the electric drive in addition to the V12. In the performance configuration, the compact overall systems are designed to offer the perfect balance between power and hybrid capabilities. This means that you benefit at all times from a flexible driving style, from economical through to extremely sporty.

Comfort – First-class and practically silent driving experiences.

Our comfort system configuration offers quiet and zero-emission driving, precise maneuvering, and onboard power without any noise or exhaust emissions. These characteristics are accompanied by minimum vibrations at a level that sets new benchmarks compared with conventional drive systems. Glide gently over the water in zero-emission mode – this mode is practically silent and without emissions and vibrations. In Hotel mode, you can drop anchor in a completely relaxed way, enjoy the peace and silence, and still have full electric power available.

HYBRID DRIVE SOLUTIONS FOR COMMERCIAL VESSELS.

With the innovative and modular hybrid system from MAN Engines, you can sustainably reduce your emissions and achieve lower operating costs while at the same time benefiting from maximum operating convenience. Depending on your application needs, you can individually configure your MAN Engines hybrid system with the focus on efficiency or performance.



Performance – Maximum power when it is needed.

Higher performance, lower emissions. The compact MAN Engines hybrid system combines the advantages of a conventional diesel engine with the additional power reserves of the electric motors. That means absolute power exactly when it is needed as well as a dynamic driving style that is gentle on the engine.



Efficiency – Greater efficiency, lower costs.

Efficiency is part of the DNA of the marine engines from MAN Engines. This is more evident than ever before in our compact hybrid system. In the efficiency system configuration, for example, the complete driveline is consistently modified to achieve long ranges and economical operation. In the diesel or crossover driving modes, the efficient diesel engine always runs at its optimum operating point and is automatically supported by the electric motor when needed. This does not just save fuel, but also permits low-load and low-wear operation of the driveline, which in turn makes it possible to extend the service intervals. The high torque plateau ensures efficient operation in all three operating modes available in the efficiency system configuration.

MAN ENGINES – YOUR PARTNER FOR INNOVATIVE MARINE HYBRID SYSTEMS.

One system from a single source

From the planning and concept phase to development and technical implementation through to service and maintenance – MAN Engines supports shipyards and ship designers from the idea to realization to after-sales service. As a renowned system supplier, our experts at MAN Engines support you in choosing the perfect configuration of complex components such as diesel engines, electric motors, as well as batteries and power electronics.

Scalable solutions

With its traditional diesel engines, MAN Engines already offers a very wide range of solutions for yachts and working boats, ranging from the i6 through to V8 and V12 engines. Innovative electric motors complement the MAN hybrid system. We also offer you maximum flexibility in designing your drive concepts, so that you always benefit from the choice extending from low power output through to the top-of-the range engine power when equipping a product series.

Operating modes based on requirements

Thanks to the flexible combination of diesel engines with electric motors, which are combined in turn with batteries and/or onboard generator sets, it is possible to realize an individual level of hybridization that is optimally tailored to your needs. Depending on the required operating modes, the MAN hybrid system can be configured with the focus on efficiency, comfort, or performance.





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