OSV and workboat

MAN Energy Solutions
Future in the making

Highly reliable engine solutions
MAN Energy Solutions is the world’s leading provider of large-bore diesel engines, turbomachinery, and integrated power systems. We make four-stroke and two-stroke engines for marine and stationary applications, turbochargers and propellers, gas and steam turbines, compressors, and chemical reactors.

Our marine systems expertise is focused on emission reduction, complete propulsion packages, electric propulsion, dual fuel, LNG, and digitized services.

Many years of experience ensure that our innovative marine engines and systems are ideally suited to your business operations, both offshore and in harbors.
Focused on your business

Reliability in the face of new challenges

As the demand for energy continues to grow, drilling operations are moving into deeper waters in search of resources. When the large ships that transport and consume this fuel come into port, they need more powerful tugs. New opportunities are arising for offshore and harbor operators to increase their profits.

Offshore vessels require highly reliable and efficient propulsion systems that easily adapt to heavy seas, harsh environments, and low-load operation. They often have to meet strict emissions regulations.

Engines that keep your business running

Our engines are reliable, compact, safe, and clear in design. They are made to keep your business running smoothly, with a long TBO (time between overhauls), high HSE (health, safety, and environmental) standards, and easy maintenance.
Four-stroke engines for OSV and workboats
<table>
<thead>
<tr>
<th>Engine Type</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>MAN 21/31</td>
<td>GenSet</td>
</tr>
<tr>
<td></td>
<td>1,000 – 1,980 kW</td>
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<td>7,200 – 12,000 kW</td>
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### AHT / AHTS

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### PSV

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<tbody>
<tr>
<td>MAN L21/31</td>
<td>1,290–1,935 kW</td>
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<td>MAN L21/31 GenSet</td>
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### Tugs

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### Multi-purpose support vessels

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Anchor handling tugs (AHT) and anchor handling supply vessels (AHTS) complete a wide range of jobs, such as high-powered towing, delivering supplies to rigs, and emergency rescue operations. All these tasks have to be performed with reliability.

**Flexible performers**

Versatile vessels need versatile engines. On an AHT, you want high propulsion power for transit but significantly lower power for dynamic positioning mode and station-keeping. And sometimes you require high power very quickly.

Low SFOC (specific fuel oil consumption) is essential for the charter and oil businesses which want to work with companies that have a green profile. Other specific requirements can include accommodation for up to 60 people, high winch capacity, and subsea construction capability.

Our engines cover all these needs as well as complying with new international regulations such as IMO and MARPOL.
Good for business
Heavy-duty propulsion and maneuvering power are the core of the MAN L27/38’s performance characteristics. This solid and reliable engine delivers good performance over the entire load range with quick acceleration and immediate load response.

The proven reliability of this engine ensures long times between overhauls and no unscheduled maintenance or repair work. Additional economic benefits are derived from its low fuel and lube oil consumption – while fulfilling legal emission limits. Noise and vibration levels are also reduced, providing comfort to the crew.

Benefits

Reliability in operation
Solid and compact design

Long times between overhauls
32,000 hours

Low fuel and lube oil consumption
Thanks to efficient fuel injection

Propulsion package

The MAN L27/38 is available as part of an integrated package including reduction gearbox, shaft line, propeller, and control system. This has notable advantages for both ship builders and operators with excellent results in terms of operating economy, reliability, durability, and predictable service intervals.

Power take-off (PTO)
100 % PTO is possible from either end of the engine and additionally a small 50 kW PTO is optionally available on the front-end box for driving a seawater pump or similar.

Jet assist
This device supports rapid acceleration in partial-load operation. Compressed air is blown onto the compressor wheel of the turbocharger. The charge air pressure is increased and the maneuvering characteristics are improved.

Further power solutions
MAN 175D
MAN 32/44CR
Reliability in challenging conditions
Platform supply vessels (PSV) transport cargo and crews to offshore oil rigs and platforms. They can also be adapted for a variety of offshore support operations, such as subsea surveys, flexible pipe laying or repairs.

The need for exceptional load response

One of the challenges for PSV engines is operating at very low load while keeping position near the rig. On the other hand, high-load operation is necessary when in operation and in transit. Some engines have to cope with very cold climates, for example on exploration missions in Arctic waters. And in terms of getting a return on one’s investment, low SFOC and long TBO are very desirable life-cycle cost qualities.

All in all, the platform supply business depends on very special engines.
Dynamic and cost-effective

MAN 175D
Designed for extreme robustness, first-rate reliability, and maximum efficiency, the MAN 175D offers not only high speed but also a rapid return on investment. This powerful and compact engine provides outstanding SFOC and long TBO.

Benefits

Environmentally friendly
Full IMO Tier III compliance in combination with MAN SCR

Advanced and robust
Cutting-edge technology based on many years of experience

Economical in many ways
Low OPEX and life-cycle costs

Compact performer

With its quick load response, the MAN 175D allows safe maneuvering in the harshest environments, even in Arctic temperatures. It is ideal for economical operation in platform supply vessels. Easy accessibility enables a long service life, while the small size of the engine allows more space for cargo.

Clear-cut design
A functional design with the minimum weight and dimensions. Easy to commission, easy to operate, and easy to service.

Modular concept
For easy adaptation to different applications, the MAN 175D can be configured with auxiliary equipment and modular components, such as a seawater cooler. It has four auxiliary power take-offs (PTOs).

Further power solutions
MAN 21/31
MAN 21/31 GenSet
MAN 27/38 GenSet
MAN 175D GenSet
MAN 27/38
Robustness you can build on OCV/WIV
Offshore construction vessels (OCV) are very special vessels needed for building offshore structures like oil rigs, laying underwater pipes, and installing subsea systems in deep waters. Windfarm installation vessels (WIV) specialize in windfarms. OCVs are sometimes involved in well intervention and drilling, and have to withstand the harshest of conditions.

Reliable and economic operation

As well as transporting construction equipment and structures, OCVs often store large quantities of liquids or dry substances under deck and can have a deck load capacity of up to 9,000 tons. Some have moon pools and cranes for support work.

Owners and operators are looking for low-speed operation to ensure long engine life, low wear rates, minimum downtime, easy and efficient maintenance, and fuel economy. Our engines deliver.
Excellent load response

MAN 32/44CR GenSet
The flexibility of the common rail injection system allows the fuel consumption and emissions of the MAN 32/44CR GenSet to be optimized according to its operation profile. The engine easily matches different load profiles and provides excellent load acceptance.

The MAN SaCoS\textsubscript{one} management system can detect a load increase at an early stage and improves the load response of the engine significantly by activating a boost injection in the common rail control.

Benefits

**Highly efficient common rail technology**
Outstanding low-load capabilities and low fuel consumption

**Low exhaust emissions**
Complies with IMO Tier II and IMO Tier III (with optional MAN SCR)

**Low operating costs**
Thanks to SFOC savings due to the in-house development of MAN ECOMAP

**MAN 175D GenSet:**
**Compact powerhouse**
Packing state-of-the-art technology into a minimum volume, the MAN 175D GenSet is the perfect complement to the MAN 32/44CR: Easy to commission, easy to operate, and easy to service.

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**Common rail injection system**
Advanced electronic fuel injection system allows injection timing, duration, and pressure to be flexibly set for each cylinder. The optimized match for each load results in low SFOC/OPEX.

**Boost injection**
This is a special patented feature for common rail engines. It provides a temporary increase of injection pressure and change of injection timing in the event of load steps.

**MAN ECOMAP**
MAN ECOMAP is a software feature for our electronically controlled engines that allows the engine to be programmed to run according to different SFOC/power characteristics, each of them having optimum efficiency at different load points.

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**Further power solutions**
**MAN 175D GenSet**
Small but strong Tugs
Global growth in marine transport has brought larger vessels and an increase in the volume and complexity of harbor traffic, prompting the development of larger, more powerful tugs for ship assistance and harbor operation.

Clean and flexible engines for hard-working boats

Harbors are environmentally sensitive areas and emission requirements are strict in terms of NOx and particulate matter. Modern tugs require cost-efficient engines with great adaptability to various propulsion systems. The operation profile of a tug could be described as a “sleeping bear” – many hours of standby interrupted by full power demand on all engines.

Some ocean-going tugs serve as icebreakers or salvage boats. Small crews mean easy maintenance is a must. That’s never a problem for our engines.
Ready for business

MAN 27/38
This well-known engine is designed for solid, reliable operation with no unscheduled maintenance or repair work, and long TBO. The MAN 27/38 is equipped with jet assist, which boosts the turbocharger speed if sudden load peaks occur, for rapid and smoke-free load increases.

Benefits

**Reliability in operation**
Long time between overhauls and no unscheduled maintenance

**Low fuel and lube oil consumption**
While fulfilling legal emission limits

**Convenient power take-off (PTO)**
100 % PTO from either end of the engine plus optional 50kW PTO

Environmental compliance

The MAN 27/38 engine is compliant with the limits specified in Tier II of the emissions legislation of the International Maritime Organization (IMO). It can achieve full compliance with IMO Tier III in combination with the MAN selective catalytic reduction.

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**Efficient fuel equipment**
Including high injection pressure and good atomization for optimal charge air mixture – even at partial load.

**Genuine propulsion package**
A risk-minimizing concept with built-in system responsibility that is suitable for current and future propulsion requirements. Includes all core elements of the propulsion system – such as main engine, reduction gearbox, shaft line, propeller, and control system.

**Further power solutions**
**MAN 175D**
The specialist talents of the ocean

Multi-purpose support vessels
The label “multi-purpose” covers a wide range of specializations. These vessels commonly support diving operations and structure maintenance, and provide general assistance in the offshore industry. Often, they are adapted with special equipment for fire-fighting safety standby, emergency evacuations, and rescue operations.

Adapting to the circumstances

Multi-purpose support vessels can be customized for operations and construction work on the seabed and sometimes have sophisticated features such as a helideck and foundations for heave-compensated offshore cranes and A-frames.

Dynamic positioning is an important requirement, together with environmental friendliness and fuel economy. These are all factors that are taken into account by our engineers and displayed by our engines.
Compact and powerful

MAN 175D
The MAN 175D is compact, reliable, and efficient—properties that are essential for working vessels to allow safe maneuverability in the roughest weather conditions.

Easy to operate and easy to service, this high-speed engine packs the latest technology into a very small volume and offers four auxiliary power take-offs (PTOs).

**Benefits**

**Silent operation**
For comfort

**Environmentally friendly**
Full IMO Tier III compliance in combination with MAN SCR

**Dynamic positioning ability**
For lower fuel consumption and costs

An investment in the future

The engine is designed to meet emissions standards, without compromising on efficiency or performance. The compact, modular MAN SCR exhaust gas after-treatment system makes the MAN 175D an eco-friendly, sustainable choice with the lowest emissions at maximum efficiency.

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**Compact design**
Smallest footprint in its power range.

**Engine control system**
Based on the modular concept for low and easy maintenance, this is an internal development using well-proven MAN standards of robustness, reliability, and safety.

**Turbocharger technologies**
This is a key area of expertise of MAN Energy Solutions. The single-stage turbocharging is simple and easy to maintain, compared to more complex sequential turbocharging. It was specially developed for the MAN 175D and consequently provides highly efficient performance with a very wide operating range.

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**Further power solutions**
- MAN 21/31 GenSet
- MAN 27/38 GenSet
- MAN 175D GenSet
- MAN 27/38
- MAN 32/44CR GenSet
- MAN 32/44CR
Battery hybrid marine solutions

Flexibility and maximum efficiency optimally combined

In a hybrid system, mechanical and electric power work together in the propulsion train, optimizing the propulsion efficiency for ships with a flexible power demand. The combination of mechanical power delivered by diesel engines and electric power provided by electric motors ensures the ship’s broad operational capability, providing the right amount of power and torque to the propeller in each operation mode. A hybrid propulsion system is better prepared for changes in operation during the vessel’s trip or even the vessel’s lifetime.

MAN Energy Solutions provides fully tailor-made hybrid propulsion solutions. All components such as the main engines, gensets, switchboards, converters, electric motors, gearboxes, and propellers are individually designed.

Benefits
- Large variation of operation modes
- Flexible power demand with fast system responses and high system flexibility
- The propeller can be driven by the diesel engine, and/or by the electric motor
- Highly redundant and reliable propulsion system
- High system efficiency over a wide range of operation modes
- Fuel oil consumption is lower, and fuel-related emissions like SOx and CO2 are also reduced
MAN PrimeServ

Service with passion

MAN PrimeServ is the dedicated MAN Energy Solutions service brand. Via a network of over 100 service centers worldwide, MAN PrimeServ provides 24/7 service across the globe. Our range of services includes technical support, consulting, and OEM spares, as well as maintenance, repair, and comprehensive individualized service plans.

365 days a year
24 hours a day
MAN PrimeServ provides:

- Prompt delivery of high-demand OEM spare parts within 24 hours
- Fast, reliable, and competent customer support
- Individually tailored O&M contracts
- Ongoing training and qualification of operators and maintenance staff
- Global service, 24 hours a day, 365 days a year
- Diagnosis and troubleshooting with our high-performance online service
Worldwide service

We offer retrofitting and upgrade services to bring engines and turbochargers already in service up to the very latest standards of performance and efficiency.

Using the latest digital technology, we enable you to maximize the performance and availability of your MAN equipment by accessing real-time data analysis, remote support, and rapid solutions. We also offer an extensive range of training courses at MAN PrimeServ Academies around the world.

Our service does not vary according to location. We know that a vessel may be built in Asia, operated in Europe for ten years, and then move to Africa for the next ten years. That does not alter our focus on dedicated training, fast delivery of strategic spare parts, a comprehensive approach, or our tailored maintenance contracts.

For more information, please visit www.man-es.com/services
100 service centers worldwide
Get your engines started ...
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