Highly reliable engine solutions

OSV and workboat

MAN Energy Solutions
Future in the making
Future in the making

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, electrical 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 adapt easily 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 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>Model</th>
<th>Type</th>
<th>kW Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAN 175D</td>
<td>Propulsion</td>
<td>1,499 – 3,700</td>
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<tr>
<td>MAN 27/38</td>
<td>Propulsion</td>
<td>2,040 – 3,285</td>
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<tr>
<td>MAN 21/31</td>
<td>GenSet</td>
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<td>MAN 32/44CR</td>
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<tr>
<td>MAN 175D</td>
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</tbody>
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**MAN Energy Solutions**

OSV and workboat
### Anchor Handling Tugs (AHT) and Anchor Handling Supply Vessels (AHTS)

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
<th>Engine Type</th>
<th>Power Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHT/ AHTS</td>
<td>8–11</td>
<td>MAN L33/38</td>
<td>2,840–3,200kW</td>
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<td></td>
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<td>MAN V175D</td>
<td>1,499–3,700kW</td>
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<tr>
<td></td>
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<td>MAN L32/44CR</td>
<td>3,600–6,000kW</td>
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<tr>
<td>PSV</td>
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<td>MAN L21/21</td>
<td>1,994–3,030kW</td>
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<td></td>
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<td>MAN L21/31 (GenSet)</td>
<td>1,994–3,030kW</td>
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<td></td>
<td></td>
<td>MAN V175D (GenSet)</td>
<td>1,440–3,200kW</td>
</tr>
<tr>
<td>OCV/WIV</td>
<td>16–19</td>
<td>MAN V175D (GenSet)</td>
<td>1,440–3,200kW</td>
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<tr>
<td></td>
<td></td>
<td>MAN L32/44CR (GenSet)</td>
<td>3,600–6,000kW</td>
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<tr>
<td></td>
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<td>MAN V32/44CR (GenSet)</td>
<td>7,200–12,000kW</td>
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<tr>
<td>Tugs</td>
<td>20–23</td>
<td>MAN L33/38</td>
<td>2,840–3,200kW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MAN V175D</td>
<td>1,499–3,700kW</td>
</tr>
<tr>
<td>Multi-purpose support vessels</td>
<td>24–27</td>
<td>MAN L21/21 (GenSet)</td>
<td>1,994–3,030kW</td>
</tr>
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</tr>
</tbody>
</table>

### 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

MAN 27/38

Heavy-duty propulsion and maneuvering power is 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 periods between overhauls and no unscheduled maintenance and repair work. Additional economic benefits derive 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 periods 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, shaftline, 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 optional 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

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 and proven reliability

**Powerful and reliable**
Peak performance built on experience

**Maximum power, minimum volume**
With its quick load response, the MAN 175D allows safe maneuvering in the harshest environments, even in Arctic temperatures. The small size of the engine allows more space for cargo. The MAN 175D is ideal for economical operation in platform supply vessels.

**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 meet 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 on its operating profile. The engine easily matches different load profiles and provides excellent load acceptance.

The MAN SaCoSone 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.

Common rail injection system
Advanced electronic fuel injection system allows the flexible setting of injection timing, duration and pressure 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 short time increase of injection pressure and change of injection timing in case 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 along different SFOC/power characteristics, each of them having optimum each of them having optimum efficiency at different load points.

Further power solutions
MAN 175D GenSet
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.

Harbors are environmentally sensitive areas and emission requirements are strict in terms of NO_x and particulate matter. Modern tugs require cost-efficient engines with great adaptability to various propulsion systems. Because 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.
This well-known engine is designed for solid, reliable operation with no unscheduled maintenance and 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 increase.

**Benefits**

**Reliability in operation**
Long periods 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 comply fully with IMO Tier III in combination with the MAN selective catalytic converter.

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

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

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

Multi-purpose support vessels

The multi-purpose label covers a wide range of specializations. These vessels commonly support diving operations, offshore structure maintenance and provide general assistance in the oil and gas 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.
The MAN 175D is compact, reliable and efficient – properties that are essential on 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 competence 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.

**Further power solutions**
MAN 21/31 GenSet
MAN 27/38 GenSet
MAN 175D GenSet
MAN 27/38
MAN 32/44CR GenSet
MAN 32/44CR
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 electrical power provided by electrical 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 plant 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 a high plant flexibility
- The propeller can be driven by the diesel engine, and/or by the electric motor
- Highly redundant and reliable propulsion system
- High plant 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 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.

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

MAN PrimeServ
Service with passion

24 hours a day
365 days a year
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/primeserv
Get your engines started ...

An interactive experience
Download our MAN Brochure Store app from the App Store or Google Play Store. Use its exciting interactive features to explore our complete range of products and services. Suitable for iPhone, iPad and Android.

Explore our latest news via an app
DieselFacts brings you the most recent news from the world of two-stroke and four-stroke engines, including the latest technical papers, in-depth features and videos.
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