

# MAKING THE SWITCH: OXE DIESEL



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# MAKING THE SWITCH: OXE DIESEL

An OXE outboard is not like anything you've ever experienced before, but what makes it different from traditional outboards? Here is what you need to know before switching to OXE:

- Difference between a traditional gasoline outboard and an OXE Diesel outboard
- Boat hulls for an OXE
- Power to weight ratio
- Weight of an OXE Diesel outboard
- What to think about during installation
- Cavitation plates and rig lengths
- Air intake
- Battery size and circuit breakers
- Service intervals
- Naval architect analysis – Ensure your preferences will be met

# DIFFERENCE BETWEEN A GASOLINE OUTBOARD AND OXE DIESEL OUTBOARD

Gasoline outboard engines and OXE Diesel outboard engines differ primarily in the type of fuel they use and the combustion technology employed. Here are the key differences between the two:

## 1. Fuel Efficiency:

- **Gasoline Outboard Engines:** Gasoline engines tend to have lower fuel efficiency compared to diesel engines. They may consume more fuel for the same power output.
- **OXE Diesel Outboard Engines:** Diesel engines are generally more fuel-efficient, offering better mileage and longer range on a single tank of fuel.

## 2. Torque and Power:

- **Gasoline Outboard Engines:** Gasoline engines often produce higher RPM (revolutions per minute) but may have less torque at lower RPMs.
- **OXE Diesel Outboard Engines:** Diesel engines are known for their higher torque at lower RPMs, making them well-suited for applications requiring more low-end power, such as towing.

## 3. Longevity and Durability:

- **Gasoline Outboard Engines:** Gasoline engines can have a shorter lifespan compared to diesel engines, especially in high-demand or commercial applications.
- **OXE Diesel Outboard Engines:** Diesel engines are typically more robust and durable, making them suitable for medium-duty use and applications where longevity is crucial.

## 4. Safety and Stability:

- **Gasoline Outboard Engines:** Gasoline is more flammable than diesel, so gasoline engines pose a higher risk of fire in the event of a spill or leak.
- **OXE Diesel Outboard Engines:** Diesel fuel is less volatile than gasoline, reducing the risk of fire. Diesel engines are often considered safer in terms of fuel handling.

## 5. Environmental Impact:

- **Gasoline Outboard Engines:** Gasoline combustion tends to produce more carbon dioxide emissions compared to diesel engines, contributing to environmental concerns.
- **OXE Diesel Outboard Engines:** Diesel engines can be more fuel-efficient and produce less carbon dioxide per unit of energy compared to gasoline engines, but they may emit other pollutants such as nitrogen oxides and particulate matter.

**When choosing between a gasoline outboard engine and an OXE Diesel outboard engine, factors such as intended use, fuel efficiency, torque requirements, safety considerations, and environmental impact should be taken into account.**

# DIFFERENT TYPES OF HULLS

There are various types of hulls, each designed to serve specific purposes and provide different performance characteristics. Here are a few types of hulls that can accommodate outboard engines:

## 1. Planing Hulls:

- **Description:** Planing hulls are designed to rise up and glide on top of the water at higher speeds. They have a flatter bottom and are often found in powerboats, speedboats, and some fishing boats.

## 2. Displacement Hulls:

- **Description:** Displacement hulls are designed to displace water efficiently as the vessel moves through it. They are characterized by their rounded or V-shaped bottoms, which make them more suitable for cruising at lower speeds.

## 3. Semi-Displacement or Semi-Planing Hulls:

- **Description:** These hulls combine features of both displacement and planing hulls. They can operate at displacement speeds for efficiency but also have the ability to achieve higher speeds and partially rise onto the water's surface.

## 4. Catamarans and Trimarans:

- **Description:** Catamarans have two hulls, while trimarans have three. These multihull designs offer increased stability and deck space compared to monohulls.

## 5. Pontoon Hulls:

- **Description:** Pontoon hulls consist of flat, buoyant tubes or "pontoons" that provide stability. Pontoon boats are popular for their spacious decks and comfort.

## 6. Deep-V Hulls:

- **Description:** Deep-V hulls have a V-shaped bottom that extends deep into the water. This design is common in offshore powerboats and provides a smooth ride in choppy waters.

There can be different pitfalls depending on what type of hull and what type of material you're choosing. E.g – Aluminium hulls needs proper electrical isolation. Ask OXE Marine or your naval architect for support.

## GENERIC RULE – POWER TO WEIGHT RATIO

Determining the appropriate amount of horsepower for a boat based on its weight, or displacement, involves considering various factors, and there isn't a strict, one-size-fits-all rule. However, there are some general guidelines and ratios that boat designers and enthusiasts often use to estimate the suitable power for a given boat size. One commonly used rule of thumb is the "power-to-weight ratio." The power-to-weight ratio is typically expressed as horsepower per ton (or horsepower per metric ton) of boat displacement. The recommended range for this ratio can vary depending on the type of boat, its intended use, and design considerations. We normally recommend 100hp per ton.

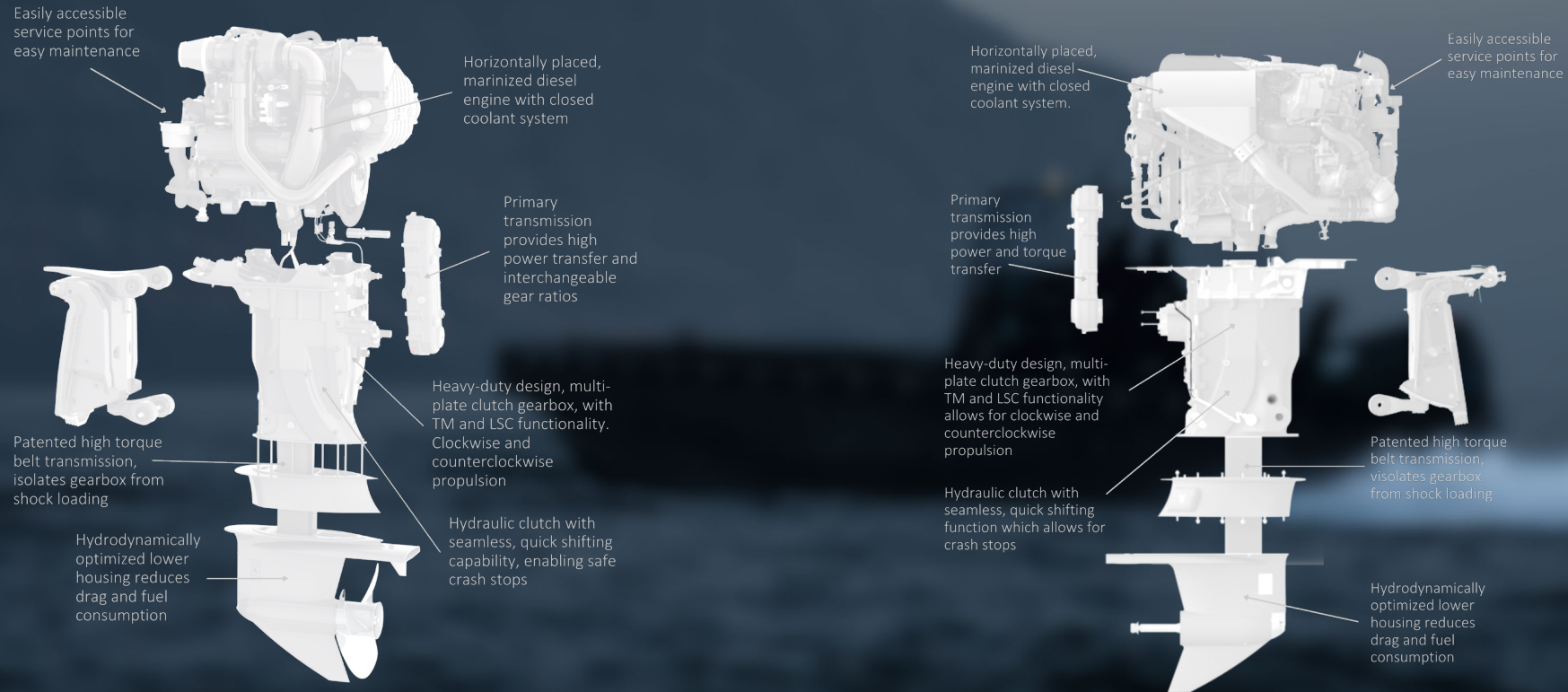
A naval architect can help you with the power to weight ratio if you are unsure for your application.

# WEIGHT OF AN OXE OUTBOARD

The weight of outboard engines can vary depending on the specific model, brand, and features. However, in general, diesel outboard engines tend to be heavier than their gasoline counterparts with the same horsepower. This weight difference is primarily due to the construction and components required for diesel engines.

Diesel engines typically have stronger and more robust components to withstand the higher compression ratios and forces associated with diesel combustion. They may also have additional features such as intercoolers and turbochargers, contributing to increased weight.

Gasoline engines may also use materials that are lighter but may not be as durable as those used in diesel engines.



# INSTALLATION IS KEY

The installation of an outboard engine on a boat is a critical factor in ensuring a safe, efficient, and enjoyable boating experience for the operator. Several reasons emphasize the importance of proper installation:

**1. Performance:** Correct installation ensures that the outboard engine operates optimally, providing the desired performance. This includes achieving the right balance between power and fuel efficiency, as well as ensuring proper handling and responsiveness of the boat.

**2. Safety:** A properly installed outboard engine contributes to the overall safety of the boat. Proper alignment and secure mounting help prevent issues such as engine vibration, which can lead to mechanical failures or structural damage over time. Additionally, a well-installed engine reduces the risk of accidents caused by malfunctions or unexpected failures.

**3. Handling and Stability:** The position and alignment of the outboard engine can significantly affect the boat's handling and stability. Proper installation ensures that the boat maintains its balance, tracks straight, and responds predictably to steering inputs. This is crucial for maneuvering in various water conditions and contributes to a smoother, more controlled boating experience.

**4. Fuel Efficiency:** Correct installation includes optimizing the trim and tilt settings of the outboard motor. Properly trimmed engines reduce drag, improving fuel efficiency and extending the boat's range on a single tank of fuel.

**1. Durability and Longevity:** A well-installed outboard engine is less prone to wear and tear. Properly aligned components experience less stress, reducing the likelihood of premature engine or gearbox failures. This, in turn, enhances the overall longevity of the outboard motor.

**2. Compliance with Manufacturer Guidelines:** The OXE outboard engine comes with specific installation guidelines. Following these guidelines is crucial to maintaining the warranty and ensuring that the engine performs as intended. It also helps avoid potential issues that may arise from improper installation, which could void the warranty.

**3. User Experience:** For the operator, a boat with a correctly installed outboard engine provides a more enjoyable and predictable experience on the water. Smooth acceleration, responsive steering, and overall stability contribute to a positive boating experience, whether for recreational cruising or more demanding activities like fishing or water sports.

In summary, the proper installation of an outboard engine is fundamental to achieving optimal performance, safety, and longevity. Following manufacturer guidelines and ensuring accurate alignment and secure mounting will contribute to a satisfying and trouble-free boating experience for the operator.

# CAVITATION PLATE DISTANCE AND RIG LENGTH

The OXE Diesel can be delivered in two lower leg lengths – XL & XXL

## DISTANCE BETWEEN PROPELLER SHAFT AND CAVITATION PLATE

On an OXE diesel outboard, the length between the propeller shaft and the cavitation plate is longer than an traditional gasoline outboard, and therefore allows up to 17" diameter sized propellers to have the potential to generate more thrust compared to smaller propellers. A larger diameter propeller can also contribute to better low-speed acceleration and slower planing speeds.

Because of the increased distance between the propeller shaft and the cavitation plate, the OXE Diesel outboard typically requires mounting at a higher position on the boat's transom compared to traditional gasoline outboards.

## RIG LENGTHS

- **OXE XL:**

XL have a distance of 25" between the cavitation plate and the inside of the transom clamp

- **OXE XXL:**

XXL have a distance of 33" between the cavitation plate and the inside of the transom clamp

- **Gasoline outboards:**

Standard shaft lengths for gasoline outboards are 15, 20 and 25". For mid-range engines, the most common shaft length is 20". Other shaft lengths exist. Larger engines such as 250 HP or more, can have 30" long shafts.



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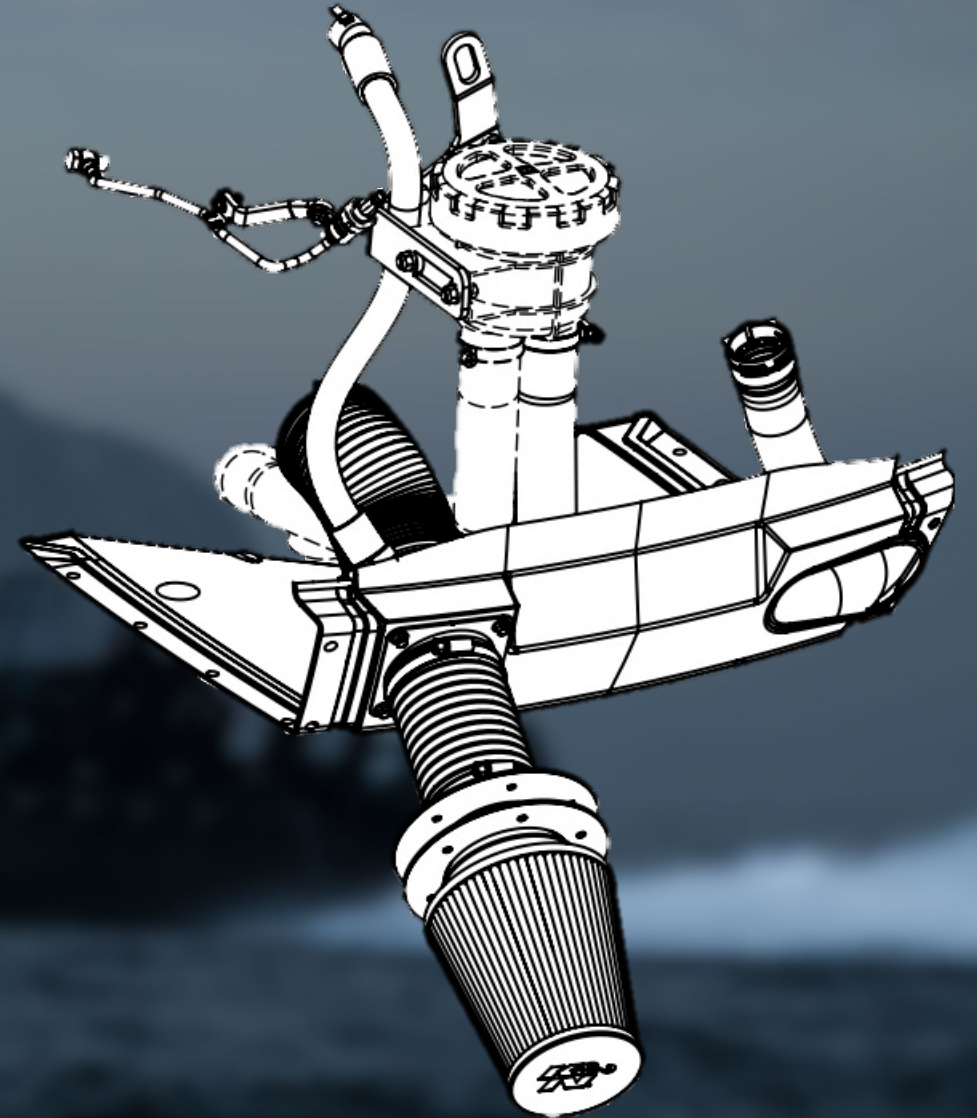
# AIR INTAKE OF THE OXE OUTBOARD

The OXE Diesel outboard engines have a unique design compared to traditional outboard motors and are known for their innovative technology. In the case of the OXE Diesel outboard, the air intake is located on top of the powerhead top cowling. The design of the OXE Diesel outboard is characterized by a sealed, air-tight lid covering the engine. The air intake is typically positioned at the highest point of this lid, allowing the engine to draw in air for combustion.

The air intake can ingest up to 255 liters of air per second on full load and therefore the correct positioning of the engines are crucial to prevent water to ingest through the air intakes. However, the OXE diesel outboard are delivered with a unique design of filtering mechanism to prevent all potential water entering through the air intake.

In certain environments, such as navigating through shallow waters, marshes, or flooded areas, the OXE300 with a snorkel kit becomes a versatile choice. The extended air intake system helps prevent water from entering the engine, reducing the risk of damage and ensuring the OXE Diesel engine can continue functioning smoothly even in challenging conditions.

OXE Marine offers snorkel kits for their OXE300 outboard engines where it's needed, providing a solution for situations where the standard air intake may be at risk of submersion. The snorkel kit is designed to elevate the engine's air intake point, allowing the OXE300 to operate reliably in conditions where water levels may pose a threat.



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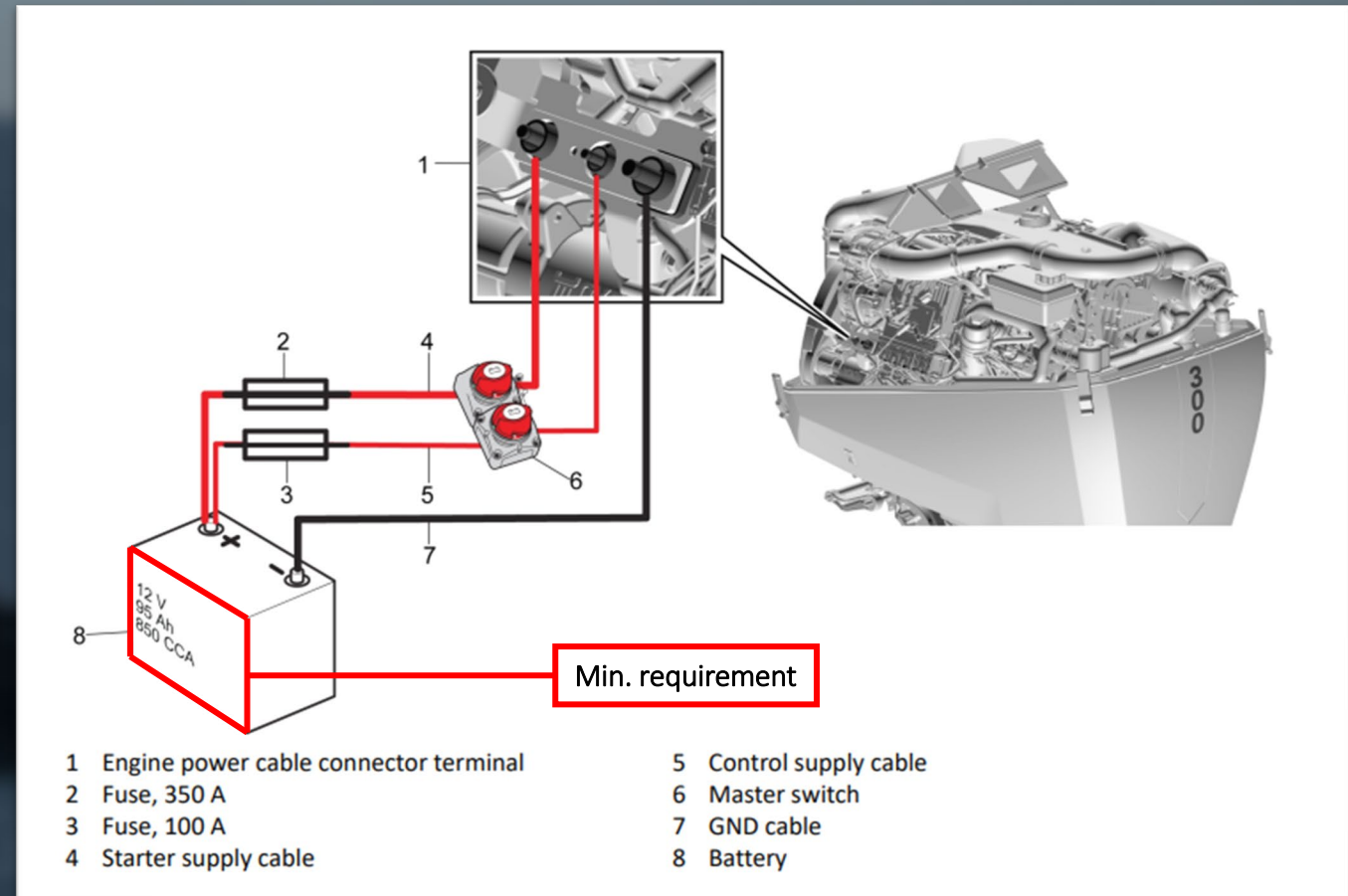
# BATTERY SIZE IN BOAT AND TWO CIRCUIT BREAKERS

The OXE Diesel outboard engines, being a unique and innovative design, have certain electrical requirements that may differ from traditional gasoline outboards. While the size of the battery required depends on the specific model and configuration of the OXE Diesel outboard you are installing, it's important to note a few considerations:

**1.High Compression Starter:** Diesel engines, including the OXE Diesel outboards, typically have higher compression ratios than gasoline engines. As a result, the starter motor may require more electrical power to turn over the engine. This might influence the specifications for the starting battery.

**2.Electrical Systems:** The OXE Diesel outboards have additional electrical systems, such as advanced electronics and sensors, which could affect the overall electrical demand.



**3.Cold Weather Starting:** Diesel engines can require more electrical power to start in cold weather. If you operate in colder climates, the requirements for the starting battery might be influenced by the temperature conditions.

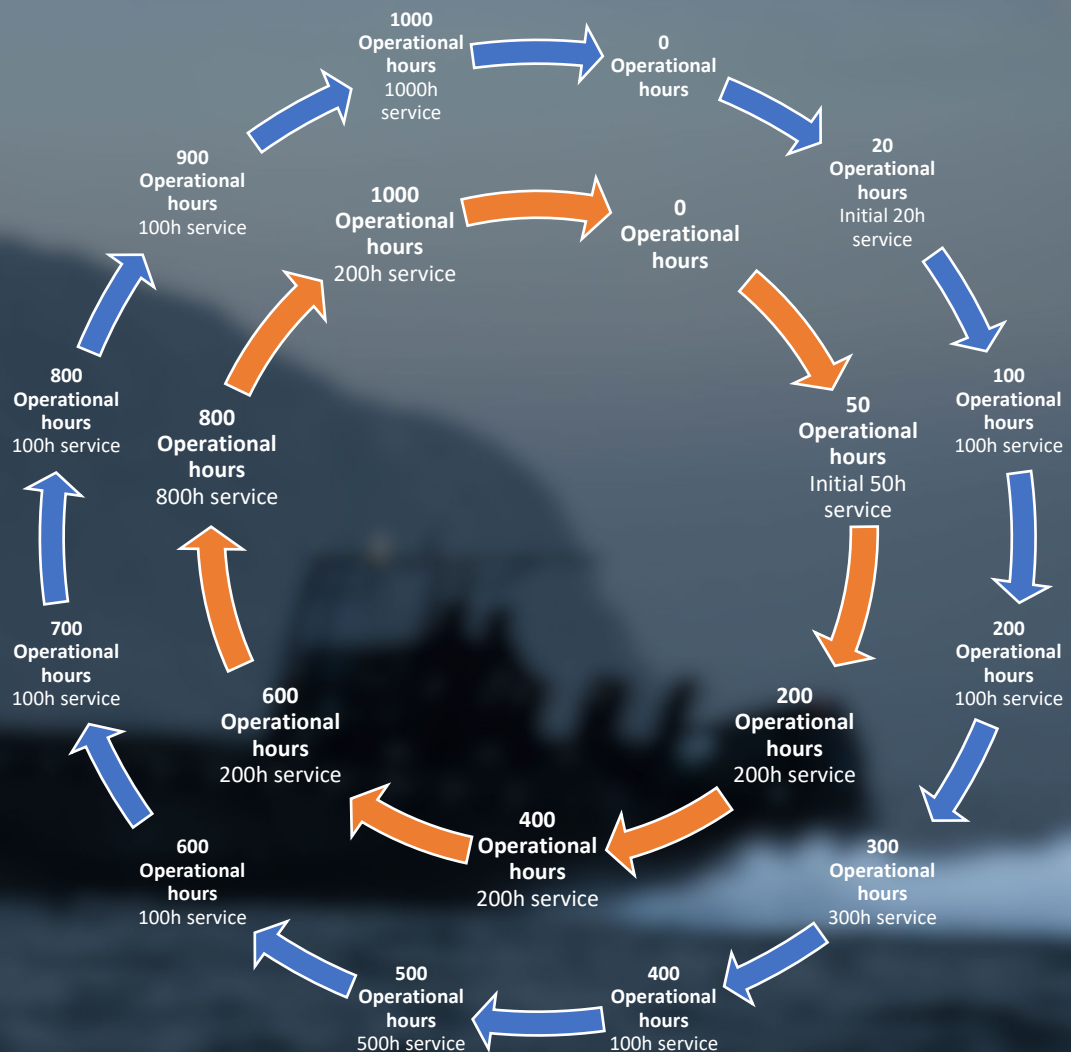


# SERVICE INTERVALS

The OXE Diesel outboard typically features extended service intervals compared to conventional gasoline outboards, enabling you to maximize your time on the water rather than attending to maintenance tasks.

Illustrated in the diagram, the service intervals for a conventional gasoline outboard, depicted in blue, and an OXE Diesel outboard, represented in orange, range from 0 to 1000 operational hours. Notably, the OXE Diesel requires maintenance on six occasions, while the gasoline outboard necessitates service on eleven instances.

-  Traditional gasoline outboard
-  OXE Diesel outboard



# NAVAL ARCHITECTS

Use your own or contact OXE's team for support

Engaging a naval architect when building a new boat or repower an existing, especially one powered by OXE Diesel outboard engines, is highly recommended. A naval architect specializes in the design, construction, and overall architecture of boats and other marine vessels. Their expertise is crucial in ensuring that your boat is not only safe and seaworthy but also optimized for performance and efficiency. Here are some reasons why you should consider involving a naval architect:

1. **Optimized Design:** A naval architect can design a boat that is specifically tailored to the characteristics and requirements of the OXE Diesel outboard engines. This includes considerations for weight distribution, hull design, and overall hydrodynamics to maximize the performance and fuel efficiency of the boat.
2. **Structural Integrity:** Ensuring the structural integrity of the boat is essential for safety and durability. A naval architect can design a robust hull and structure that can handle the high torque associated with the OXE Diesel outboards.
3. **Stability and Handling:** Naval architects consider factors such as stability and handling characteristics in their designs. This is crucial for providing a smooth and controlled ride, especially when dealing with the unique characteristics of diesel outboard engines.
4. **Compliance with Regulations:** Naval architects are well-versed in maritime regulations and standards. They can help ensure that your boat design complies with relevant safety and regulatory requirements, contributing to the overall safety and legal compliance of your vessel.
5. **Customization:** If you have specific requirements or preferences for your boat, a naval architect can work with you to customize the design to meet your needs. This may include considerations for the boat's intended use, passenger capacity, and other features.
6. **Performance Testing:** Naval architects often have the tools and expertise to conduct performance simulations and testing, helping to predict how the boat will behave under various conditions. This can be valuable in fine-tuning the design for optimal performance.

If you don't have access to a naval architect of your own, OXE's team are more than willing to help you. Contact your sales rep or our team at [info@oxemarine.com](mailto:info@oxemarine.com)

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