



Frequently Asked Questions – Marine Drives

- ***Why Buy Electric?***
- ***Design / Installation***
- ***Performance***
- ***Maintenance***
- ***Batteries / Power***

Why Buy Electric?

What benefits do I get with an LMC electric motor system?

A Lot - LMC Motor systems provide you with a huge array of benefits, that owners of traditional propulsion systems can only dream about.

Here is a list of the benefits most often expressed by our customers:

Comfort

- Low Vibration
- Ultra Quiet operation
- Simple Operation
- No smell of burning fossil fuels

Environmentally Friendly

- No air or water pollution from fossil fuels
- No need for an exhaust system like on diesel or petrol motors
- No fuel tanks or related hoses
- No coolant requirement
- No fuel oil or filters
- Virtually Emission Free
- Clean Engine Room

Costs

- Low Cruising costs
- Low maintenance costs
- Low Installation Costs
- No warm-up time required
- No need for winterizing the motor or spring commission
- Long Service intervals

Technically Superior

- High torque at all times, assuring better control at the helm
- High torque, providing possibility to increase prop efficiency
- High efficiency providing longer motoring time – Motor Efficiencies of up to 94%
- Source for additional electrical power for on-board needs
- Simple Installation
- Compact Space Saving
- Reliable Technology – over 20 years of Experience



Design / Installation

How can I have an LMC propulsion system configured for my boat ?

WE DO IT FOR YOU - An LMC Propulsion System can be configured for your boat by simply forwarding to us information regarding your boat. [Enquiry](#)

What motor size should I choose?

WE CAN RECOMMEND - We will work with you to analysis you're requirements and your boats detailed design to determine which size motor is best suited for your specific requirements. (Product Selector Hyperlink)

Can an LMC propulsion system be installed in new boats?

YES - have your boat builder contact us at and we will work with your boat builder to get the right system for the boat you are having built. (hyperlink to example drawing)

Can I use my existing prop and shaft ?

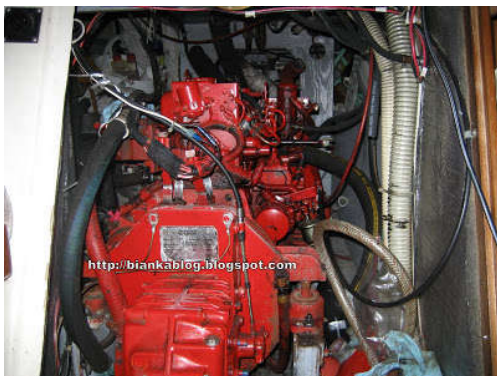
YES - This is one of your advantages, when choosing an LMC system. It is not only possible to use your existing prop and shaft for your new electric system. It is remarkably easy to fit. As we have several gearing options for each model.

What Propeller should I use?

This is one of the main questions we are asked relating to propellers; we are not a propeller supplier, however as a rule of thumb for electric drives, the larger the better as there is always torque available, and they run at relatively 'low speed' compared to an internal combustion engine.

Example of a refit –

Before AND AFTER



To optimize the efficiency of your electric propulsion system, you might want to change your prop to a larger, to take full advantage of your new increased torque.

How long does it take to install?

NOT LONG - Installation depends on whether it is a new boat or existing boat and if the old engine is to be removed. An experienced boatyard should be able to complete an installation in 2-5 days.



Can I install the system myself?

YES - If you have handyman skills, you can install the system yourself, up to 48V. Systems above 48V – you can install the engine and prewire the system, but a certified electrician must make the final connections and certifications. However we do offer an installation service on request.

Can I use solar panels as a secondary power supply?

YES - Many of our existing customers use solar panels as a way to charge their batteries. Others use a small on-board windmill or a combination of the two.

Where are LMC electric propulsion systems in use today?

JUST ABOUT EVERYWHERE - LMC has installed electric propulsion systems in boats for more than 20 years for and with customers around the world.

Our systems have been installed in sailboats, powerboats, rental/ tour/sightseeing boats, water taxis, barges, multihulls and even submarines.

Performance

What size boats are ideal for an LMC propulsion system?

ANY BOAT SIZE - The LMC Motors are currently being installed in mono and multihull boats, ranging in sizes up to 60'. Custom motors can be developed for other sizes and applications.

What range do your Electric Propulsion systems provide?

Short Answer UP TO YOU - Motoring times and distance for the LMC propulsion systems dependent on a number of factors including the boat design, system configuration and sea conditions.

If you want, we will help you configure the optimal system to meet your requirements.

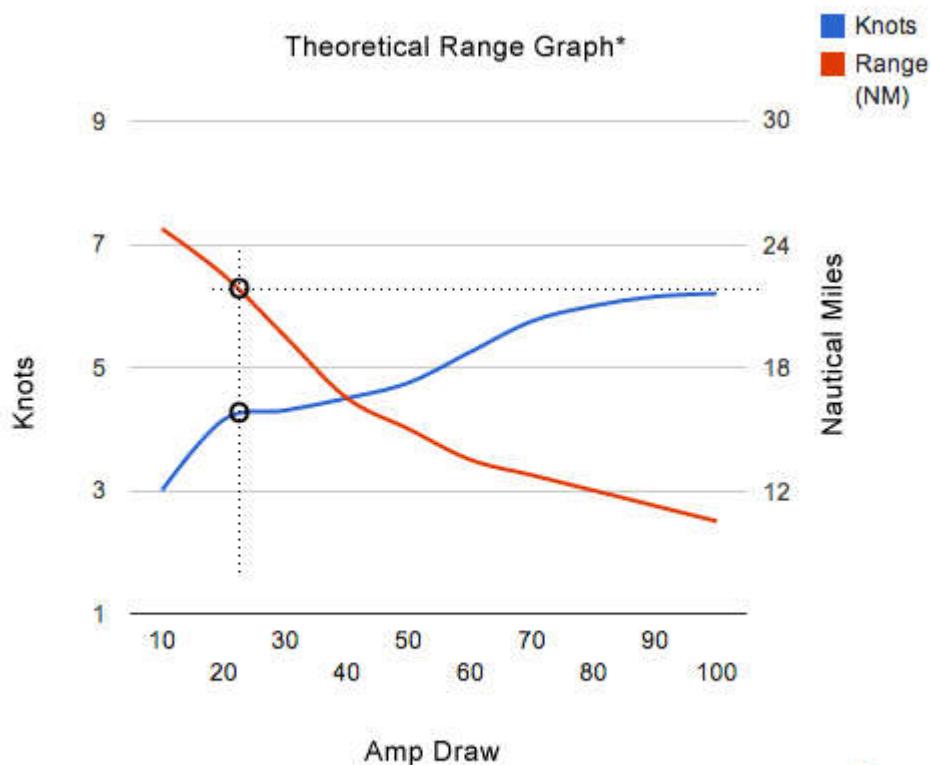
Boats with Genset can significantly extend the range by producing electricity when the batteries are drawn down.

A Fuller Explanation

As you can imagine giving a precise answer to this question involves many factors in the same way that asking how far can I get on a tank of fuel? Some of the factors include; hull drag, Minimise and estimate mechanical losses, Maximise and estimate propeller efficiency, Decide on cruising speed and calculate power required (Design of Electric Drives for Boats). Below is a theoretical example:- For a boat using an electric motor, consider the battery as your “fuel tank.” Therefore, the more battery power available the more “fuel” available. Range will ultimately depend heavily on the type of cruising you plan on doing and how many ‘battery banks’ you have available. Wind, water current and water conditions also affect your time on the water.

A general range optimization strategy is to find the “sweet spot” where your speed and amp draw will get you the most range. Generally this means drawing back on your knot speed to approximately 50-60% of your hull speed and using around 20-30% of your available amp draw.

Below is a theoretical range graph one might expect to see powering with an electric sailboat in smooth conditions.



*These entries are for illustrative purposes only and represent a theoretical example.



As you can see, the amp draw to speed is not linear, however, there is a “sweet spot” in which the range is optimized for approximately 22 nautical miles while maintaining an approximate speed of 4.2 knots and at the same time only drawing 23% of the available amp hours. (based on a 200Ah system)

By sacrificing a few knots, there is a 145% increase in range.**

**This graph is for illustrative purposes only and represents a theoretical example. Water conditions and individual boat dynamics will compute different findings.

What maximum speed should I expect for my boat with an LMC system?

HULL SPEED - The LMC Motor systems are configured to sustain hull speed. The LMC Motor can be used while sailing to increase speed in light winds and stability in heavy seas.

What to consider - HP or Torque?

BOTH ARE IMPORTANT - It is important to understand the amount of torque your boat requires and then confirm that a motor has the ability to generate the needed torque. Many measure the power capacity of a motor by its horsepower; the more HP the more power. Horsepower is a measure of energy used to generate torque. Torque is the power resulting in propulsion (measured in foot-pounds). The typical sailboat achieves hull speed with RPM at the prop about 900-1200. It is the job of the motor to generate the RPM at the prop.



How do I regulate RPMs on an electric boat motor?

In Simple Terms using a control throttle connected to a motor controller. ([HYPERLINK TO THRITTLE](#)) This is how the controller works ([HYPERLINK TO CONTROLLER](#)), The RPMs on the motor are regulated by adjusting the voltage with the motor controller. The motor controller chops the voltage from the batteries into small pulses. The longer the pulse sent to the motor, the more power and RPM the motor outputs. This instant use of available power makes the system extremely efficient.

Maintenance

How much maintenance is needed ?

NEXT TO NOTHING - This is one of your big advantages with our systems.

Once your LMC system is installed, it requires very little maintenance.

The brushes have a run time of 3000 hours and the belts have a lifetime of 5000 hours.

What maintenance I will need to perform on my LMC electric motor?

ONCE A YEAR - Check the brushes in the motor and the belt for wear and tear.

And low/Air clean the motor to remove any carbon dust from the brushes.

10 minutes a year - Thats it, you're done!

HOWEVER you can **EXTEND YOUR WARRANTY (ADD Hyperlink)** as we do offer an annual service which will extend your warranty for a further year.

EVERY 3RD YEAR – The manufacturers of the drive belts recommend that they are changed every 3 years as the rubber can start to perish.

Batteries / Power

How many batteries – do I need?

2 - 16 12V BATTERIES - LMC systems deliver propulsion systems from 24–72V.

So you need 2(two) 12V batteries for a 24V system, 4(four) 12V batteries for a 48V system and 6(six) 12V batteries for a 72V system.

The motoring time is relative to the amp hour of the batteries, so you can either increase the amp hour of the battery or increase the number of batteries.

Note, you should have as a minimum the C5 value of the battery

What type of batteries should I choose?

AGM, GEL OR LITHIUM - We recommend the usage of AGM or Gel batteries, for vessels with limited motoring requirements.

Lithium batteries, will give you a big advantages of weight saving, increased cruising range and motoring duration.

However it adds to you total cost of the system.

In many cases, buying a genset will give you what you need, at a much lower cost.

If you are racing, Lithium will save you significant weight, so this might be your best option, even though you probably don't need the extended range.

Do the batteries add much weight of my boat?



YES AND NO - The weight of batteries must be taken into consideration, however, in most cases the weight of the old motor and full fuel tank exceed the weight of your new system.

Electric propulsion allows for better weight distribution, a significant factor if racing. You can also increase the waterline through by distributing the weight more evenly.

For boats with extensive electrical equipment and heavy house loads – we recommend the use of Lithium batteries or a genset.

Can I use solar panels as a secondary power supply?

YES - Many of our existing customers use solar panels as a way to charge their batteries. Others use a small on-board windmill or a combination of the two.

How long will the batteries last, before I need to replace them?

5 YEARS OR MORE - Battery life of is dependent on their use, maintenance and management we recommend that you follow the manufacturer's instruction. When properly used, the life of batteries can exceed five years.

Lithium batteries may last significantly longer than 5 years.

Can I use the engine battery bank for other on-board applications?

YES - You will need to install a DC-DC converter to the main battery bank – You can then draw 12 V for other on-board applications. Just ask for a DC-DC converter as part of your motor package.

What kind of battery is best for my electric boat motor? AGM or Lithium?

At this point due to cost we recommend using AGM (Absorbed Glass Mat) batteries over lithium. These batteries create voltage using the time tested lead acid technology however they use much less battery acid than a traditional lead acid battery.