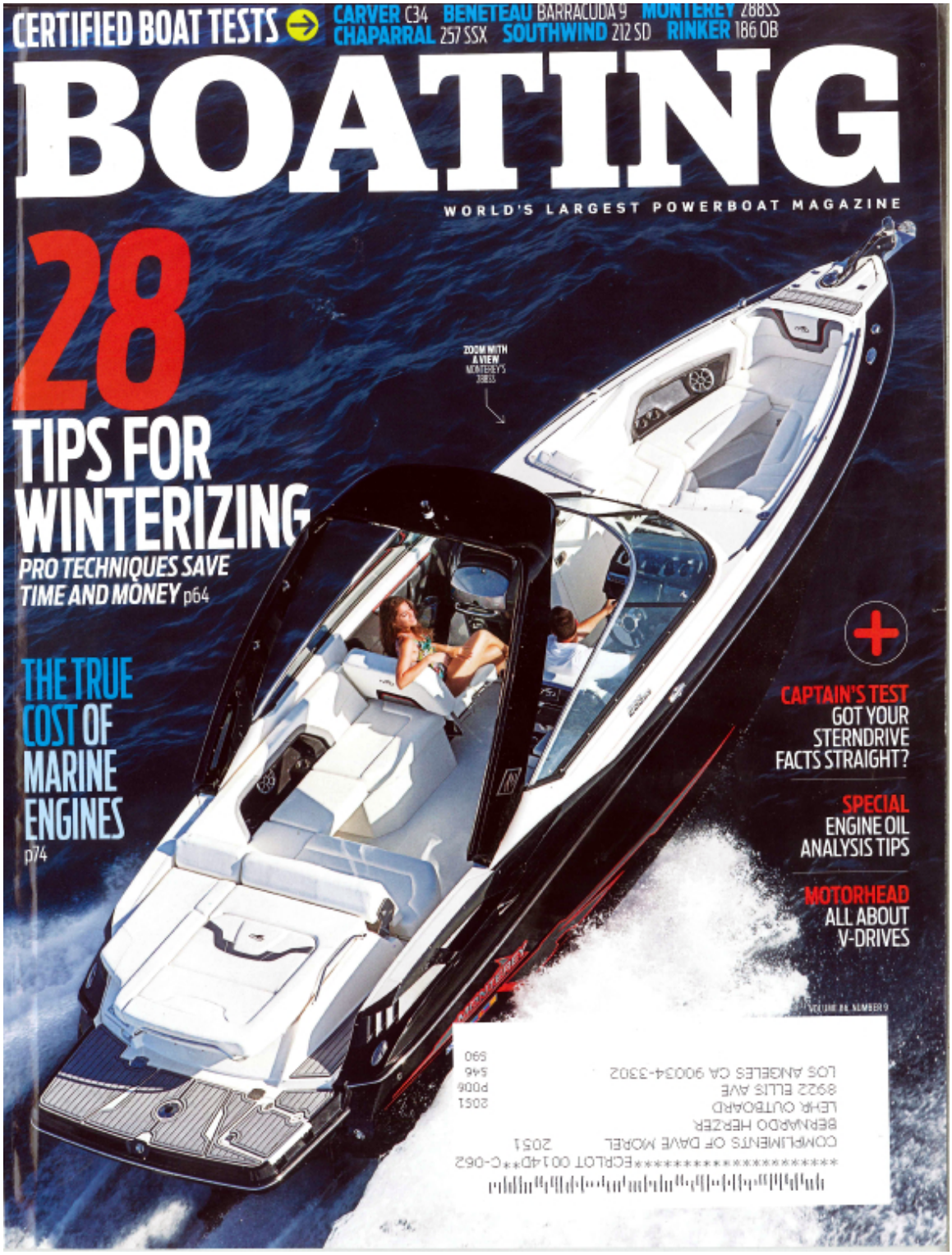
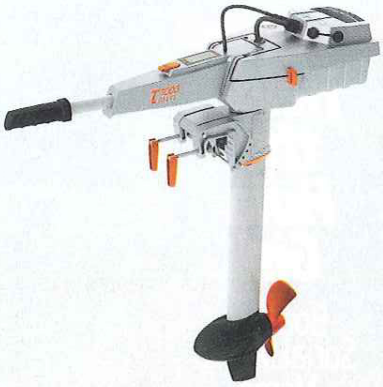
LEHR Featured in Boating Magazine



FOR COMPARISON'S SAKE

Dinghy Outboards

If you are in the market for a new or upgraded dinghy outboard, your choices are no longer limited to gasoline two- or four-strokes. Today you can select among three distinctly different fuel options: gas, electric and propane. We put comparable motors up against each other to see how they stacked up using our Quicksilver 310 inflatable. — *Joe Friedman*

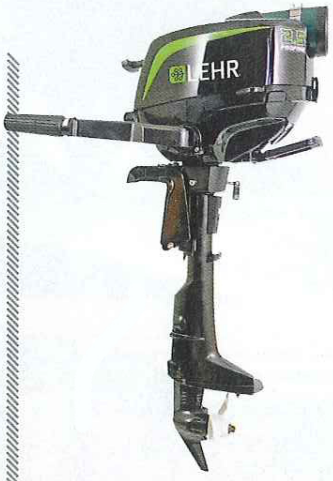


Torqeedo
4 hp Electric

THE WET: Torqeedo seems to have perfected electric outboards (as opposed to electric trolling motors). At a mere 30 pounds, this one is easy to carry and easier to mount, since it breaks down to three pieces (motor, battery, tiller). The new lithium-ion battery lasts longer. A tiller display includes GPS speed-over-ground reading and battery charge status. And it's quiet — 71 decibels at wide-open throttle.

THE DRY: The slowest of the three test motors (6 knots average). There's forward and reverse, but no neutral. If the battery dies, you must be near an electrical source. Pricey.

$1,999; torqeedo.com/us

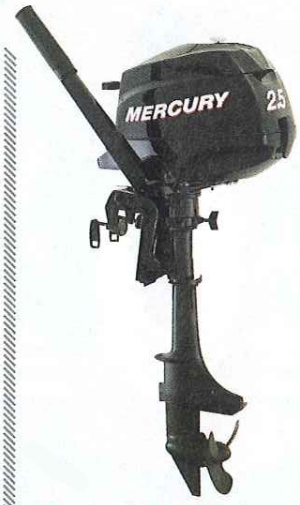


Lehr
2.5 hp Four-Stroke Propane

THE WET: Lehr is the first propane-fueled outboard that is not a gasoline conversion. The shifter is conveniently located and smooth. There's a handy carry handle at the rear. Propane doesn't need a choke, so starting is fast and easy with no flooding. A convenient one-pound canister mounting allows a quick fuel change, and canisters are available everywhere. It's virtually odorless and eco-friendly.

THE DRY: For convenience, a remote five-pound auxiliary tank (barbecue-style) is recommended. At 7.6 knots average, it's not quite as fast as the Merc.

$1,259; golehr.com



Mercury Marine
2.5 hp Four-Stroke Gasoline

THE WET: Mercury's tried and true 15-inch short shaft four-stroke proved to be the fastest (9 knots average). Shifting is smooth and the oil level sight glass is very convenient, making it easier to keep track of your oil needs. And it's a Mercury, so parts and service are available everywhere, with a parts and service network the other two can't match at this point in the game.

THE DRY: The tiny integrated fuel tank will get you there, but maybe not back. I'd recommend an auxiliary tank to go any distance. It's also a bit noisier at wide-open throttle (86 decibels).

$1,040; mercurymarine.com

EXTENDED POWER With only one person aboard, all the weight is too far aft and the dinghy is way out of trim. Davis Instruments has an answer for this in its Model 1440 Handi-Mate extension handle. We tried it on all three of our test motors and it worked just fine. Simply tighten the collar over the existing twist-grip tiller handle, and off you go. It extends from 30 inches to 47 inches and makes for a faster, more fuel-efficient ride. $47; davisnet.com — *J.F.*

Captain's Test

Engine Aptitude

You know there's some combination of an engine and drive in and on the back of your boat. But how much do you know about it? Take this test to see if you're a gearhead. – *Eric Colby*

(Answers on p. 18)

1 Volvo Penta's Duoprop was the first drive to have what technology?

A. Two propeller blades
B. Four propeller blades
C. Two propellers
D. Three propellers

2 From which military application did Volvo Penta borrow the technology for the Duoprop's counter-rotating propellers?

A. Torpedoes
B. World War II twin-engine fighter planes
C. Navy warships
D. All of the above

3 When you look at the side of your drive, you see that it has a ratio of 1.5:1. What does that mean?

A. The drive turns 1.5 times for every revolution of the engine.
B. The engine turns 1.5 times for every revolution of the prop.
C. The engine weighs 1.5 times as much as the drive.
D. The lower drive gears turn 1.5 times for every revolution of the upper gears.

4 When you look at a MerCruiser 350 Mag MPI, what does the 350 stand for?

A. The horsepower
B. The cubic-inch displacement
C. The displacement in liters
D. None of the above

5 A MerCruiser 8.2 HO sterndrive is rated for 430 hp. Where is the horsepower measured?

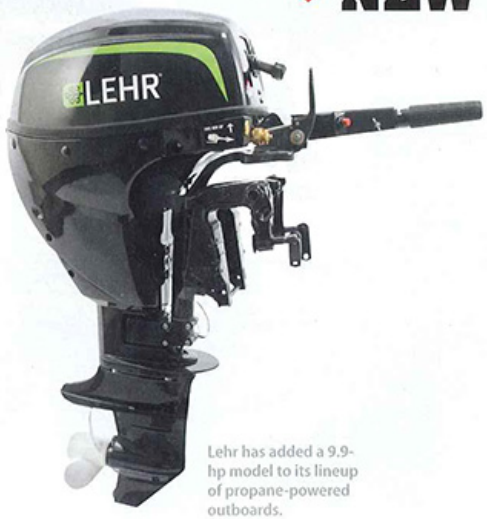
A. At the engine's crankshaft
B. At the propeller shaft
C. At the exhaust
D. All of the above

MORE QUIZZES

Get more Captain's Tests by scanning this tag or visiting boatingmag.com/quizzes.

Cottage Magazine Features LEHR

NEW PRODUCTS



Lehr has added a 9.9-hp model to its lineup of propane-powered outboards.

Propane Powered Outboard

Lehr, the world's first original equipment manufacturer of propane-powered outboards, has expanded its line with a new 9.9-hp model. This complements their 2.5- and 5-hp outboards introduced in 2012. The two smaller motors can be fuelled by either a standard screw-on propane canister or by a hose from a stand-alone 10- or 20-pound propane tank. The 9.9 requires a stand-alone tank.

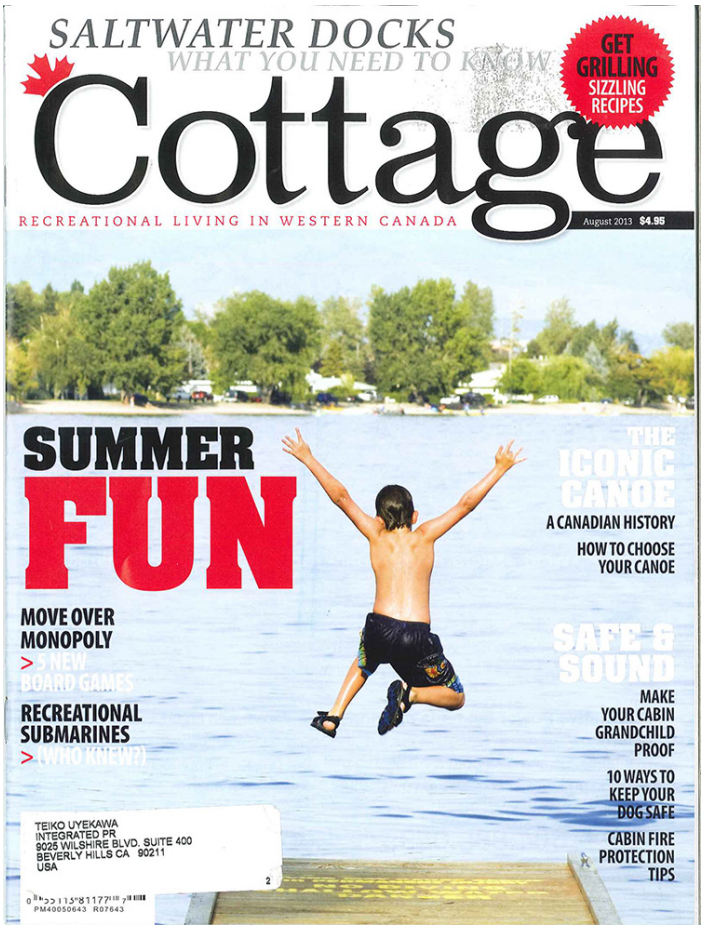
The benefits of propane over gasoline include the elimination of potentially water-polluting gasoline, no ethanol or fuel-related issues, zero evaporative emissions, easy starts (no choke), no priming, no carburetor gum-up, no winterizing and, depending on where the propane is purchased, the cost of fuel is as little as half the cost of gasoline, and at most, the same price.

Propane conversion kits have been available for gas outboards for some time, but Lehr is the first to build a propane-powered outboard from the ground up. The technology has won Lehr a number of environmental and innovation awards.

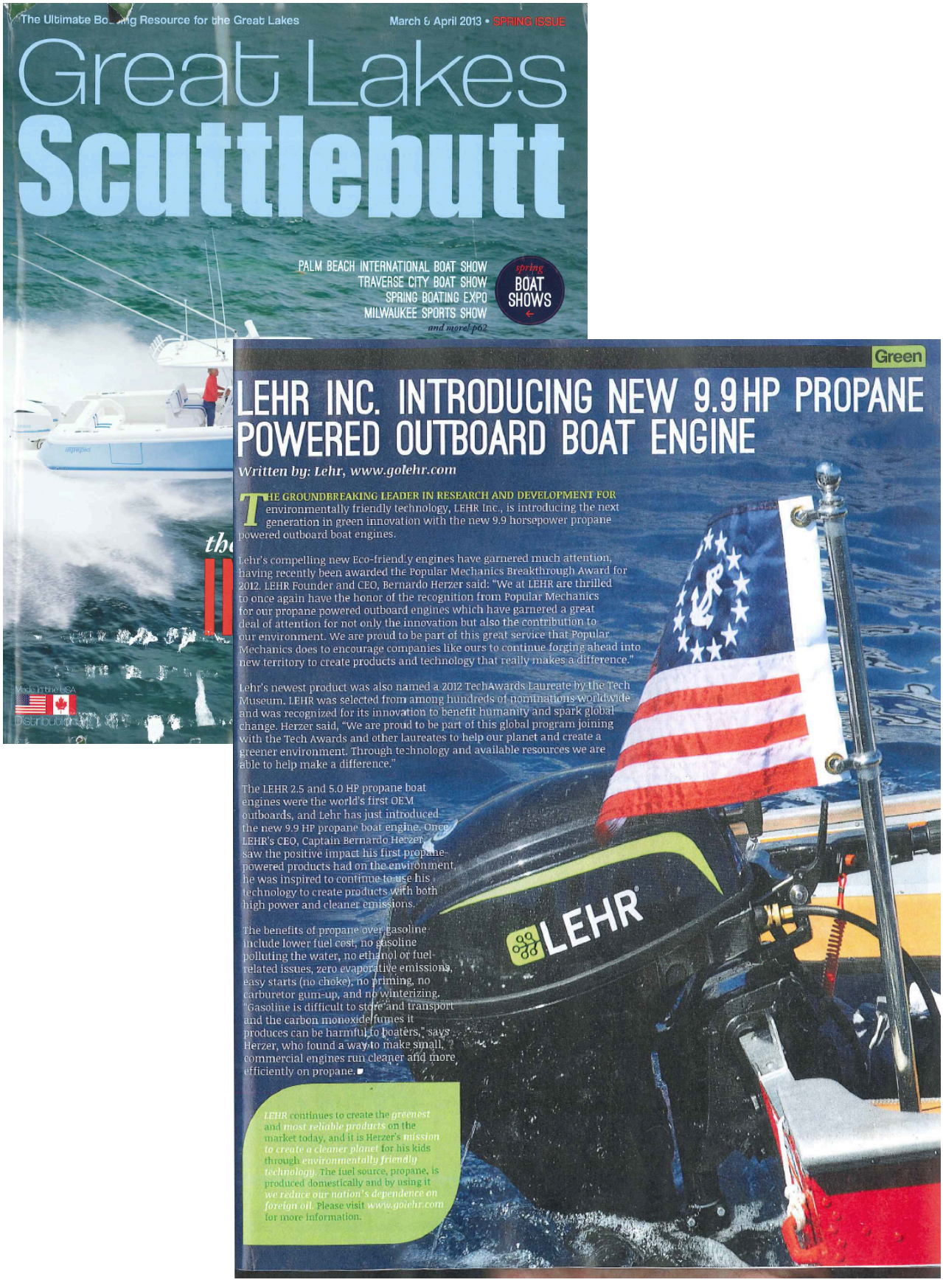
The twin-cylinder 9.9 is available with tiller or remote steering, manual or electric start and 15- and 20-inch shaft lengths.

At wide-open throttle, a 20-pound propane tank will last about five hours. However, with normal cruising, a tank should last about 14 hours. Fuel consumption is 0.44 US gallons per hour at 3,000 rpm. Lehr says performance and range (gallon per gallon of fuel) is about the same as gasoline.

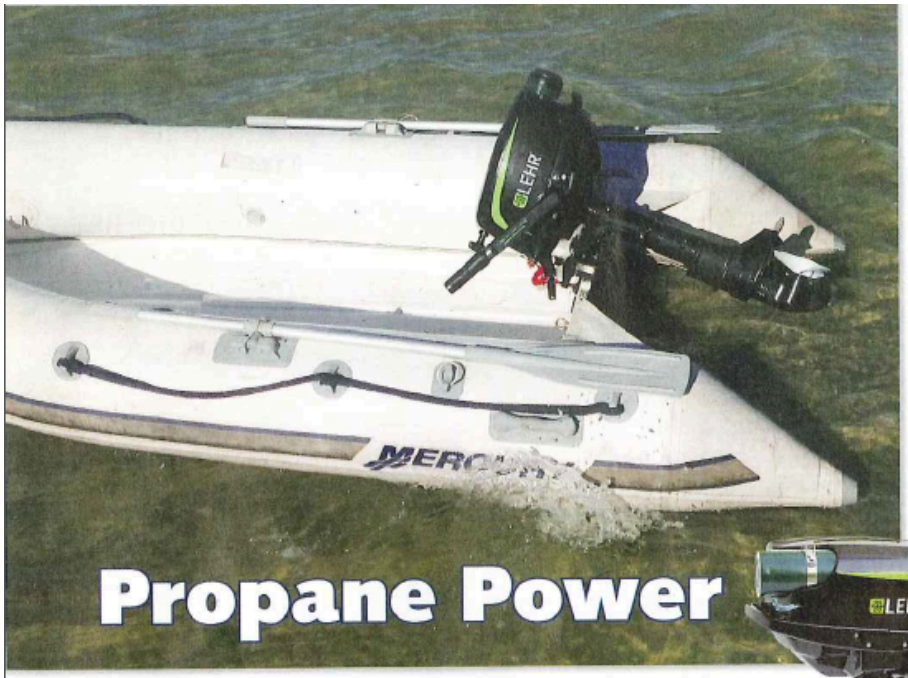
MSRP is approx. $3,200 for the basic manual start, short shaft, tiller model.
For more information, visit: *www.golehr.com.*



LEHR Featured in Great Lakes Scuttlebutt

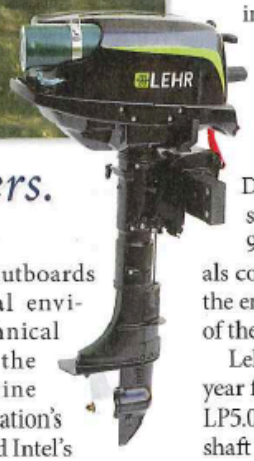


LEHR Featured in Practical Sailor



The propane-powered Lehr LP5.0 had no problem getting our test boat, a Mercury 310 RIB, on plane.

Propane Power



Lehrs outboard impresses testers.

Capt. Bernardo J. Herzer has been converting small engines from conventional fuels to propane since he was a teenager. In 2003, his passion for eco-friendly engine tinkering was renewed during a North Sea surveying project aboard his 180-foot oceanographic research vessel.

"There was a considerable amount of damage done to the North Sea—a lot of it due to overfishing and some of the problems with gasoline and oil spills," Herzer explained. "Our technologies are vastly more powerful than our environment. Running commercial research vessels, you learn about innovation and technology, and how to use that technology very responsibly."

He returned to his California home with a new determination. "I wanted to make a difference, and I think we are doing that," said Herzer, the founder and CEO of Lehr Inc., a manufacturer of zero-emissions, propane-powered lawn tools and marine outboards.

In 2008, Herzer patented his propane-powered small-engine technology and developed a line trimmer, leaf blower, and lawn mower. In early 2012, he introduced his first propane outboards—2.5- and 5-horsepower models—and later launched the 9.9-horsepower model.

Practical Sailor recently tested the 5-horsepower Lehr LP5.0, and we plan to test the newer 9.9 soon.

WHAT WE TESTED

The Lehr propane outboards have earned several environmental and technical awards, including the 2012 National Marine Manufacturers Association's Innovation Award and Intel's 2012 Environmental Award. They also were among the winners of West Marine's 2012 Green Product of the Year award.

"These next-generation products are easier to use, maintain, cheaper to operate, and better for the environment," Herzer said. He added that propane outboards are more efficient than gas engines because their higher compression allows them to burn the fuel more completely, resulting in zero emissions.

The water-cooled, four-stroke LP5.0 operates at 4,000 to 4,500 rpm at wide-open throttle. It has an electronic ignition—no priming or choke required—and its crankcase holds about a half-quart of 10W30 oil. We tested the 49.6-pound, short-shaft (15 inches) model; the long-shaft (20 inches) version weighs in at 52.8 pounds.

The engine can be fueled using a 16.4-ounce propane twist-on bottle like those used with camping stoves and portable grills. The small bottle—which retails for about $4 to $5—fits in the back of the engine. Cruisers and others who'd rather not store multiple small propane canisters for extended trips can instead buy a 20-pound, 5-gallon remote propane tank that is made of composite and housed in a hard-plastic carrying case ($150); a 4-foot connecting hose ($30) is required for the setup. The cost of getting the 20-pound tank filled will vary, but $3 to $5 per gallon is a typical price in the U.S.

According to Lehr, the LP5.0 on an 8- to 10-foot RIB with two people aboard will run wide open for about 30 minutes on one 16.4-ounce canister of fuel. During typical use (with varying speeds), the canister will last about 90 minutes. *Practical Sailor*'s sea trials confirmed these claims: Testers ran the engine for 45 minutes and used half of the small canister.

Lehr backs the outboards with three-year factory warranties. The short-shaft LP5.0 retails for $1,700, while the long-shaft version sells for $1,730; the LP2.5, which only comes in a 15-inch shaft, is $1,050.

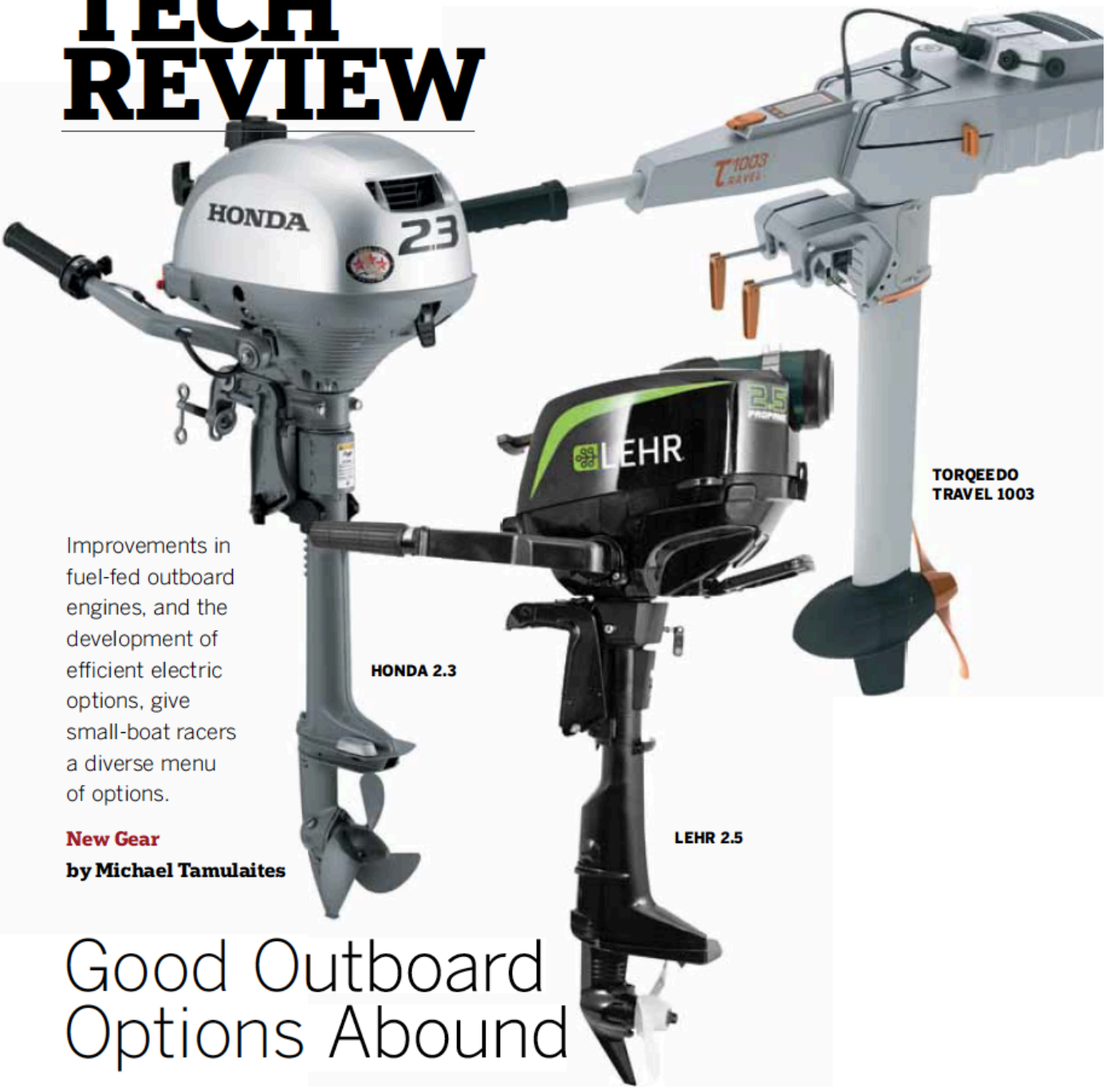
HOW WE TESTED

For sea trials, *PS* mounted the LP5.0 on a 10-foot-2-inch Mercury Dynamic 310 RIB (*PS*, July 2008). The inflatable dinghy, which can carry up to four people or 1,089 pounds, was inflated to its recommended air pressure for the test. The test site was Sarasota Bay, Fla., in light winds and calm water.

Testers examined all components and critical access areas of the outboard, including its oil fill and dip stick, carrying handles, tiller ergonomics, throttle, forward/reverse shift, cowling clips and fasteners, etc.

The engine we tested was already broken in, so once it was mounted, we put it through its paces to gauge performance. Testers measured its speed and noise levels at idle and full-throttle in two directions and averaged the readings to account for wind and current. We started the engine both warm and cold several times, and noted how easy

TECH REVIEW



TORQEEDO TRAVEL 1003

HONDA 2.3

LEHR 2.5

Improvements in fuel-fed outboard engines, and the development of efficient electric options, give small-boat racers a diverse menu of options.

New Gear

by Michael Tamulaites

Good Outboard Options Abound

In the early days of the outboard they were usually relegated to the murky confines of the bilge to wash around in squalor with halyard tails, old candy bars, and spent duct tape rolls. They were two-horses strong, four tops, and when called for duty these two-stroke dandies took dozens of pulls to get started. Once lit, they spewed all matter of what-not into the air and sea until they warmed up and got to work. There was one gear, so when journey's end arrived it was the last tactic of the day to decide when to pull the choke and shut her down for the coast to the dock or mooring. But as hulls and sails have progressed, so too has the lowly outboard engine, which has morphed into a piece of technology worthy of its own custom-made, water-resistant storage bag. Today you can't buy a new two-stroke in the United States, and now you even have your choice of fuel: gasoline, electricity, or propane.

COURTESY OF THE MANUFACTURERS

"The solar panel, when plugged into the Torqeedo battery while motoring will dramatically increase run times to almost limitless."

Gasoline

PROS

- Proven technology, readily available, and serviceable
- Many options from which to choose
- Gasoline is easy to source near regatta venues
- Can be refueled from a jerry can when you run out
- Less expensive than electric

CONS

- Reverse gear not standard
- Routine maintenance required
- Physical starting process required
- Fuel transfer from jerry can to integrated tank can be difficult underway
- Gas storage onboard can be messy and odorous
- Heavy for transom mounting, especially hard-to-reach brackets
- Vagaries of ethanol percentages in gas and their effect on gasoline engines

Electric

PROS

- No gas, oil, or lubricating grease to spill in the water, on deck, or in the bilge
- No maintenance/winterization
- Engine separates into two pieces of similar weight for carrying to the boat and mounting on the transom
- Batteries can be mounted to the boat belowdecks on brackets so they are not moving around while sailing
- Instant start, every time, no pull cord or engine problems
- Forward, neutral, and reverse with a twist of the throttle
- High torque for quick acceleration and quick stops when needed
- Quiet running
- Non point-source polluting (yes, there is pollution involved with the making of electricity)

CONS

- Initial expense
- Limitations on run time for long distances (requires carrying an extra battery or solar panel)
- Remembering to remove battery from the boat for charging after multiple runs

Propane

PROS

- Propane burns cleaner than gasoline
- No ethanol concerns
- Self-contained fuel units simplify fuel storage and access
- Transferring fuel for longer runtime is a clean and easy process
- Starting is easier than gasoline units. No choking required

CONS

- Only 15-inch shaft length model is available
- Heavy for transom mounting, especially hard-to-reach brackets
- No reverse gear
- Some regular service required

Smarter gas engines

Any of the gasoline engines available today will do the trick for your small raceboat, and most have the preferred option for an on-engine gas tank, so we'll continue generically. A few specifications to note when you're doing your outboard search are overall weight, fuel capacity, ability to connect to a remote tank for longer trips to and from the racecourse, and shaft length. A 20-inch shaft length is appropriate for most sportboats; a 15-inch shaft will suffice for smaller boats.

The transition from two-stroke to four-stroke has resulted in engines that are quieter, cleaner running, and more reliable, but also a bit heavier, unfortunately. With four-strokes, there's no premixing of oil and gas, and that alone is worth upgrading to a new engine if you remain burdened with an old-tech two-stroke. Two other useful, though less-recent, improvements include having the throttle on the tiller arm and a neutral gear. Most of these units do not have reverse gears, but they can be turned around for reverse when necessary. The horsepower range recommended for 20-foot sportboats is 2.5 to 3 horsepower.

Electric has arrived

The Torqeedo company was launched in Germany in 2005 with an electric outboard motor the designers and engineers were convinced would be revolutionary. Having won a handful of industry awards lately, it would seem that the Torqeedo concept has been universally accepted, but only in the last year have we begun to see greater penetration into the sailing and small-boat racing market. With the Torqeedo Travel 1003 the company has introduced an engine that is appropriate for lightweight sportboats used primarily for inshore races where transit times are short. The 1003, with more battery capacity than earlier models, and 3 horsepower equivalency, communicates with the user both visually and audibly. As the battery depletes, the 1003 sounds a simple alarm when 30 percent, 20 percent, and 10 percent of the charge remains.

The technology of the Travel 1003 shines, however, when you look at the LCD screen housed in the tiller arm. This small display shows distance remaining at current speed, actual speed over ground, charge percentage remaining, and power consumption, all from a built in GPS and microchip working in concert. When you adjust the speed the 1003 recalculates and gives you updated information. This is crucial, as speed is a power kill. For example, according to Torqeedo's numbers, reducing from full to half throttle increases the run time by a factor of seven or so, while decreasing the speed by a little less than half. If you have a long way to go, taking it easy will get you there.

The Travel 1003 breaks down easily into three parts: the battery pack, the tiller, and the aluminum leg. The motor itself is housed in a pod at the bottom of the leg, linked directly to the highly engineered, composite, three-blade propeller. The battery weighs just under 10 pounds with the tiller and leg coming in at just over 19 pounds together. This makes for a package that is very easy to carry in two parts and easy to

TECH REVIEW

MODEL	HONDA 2.3L	TRAVEL 503L	TRAVEL 1003L	YAMAHA F2.5	MERCURY 2.5	MERCURY 3.5	TOHATSU 2.5	TOHATSU 3.5	LEHR 2.5L
COMP HP	n/a	1.5 to 2	3 to 4	n/a	n/a	n/a	n/a	n/a	n/a
WEIGHT (lbs.)	31	29.3	30.8	37	40	40	41	41	37.4
FUEL CAP	0.29 gal	n/a*	n/a	n/a	0.3 gal	0.3 gal	.26 gal	.26 gal	16.4 oz**
FUEL TANK	integrated	n/a	n/a	integrated	integrated	integrated	integrated	integrated	external
CYLINDERS	1	n/a	n/a	1	1	1	1	1	1
COOLING	forced air	n/a	n/a	water	water	water	water	water	water
SHAFT LENGTH	22.5"	28"	28"	15"	15"	20"	15"	20"	15"
GEARS	F N	F N R	F N R	F N	F N	F N	F N	F N	F N
WEB	honda.com	torqeedo.com		yamahaoutboards.com		mercurymarine.com		tohatsu.com	golehr.com

*Torqeedo engines run on electricity stored in the onboard/removable battery

**LEHR engines run on propane. A 16.4-oz bottle is the common camping bottle

mount. For easiest installation, mount the leg/tiller combination to the bracket, then install the battery and lock them together with the provided pin. Attach two wires to the battery, one from the tiller and one from the leg, with their waterproof connections, confirm that the magnetic kill switch is in place, twist the throttle, and go—in forward or reverse—with nearly silent thrust.

In practical use the Travel 1003's battery will rarely be depleted completely while on the water, but if it is, give yourself nearly 15 hours to charge it to 100 percent with the provided charger. Torqeedo's flexible 45-watt solar panel in the summer sunlight of North America and Europe will charge the battery in approximately 13 hours. The solar panel, when brought on board and plugged into the battery while the motor is running, will dramatically increase run times, even make them limitless at appropriate speed. The 1003's brain calculates the solar panel's input into the run time equation and keeps you up-to-date on the LCD Panel.

"With the extra battery, the run time for a Travel 1003 is more than 40 minutes at full throttle, which is comparable to a 2.3 Honda with its integral tank and an extra gallon of gas in the jerry can," says Torqeedo representative Brandon Flack. "Using a Torqeedo eliminates the negatives of a gas engine, and introduces the positives of electric power. The attraction is the simplicity. No gas, no oil, no spills, no mess in the bilge, and virtually no maintenance."

The latest version of the Travel 1003 is truly tuned to the water environment. Maintenance is simply a rinse with freshwater at the end of the day if available, and for hot climates, battery storage is better in a cool place rather than in boat when it's not in use. The Travel 1003, when put together or in components, is waterproof to three feet—drop it in, pull it up, and twist the throttle, a very nice feature in our world.

Powered by propane

Introduced in 2012, LEHR's outboard engines are gas combustion—with a propane twist. Propane is used in many engines, from lawn equipment to trucks and buses. LEHR's engines are designed to work with either the ubiquitous one-pound green disposable canisters more commonly found lighting camp stoves and portable barbecues, or the 20-pound bottles that fuel your big grill. You don't want to be lugging around the big bottle, though, so for sportboats, the 2.5 horsepower LEHR, using one-pound canisters is the way to go.

"Propane has a higher energy density than gasoline," says Bernardo Herzer, founder and CEO of LEHR, who patented his technology for converting small engines from running on gasoline to using propane for fuel. "Propane is a better lubricant, and the engine does not need to be choked to get started. Simply pull the cord and you're off."

The 2.5 horsepower engine runs for approximately 2.5 hours at three-quarter throttle, says Herzer. And, although it's not zero emissions, it emits 60 percent less carbon dioxide than gas engines, and emits no other chemicals. "Propane is not a marine pollutant, and at room temperature it evaporates," says Herzer. "Also, there is zero contribution to ozone depletion from propane engines, no volatile organic compounds."

Quick Price Comparison

» TORQEEDO TRAVEL 1003

$1,999 engine with battery

$699 spare battery

$899 solar panel

» LEHR 2.5

$1,095 engine

$4.99 per one-pound gas bottles

» HONDA 2.3 LONG SHAFT

$1,025 engine

$3.78 per gallon (national current average)

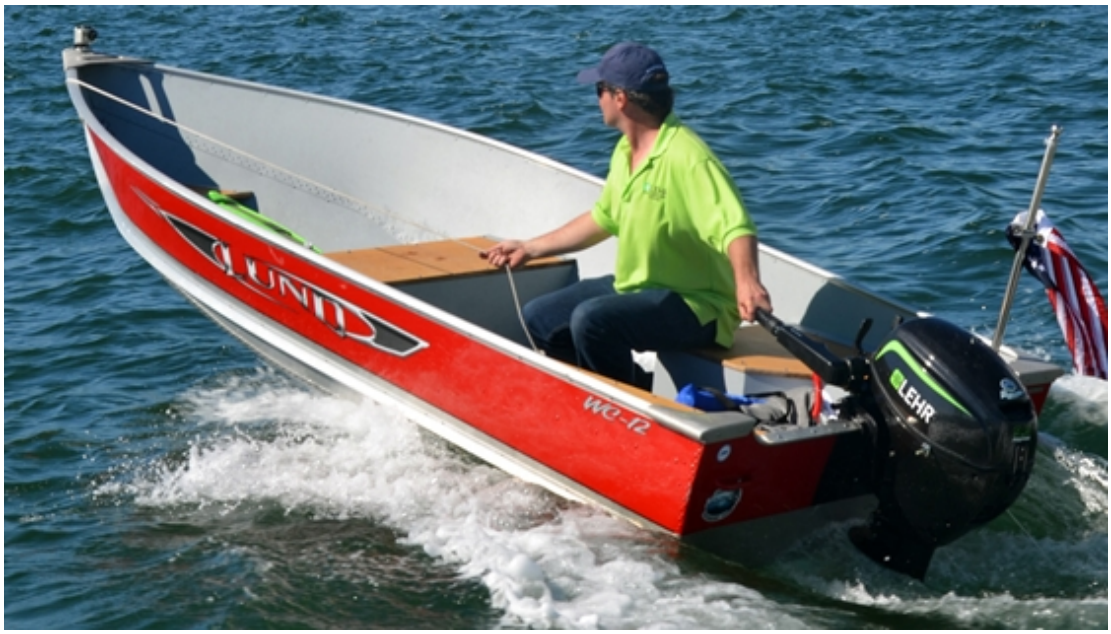
The 2.5 horsepower outboard has forward and neutral gears, and can spin around for reverse, like its gas counterparts. The fuel source is easily found and self-contained, so adding fuel is a matter of unscrewing one canister and screwing in another.

Whatever means you choose to power your boat to and from the racecourse, today's outboards are outstanding in their diversity and their individual strengths. Your needs and circumstances will guide you to the correct choice. Happy motoring . . . when you absolutely can't sail.

Lehr 9.9 Horsepower Propane-Fueled Outboard to Debut at Fort Lauderdale Boat Show

The new fuel-efficient and eco-friendly 9.9-hp model is likely to be competitive in a big segment of the boating market.

A new propane-fueled Lehr 9.9 outboard motor will debut this week at the Fort Lauderdale International Boat Show and reach the market in January, 2013, according to company president Capt. Bernardo Herzer, who just called me from California after completing a 40-mile, round-trip blast from Long Beach to Catalina and back in a 12-foot



Lund boat powered by the Lehr 9.9 motor.

The Lehr 9.9 during a test run in Southern California.

“We ran wide-open all the way with no problems,” said Herzer. “We think this motor will really demonstrate the potential of propane fuel for a marine engine.”

The new twin-cylinder 9.9-horsepower model will be offered alongside the single-cylinder 2.5- and 5.5-horsepower Lehr motors that were introduced in 2012 and won an Innovation Award at the Miami International Boat Show and the Green Product of the Year Award from West Marine. The 9.9 will take Lehr into a much larger market segment at a very popular power rating. The 212-cc four-stroke motor features F-N-R shifting and weighs 87.7 pounds in its lightest version, about five pounds more than a

Mercury 9.9 FourStroke. It will be offered in both 15-inch and 20-inch lengths, with tiller or remote steering and optional electric starting. Pricing will start at $2,599.
Unlike the Lehr 2.5 and 5.0 models, the new Lehr 9.9 will not have a provision to be fueled from a one-pound “camp stove” propane canister mounted on the motor. At this horsepower rating that small fuel supply would be impractical. The Lehr 9.9 will be fueled by a 10- or 20-pound portable cylinder carried in the boat, which will be sold separately. A steel tank like those used for backyard grills will work, but Lehr dealers will sell private-labeled see-through composite tanks manufactured by Lite Cylinder that are lighter than steel, non-corrosive, and probably a better choice for marine use.

The new propane-powered Lehr 9.9 is similar in size and weight to a gasoline-powered outboard.

According to Lehr, the 9.9 model burns 0.44 gallons per hour at a 3,000-rpm cruise speed, and at that rate would operate for 10 hours on a 10-pound fuel cylinder. Herzer says the new motor was designed by the Lehr engineering staff, and will be assembled in China with components sourced around the world. A key component is a patented fuel-metering system that replaces the carburetor or fuel injection found on a gasoline-powered outboard. Because the propane is delivered under pressure, Lehr says owners can expect easy starting in hot or cold conditions.

Derived mostly from natural gas, propane is currently cheaper than gasoline in some markets when purchased in bulk. Propane is clean-burning, non-toxic, produces no evaporative emissions, and will not damage marine life. It’s also much cleaner and perhaps safer to have on board than gasoline for auxiliary power, a reason Lehr says its 2.5 and 5.0 models are attractive to sailboat and trawler owners who need auxiliary power, would rather not have gasoline on board, and may already carry propane as cooking fuel.

“Imagine boating without gasoline,” said Herzer. “No more ethanol problems, no more fuel additives, no more spilled fuel in the water. This is all attractive to the green consumer, but I think propane power offers advantages any small boat owner will appreciate.”

Herzer says the Lehr 9.9 will be sold through West Marine and other marine specialty retailers, and through independent marine dealers.

LEHR Featured in Florida Sportsman

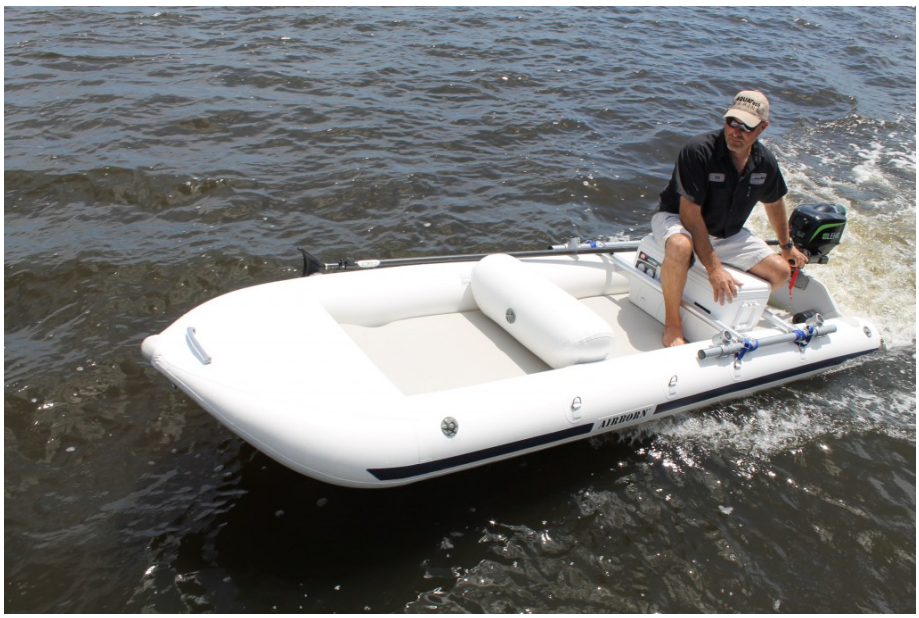
Bigger isn't always better, that's the case with the new Bare Bones built by Airborn Inflatable Boats. Touted as the world's first inflatable flats boat; the Bare Bones packs down to the size of a large suitcase. It can be checked on most airlines and fits into the trunk of your car. If you travel to the islands by large boat or private plane, now you have the option of fishing the flats with your buddy when you get there.

The unique design features a high pressure inflatable floor, much like an inflatable paddle board, and when pumped up to 8-pounds of pressure it's amazing how rigid it becomes. The hull is backed by a two year warranty and constructed from HD PVC coated 1000 denier polyester fabric. On the bottom of the hull you will find three flexible plastic fins to keep you on track and diminish effects by the wind. Topside interior features include a covered bow for storage and fly line landing, plus an inflatable seat that can be Velcroed in place in two different positions.

Further enhancing the Bare Bones portability is pairing it with the new LEHR outboard marine engine. These lightweight 4-stroke engines are propane powered using a standard 16.4-ounce camping bottle for fuel. No more mess or danger of spilling gasoline in your car, boat or plane. The combined weight of the boat and motor package is less than 100 pounds.

Airborn CEO, Richard Swan, met me in Stuart so I could get a close up look at his new watercraft along with the clean and efficient LEHR outboard.

Original Source: http://www.floridasportsman.com/2013/05/07/airborn-bare-bones/#.UYv4JXlV7Lk.email



Electric Outboard Motor vs. Propane Outboard Motor

In this How to Buy an Outboard Motor series of articles we have looked at current offerings in the four-stroke and two-stroke outboard motor market from many major manufacturers. We have explained how they work and what the truths, myths and misconceptions are when choosing an appropriate engine for your application. In the spirit of exploring all the options, we would be remiss if we did not look at alternative energy outboard engines such as the electric outboard motor and propane outboard motor.

This category is relatively new to the outboard motor market and is gaining in technology, ingenuity and popularity at a rapid rate. Advancements have moved these motors (be it mostly in the smaller kicker category) to the forefront and they have a great future.

One form of an alternative outboard motor to the traditional gas combustion engine spoken about widely in the automotive industry is that of an electric or gas-electric hybrid outboard motor. This technology is now making a foothold in the marine market, too.

An electric outboard motor on boats have commonly been thought of as trolling motors that propel at relatively slow speeds, enabling fishermen to cover more area while casting for the big catch. But now there are more offerings and options, including some that can truly replace a gas outboard and provide the same performance as smaller combustion outboards. Companies such as Torqueedonow offer 13 **electric outboard motors from one to 15 hp** and have motors capable of comfortably pushing vessels up to four tons.

This technology came about as a need by Torqueedo's founder for an electric motor that could propel his boat in Germany on a lake that had banned gasoline engines. The technology did not exist at the time to provide the required performance, so he founded a company to develop a motor that could. Torqueedo's latest generation of motors is up to the task and uses some innovative technology and engineering.

What is at the Heart of the Electric Outboard Motor?

The heart of their product is a brushless motor that is made with rare earth magnets. The motor is powered with lightweight clip-in modern technology lithium batteries and their larger touring 'Cruise' series motors can be fueled with wet cell or AGM batteries.

All the power generated ends up at an oversized polymer prop similar in design to those found on large vessels. This large prop allows for the propeller to turn slower than a traditional one but produces more thrust at a lower RPM, translating to a very efficient movement through the water. The thrust claimed by the electric outboard motor is rated differently from traditional trolling motors and, according to the company, **50% more thrust should be added to their motors' specifications to compare with traditional electric trolling motors.**

Other features, such as a ***built-in monitor****, allow the user of the electronic outboard motor to take all the guesswork out of wondering how much power is left or how far the motor can take them on the batteries' power.* All the user has to do is look at the monitor and adjust the throttle as required to increase range.

The power of a electronic outboard motor goes a lot further in their latest generation of motors. Improvements in efficiency and battery technology have increased range to a very respectable and usable amount. An example would be the performance of the largest of their current line-up: the 4.0 R motor connected to four of their Power 26-104 lithium batteries can push an 18-foot, lightweight skiff at half throttle at a speed of 9.9 miles per hour for 17.4 miles with a run time of two hours. If a longer run time is required, Torqueedo engineers have even come up with a solar panel that will charge batteries while underway.

The electronic outboard motor is very quiet when running and of course do not have the issues of remote fuel tanks as do their gasoline counterparts. Although the **electronic outboard motors are lighter** than comparable motors, **the additional weight of remote batteries should be considered when deciding on which motor to go with.** Torqueedo's smaller motors have batteries that attach directly to the motor (in place of onboard tanks in gas motors). These lightweight motors are designed to be highly portable and are a good option for cruisers with a tender, where the motor is taken on and off the tender often.

Technology is constantly improving and as each generation arrives, efficiency and reliability increases. Although limited to smaller motors, the power of the light electronic outboard motor is increasing and they are now a viable option for specific applications and are worth considering.

The Propane Outboard Motor

The **propane outboard motor** is a relatively new option in the outboard market. *There have been propane outboard refit kits available for some time, where the kit replaces the carburetor or injector system with a propane delivery system.* With a resulting partial loss in horsepower, these systems have yet to develop to the extent that they are accepted the way their automotive counterparts are. Propane, for whatever reason, has just not been viewed as a viable option. However, a new offering in the outboard category is catching on and making strides.

LEHR has introduced two small propane outboard motors that were designed from the ground up to run on propane. With current offerings of a 2.5HP and 5HP, long and short shaft motor and plans on manufacturing larger motors in the near future, these portable propane outboard motors are proving quite popular and are winning awards.

Developed by maritime captain Bernardo Herzer, these small propane outboard motors **run on either a regular propane tank like the one you use for your BBQ or a small twist-on disposable tank**, the type used for small camping stoves. If using the larger tank option, a line runs from the tank (they offer a polymer, non-corrosive tank for longer range without rust issues) and just connects to the front of the motor. With no priming, choking or carburetor issues, you just pull start the motor and you're on your way. If portability or refilling the larger tank is a concern then either model motor can be run on a disposable tank that clicks into an opening in the cowling. Fueling these motors with readily available propane-filled tanks eliminates the concern of spilling gas, fumes of stored gas and gummed tanks and carburetors.

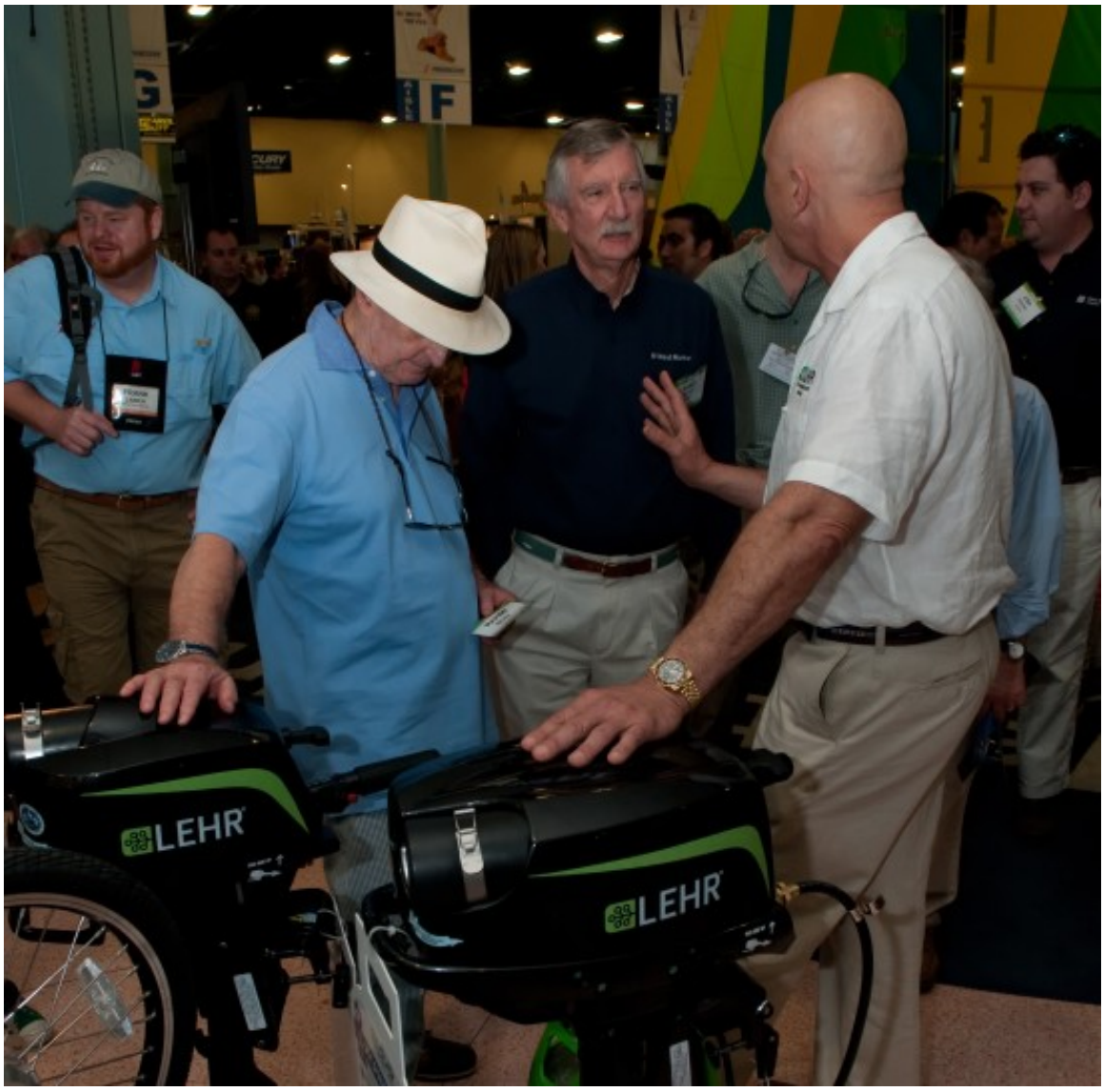
The efficiency of the propane outboard motor is reported to be comparable to gasoline motors in that each pound of propane will perform roughly the same as a gallon of gas providing similar power and range. There are claims that they can be as much as 14% more efficient than gas, but at the very least, performance of the motors is comparable to any 2.5 and 5 horsepower gas outboard. Physical specifications are also comparable. Apart from the oil in their crankcase and the disposable tanks (which are 100% steel and can be recycled) p**ropane outboard motor emissions make these truly green engines**. One just has to look at the environmental awards and accolades the motors have already received to see this is a major benefit.

As technology advances in both the electric outboard motor (and the batteries that power them) and in newly developing propane outboard motor, they will surely gain a large part of the outboard market. No matter whether you end up with a two-stroke or four-stroke outboard motor, or an electric or propane outboard motor, the fact is you will have a motor that is vastly improved over those of years past. Differences between

all of them will continue to blur, but there has never been a better time to purchase a new outboard.

For more information follow up on our How to Buy an Outboard Motor series

Glenn Hayes has reported on outboard motors since the magazine's inception in March. He can be reached online at hayesstudios.com.



LEHR Inc. AWARDED PITTMAN INNOVATION AWARD FOR 2013

LEHR Inc. AWARDED PITTMAN INNOVATION AWARD FOR 2013

LOS ANGELES, Jan. 24, 2013/ — LEHR Inc., founded by Captain Bernardo J. Herzer, was today awarded a Pittman Innovation Award for 2013. Presented by *Sail Magazine*, the awards recognize the most innovative and interesting new products on the market. In honor of widely respected Technical Editor, Freeman K. Pittman who succumbed to Lou Gehrig's disease in 1996, the Pittman Innovation Awards follows only the best in technical developments and marine technology.

LEHR Inc., the award-winning technology company that created the innovative solution of powering small engines using propane instead of gasoline has now developed the world's first OEM marine outboard engine fueled by propane. Previously available for vehicles, forklifts and large equipment, LEHR's innovation addresses the need for the benefits of alternative fuel propane in the marine market segment.

"Lehr's small propane-fueled outboards are at the forefront of what could be a significant trend – a trend fueled in large part by problems with ethanol-blended gasoline," says *Sail Magazine* technical editor Jay Paris. "Gasoline containing 10 percent ethanol has a nominal shelf life of a month or less and is especially problematic when used in small engines, which can become difficult to start and run, and may suffer carburetor damage."

The use of propane not only avoids the problems created by gasoline, but also makes engines more environmentally friendly and easier to maintain.

Captain Bernardo J. Herzer, founder and CEO of LEHR, is the trend setting entrepreneur and inventor with a deep passion for helping the environment. Founded in 2004, LEHR is dedicated to a cleaner planet through environmentally friendly technology. Inspired by Captain Herzer's commitment and forward thinking, the current slate of LEHR's research is focused on the use of clean burning propane to power small engines throughout several industries. LEHR continues to receive great recognition for its innovations that benefit humanity and spark global change. www.golehr.com

LEHR Inc. Now In Scandinavia

Lehr Scandinavia AB will import, market and distribute the company's gas-powered engines

Lehr Inc, a US inventor and maker of environmentally friendly, gas-powered engines, has appointed its first distributor outside the US.

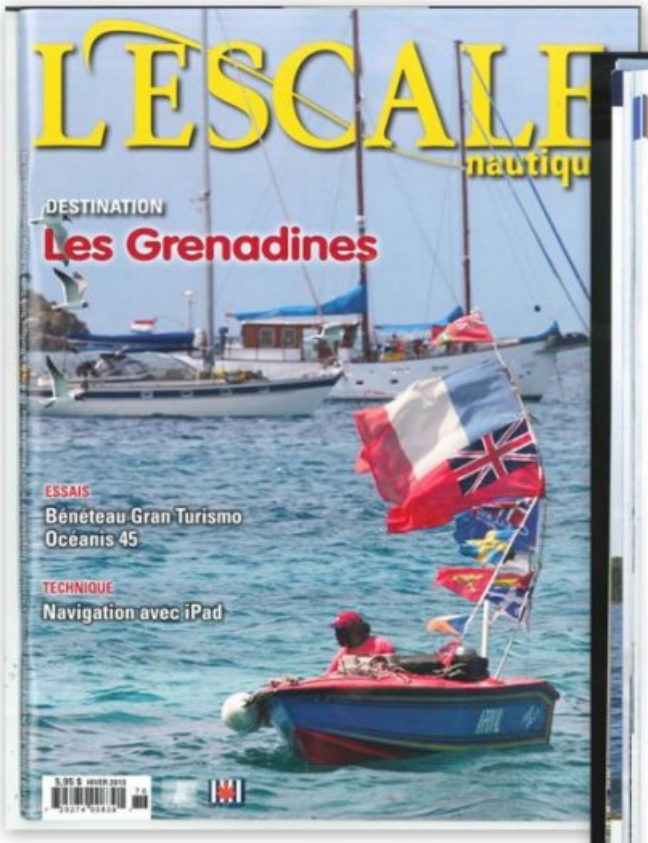
Lehr Scandinavia AB will import, market and distribute the company's complete range of outboards to recreational boaters throughout the region. The company is based in Gothenburg, Sweden.

"After a successfully and greatly accepted launch of our range of gas-powered engines in the US, we are truly pleased to now take this step against Scandinavia and the Europe market and contribute to cleaner air and responsible usage of outboard engines as well as yard equipment," says Bernardo Herzer, founder and CEO of Lehr Inc.

Kjell Hansson, partner and co-founder of Lehr Scandinavia, adds: "With its unique patented technology, it is very timely, particularly given the discussions on polluting two-stroke engines, to finally be able to offer a greener alternative for cleaner water in our active boating."

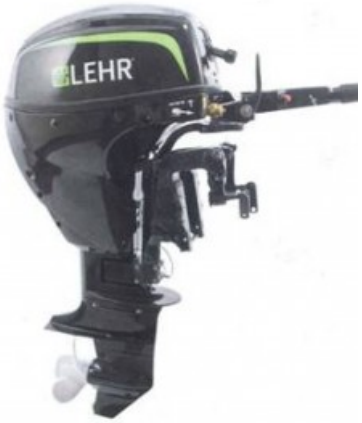
Lehr gas outboards are available in three models: LP2.5 (2.5hp), LP5.0 (5hp) and LP9.9 (9.9hp).

The French take a Liking to LEHR



motorisation

Des moteurs hors-bord au propane



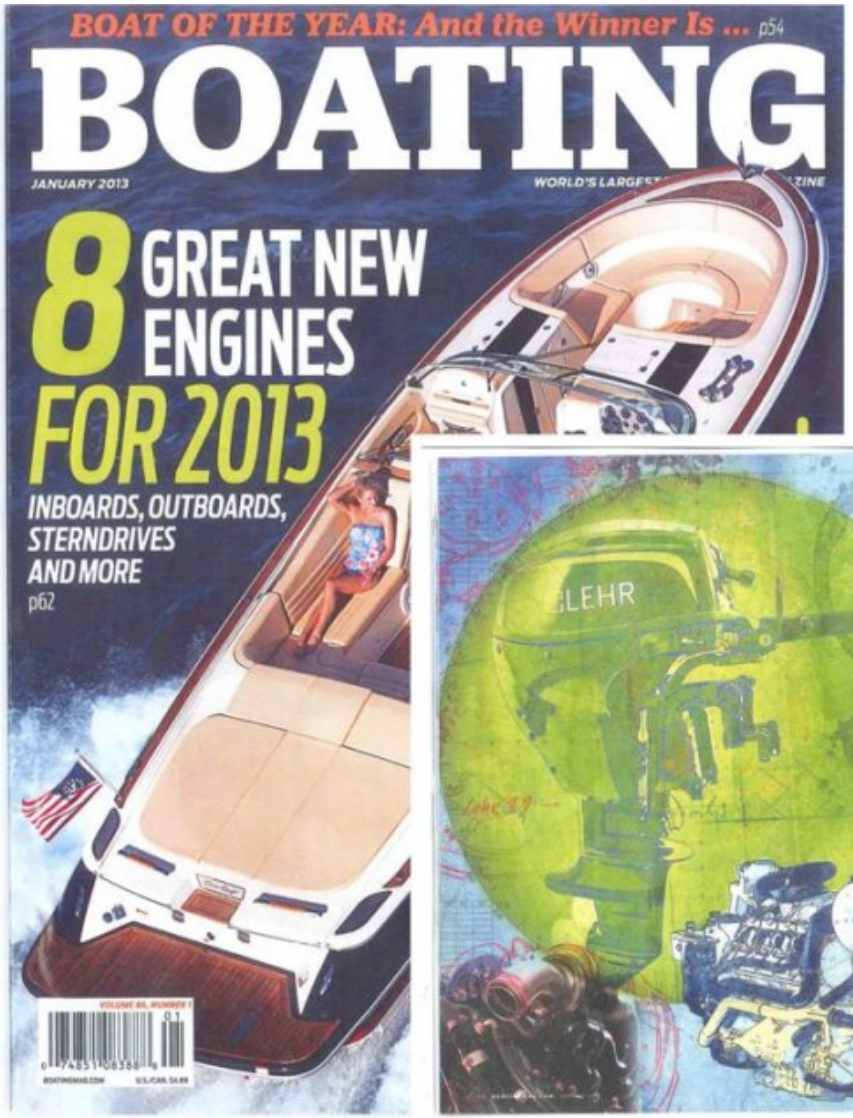
L'entreprise californienne Lehr vient de mettre récemment sur le marché une série de trois moteurs hors-bord fonctionnant au gaz propane domestique, le même que l'on utilise pour les cuisinières ou les BBQ. Lehr se trouve à adapter ainsi aux petits moteurs une solution qui a déjà fait son chemin dans le transport en commun et certaines automobiles. Outre les hors-bord, la compagnie utilise aussi la motorisation au propane pour une série d'outils de jardinage (désherbeurs et tondeuses).

La série de moteurs de 2,5 CV, 5CV et tout dernièrement 9,9 CV constitue une première dans l'industrie nautique, ce qui a attiré beaucoup d'attention sur le manufacturier qui a remporté plusieurs prix d'innovation. Son propriétaire, Bernardo J. Herzer, ardent promoteur de l'utilisation du propane, fait valoir le faible coût de ce carburant et ses indéniables vertus écologiques. Le gaz brûlé rejette effectivement très peu de particules dans l'atmosphère.

Ces trois moteurs de 4-temps s'adressent aux propriétaires de canots, dinghys et autres petites embarcations. L'alimentation peut se faire soit avec une simple bouteille de type camping, que l'on visse derrière le bloc et qui se trouve encastrée dans le capot, ou, mieux pour l'autonomie, avec une bonbonne métallique de 10 ou 20 livres. Lehr propose aussi pour 140 $ environ des bonbonnes en composite qui ne craignent pas la corrosion.

Les blocs monocylindres fabriqués par Lehr n'ont rien de particulier, sinon qu'ils sont équipés d'un carburateur qui régule la pression du propane expédié dans les cylindres. Ce système d'injection auto-régulé ne nécessite pas de starter et élimine toute possibilité de noyer la bougie. Le moteur part d'ailleurs le plus souvent du premier coup. Inutile par ailleurs d'hiverniser la ligne d'alimentation, le propane ne se dégrade pas avec le temps. La légèreté de ces petits moteurs constitue un autre avantage non négligeable, le 5 CV (arbre court) pèse 22 kg, soit 5 kg de moins qu'un Honda ou un Yamaha de même puissance. Les prix proposés sont très compétitifs et la garantie est de 3 ans. Ça fait beaucoup de bonnes nouvelles, le seul élément restrictif étant finalement celui du ravitaillement en carburant puisqu'on ne trouve pas facilement du propane partout. Les moteurs Lehr sont distribués au Québec par la Boutique nautique 30 Degrés.

Lehr 2,5 CV: 16,7 kg - 1 000 $ US
Lehr 5 CV: arbre long 20" - 23,5 kg
1 600 $ US
Lehr 9.9 CV: N/C



ALTERNATIVE FUELS

Electric and Propane

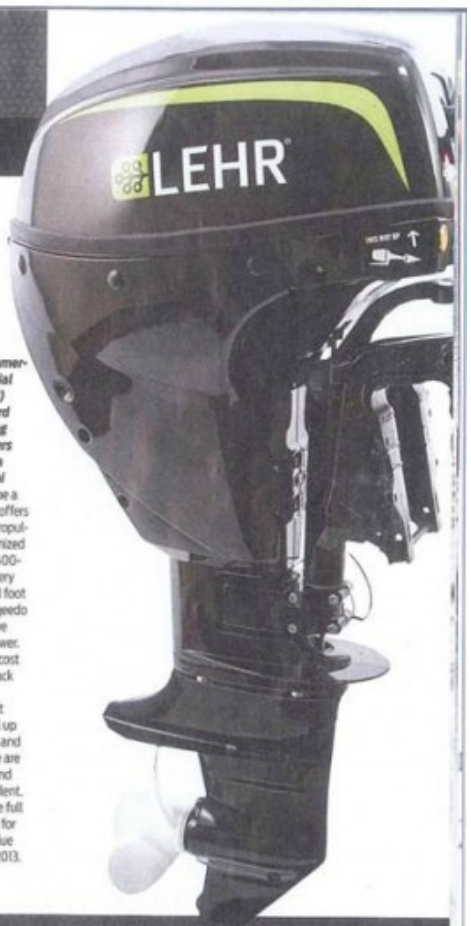
WHO WANTS IT? Boaters seeking less noise and/or less odor

IMPORTANCE? Leapfrogging power and run-time limits bode well for the future of alternative propulsion.

Propane outboard manufacturer Lehr Inc. will add a 9.9 hp outboard to its marine engine line in 2013, joining its 2.5 hp and 5.0 hp models. This new 9.9 takes Lehr into a larger market segment. The twin-cylinder, 212 cc motor features forward-neutral-reverse (F-N-R) shifting and weighs 87.7 pounds. A Mercury 9.9 FourStroke displaces 208 cc and weighs 83 pounds, just for comparison. The Lehr 9.9 is fueled from a 10- to 20-pound propane bottle placed in the boat. Retail pricing starts at $2,599 for a 15-inch model with manual starting and a tiller. The motor will also be offered with a 20-inch shaft, remote controls and electric start options. Derived mostly from natural gas, propane is currently cheaper than gasoline in some markets when purchased in bulk. Propane is clean-burning and nontoxic, produces no evaporative emissions, and will not damage marine life. It's also much cleaner and perhaps safer to have on board than gasoline for auxiliary power. Contact golehr.com/index.shtml.

Torqeedo expects the commercial market to provide initial sales for its 80 hp (60 kW) Deep Blue electric outboard motor, but it's also working with pleasure-boat builders and may rig the motor on a pontoon at the 2013 Miami boat show. This motor will be a big leap for Torqeedo, which offers a line of kicker-size electric propulsion motors up to 4 kW. Marinized lithium batteries power the 400-volt system. Each 14 kW battery measures 3 feet by 2 feet by 1 foot and weighs 330 pounds. Torqeedo says four batteries provide five to seven hours of working power. The motor with controls will cost $17,500, with each battery pack priced at $15,000.

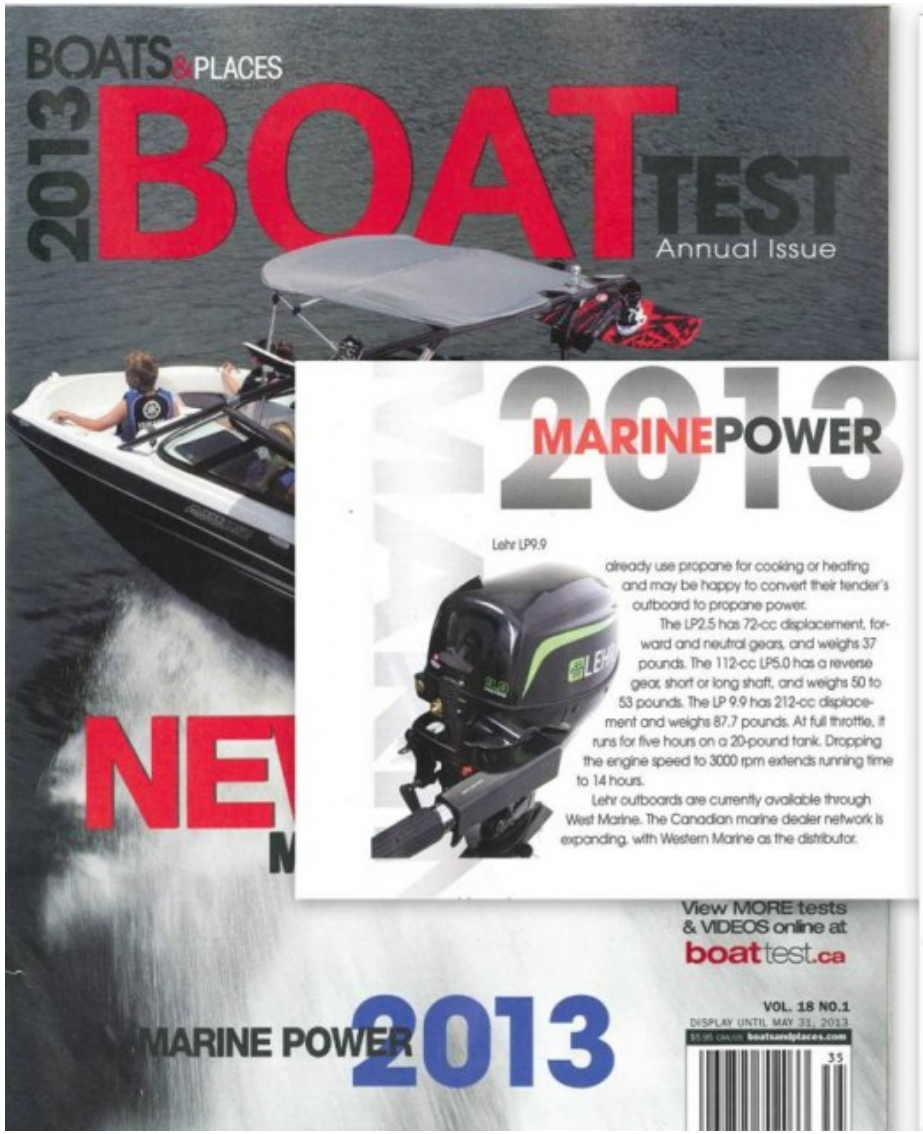
Torqeedo's position is that you're buying 10 years of fuel up front. There's no fuel to store and no service costs, it says. There are environmental advantages and electric motors are virtually silent. Because electric motors make full torque at all speeds, it's ideal for pushing heavy boats. Deep Blue will be available in February 2013. Contact torqeedo.com



Joystick control offers outboard owners the same maneuverability that pod-drive and sterndrive boaters have come to enjoy. It's expensive technology that limits its appeal to the upper end of the market. Owners of outboard-powered fishing rigs are apt to pooh-pooh a joystick: Man up and learn to dock your boat! Of course, these are the same folks who had no use for power steering and digital controls a few years ago. Teleflex Marine debuted its Optimus 360 outboard joystick, a system that works with all cable-controlled outboards in a dual installation, in 2012, and it incorporates a digital helm and controls for $18,000 plus installation. In 2013, Mercury joins the joystick party.

In early 2013 joystick piloting for Verado 250 and Verado 300 outboards debuts. It can't be retrofitted, so you'll have to repower or buy a new boat to get it. It's offered for twin, triple and quad Verado installations. Mercury already has joysticks for its Zeus pod-drives and its Axius system for MerCruiser sterndrives. The Axius steering actuator mates to the Verado steering ram in a single unit located in front of the motor. The Verado motors already have a digital helm, digital throttle and shift, and power steering. The joystick plugs right into that system, so it's a very tidy installation compared with the Teleflex system. Pricing is not yet available. As with Axius, we expect cost will vary by builder.

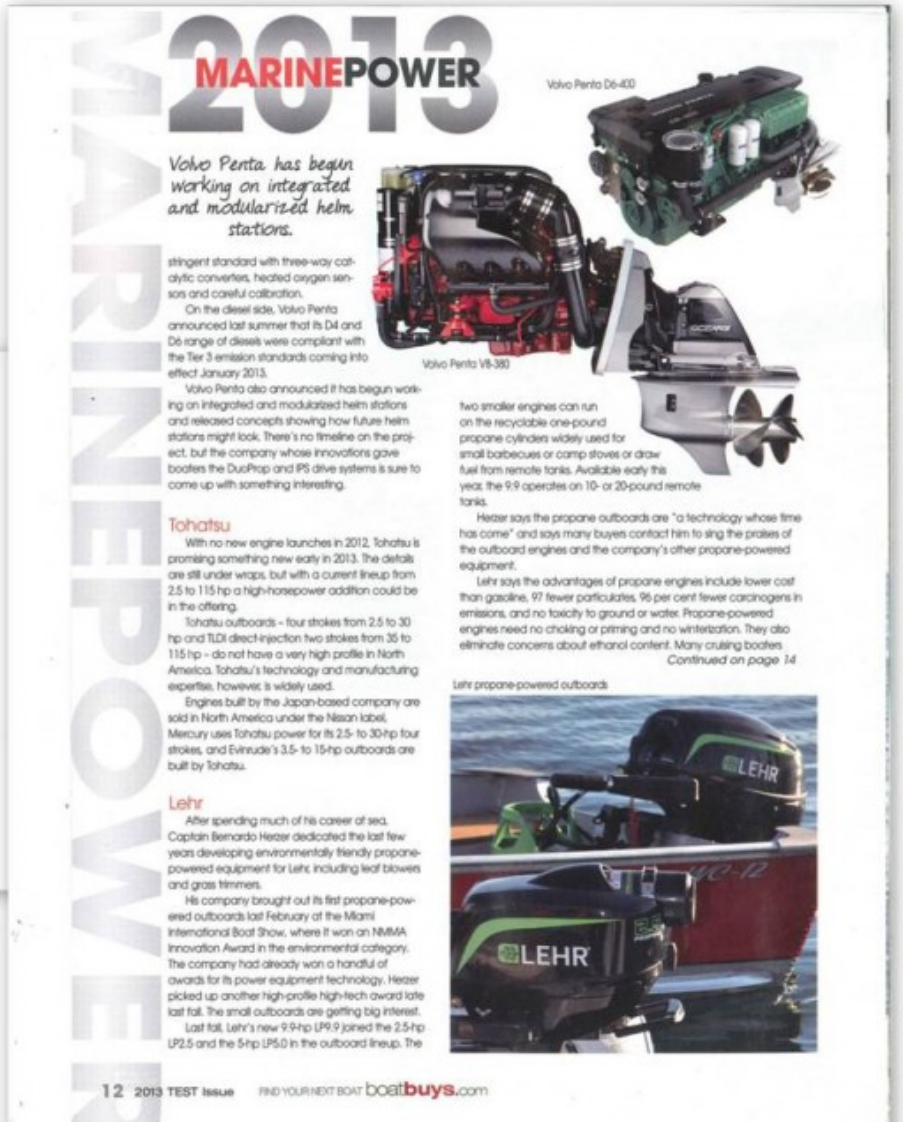
LEHR's Feature in Boating Magazine



already use propane for cooking or heating and may be happy to convert their tender's outboard to propane power.

The LP2.5 has 72-cc displacement, forward and neutral gears, and weighs 37 pounds. The 112-cc LP5.0 has a reverse gear, short or long shaft, and weighs 50 to 53 pounds. The LP 9.9 has 212-cc displacement and weighs 87.7 pounds. At full throttle, it runs for five hours on a 20-pound tank. Dropping the engine speed to 3000 rpm extends running time to 14 hours.

Lehr outboards are currently available through West Marine. The Canadian marine dealer network is expanding, with Western Marine as the distributor.



Volvo Penta has begun working on integrated and modularized helm stations.

stringent standard with three-way catalytic converters, heated oxygen sensors and careful calibration.

On the diesel side, Volvo Penta announced last summer that its D4 and D6 range of diesels were compliant with the Tier 3 emission standards coming into effect January 2013.

Volvo Penta also announced it has begun working on integrated and modularized helm stations and released concepts showing how future helm stations might look. There's no timeline on the project, but the company whose innovations gave boaters the DuoProp and IPS drive systems is sure to come up with something interesting.

Tohatsu

With no new engine launches in 2012, Tohatsu is promising something new early in 2013. The details are still under wraps, but with a current lineup from 2.5 to 115 hp a high-horsepower addition could be in the offering.

Tohatsu outboards – four strokes from 2.5 to 30 hp and TLDI direct-injection two strokes from 35 to 115 hp – do not have a very high profile in North America. Tohatsu's technology and manufacturing expertise, however, is widely used.

Engines built by the Japan-based company are sold in North America under the Nissan label, Mercury uses Tohatsu power for its 2.5- to 30-hp four strokes, and Evinrude's 3.5- to 15-hp outboards are built by Tohatsu.

Lehr

After spending much of his career at sea, Captain Bernardo Herzer dedicated the last few years developing environmentally friendly propane-powered equipment for Lehr, including leaf blowers and grass trimmers.

His company brought out its first propane-powered outboards last February at the Miami International Boat Show, where it won an NMMA Innovation Award in the environmental category. The company had already won a handful of awards for its power equipment technology. Herzer picked up another high-profile high-tech award late last fall. The small outboards are getting big interest.

Last fall, Lehr's new 9.9-hp LP9.9 joined the 2.5-hp LP2.5 and the 5-hp LP5.0 in the outboard lineup. The two smaller engines can run on the recyclable one-pound propane cylinders widely used for small barbecues or camp stoves or draw fuel from remote tanks. Available early this year, the 9.9 operates on 10- or 20-pound remote tanks.

Herzer says the propane outboards are "a technology whose time has come" and says many buyers contact him to sing the praises of the outboard engines and the company's other propane-powered equipment.

Lehr says the advantages of propane engines include lower cost than gasoline, 97 fewer particulates, 96 per cent fewer carcinogens in emissions, and no toxicity to ground or water. Propane-powered engines need no choking or priming and no winterization. They also eliminate concerns about ethanol content. Many cruising boaters

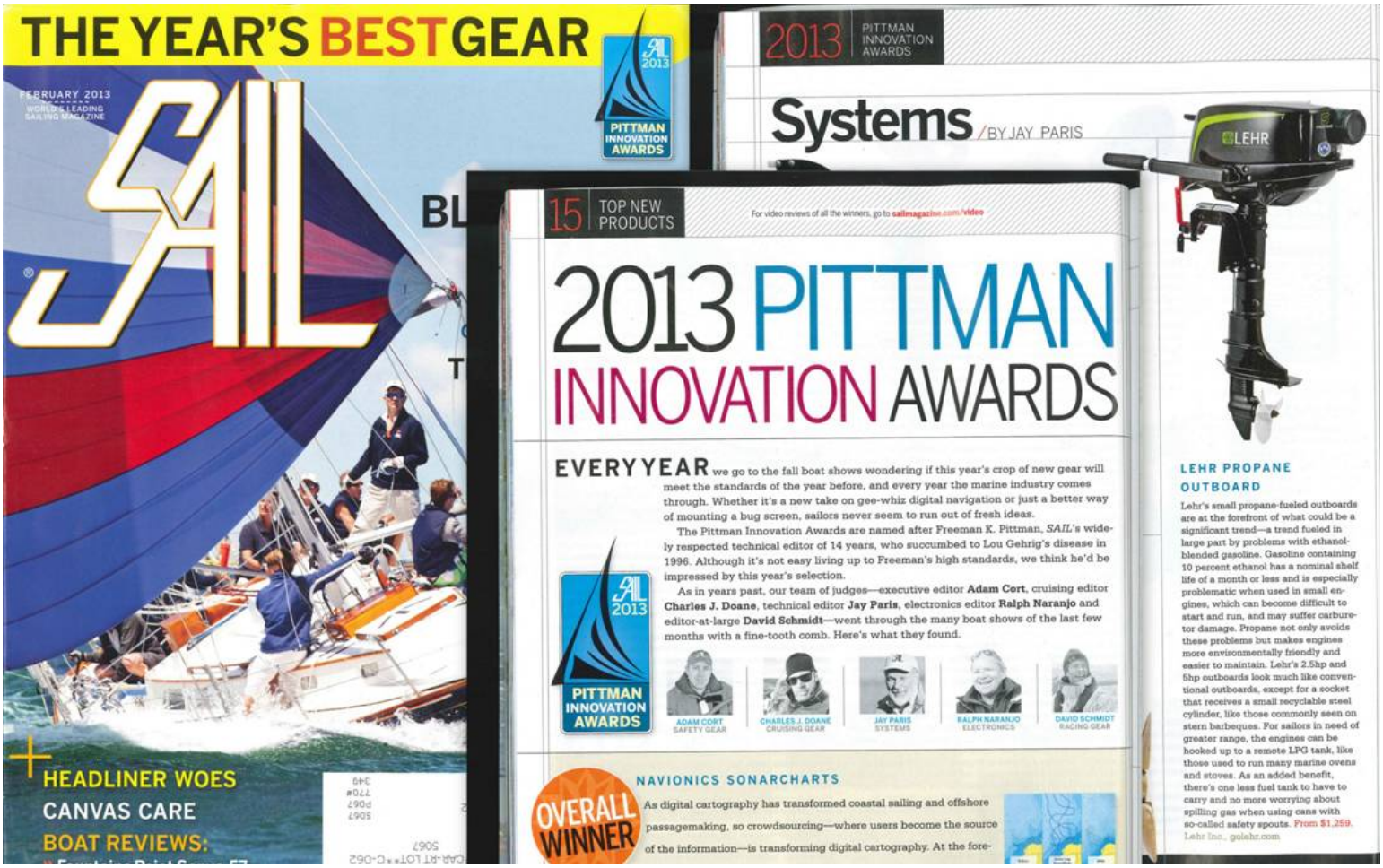
Continued on page 14

LEHR Featured in Boats & Places

LEHR Wins the Pittman Award

LEHR has won the Pittman award 2013 and is featured in this month's Sail magazine.

The award will be live at the Chicago strictly sail boat show January, 2013



LEHR Inc. Named 2012 Tech Awards Laureate By The Tech Museum

LEHR Inc., founded by Bernardo J. Herzer , was today named as a laureate of The Tech Awards 2012, one of 12 global innovators recognized each year for applying technology to benefit humanity and spark global change. The Tech Awards, a signature program of The Tech Museum, and presented by Applied Materials, Inc., selected LEHR from among hundreds of nominations worldwide.

LEHR Inc., the award-winning technology company that created the innovative solution of powering small engines using propane instead of gasoline has now developed the world's first OEM marine outboard engine fueled by propane. Previously available for vehicles, forklifts and large equipment, LEHR's innovation addresses the need for the benefits of alternative fuel propane in the marine market segment.

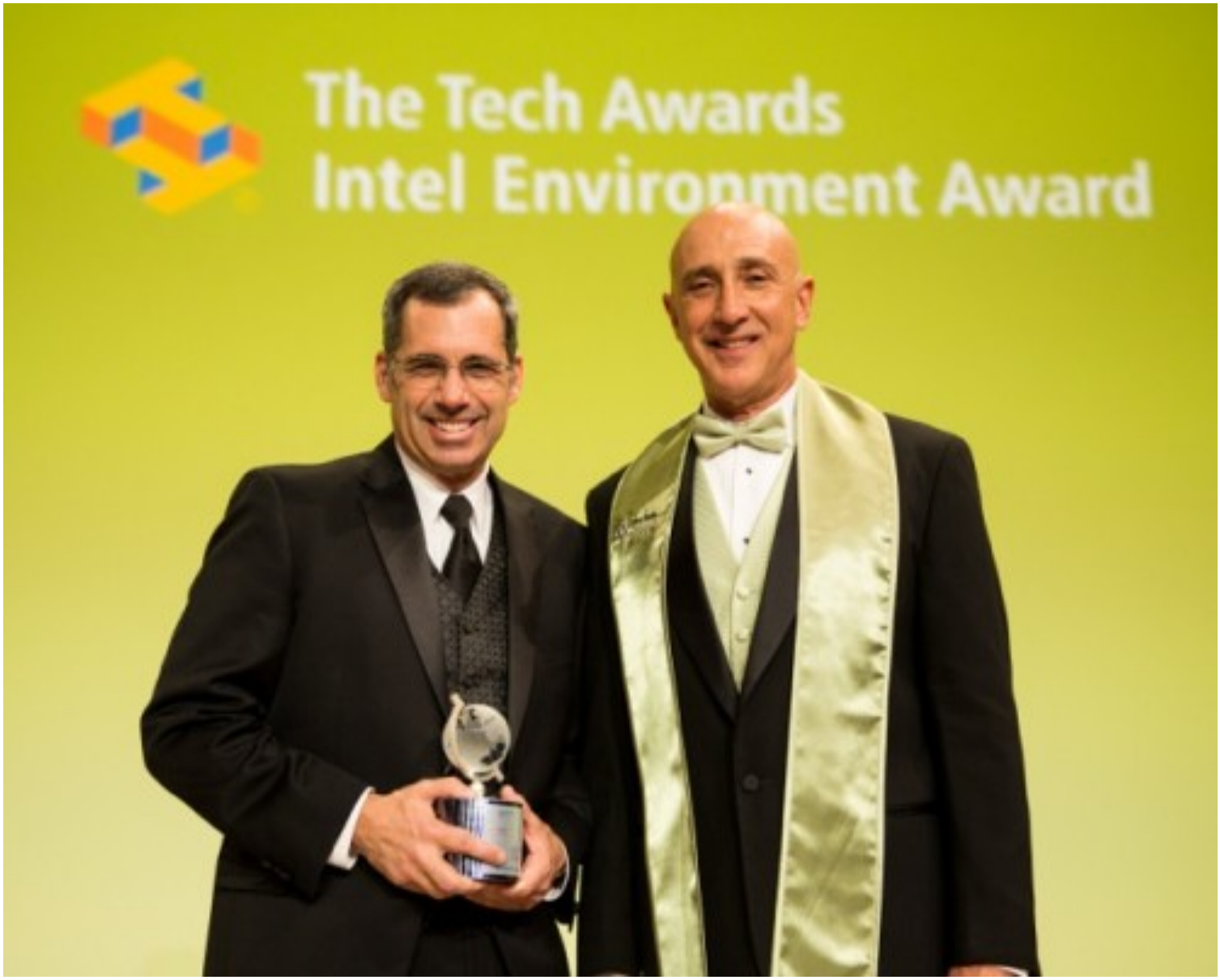
"The laureates' remarkable innovations are a powerful incentive for us to consider our individual responsibility to contribute to positive change around the world," said Tim Ritchie , president of The Tech Museum of Innovation. "The laureates personify what happens when we harness the very best of ourselves with the express purpose of developing innovative ideas for a more promising future."

Herzer said, "We are proud to be part of this global program joining with the Tech Awards and other laureates to help our planet and create a greener environment. Through technology and available resources we are able to help make a difference." This year, two cash prizes will be awarded – $75,000 and $25,000 – in each of the six Tech Awards categories: Intel Environment Award; Microsoft Education Award; The Swanson Foundation Young Innovator Award; Nokia Health Award; Flextronics Economic Development Award, and The Sustainable Energy Award.

Captain Bernardo J. Herzer , founder and CEO of LEHR, is the trend setting entrepreneur and inventor with a deep passion for helping the environment. Founded in 2004, LEHR is dedicated to a cleaner planet through environmentally friendly technology. Inspired by Captain Herzer's commitment and forward thinking, the current slate of LEHR's research is focused on the use of clean burning propane to power small engines throughout several industries.

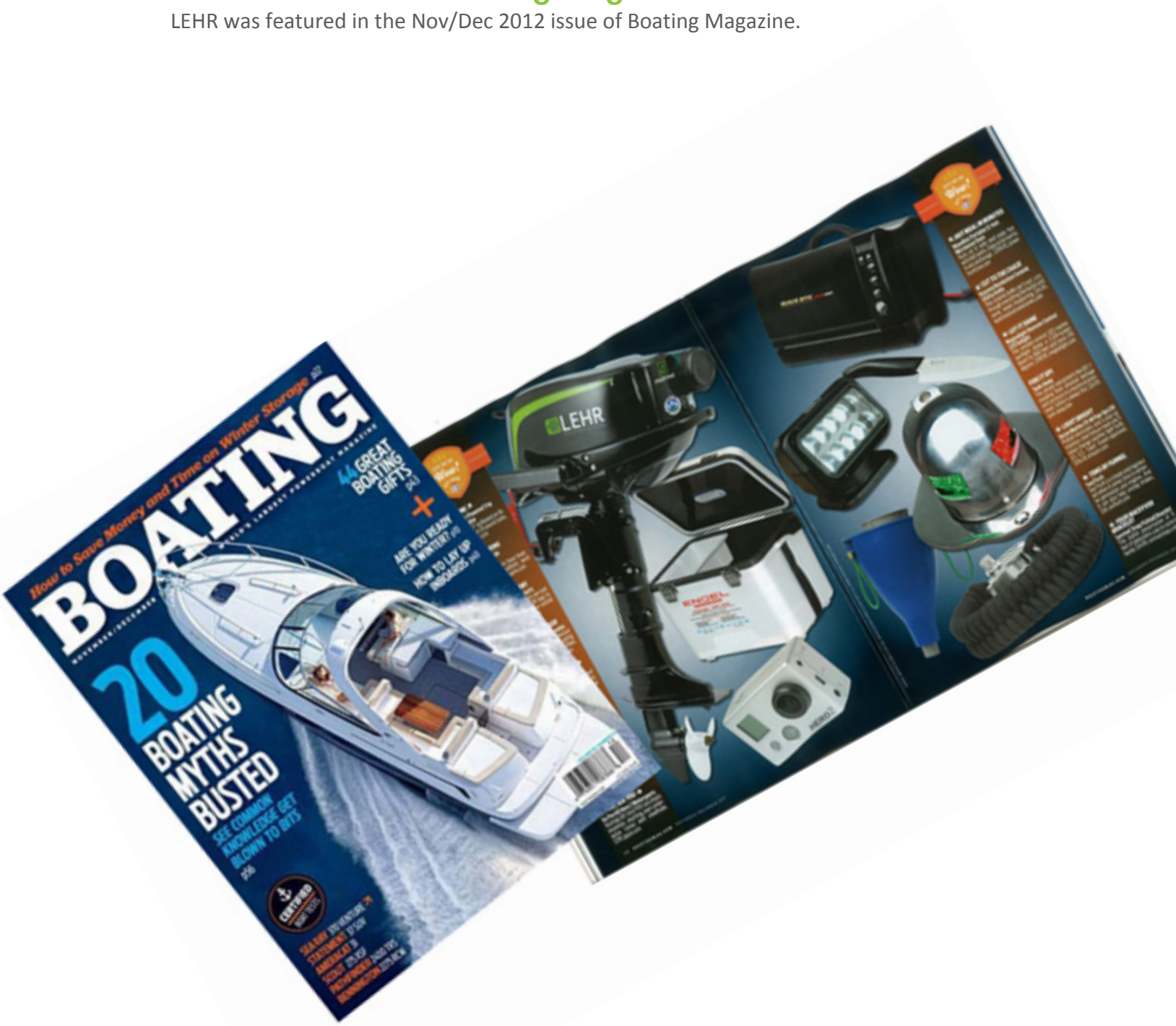
LEHR wins tech award

LEHR has won the Intel Environmental Award! Congratulations to Captain Bernardo Herzer and the entire LEHR team!



LEHR Featured in Boating Magazine

LEHR was featured in the Nov/Dec 2012 issue of Boating Magazine.



LEHR is product of the week at Sail-World.com

Our Product of the Week is a quiet, low-emission alternative for your dinghy's engine, which won the 2012 National Marine Manufacturers Association Innovation Awards Ecological prize.

Brand new from a company named Lehr, the 2.5 and 5 hp models are powered not by normal fuel but by propane (LPG).

The brainchild of Capt. Bernardo Herzer, the company's founder, they grew out of his desire to create a greener engine. Herzer started with gardening equipment and generators, so outboards were a natural outgrowth.

As Capt. Herzer explains, the ideas behind LEHR Incorporated were born during a series of long, cold nights spent converting gasoline engines to run on propane aboard the research vessel the Sea Surveyor at work in the North Sea.

Having already used propane to power small engines on several other ships in his years at sea, Captain Herzer knew he had something. 'Propane is just safer, more efficient and more reliable,' he says today, 'that's why we used it on our ships.'

Five years later, with corporate offices, and an R&D center at its 'green' headquarters in Los Angeles, California, LEHR is now a groundbreaking leader in the research and development of environmentally friendly technology.

The first generation of outboards includes a 2.5 and 5 hp four-stroke motor, in both 15- and 20-inch shaft lengths. Weighing just 52.8 pounds (long shaft), the 5 hp is the lightest outboard in its class, by a margin of up to 9.5 pounds. It's a fairly conventional engine with a single cylinder with a 112cc displacement, which is the smallest in its class.

When propane is pressurized, it's in a liquid state, which is more compact, but when the pressure is released it turns to vapor, which also makes it spill-proof. Even if it is vented into the atmosphere, it's not a problem since it's not classified as a greenhouse gas. Because propane is under pressure, Lehr outboards need a different fuel-delivery system that includes a special carburetor that doesn't have a choke, so we were able to start it easily with one pull. A major plus is that propane doesn't degrade with time, like

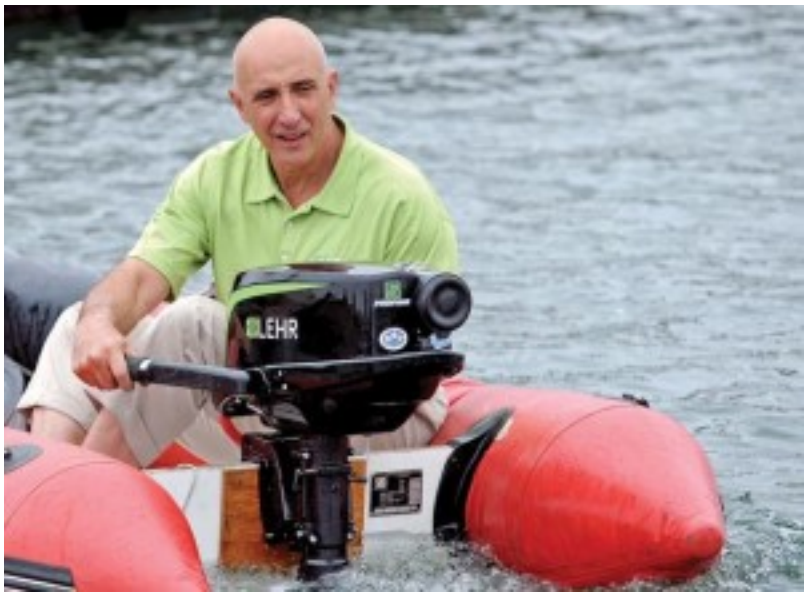
gasoline or ethanol-laced gasohol, which has damaged many small motors throughout North America.

Propane for a Lehr can be stored in a regular 20-pound-capacity barbecue tank, but a better alternative is a fiberglass or composite tank, which only weighs around 12 pounds. You can even screw one of those 1-pound camping tanks right into a fitting in the engine's cowling.

The Lehr outboard is very solidly built using high-grade metals such as stainless steel and bronze, and the fit and finish is good. Lehr produces its own engine block, so quality-control issues are within the company's sphere of influence. Pricing is comparable to conventional outboards, and based on current gas/propane pricing and fuel efficiency, your fuel bill will likely be lower.

Lehr plans to build engines up to 175 hp, but the company started small in order to work out any issues.

If your local dealer cannot produce the product for you, click here to learn more and purchase online.
by Sail-World Cruising



TalkOfTheDock.com covers LEHR

INNOVATIONS

Fun Above and Below the Water

by Zuzana Prochazka
TalkoftheDock.com

It's hard to say whether these three products are for entertainment or safety but you could argue it's both. As part of the National Marine Manufacturers Association awards judging panel, I had the opportunity to inspect these products at the Miami boat show and found them to be quite innovative. Now I just need to get them on my boat to have a little fun.

PROPANE OUTBOARD BY LEHR

You probably already have a gasoline powered outboard and you've seen the electric versions that are nice but expensive. Now there's a third option – propane. That's right, if you have a diesel as your main engine, and you don't want to carry gas for the tender, you can get a propane-powered outboard that is a cleaner and arguably safer solution aboard.

The Lehr propane-powered outboard is an award-winning design that runs on 16-ounce bottles which you screw directly into the outboard like you do with your onboard gas grill. You can also hook it up to a larger remote propane tank that you put in the dinghy with you. Propane is a clean fuel with zero evaporative emissions, virtually no particulate emissions and no messy gas or oil to drip into the water. Propane prices are lower than gasoline and aren't nearly as volatile so you're likely to save at the pump too.

The new outboards are currently available in 2.5 hp and 5.0 hp models with short or long shafts. The engines have a traditional manual pull start and the 5 hp model has forward, neutral and reverse while the 2.5 hp has forward and neutral so you just turn the engine around to go backwards. Weight depends on the model and ranges from 38 to 53 pounds. A gallon of propane can power the 5 hp outboard for up to two hours and the 2.5 hp model for up to four hours, depending on speed and sea state.

Outboards aren't Lehr's first venture into propane-powered equipment. CEO, Bernardo Herzer, started with lawn mowers and scooters before coming up with an outboard that isn't just a conversion engine but is actually designed and optimized to burn propane. The Lehr engines come with a 3-year limited warranty. Pricing for the 2.5 hp model starts at $1,200 and goes up to $1995 for the 5 hp long shaft. A 20 hp version is in the works. For more information visit GoLehr.com.

AQUALENS AND HYDROVIEW BY AQUABOTIX

Do you need to see what's stuck on your rudder but don't want to take a dip in chilly water? How about checking on your anchor from the security of your deck? Both are now possible with two fun and useful gadgets by Aquabotix.

AquaBotix offers two viewing systems, one self-contained and one that works from the end of a pole. The AquaLens is a portable underwater camera with live video feed and LED lights that you can mount on the end of your boathook. It weighs three pounds and has a diameter of five inches. The 640 x 480 pixel camera has a 3.5-inch LCD screen and uses eight AA batteries. The system is collapsible so it's easy to store and retails for $475. If you want to do a quick check on your prop after running into a submerged object or you wish to evaluate the underwater condition of the piling you're tied to, hook up the Aqualens and stay dry.

Now, if you want to venture farther, try the new HydroView which is as kind of underwater rover also with a built-in camera and LED lights. It looks like a small airplane with two propellers on either side of the lens. It measures 19 x 15 x 7 inches and weighs only eight pounds but can go to a depth of 75 feet and with the optional cable, can venture 300 feet from its control source. You "drive" the Hydroview via the topsides WiFi box and steer it with your iPad, iPhone or Android device by simply tilting your tablet or smartphone in the direction you want to go. The Hydroview can travel at up to five knots, has a two hour run time and retails for $3,995. That's a steep price to pay just to check on your anchor but then if there are sharks around, it seems like a pretty reasonably priced solution. Besides, maybe you'll find sunken treasure with it and it will more than pay for itself. For more information, visit Aquabotix.com.

LEHR Featured in Proptalk

Clean, Green, Propane Machines—Lehr's 2.5- and 5-Horsepower Outboards

Most people wouldn't bet their lunch money that a pair of small four-stroke outboards could be show stoppers at any boat show, much less the Miami International Boat Show. But that was before Lehr introduced its new 2.5- and 5-horsepower outboard engines, which run on clean, relatively cheap, liquefied petroleum gas—also known as LPG or propane. Lehr has been manufacturing LPG-powered lawn mowers and other lawn implements like blowers and trimmers for some time, so making the transition to marine engines seemed logical. There are many advantages to propane-fueled engines: they are more efficient than their gasoline counterparts, have no choke and require no priming. They are easy to start, there is no carburetor gum-up from bad fuel, and the engine produces no evaporative emissions. Both units are capable of running off the small, disposable 16.4-ounce propane cylinders found in most outdoor and hardware stores for camp barbecues and lamps, but can also be hooked up to a larger cylinder to extend range (make sure you take precautions for overboard venting of LPG fumes if you use a large cylinder inside the boat). The 5-horsepower model has forward, neutral, and reverse gears. The 2.5-horsepower model has only forward and neutral, but the outboard swivels 360 degrees, so reverse can be facilitated simply by turning the unit around. The 2.5-horsepower comes only with a 15-inch (short) shaft option and retails for $999.99. The 5-horsepower unit has 15-inch (short) and 20-inch (long) shaft options, which retail for $1599.99 and $1629.99, respectively. *golehr.com*

Yep, that's a 16.4-ounce propane canister and Lehr's 2.5- and 5-horsepower outboards run beautifully on the clean fuel. Image courtesy of Lehr

LEHR Wins 2012 Innovation Award

PRODUCTS & INNOVATION

2012 Innovation Awards

Winners from the Miami International Boat Show & Strictly Sail

Lehr Propane

Shown both in Booth T68 and at the West Marine display (where it won a West Marine green award for the positive environmental aspect) was an amazing new product, the Lehr Propane outboard engine.

Lehr Inc. is the award-winning technology company that has introduced the innovative solution of powering small engines using propane instead of gasoline. Their debut at the Miami International Boat Show was to announce the world's first OEM marine outboard engine fueled by propane.

These are small engines, best suited for canoe use or on smaller dinghies, but among the big boat crowd, propane fuel could be very attractive.

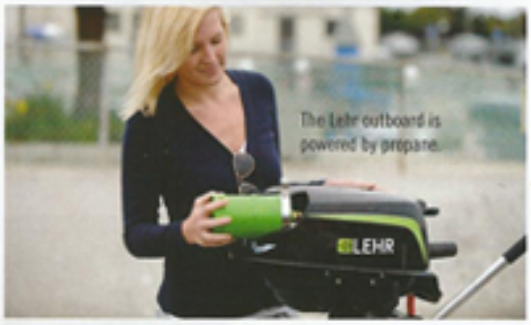
Previously available for vehicles, forklifts and large equipment, Lehr's innovation addresses the need for the benefits of propane as an alternative fuel in the marine market segment.

Captain Bernardo J. Herzer, founder and CEO of Lehr, is an entrepreneur and inventor. He founded Lehr in 2004 and in 2008, Captain Herzer was granted the first of many patents to power small engines using propane. Lehr was given the EPA Clean Air Excellence Award and numerous breakthrough products of the year awards, including ones from Popular Mechanics and Popular Science.

Applying Lehr's technology to a marine solution is both timely and beneficial for our planet and its water supply. The EPA and CARB set strict new standards for gasoline marine engines and especially fuel systems in order to reduce the amount of gas fumes, carbon monoxide, hydrocarbons and smog-forming pollutants. (See *Boating Industry Canada*, February 2012 for a complete article by Dave Gerr of the Westlawn Institute on the new Fuel Systems).

Propane does not "go bad" with time (avoiding the fuel related-carbureted maintenance and repairs associated with ethanol added fuels). The Lehr engines are offered in 2.5 HP and 5.0 HP models and are available through West Marine stores.

ENVIRONMENTAL AWARD
– Propane Outboard by Lehr



The Lehr outboard is powered by propane from many sources including the small green BBQ bottles. With zero evaporative emissions and no winterization needed, Lehr makes sure some boaters never need to carry gasoline aboard. Mark Corke noted "I'd love to put this on the tender to my diesel powered sailboat and never think about gas again."

The 2012 Miami International Boat Show & Strictly Sail is one of the most important venues for companies marketing products and services to the marine industry. The show attracts visitors; both consumers and marine industry professionals from around the world, making it a great launching pad for new products.

The weather this past year was excellent and the boats and related products displayed were sufficiently impressive that our impressions as we left the show were that the industry was moving forward from the recent downturn and into better times. ■

LeBlanc: Alternative fuel in outboard motors

I know the gasoline prices have really hurt us outdoor types especially if you are one who is pulling a boat. It is bad enough that your truck gas mileage decreases when you hook on the boat but then if you are running on the lake either skiing, using personal watercraft, or fishing with a three digit horsepower engine you are really burning up the fuel and at close to four dollars a gallon that can knock a hole in the old wallet.
Weekend before last I had the privilege of being invited to the Rockport/Fulton Spring Fling, which hooks up local businesses, fishing and outdoor accessory companies, and a few outdoor writers. As usual Pam and I arrived on Saturday and left Tuesday.
We were put up at the Inn at Fulton Harbor that is right across the street from Fulton harbor where the shrimpers, oyster boats, fishing boats, and all sort of pleasure craft dock, and also resides one of the finest seafood eateries on the Texas Coast, Charlotte Plummer's restaurant. And yes I ate too much, but I do not know how to eat in moderation when I am down there and faced with fresh shrimp, oysters, crabs, and fish all over the table. I can only hope The Good Lord forgives me for the sin of gluttony.

Because the wind was pretty stout and my back cannot take a lot of pounding I took Tommy Moore's Birding trip once more and each time I go I see more, different birds that call the Texas Gulf Coast home. It also helps that Tommy has a 42 foot boat of his own design and the boat motion has yet to bother my back. If you get a chance to go down into that area and take birds for granted as I did at one time take a trip with Tommy and you will really get into the beauty and fascination of our birds. He can be reached at tmoore@rockportadventures.com.
Sunday night we had an opportunity to get with the local merchants, outdoor product dealers and manufacturers, and look at some new products, beside eat. One that really caught my eye was the outboard motors by LEHR and distributed by Donovan Marine. They were two and one-half and five horsepower, are four cycle, and run on propane.

You can either screw on a Coleman type propane bottle like you use for you lantern or camping stove, and the five horsepower will run for an hour on one canister of propane. If one so chooses you can hook on a 20 pound bottle like is used on your gas grill and not have to worry about changing bottles.

Some of the features of the propane fueled engine is it does not have or need a choke to use when you start it. It needs no priming and it has no carburetor gum up as our

gasoline powered engines will tend to do, as we have to use the sorry excuse for gasoline that we must tolerate, and there are no additives to add to the fuel if you are going to have to leave the fuel sit for four to six weeks or more.

To keep the green people from getting the vapors, the propane fueled engine has zero evaporative emissions, it is not a marine pollutant, and it is nontoxic fuel.

In case you did not know – and I didn't – according to LEHR driving a gasoline powered motorboat with an outboard engine for one hour may make as much air pollution as driving a car for 800 miles. The main reason seems to me to be the fact that an engine in a car does not have to pull all of the time, there are periods of low strain while cursing where it only takes a minimum of power to keep your car or truck going. A boat motor on the other hand has the drag of the water to contend with as well as the weight and is under a strain the entire time a boat is moving.

Another important point about using propane is if you run a car or truck on gasoline and then switch it to propane your fuel consumption will decrease considerably when you switch to propane, but when ran in a boat the propane will be within ten percent of fuel consumption with the gasoline engine. Now compare the cost differential of about one and one-half dollars per gallon with propane costing the least you can see how you can save money running the propane engine.

The small engines now available are great for johnboats and especially for sailboats, as it comes with a 15 inch short shaft, or a 20 inch long shaft. That doesn't mean a lot to the bass angler and many involved in other watersports that demand larger, more powerful engines but the man from Donovan's Marine told me that testing had been successful on a prototype, 175 horsepower, outboard running on propane and should not be long from being seen on the market.

I do not know about you folks out there, but I can get excited by propane fueled outboard engines, so let's keep our eyes open and see how this plays out for us water lovers.

Sounding Trade Only: Lehr offers propane outboards

MIAMI – Just as he promised at the 2010 Fort Lauderdale boat show, Capt. Bernardo J. Herzer's Los Angeles-based Lehr Inc. has debuted two propane-powered outboards – 5-hp and 2.5-hp models – at the Miami International Boat Show.

"I'm an inventor," Herzer said. "I developed this technology in a number of industries (lawnmowers, weed trimmers, leaf blowers, motor scooters), but my passion is to bring it to boats."

Formerly the captain of an oceanographic vessel, Herzer said he saw firsthand the destruction technology has wreaked on the oceans, in particular the use of factory ships in fishing, so he decided to do something.

He said propane engines are as much as 50 times cleaner than gasoline engines. Propane is half the price of gasoline and doesn't gum up carburetors. Propane-powered outboards do not require winterization. The fuel is easy to store, and boaters can use lantern or BBQ propane canisters to fuel the boat.

Herzer said the 5-hp outboard will run for 10 hours at full throttle on five gallons of propane; the 2.5-hp outboard will run for 20 hours on the same amount of fuel.

He also said his outboards meet the Environmental Protection Agency's 2015 emission standards for small motors.

The suggested retail price of the 2.5-hp model is $1,199; the price of the 5-hp engine is $1,919. West Marine and Donovan Marine are carrying the Lehrs.
"In Venice, Italy, they've converted all their gondolas to propane," Herzer said.

— Jim Flannery