

FOUR-BANGER BOOST



We pit fuel injection against carburetor on the venerable 3.0L block to see how this four-banger benefits from EFI and other mods

> BY JIM BARRON

General Motors' 3.0L I-4 block has been around for decades. This classic four-banger was originally designed for vehicles such as the Chevy Nova, and there also was a higher-displacement six-cylinder version. Yet, it was the economically priced I-4 that caught hold as a sterndrive powerplant.

Today, the 3.0L is showing its age. The push-rod valve train limits rpm versus the newer overhead cam designs. Yet some things are timeless, and the 3.0L's cast-iron construction, high torque and proven reliability are assets in marine applications.

Until recently, the marine 3.0L existed strictly as a carbureted powerplant. Now, we are seeing the same engine with electronic fuel injection (EFI) from both MerCruiser and Volvo Penta.

It's important to remember that EFI is not a horsepower-enhancing system. It is simply a more efficient way to deliver fuel to the combustion chamber. A carburetor, when not encumbered with emission controls, works quite well. Any increase in power experienced with EFI is often due to other refinements, such as a modified cam, head, intake or exhaust.

HORSEPOWER MODS

In the case of Volvo Penta—its 3.0GX_i with EFI—there have been extensive modifications to both the intake and exhaust manifolds that boost the horsepower to 150 versus 135 for the carbureted 3.0GL version.

The Volvo Penta EFI intake manifold is a long-runner design that wraps over the top of the engine. This enhances midrange torque by providing a tuned ram effect to force more of the fuel/air mix into the combustion chamber. The exhaust manifold also has been redesigned with an expansion chamber shape to help draw exhaust gasses out.

A comparison can be drawn with the 3.0L EFI from MerCruiser—it has a conventional manifold system and is rated at 135 hp, same as the carbureted version. Thus Volvo's extra 15 hp does not come simply from the addition of EFI but rather from refinements to the manifold system.

There's been a need for an engine in the 150- to 165-hp range for quite some time. The gap between the 135-hp 3.0L and the 190-hp 4.3L V-6 is substantial, and a lot of smaller boats could benefit from a bit more horsepower.

To see what the extra ponies would do, we decided to test both versions of Volvo's 3.0L I-4 in a Stingray 195LX bowrider on South Carolina's Lake Robinson, which is near the

Stingray factory. At 19½ feet and 2400 pounds, the 195LX was a challenging test boat for a 3.0L sterndrive.

TESTING PROTOCOL

The first thing we did was run tests of the 195LX with the 135-hp carbureted 3.0GL. The tests included top speed, acceleration and fuel consumption. We also recorded acceleration when towing a ski



■ As a baseline, we tested Volvo's carbureted 3.0L in a Stingray 195LX bowrider.

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STINGRAY 195LX

Stingray's Z-Plane hull design makes each of the company's boat models exceptionally fast, and the 195LX was no exception. The hull carved turns very tightly, and was relatively quick to plane considering the power applied.

Performance was adequate with either of the Volvo Penta 3.0L I-4



sterndrive engines we used for this test; yet in our opinion, a 4.3L V-6 in this nearly 20-foot boat is a better choice if

you plan on loading the boat with several passengers and gear.

Stingray's 195 series boats are available in bowrider and cuddy models with three different interior arrangements.

Our test boat was a 195LX with a sunlounge over the engine and a full width bench seat in front of the engine.

drone, a device that mimics the affect of a skier on the boat's acceleration.

We then replaced the engine with the 150-hp 3.0GXi EFI, using the same hull, SX drive and 21-inch-pitch Volvo Penta aluminum three-blade propeller, and then repeated the tests. The prop held the engines in their rpm range but, as expected, the 150-hp engine turned the prop at a higher rpm.

Let's check out the test results.

Top speed with two adult males on board was 42.3 mph at 4650 rpm with the 135-hp engine. The 150-hp engine pushed the top speed to 44.2 mph at 4800 rpm, besting the carbureted version by nearly 2 mph.

Acceleration from 0 to 30 mph measured 8.2 seconds for the 135, and 6.9 seconds for the 150—no surprises there. What did surprise us was the difference when we ran acceleration tests with the ski drone attached. Our 0-to-30-mph times climbed to 13.3 seconds for the 135, a 5.1-second difference from the unladen boat. The 150 required 10.8 seconds to reach

SPECIFICATIONS

STINGRAY 195LX

Base price	\$21,300
Price as tested (w/ Volvo 3.0GXi)	\$23,641
Length	19' 6"
Beam	7' 7"
Deadrise at transom	19 degrees
Weight	2400 lbs.
Draft (drive down)	31"
Fuel capacity	21 gals.

ENGINE AS TESTED

Make	Volvo Penta 3.0GL/SX	Volvo Penta 3.0GXi/SX
Horsepower	135	150
Number of cylinders	I-4	I-4
Displacement	3.0L (181cid)	3.0L (181cid)
Weight	670 lbs.	686 lbs.
Induction	2V carburetor	Multiport EFI
Gear ratio	1.97:1	1.97:1
WOT rpm range	4600	4800
Propeller	Volvo Penta 14.75x21" 3-blade aluminum	Volvo Penta 14.75x21" 3-blade aluminum

ENGINE/RPM	SPEED/MPH	FUEL/GPH		FUEL/MPG		RANGE/MILES ¹	
		135	150	135	150	135	150
1000	4.7	0.8	1.1	5.9	4.3	111	81
1500	6.7	1.3	1.8	5.2	3.7	98	69
2000	7.9	3.2	2.3	2.5	3.4	47	64
2500	15.6	4.3	3.6	3.6	4.3	68	81
3000 ²	24.2	5.5	4.6	4.4	5.3	83	100
3500 ³	30.5	6.8	6.0	4.5	5.1	85	96
4000	36.3	8.4	8.3	4.3	4.4	81	83
4500	41.7	11.6	11.8	3.6	3.5	68	66
4650	42.3 (WOT 135)	12.2		3.5		66	
4800	44.2 (WOT 150)	12.9		3.4		64	

¹ Based on 90% fuel capacity

² Optimum cruising speed for 150-hp engine

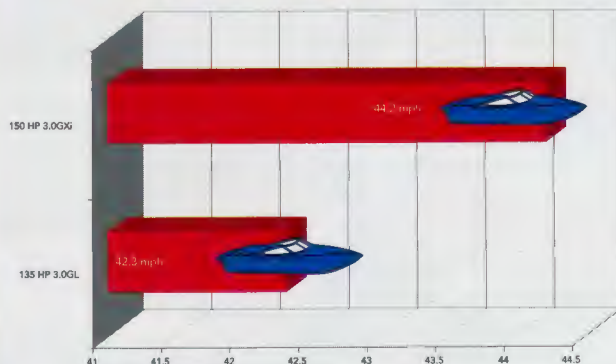
³ Optimum cruising speed for 135-hp engine

Stingray Boats, Dept. TBM, 625 Railroad Ave., Hartsville, SC 29551; 843/383-4507; stingray.com
Volvo Penta, Dept. TBM, 1300 Volvo Penta Drive, Chesapeake, VA 23320; 757/436-2800; volvopenta.com



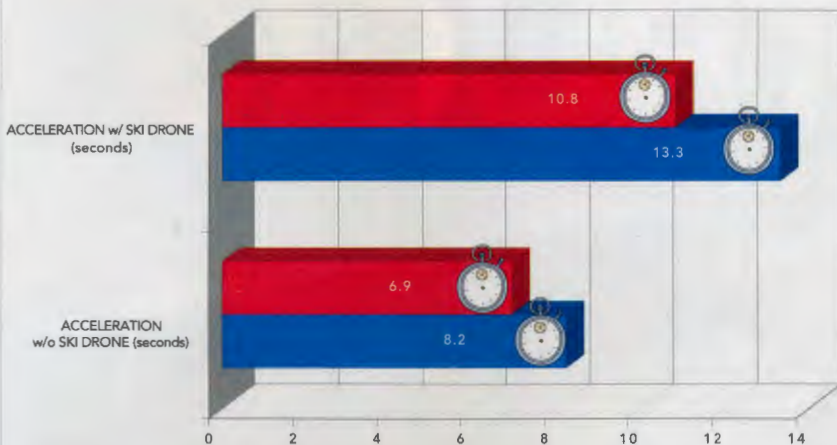
■ Stingray's sporty bowrider squeezed out nearly 2 mph with the additional 15 horsepower provided by the Volvo Penta 3.0GXi/SX sterndrive with EFI.

TOP SPEED COMPARISON



ACCELERATION TIMES (0 TO 30 MPH)

■ 135 HP 3.0GL ■ 150 HP 3.0GXl



30 mph, a difference of 3.9 seconds. The 150-hp engine was clearly quicker at popping up skiers, and the difference will be most noticeable when trying to start a heavy skier on a single ski in deep water, often a struggle with the 135-hp engine.

SURPRISING FUEL EFFICIENCY

The fuel consumption data surprised us. We'd expect an EFI-equipped engine to do slightly better than a carbureted engine if both engines are of equal horsepower. EFI offers a more efficient method of

delivering fuel, and maintains a more uniform fuel/air mix across the rpm range. With 15 additional horsepower, we also would expect the 150-hp 3.0L to burn more fuel across the rpm range. However, it doesn't and it's surprisingly more fuel efficient over much of the rpm range, particularly from slow displacement speeds (2000 rpm) through higher cruising speeds (4000 rpm). Only at idle speeds and near wide-open throttle does the 150-hp EFI burn more fuel than the 135-hp carbureted model.



■ After running the boat with the Volvo Penta 3.0L GL, the engine was swapped out for the 3.0GXl.



■ The 150-hp 3.0L scored a significantly quicker acceleration time when pulling the ski drone.

The difference in fuel consumption will probably not make much of a difference when considering the overall costs of owning and operating a boat. Yet, there appears to be no penalty in choosing the more powerful engine. The cost difference is going to be most noticeable in the initial purchase price. The 135-hp Volvo Penta 3.0GL/SX sterndrive has a suggested retail of \$9100. The 150-hp Volvo Penta 3.0GXl/SX sterndrive with EFI is \$10,880. The carbureted 190-hp Volvo Penta 4.3L V-6 is \$11,135.

From a purely subjective view, the 3.0L with EFI was noticeably smoother than the carbureted unit. The carbureted engine had a slight tendency to hesitate when the throttle was popped open to accelerate, while the EFI engine was smooth and progressive throughout the rpm range. From the seat of your pants, the difference in acceleration and top speed was noticeable.

The 150-hp Volvo Penta 3.0GXl with EFI is a worthy upgrade for most entry-level boats—increasing performance without adding the mass of a larger 4.3L V-6. The 3.0L EFI was smoother and pulled better than its carbureted counterpart, while costing nothing extra in terms of increased fuel consumption.

Volvo Penta has certainly given this four-banger a boost. ⚙️