

Viper 640 Sportboat Buyer's Guide

Interested in a Viper 640? This guide is intended to help sort through the various Viper options you may be considering – whether new or used.

Vipers 640s have been made by two builders and an informal Mark I through Mark VI lingo has evolved to describe the six distinct, but subtle evolutions. The differences are largely cosmetic or functional and reflect modest and thoughtful updates and improvements to the boat over time. There have been no changes to the hull or foil shapes. On the water, any version of the boat can and does win races.

First, the high level aspects of a Viper that are relevant to any one-design class: hull, mast, sails and foils.

Hull – In 2011, the Class Technical Committee conducted a very high resolution digital scan of the Mark I and then-current Mark III hull shapes, primarily to create a digital record of the hull and foil shapes for safekeeping. A detailed analysis of the two hulls confirmed that there is no material difference between the two versions, particularly where the hull is in the water while sailing. The current Mark VI hull molds were created from the Mark III plug and are identical.

Mast - The mast, a key variable in some classes, has not changed since the introduction of the carbon mast in 2007. All Viper mast section tubes have been made by the same carbon composite vendor so bend characteristics are very uniform and mast failures are rare. The carbon rig is a significant improvement over the initial aluminum rig and is an essential upgrade if you happen to uncover an early boat that does not have one.

Sails - As with any racing sailboat, fresh sails can make a difference. Class rules strictly limit sail purchases to one set per year and include a relatively robust minimum fabric weight for the main and jib. A 2018 rule change allows aramid fibers in the jib for a longer competitive life. Purchase limits help to manage the cost of ownership and maintain a level playing field – an attractive feature for many. In the first year of ownership of a new boat you can acquire a second set of new sails (essentially next year's sails). With a used boat, the new owner has more options, including keeping the used sails that came with the boat or starting over. At the end of the day, you can have only one main, jib and spinnaker each from a given year. Details are in the Class rules. Sail designs and construction have evolved incrementally and the current designs from the many Class-approved sailmakers are easy to tune and very close in performance.

Foils – As a lifting keel sport boat, some wear and tear occurs when raising and lowering the keel. In 2012 the Class adopted an official keel foil shape to guide keel refinishing and fairing. New keels are now made to this shape. There were some minor inconsistencies in all the original keels through the Mark III boats. Though fairing is not required, if any fairing is done, it must be faired to the official Class shape within a fairly narrow tolerance band, as per the Class rules. A keel foil template can be purchased inexpensively from the Class. Mark I boats must have the larger keel bulb upgrade installed. All active boats have done this, but there might be a “barn” boat or two that has not. Rudders have a very consistent shape.

A 2017 Class rule change updates the original swept rudder to a vertical rudder over a 3 year period (until March 31, 2020). The vertical rudder improves control of the boat, especially downwind in breeze. The newest Mark VI boats have a rudder tower with a vertical aft face to implement this. Mark III through V boats can install a simple bolt-on vertical bracket available from Rondar. The many Mark I and II boats that have already upgraded to the Mark III rudder

tower can install the same Rondar bracket. Remaining Mark I and II boats with small towers can install the Mark III tower or possibly a specific vertical tower conversion the Class is working on, but is not yet available.

This guide will review the different Viper versions and things to look for and be aware of when considering buying a boat. Any Viper that may have been neglected can be made front-of-the-fleet competitive – with some effort and funds. A helpful feature of the Class rules is a provision that allows older boats to be upgraded to include current features. The Mark III style rudder tower and forward footblocks in the cockpit are good examples. Otherwise, strict one-design limitations exist on any changes as in most classes

The Viper 640 Class Rules are readily available on the Class website and are an easy read. Please check them before making any changes to your new ride to make sure your “great idea” is legit. Questions will be gladly answered by anyone on the Class Technical Committee. See www.viper640.org

All estimated costs below assume approximate costs as of the date of publication to acquire the replacement parts, and may include a rough time estimate, but do not include the cost of any professional repair or installation. If a prospective buyer or an owner looking to sell would like suggestions for a “market” price for a particular boat, please contact a member of the Executive or Technical Committees for a recommendation. There are of course many factors that impact price: the condition of the boat and sails, what equipment is included, what modifications have been made or need to be done, etc.

Mark I (through hull 60)

Vintage 1996-1998, the first Vipers were built by Performance Boats of Bristol, RI. aka “Bennett boats”, for Brian Bennett, the designer and initial builder. Unfortunately, Performance Boats went out of business in 1998 and the molds were sold off in the liquidation. Some of the very last hulls ended up in Europe and have 600 designations. Construction is epoxy/foam/glass, hand laid and vacuum bagged.

Things to look for:

- Gelcoat adhesion issues. These boats used the same tie coat product between the epoxy hull and polyester gelcoat as the early Mumm 30s and Farr 40s and gelcoat separation can occur. Repair cost varies based on the extent of gelcoat adhesion issues, if any.
- The original small swept rudder towers can sometimes fail and will need to be upgraded by March 31, 2020. A part to update to the Mark III version is available and many Mark I’s have done this upgrade. To get to a vertical rudder, the Rondar vertical bracket is installed. The Class is working on a direct vertical replacement tower for Mark I and II’s, but it is not available yet. Estimated cost to upgrade: \$500, time commitment: 4-6hours.
- Keel bulb upgrade. Required to race one-design. Nearly all Mark Is have done this. If not, the estimated cost to upgrade is \$150, time commitment: 10-15 hours.
- Leaky keelboxes. The Mark I keelbox fits around the keel and rebuilds may be needed if the boat has been grounded hard. Repair cost varies depending on how hard the boat was run aground, if at all.
- Leaky transom seams and hull/deck separation. Easy to fix. Time commitment: 2-3 hours.
- Sunken mast step. Plywood under the step may need to be removed and rebuilt plus an inspection port or hatch installed in the cockpit floor to access this area. Time commitment: 4-6 hours.
- Prices on Mark I’s vary significantly depending on how well the boat has been cared for and its condition. Because the boats are older, it is not uncommon to see more wear and

cosmetic issues on these boats. On the low end of the range are boats that have not had all upgrades done, have older sails and need a fair amount of TLC. That said, there are Mark I's that have been very well cared, fully tricked out and in great condition.

- Common updates/replacements
 - Remove bow roller and replace with curved bar for chute launcher. Many Mark I's have done this. Estimated cost: \$200. Time commitment: 4-6 hours.
 - Upgrade GNAV to ball bearing car and track. Purchase between 8:1 and 16:1 allowed. Recommend that the original Proctor/Selden boom be reinforced with the allowed sleeve or prave to handle the increased loads. Estimated cost: \$400. Time commitment: 2-3 hours.
 - Add footblocks to cockpit floor for forward crew. Estimated cost: \$250. Time commitment: 2 hours.
 - Keel refinishing and/or fairing.

Mark II (hulls 70-101) Built 2007-2009 by Rondar Raceboats in the UK out of the original Performance Boats molds, which ended up in Europe and were unused for years. Vinylester/foam/glass construction, hand laid & vacuum bagged. Same small rudder tower and large, black delrin keel guides are the visual give aways. These boats switched to the larger keel bulb and carbon rig as standard and changed spinnaker chute roller to more effective curved bar.

- An early batch of Mark II's (hulls 70-79) came out of the molds heavy and were warrantied and resold by the manufacturer with full disclosure, though there are owners who have these who have raced them well.

Mark III (hulls 102-179). Built 2009-2011 by Rondar UK built using the first set of molds they constructed. MKII changes, plus much larger bombproof rudder tower, mini "sugar scoop" transom for a more secure & robust hull/deck joint, sacrificial keel cassette/guide to prevent or minimize hull damage in the event of grounding at speed. Minor changes to some molded parts to ease production/de-molding. Some Mark III's have had keel cassette repairs made when the "sacrificial" keel cassette/guide breaks loose from a grounding or if the keel was not well shimmed. Boats that have had more robust work to strengthen this area should command a premium.

Mark IV (hulls 180-218). Built 2012-2014. Rondar UK and Rondar US built in a second set of molds. All of the MKIII changes, plus larger cockpit lockers with hatches on flat flanges so the hatches seal better, more robust keel cassette and new keel mold for more fair keels to Class spec shape (from #192), less aggressive non-skid on the deck. US built were resin infused. US and UK molds from the same plug.

Mark V (hulls 219-276). Built 2104-2017. Starting at hull 219 in early 2014, Rondar UK built with delrin keel wedges were installed on the sides of the keel that seat into new pockets in the keel box, eliminating the top cassette and providing a more simple and robust way to secure the keel in the boat. This setup is not retrofitable and does not provide any speed advantage, but should prove to be more durable over time.

Mark VI (hulls 277-present). Built 2017 - present. Rondar UK built. Only significant change is the vertical rudder tower that builds on the Mark V improvements.

Over the years there have been tweaks to enhance the boat's durability and ease of use. Nothing that is speed altering however. Old Vipers are every bit as fast as new ones, they just have older boat maintenance issues, as you would expect. Things like cosmetics, some issues with the polyester gelcoat adhesion to the epoxy laminate, tired non-skid, worn hardware and running rigging, leaks and so on.

Common Repairs / Upgrades on Many Used Vipers:

- **Sails:** Almost all used boats will come with sails that have been used in a fair number of races. New Viper sails cost around \$5000-6000 depending on the sail maker. Some sail makers offer discounts for bulk orders or during less popular times of year, such as early fall, where you can often get 5 to 20% off a sail order. Spinnakers are the most expensive sail and get a fair amount of wear and tear from hoisting and dousing through the bow launcher, gybing around the headstay, and through improper storage in some situations where left in the kite sock wet.
 - Used sails are usually available for purchase second hand and there is a specific section in the Class on-line forums for used sails. Good used spinnakers can be difficult to source since many teams will want to keep an old kite around for windy practice days. The price of used sails will vary significantly, with an extremely good used set that only has a few days on it going for \$3000-4000 and sets with a full season or more going for less than \$1000 or up to \$2500 depending on condition.
- **Mast:** New masts come with a clearcoat finish that wears off over time with UV exposure. If the mast looks chalky or dull, a fresh application of clearcoat or paint protects the carbon fiber. A brushed-on two-part clear finish or paint works well.
- **Spreader Sweep:** Spreader angle or sweep can vary. Check this key dimension before sailing and adjust to the at least the Class minimum dimension and preferably the value recommended by your sailmaker for the design of their sails. Replace spreaders if attachment is loose or sloppy and drill new holes very carefully. In about 2016 Rondar upgraded to a thicker spreader section.
- **Standing Rigging:** Almost all teams have upgraded to lower shrouds with adjustable open-body turnbuckles. The manufacturer supplied many boats with column adjusters and “fast pins”, which are harder, not as precise, and not as safe to adjust on the water. Standing rigging replacement every 3 years or so is prudent.
- **Mast Blocks:** Rondar boats usually come with a line-based system to control the mast at the partners and influence mast bend. Almost all teams have shifted to using mast blocks for more solid and repeatable tuning and control.
- **Running Rigging:** Update to favorite lines. Note that there are minimum diameters and tapering is not allowed in current class rules.
 - Increase gnav purchase to the 16:1 maximum allowed by class rules for easier adjustment of a key control
 - Move Cunningham cleating from the mast to a dual side mounted system for the forward crew. 4:1 purchase is sufficient.
 - There are 4 different mainsheet configurations available that are fairly easy to switch between. Choose what best fits your sailing style.
- **Keel lower cassette shimming** on some of the Mark III and later hulls. If the keel moves at all while sailing this needs to be addressed. There is a Tech Committee document on keel maintenance available in the Class forums.
- **If a keel was faired** after Sept, 2012 it needs to meet the official class shape. Check the shape against the class template if a fairing job is part of the value of a used boat
- **Hull covers** for transport and storage
- **Trailer maintenance.** Most Rondar boats come with European spec trailers with metric bearings, hubs, rims and tires that are hard to find locally. Plan ahead and don't be that team that ignores trailer maintenance.