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**BUILDING
FROM SCRATCH:
THE NEW
FATHOM
40**



**INSIDE
A Tolly Repower**

**Shedding Light On
NIGHT PASSAGES**

**ESCAPE TO
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Courtesy Fathom Yachts



Building From Scratch

THE NEW FATHOM



40

Story By ROBERT M. LANE

Just think of the opportunity: Use the best high-technology design and innovative construction techniques to produce an all-new yacht whose good looks, performance, and efficiency will make it a winner by appealing to the flood of buyers nearly everyone sees just over the horizon.

Start with an open mind, sharp pencils, and a ton of drafting paper for sketching ideas from scratch. Be aware of boatbuilding traditions, but look to the future. Emphasize contemporary ideas and techniques that make yachts and yachting enjoyable, economical, efficient, and trend setting.

Call on the years of experience in boatbuilding accumulated by the principals in this risky new venture. Find an outstanding naval architect. Buy the best three-dimensional design and drafting software and computer equipment, and find people who know how to use it. Lease an empty building. Hire a dedicated crew. Spend a lot of money. Go to work.

Finally, price it as an “entry level” boat, one that appeals to first-time buyers of cruising boats.

It sounds like fun. And a big challenge.

There are several fresh-start boats coming to market, but the first to splash is the Fathom 40, a craft described by its builders as a fast expedition-style yacht. Unlike most expedition yachts, which tend to be of mega size, this is a family boat with space for a cruising couple and occasional visitors. It looks like a strong contender in the market race for the baby boomers who will be retiring with cash in their pockets over the next few years. As a surprising bonus, it is one of the quietest production boats on the water.

The first Fathom 40, labeled a prototype by her builders, has been in the water for several months and has been worked hard. The second in the line, with some modifications and improvements identified in prototype testing, has splashed and is making the boat show rounds. With several Fathom 40s sold before any were built, the small fabrication plant in Sedro-Woolley, Washington, is jammed with boats under construction.

As for credentials: The principals behind the Fathom 40 all have years of boating experience. Eric “Ric” Reid, Fathom’s director of manufacturing, is a former president of Nordic Tugs and has held managerial positions at Northern Marine, Wellcraft, and Bayliner. He also is a journeyman machinist who built much of the



Robert M. Lane

Down it goes. With the folding transom lowered, the cockpit is stretched an additional 34 inches. The up-down transom also offers easy boarding and simplifies the handling of fishing gear and loading the boat.

construction equipment in the Fathom 40 factory. Tracy Prescott, marketing director for Fathom, was a director of sales and marketing at Nordic Tugs and formerly held similar positions with Furuno USA and Northern Lights. John Greene, owner of a wood furniture manufacturing business, was a board member at Nordic and manages finance and accounting for Fathom.

Reid, Prescott, and Greene brought other experienced boatbuilders with them, including engineer-designer Scott Ellis, who designed the Fathom 40's systems with advanced three-dimensional drafting software. And they recruited a top Pacific Northwest naval architect, Gregory Marshall of Victoria, British Columbia.

This sounds like a winning team. Let's see what it has built.

FOURTEEN MONTHS

The Fathom team opened its office in April 2006 with little more than some ideas and a budding staff. Tooling—the production of plugs and molds—began in June of that year. The first boat, the prototype, splashed in June 2007.

My first view of the Fathom 40 was in January 2007, and I saw nothing more than a hull mold on the floor of the company's manufacturing plant in Sedro-Woolley. Ellis turned to his computer to show me three-dimensional images of the yacht. Working the software, he peeled away the exterior to illustrate placement of the engine, generator, and electrical and plumbing systems. He demonstrated how the software allowed him to design the most efficient and economical runs for wiring and piping and to reduce the complexity of installing some systems almost to the plug-and-play level. It was also a lesson in the give-and-take required to design spaces that are comfortable and that function well.

Returning in April, I saw the first hull and deck sections completed and joined, and I watched as a crew fitted the mold for the pilothouse into the deckhouse. It was "move it an inch this way" and "give it a wiggle." But it slid nicely into place.

Janicki Industries cut the plugs for the major components of the boat on its five-axis, computer-controlled milling machines. Janicki, probably best known for its work on the Boeing Company's new all-



Side-Power stern thrusters are standard on the Fathom 40 and should ease the process of mooring the single-engine boat.

composite 787 Dreamliner, is a neighbor of Fathom in Sedro-Woolley.

Fathom made the plugs for smaller parts in its plant and built fiberglass molds from all plugs. Components were manufactured there, too, using vacuum infusion molding, a method that produces fiberglass hulls, decks, and deckhouses that are stronger and lighter than parts made with the traditional handlaid molding process. It's also a cleaner process that poses fewer health problems by eliminating the emission of chemicals that stink and burn.

The precision molding process produces a fine finish that requires no sanding or fixing after a part is pulled from the mold. It allows workers to mate components perfectly, even those with tight tolerances. This kind of production brings boatbuilding close to the methods used by the auto and aircraft industries, and it introduces labor-saving procedures that reduce construction costs.

My third view of the Fathom 40 came late in August, after the prototype had been through final commissioning and extensive testing at sea.

She was moored at the outer end of B Dock at Cap

Sante Marina in Anacortes, Washington. This is a commercial dock, and on the long walk out I passed fishing vessels prepping for a run to sea for salmon, a salvage tug and barge, crabbers, and sport charter boats. The Fathom, with a sparkling blue hull and an immaculate white house, stood out in that crowd. The 118-foot yacht moored next door was not even a minor distraction.

But something appeared to be missing: the back of the boat. Then I remembered that the raised-pilothouse Fathom 40 has a folding transom, which was in the "down" position as I arrived. The folding transom offers easy boarding, with almost no step down from the floating dock, and expands the social area of the saloon and cockpit. This should be great for those of us with stiff knees or hips and those reluctant to slither aboard over a wet caprail.

The up-down transom also simplifies the handling of deck gear, crab and fish traps, and fishing equipment. Gas struts pop the transom firmly into its upright position when it's time to get under way. Another bonus: the folding mechanism works well even with dinghy davit hardware attached.



Robert M. Lane

Large windows flood the saloon with sunlight. The galley and the stairway to the staterooms lie beyond the settee.

The bow is the boat's expedition signature. With nearly 8 feet of freeboard, it suggests strength and a dry boat in sloppy seas. The flybridge offers the jaunty curves of a sailor's cap, while the bulwark and handrails on the foredeck (37 inches high) mean deck work forward will be safe.

The sheer drops sharply aft of the pilothouse door, and side decks narrow from 17 inches ahead of the pilothouse door to 10.5 inches aft of the door. A little tumblehome in the cabin shape (it slopes inward slightly) adds a degree of safety by providing more shoulder space for crew moving along the narrower side deck. Good stainless steel handrails attached to the deckhouse make these decks all right in an anchorage or moorage, but they probably should be avoided while the boat is under way.

The boat has spring-loaded pop-up cleats for attaching fender lines, and they can be reached without venturing onto the side decks.

A cockpit stairway—not a ladder—leads to the flybridge and lifts upward to provide access to the engine room and a small space aft of the engine room that is described as a midship lazarette, a garage, a basement, or a utility room. Whatever its name, it provides storage for

deck gear and, more importantly, houses the ship's main electrical panel, battery disconnect switches, and a Reverso oil-change system.

The house batteries (660Ah) are farther aft, in the second lazarette, while the starting battery is parked only inches from the 425hp Cummins diesel engine. Keeping house batteries and disconnect switches out of the engine room represents a good design with safety in mind and creates room to maneuver in small spaces around the Cummins engine.

Changes made as a result of prototype testing seem to be fine-tuning in nature. Interior teak finishing was improved, partly by rounding some square cabinet corners that could jab hips. The saloon deck in the prototype needed a support underneath in the engine room; upgrading the deck in the production models made it stiffer and stronger and eliminated the need for the supporting post below decks.

The engine exhaust in the prototype is underwater; in production models, Fathom moved it to the waterline to cut vibration and noise, making a quiet boat even quieter. The builder added grabrails, eliminated trims tabs because they proved unnecessary in prototype testing, and shifted some equipment aft for better weight



Photos by Robert M. Lane

Teak cabinets, granite countertops, and a laminate backsplash that looks like stainless steel are highlights in the galley. Steps to the head and stateroom run alongside the stove.

distribution. Other changes included using tempered glass in the shower door, adding an isolation transformer to the electrical system, and extending handrails on the boat deck.

A TOUR

Using the “down” transom, I walked aboard easily. This is a neat way to board the boat, but it requires backing into moorage slips. With bow and stern thrusters as standard equipment, that shouldn’t be difficult.

The cockpit, 63 inches deep with the transom up and 97 inches deep with it down, is sheltered by the cantilevered boat deck. Strong infused fiberglass and good engineering eliminate the need for supporting posts for the upper deck while allowing a boater to park a dinghy topside.

The bridge stairway is to port, with sturdy handrails. A window and sink cabinet (with hot and cold water) are centered in the aft bulkhead, and the entry door and another window are to starboard. (All doors and windows are from Diamond/Sea-Glaze of British Columbia.) Storage is provided in compartments in the

quarter panels and below decks. A Glendinning power cable retrieval system is in the side wall of the cockpit.

All components are molded in fiberglass, and most are trimmed with teak or fabric, including the settee in the saloon. The settee is to port when entering, and although flashes of white fiberglass are visible, the luxurious seating area overwhelms any hint of a plastic look. Fathom ordered thickly padded cushions with good leg and back support upholstered in Ultraleather Brisa distressed fabric in a buckskin color. The settee may be used as a berth when there’s a crowd aboard.

Adding to the luxury is the use of Ultrasuede fabric as a headliner. Prescott said it looks better on the overhead than the typical vinyl fabric and also helps make the boat quieter. A stainless steel grabrail runs along the centerline of the saloon overhead.

Fathom Yachts subcontracts the manufacture of cabinets and other wood components for its boats to firms in Sedro-Woolley and specifies teak throughout



Looking forward from the galley: the head is to port, the master stateroom is forward, and the guest stateroom is to starboard. Watch your head on entry.



Robert M. Lane

Comfortable guest seating with a panoramic view, room for chart books, and space for coffee mugs are all available in the pilothouse.

the interior, despite the scarcity of good wood and its high price.

To starboard on entering the saloon is a cabinet with bookshelves, storage, and an ice maker. Along the side wall are casual armchairs and a small storage cabinet. Near the stairway to the pilothouse is an entertainment center with a flat-screen TV and an electrical panel housing breakers for commonly used circuits.

Much of the boat is carpeted, but the galley area and some of the pilothouse are surfaced with man-made teak-and-holly-style flooring. A counter and backsplash topped with a shelf large enough for beverage containers separate the galley from the settee. Fathom applied Labrador antique granite to countertops; the granite is 1/4 inch thick and is mounted on a 3/4-inch-thick honeycomb base.

I was impressed with what appeared to be a stainless steel backsplash throughout the galley. I was more impressed to learn that it's a plastic laminate that curves easily with the shape of the boat's side wall.

Standard equipment in the galley includes a three-burner Force 10 stove (either propane or electric), a

single stainless steel sink, a microwave with an exterior vent, and a 9.1-cubic-foot Nova Kool AC/DC refrigerator/freezer. There are halogen lights overhead and LED lighting along the counter.

Steps down to the staterooms and head are in the center of the galley. Observation of rules of the road may be necessary when folks dashing below need to negotiate past the galley crew.

The head, with a full shower, is to port. The master queen-size island berth is in the bow and is brightened by skylights and ports. It has a full-length hanging locker and additional storage in drawers beneath the bed. A guest stateroom with a double bunk is to starboard. A combo washer/dryer is housed here, too. (The space may be fitted as an office.)

Four teak steps with nonskid surfaces lead from the saloon to the pilothouse. Fathom Yachts deserves credit for making them just like steps at home. The rise (height) and run (depth) are constant. This is the only way to make steps that are truly safe, and not all boatbuilders have figured out how to do it.

The Fathom 40 has only one pilothouse door, on the



Robert M. Lane

Tracy Prescott of Fathom Yachts steers the prototype on a sea trial. The helm chair sits on a step above the teak-and-holly sole.

starboard side. The design permits generous elevated guest seating on the port side with a grand view. Raising the port settee creates space for a roomy head below. The guest stateroom, beneath the lower helm area, has a generous berth but an oddly shaped overhead and a short entry door (a head knocker) because of the layout of the helm area above.

Generally, however, there's plenty of headroom. I measured 78 inches in the saloon and pilothouse, while I found the doorway to the guest stateroom had only 66 inches of clearance.

There are three deck levels in the pilothouse. The first runs from the top of the stairway forward to the helm and the doorway and is surfaced with the teak-and-holly flooring. The helm seat sits on a carpeted platform raised above that deck. Another step leads up to the guest seating and a table, and the deck around it also is carpeted.

The settee, which matches the one in the saloon in fabric and styling, will seat at least four. A small table provides space for snacks, beverages, and elbows. The

molded helm is to starboard, and a teak cabinet between it and the settee provides storage and a flat space for spreading chart books or a folded standard chart. Large windows offer a panoramic view of the sea.

It shouldn't take regular crew long to grow accustomed to the three deck levels in the pilothouse or to avoid the head bonker I visited twice there. The problem is a teak valance above the forward corner of the settee that is just the right height for someone my size (6 feet) to bump while stepping to a seat near the chart table.

The helm station is molded fiberglass that looks black or dark gray or black-brown, depending on the lighting and the angle of view. All window trim is black. There are no white or shiny surfaces to blind the helmsman with harsh reflections.

On the prototype, Fathom fitted the all-electronic helm with a Furuno NavNet package, including separate screens for radar and plotting. (Buyers of production boats will select their navigation package.) Cummins provided a SmartCraft monitor that offers a range of useful information about engine operation and performance, including speed and fuel consumption, but it is hard to read on a sunny day.

Exit the pilothouse through the starboard door and you'll find stout (1.25-inch) 316 stainless steel railings around the foredeck. Standard equipment forward includes a Lewmar stainless V3 windlass and a stainless anchor roller. The windlass sits in a shallow depression in the foredeck that catches mud and smashed clamshells as the chain comes aboard and is washed. This keeps slop from draining across the foredeck and down the side decks. A hatch cover near the windlass opens to the anchor chain locker.

Fathom 40s are plumbed for watermakers and arrive ready for installation of stabilizers by owners.

The flybridge has two helm seats, a guest seating area, and parking for a tender. What's interesting is that the bridge is fastened to the deckhouse with only four bolts, none of which penetrates the living area, guaranteeing no leaks through the Ultrasuede headliner. That simple attachment technique plus quick-connect electrical and hydraulic fittings allow the bridge to be removed or installed in little more than an hour; that's necessary because the boat is shipped by truck, and the bridge must come off for transport.

Fathom offers two models. The kind a buyer chooses will depend on whether he or she cruises hot or cold areas. The so-called tropical package includes a 9kW Northern Lights generator, reverse-cycle heating/cooling, an electric galley stove, and a Glendinning Cablemaster with a 70-foot, 50-amp cord. The polar package (for us in the Northwest) includes a



Robert M. Lane

Scott Ellis, a Fathom Yachts engineer and designer, admires the engine room. Despite limited space, all systems are easily reached for maintenance and service. A Fireboy automatic fire suppression system is standard.

diesel furnace circulating hot water, a 5kW generator, a propane galley stove, and a 30-amp shorepower cord.

The tropical boat has a list price of \$539,000, while the chilly weather boat is listed at \$529,000. Yes, in the new-boat market, those are considered entry-level prices for cruising boats.

HORSEPOWER, ETC.

Fathom Yachts says it builds to mechanical and electrical standards required in Europe and set by the American Boat & Yacht Council. I am far from expert in those fields and can't testify that the company has met every single requirement, but I will say that everything below decks looks good to me.

The engine room is hands-and-knees, seat-of-the-pants small, but putting the batteries, inverter, and switches in the lazarettes makes the Holy Place workable. The 425hp Cummins QSB common-rail diesel engine dominates the space. Against the hull on either side are 200-gallon aluminum fuel tanks secured by welded flanges.

The Northern Lights generator sits in the starboard corner aft and is reached by leaning over the ZF 280 transmission. The generator's front service panel and marine-rated Racor fuel filter are within reach, however. Fathom was looking ahead, too: A panel in the lazarette battery space farther aft may be removed to expose the

back side of the generator and the starter. That starter may not fail or require service for decades, but I'm sure someday an owner or a mechanic will bless Fathom for the easy access.

Fathom Yachts also thought ahead in its selection of "aristo blue" gelcoating. That's an Awlgrip color, and if the hull requires refinishing sometime in the future, there will be a paint color to match.

A dual marine-rated Racor filter serves the Cummins diesel. A Parker/Racor bronze fuel selector valve allows fuel flow to the engine and the return flow to be controlled with a single lever. If the valve is set to draw fuel from one tank, it sends return fuel back to that tank. If diesel is coming from both tanks, the return fuel goes back to both. There should never be an accidental tank overflow caused by sending return fuel to a full tank.

Production models of the Fathom 40 will have remote controls for fuel valves in the lazarette; electrical controls at the helm will be an option. With both fuel and electrical systems controlled from outside the engine room, and with the standard automatic Fireboy HFC-227 fire suppression system, an owner should be able to deal with an engine room fire quickly and successfully without the risk of entering that space. The Fireboy system is similar to that required on boats carrying passengers for hire. Other builders should follow Fathom's lead.



The fuel supply lines are steel-braid-reinforced Coast Guard-rated A1 hose with JIC fittings. There are no barbed fittings or hose clamps in this fuel system. The fuel lines are held in place by Weld Mount “glue studs.” A two-part acrylic adhesive sticks the lower half of the stud to a fiberglass surface, eliminating the need to use screws that would penetrate the laminated surface. The mating faces of the stud halves are grooved to match the shape of the fuel line, and the top half screws into the bottom piece, holding tightly.

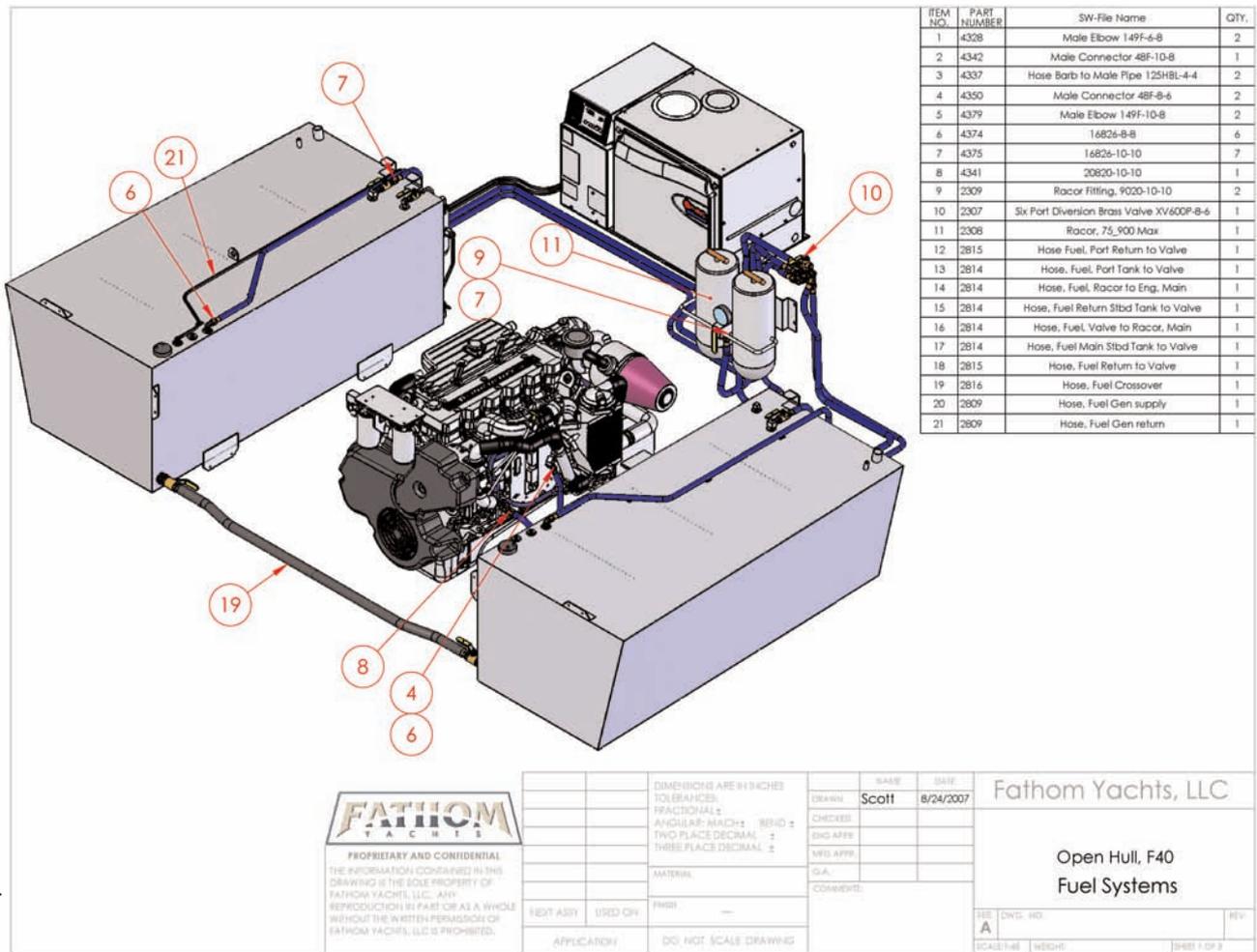
“They are incredibly strong,” Ellis told me. In a test, he found that the glue joint would not break under force. Ultimately, he said, the laminated surface failed and pulled loose.

Through-hull fittings for seawater cooling for the Cummins and Northern Lights diesels are Forespar Marelon. The only metal underwater is in the propeller (Class 1 nibral), shaft (2-inch Aquamet), and rudder (manganese bronze).

Another reason for the notable neatness of the engine room is the lack of drain hoses leading to waterline discharge points. All water that is discharged from the boat goes through a single dump point in the aft lazarette.

Electrical lines in the engine room run in conduits or raceways. Fathom’s electrical shop builds wiring harnesses that run neatly and directly between distribution panels and electrical devices. Some conduits are not full, leaving space for cable for add-on projects by the boat owner.

All Fathom 40s will be equipped with a 50-amp isolation transformer and a switch that senses the source of 120VAC (shorepower, generator, or inverter) and automatically selects it. Another plus: Although some builders pretend that engines never leak and thus skip the installation of a drip pan, the guys at Fathom know a leak will happen eventually. They put a pan beneath the Cummins.



Courtesy Fathom Yachts

This schematic of the yacht’s fuel system is typical of the information made available by computer drafting. Diagrams like this will be included in the owner’s operating manuals.



Colorful spaghetti: the wiring harnesses for Fathom 40 yachts.

GO BOATING!

Coming toward me in a marina fairway, with Ellis at the helm, the Fathom 40 looked skinny. She's not. The boat is 36 feet on the waterline and 40 feet 4 inches overall and has a beam of 14 feet 6 inches at deck level. Because of vacuum infusion and efficient computer design, she displaces 24,000 lb.; the company estimates that a traditional handlaid boat would weigh 25 percent more. Think about all the fuel that won't be burned over the boat's lifetime because of that weight reduction.

Motoring slowly by while I worked as a photographer, the Fathom 40 left only a ripple of a wake, and she turned easily as Ellis steered out of the harbor. I had discovered earlier that the yacht steers well at high speed and while turning and pounding into her own wake. My sea trial had taken place a few days before on a calm and sunny day in Guemes Channel. About all there was to do was watch for other boats and admire Mount Baker to the northeast.

Prescott and I were on the bridge and Reid and Ellis were in the cockpit, with the transom still in the down position. Owners will be instructed to raise the transom before getting under way, Prescott said, but I could understand the fascination they felt in watching our wake bubble up from below the lowered transom. On

FATHOM 40

LOA	40' 4"
LWL	36' 1"
BEAM	14' 6"
DRAFT	42"
BRIDGE CLEARANCE	15' 9"
DISPLACEMENT	24,000 lb.
FUEL	400 U.S. gal.
WATER	135 U.S. gal.
HOLDING TANK	45 U.S. gal.
GRAY WATER	45 U.S. gal.
STANDARD POWER	425hp Cummins QSB
BASE PRICE	\$529,000 to \$539,000

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earlier test runs, engineers had held cameras under the transom to record turbulence and the flow of water around the slender, finely drawn keel.

Although the rule is to cruise with the transom up, the boat is seaworthy with it down. Prescott took the boat to full speed for a short time, then slowed the engine and pulled it out of gear. Our sizeable wake overhauled the boat and rolled easily below the transom, tossing only a few specks of foam into the boat. If I were cruising the Fathom 40 with the transom down, my rule would call for anyone in the cockpit to wear an inflatable PFD.

During my turn at the helm, I pushed the ZF engine controller to maximum cruise speed (about 16 knots) and spun the helm. The Fathom 40 turned easily, with no obvious heeling, and bumped lightly through her own wake. The fuel and water tanks were full, and there were four people aboard.

This is a prototype, so I won't make much of the unbalanced steering. It didn't feel smooth as I spun the wheel, and it took more effort to make a left turn than a right. I expect this will not be an issue on the production yachts.

As mentioned earlier, this is an extraordinarily quiet boat under way. At 2000 rpm she was running at 10 knots, and the sound meter registered only 64 A-scale decibels: a little noisier than an office. The four of us talked across the pilothouse without effort. At high cruise



The Fathom 40 prototype heads out to sea at sunset. This new boat is one to watch.

(2800 rpm) the boat was making 16.5 knots, and the sound meter read 72.5dBA. I've never been aboard a production boat that was so quiet while working so hard.

Fathom earned a quiet boat by installing dense sound insulation in the engine room. There is 2 inches of insulation on the overhead in the engine room and 1.5 inches on side walls, Ellis said. I've been aboard custom boats that were quieter, but only at considerably greater investment in sound-deadening materials.

At moderate speeds, fuel consumption was good, according to information provided by the Cummins SmartCraft system. At 1800 rpm and 9.2 knots, the single diesel burned 4.7gph. That's 1.95 miles per gallon.

Fuel consumption at 10 knots was 7gph, and at 14.9 knots it increased to 14.7gph. At 2800 rpm and 16.5 knots, fuel burn jumped to 17.9gph, or about 0.9 miles per gallon. Cruising fuel use may differ because of loading, sea conditions, and operating practices.

A WINNER?

Clearly, the guys at Fathom have created a spirited and handsome small yacht. Her appearance and performance are the result of years of experience and computer wizardry. The boat's entry-level character is evident in that several of the dealers signing on to

represent Fathom Yachts normally deal in larger, costlier, more sophisticated yachts. Their interest indicates the presence of a market for a smart, smaller, less pricey boat.

Using the first hull as a prototype was a good idea that allowed the company to drive the boat hard for weeks and to identify improvements and modifications that were needed. Buyers of the production yachts will benefit.

Fathom will be competing with cheaper boats built in China. Even though many of the company's building materials come from China and other nations, the Fathom 40 can wear the label "Built in the U.S.A.," and that has appeal. Equally appealing are the technical excellence of the Fathom 40 and the boat's stylish, comfortable appearance.

With probably more than \$1 million invested by the time the prototype was launched, the principals have accepted a major financial risk. But they seem to have enjoyed the process. "It has been a fun and challenging time," Prescott says.

Reid suggests more changes are coming in boat construction. "To me, boatbuilding has completely changed over five years," he says. "But there still is a way to go." 