

Smooth Move

Here's a 10-step program for replacing cumbersome mechanical steering with BayStar's hydraulic system

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always seem to open up when working on a boat.

The directions, which are geared toward new installations, are very detailed on each step and include numerous warnings to help you avoid the "oops" factor. In truth, we found them somewhat complicated, and because we were replacing an existing system, we elected to diverge somewhat from the manual. We followed the specifics of each step, but not necessarily in the prescribed order.

Here's how we swapped out the old rack-and-pinion system for BayStar hydraulic steering:

STEP 1: We first took off the steering wheel by loosening the main nut with a 3/4-inch socket



We were hoopnetting for lobsters one night from my friend's 1986 Starcraft 191 Islander when the pitfalls of mechanical steering came to light. Trying to steer in tight pirouettes around an obstacle course of floating buoys without getting the polypropylene line from the hoopnets wrapped in the prop was trying, at best. It didn't help matters that his mechanical steering system suffered from "deferred maintenance." Over an extended period of sitting in the driveway, the boat's rack-and-pinion helm had become stiff and jerky. It was simply hard to turn the wheel.

That evening, it occurred to us that BayStar hydraulic steering from Teleflex Marine would be the ideal solution — and a serious performance upgrade for this aluminum cuddy cabin that spends much of its time saltwater fishing, but also pulls family duty at the lake. Teleflex's SeaStar hydraulic steering is pretty much standard equipment on larger outboard boats, not only due to its smooth steering motion, but also because it eliminates (OK, vastly minimizes) steering torque at the helm. BayStar was introduced a few years ago as an affordable alternative for boats powered by single outboards up to 150 hp. While hydraulic steering is often installed at the factory on new boats, there are countless other outboard-powered craft that can benefit from this easy upgrade.

THE "OOPS" FACTOR

To find out how easy, we contacted Teleflex and requested a BayStar system for the Starcraft, which is powered by a two-stroke Yamaha 90. The kit's steering cylinder will vary based

on the boat/outboard make and the splashwell dimensions. Since you cut the hydraulic tubing to fit your vessel, you don't have to worry about measuring your old steering-cable length.

With the exception of basic tools and miscellaneous supplies, everything needed comes in the box. The job can easily be completed in a day — even with the unavoidable trapdoors that



and rocking the wheel back and forth. While our wheel came off easily, it may be necessary to tap the end of the shaft lightly with a hammer to break the grip on the tapered shaft. If the wheel still won't come off, you might have to use a steering-wheel puller. Next, we disconnected the rack from the helm underneath the dash, using a 1/4-inch ratchet with a 7/16-inch socket. Then we removed the helm plate using a 7/16-inch socket and wrench on the backside of the plate. To complete this step, we removed the helm adjustment bolts and lifted the helm assembly from the dash.

STEP 2: Using a 9/16-inch wrench, we disconnected the steering tiller arm back at the outboard. After removing the Cable Buddy grease fitting nut from the tilt tube, we detached the steering cable from the tilt tube.

STEP 3: With one of us standing by the outboard to guide the cable and prevent it from hanging up on other cables or wires, we pulled the rack-and-pinion unit and steering cable out through the rigging tube. This completed the removal of the old mechanical steering system.

STEP 4: Using the back mounting plate for the new helm, we marked the helm cutout and mounting boltholes with a pencil. In our case, we had to enlarge the helm cutout to accommodate the larger BayStar hydraulic helm. We accomplished this quickly by using a RotoZip power tool with a cutting blade, and smoothing any rough edges on the aluminum dash with a



file. After enlarging and cleaning up the main hole, we drilled three new boltholes with a 3/8-inch drill bit.

STEP 5: Placing the back-mount plate onto the rear of the helm, we inserted the helm through the front of the dash — making sure it was pushed all the way in and seated firmly against the dash. Using a torque

wrench with a 1/2-inch socket, we tightened the three nuts on the rear of the helm to a maximum of 15 ft.-lbs.

STEP 6: We finished the helm installation by mounting the port and starboard elbow fittings on

the back of the helm. Use Loctite or another pipe sealant (no tape sealers) only on the threads that will be inserted into the helm. No pipe sealant should be used on the compression fittings at the helm or the cylinder. After



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hand tightening the elbow fittings, we then turned them an additional 1 1/2 to 2 1/2 turns (depending on the desired fitting orientation) with a 5/8-inch wrench.

STEP 7: Before installing the BayStar cylinder, we cleaned the tilt tube and liberally lubricated it and the guide tube with quality marine grease. Next, we slid the guide tube all the way into the tilt tube and rotated the cylinder so the threaded mount lined up with the tilt tube. Darn it! Even though the boat's splashwell met the minimum published measurements for the HC4600 cylinder, we had to unbolt the 90 hp outboard from the transom and move it over to insert the cylinder. This took an extra 30 minutes.

We then attached the cylinder assembly by hand tightening the threaded mount onto the tilt tube. After lightly greasing the tiller bolt, we installed the engine drag link to the hole in the offset link. After completing the cylinder drag link installation, we used a torque wrench to tighten the 1 1/4-inch cylinder nut to 20 ft.-lbs.

STEP 8: We attached the swaged end of one of the hydraulic tubes to the fitting on the port side of the cylinder, and marked it at both ends with tape (to tell port from starboard). We routed the tubing through the splashwell rigging hole, and snaked it forward through the rigging channel to the port side of the BayStar helm pump. Before cutting the tube's helm end to length, we made sure to leave



extra tubing in the splashwell to allow for full steering motion, as well as tilt and trim. We followed the same process for the starboard-side tubing. We inspected the tubing from helm to engine to make sure there were no sharp bends and that it was safe from heat, chafing or crushing.

STEP 9: After rigging the tubing and confirming necessary length, we cut the helm end of the tubing with a pipe cutter. Next, we connected the tubing to the helm elbow fitting by sliding the tube nut over the fitting, pushing the tubing into the helm fitting and tightening the tube nut. We hand tightened each nut, then used a 5/8-inch wrench to tighten each another 1 1/2 turns. Since hydraulic steering has small amounts of internal



slip and the wheel returns to center differently each time, we exchanged the boat's master-spoke wheel with a multispoked stainless "battleship" wheel.

STEP 10: Following the detailed instructions, we filled and bled the helm using the two supplied bottles of BayStar hydraulic steering fluid. With one person working the wheel and another at the bleeder valve, we completely bled the air from the system. This step took about 25 minutes, and we confirmed our success by following the manual's test procedures. Although not officially recommended, we bled the system into a clean, dry plastic bottle and reused the fluid (just avoid aerated, bubbly oil). If you don't reuse the purged hydraulic oil, you'll need additional bottles of BayStar steering fluid.



Muscle and Money

Converting from mechanical steering to the BayStar hydraulic system (\$686 list) took our two shade-tree mechanics approximately half a day, and required basic hand tools. In addition, we also used suitable eye protection, a pipe cutter, pipe sealant, marine grease, a RotoZip power tool with a cutting blade and a torque wrench.

To learn more about specific applications for outboard-powered boats, contact Teleflex Marine at 610/495-7011; teleflexmarine.com.

During subsequent fishing trips, it became clear that replacing the worn-out mechanical steering with Teleflex's BayStar hydraulic steering made major improvements in how the boat handled. For less than \$700 for an all-inclusive system, it's a relatively affordable upgrade that can be performed in an afternoon if you have a "boat buddy" to help with the job. 🛥

