



Heavy Lifting

The Selection of a New Engine

By Pete Dubler

We now rejoin our heroes and their boat in a Colorado cornfield...

There's no better place to start a big project than with the heavy lifting. Our complete restoration of *Regina Oceani*—a 1981 Pearson 424—in a Colorado cornfield began with the removal of the leaking aluminum fuel tank. To get to the fuel

tank, the engine had to be removed. And while the mouse had his cookie, it was time to strip and repaint. While the engine was nice and clean, and supposedly rebuilt 800 engine hours ago, I decided to pull the oil pan and check the crank and rod bearings and the oil pump.

I noticed that the oil pressure was not as high as I would like to see it at an idle. The reason was clear once I was inside the engine and the feeler

gauges, micrometers, and Plastigauge had been deployed: the bearings were all scored and the oil pump was far out of spec.

“No problem,” I thought. “I’ll just find a rebuild kit and bring things back up to spec.” The cost of parts for a 30-year-old engine suddenly changed the discussion from “just rebuild” to “when is it better to re-power?”

Gasket set: \$675...Rebuild kit: \$2,500...Oil pump \$600.

And even after all that, I’d still have a 30-year-old injection pump (a \$4,200 part) and many other old parts. It was time to consider a new engine. I decided to part out the old

engine to sister ships. This yielded more than \$3,000 toward the purchase of a new engine and a lot of new friends.

Whether you are doing all the work yourself or the extent of your labor consists of signing a check, the process for selecting a new engine is the same. I found that the criteria grouped nicely into three buckets: fit, accessories and support.

FIT

The ideal replacement engine would drop right into the existing bolt holes, mate up to your transmission and snap into your electrical

harness. But unless you are going to replace your engine with the exact same model, this is unlikely to happen. My engine, a Westerbeke W58, is no longer made, so a direct replacement was not an option. This is not a bad thing, since newer, lighter engines run smoother, quieter, cleaner and more efficiently.

While one could rebuild the engine bed to accommodate just about any engine that would fit through the companionway, I was hoping to utilize the existing bed. Pulling up a mechanical drawing of the old engine, I was able to find the spacing of the engine mounts and another

Opposite, out with the old. Below, the engine just squeaks through the companionway with the author’s guidance





From the top: the fully deconstructed transmission, freshly repainted case parts and shiny new clutch disks. Opposite: the all-important owner's manual



critical measurement: the distance from the center of the crankshaft—which is also the plane of the engine mounts—to the bottom of the oil pan. I knew then that I was seeking an engine with mounts 18.5" wide and with an oil pan depth of no more than 10.6".

The next aspect of fit is horsepower. Checking out the Pearson 424 owners' group website, I found plenty of discussions on re-powering. Two things were for sure: many different engines were used and most folks selected larger than original engines, even some with turbos. Hmmmm... is it time for more horsepower? The large engine makers have spreadsheets for calculating required engine horsepower. A lot of data is required, including water line length, displacement, beam, prop specs and transmission ratios.

After all the calculations were done, including factors for prop and transmission inefficiencies, it was determined that hull speed could be attained with only 37.2 horsepower at 2530 rpm. So who needs a 60 or 70 horsepower engine in this boat? Considering newer engines provide more torque at lower rpms than my old engine and allowing for a large alternator, engine-powered refrigeration, and motoring into a strong headwind, a 50 horsepower engine would be more than adequate. A larger engine with a turbo would be of no benefit, except to the engine seller and fuel dock owners.

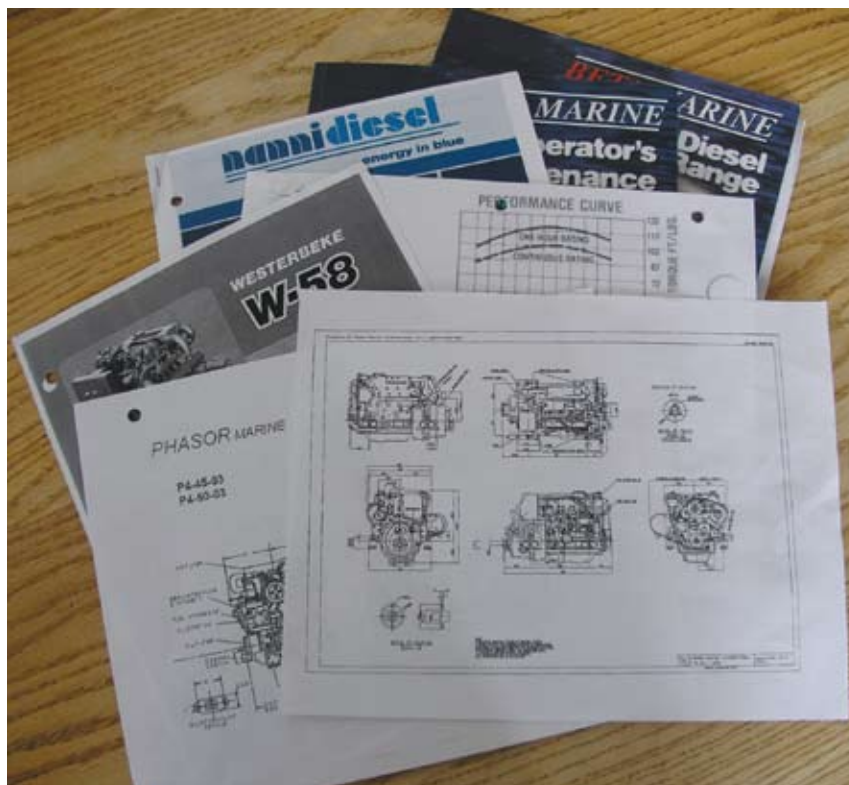
ACCESSORIES

In addition to being able to mount the alternator of your choice—and in my case, the refrigeration compressor—this selection criteria also covers mating up to your transmission (assuming you are not also intending to replace your transmission) and access to the key service points of your new engine.

Some engine manufacturers provide complete kits to adapt to popular transmissions. Others depend on the engine installer to provide the necessary belt, spacers, pressure plate, cooler, hoses, etc. Since my Borg Warner Velvet Drive 71C transmission runs, well, like velvet, and \$150 worth of parts would bring it back to brand-new condition, I decided to stick with this tranny.

My boat has dual refrigeration systems: 12V and

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engine-powered. I require an engine with a power take-off (PTO) pulley for the refrigeration compressor. I was surprised to learn that some of the largest engine providers will not warrant an engine with a PTO pulley. This eliminated consideration of their engines for the project.

Some engines include or offer as an option fittings for connection to your hot water heater. Others expect you to improvise. A properly-engineered solution will include fittings that may have a thermostatic valve and/or precisely-sized orifices to manage both engine and water heater temperatures.

Consider your exhaust installation. In my case, the exhaust of my old engine came off the pulley end of the engine. All but one of the new engines I found did not have an option for taking the exhaust off the pulley end. This meant a longer exhaust run and the drop to the lift muffler had to be taken into account. A high-rise exhaust elbow was required.

Most manufacturers have finally figured out that easy access to water pump impellers, filters and dip sticks is pretty important. Unfortunately,

most have *not* figured out that not all engines go into the boat with the flywheel aft. In the case of the Pearson 424, the flywheel is forward and the prop shaft is driven by a separate Walter V-Drive. This makes an impeller on the pulley end of the engine—while very easy to access in a flywheel aft installation—nearly impossible to access in my installation. This is not simply a convenience consideration; it is a safety factor since we all know that impellers tend to fail in a seaway with a rocky lee where a quick impeller change could save your boat.

An easy means of changing the oil and sensible filter positions should also be considered. I favor built-in oil change pumps, but of course you can add one to the engine of your choice. The oil and fuel filter should be positioned so they can be changed easily without spilling fluids.

SUPPORT

I can't say enough about the importance of support. You will have questions when you are installing the engine. You will need parts and advice later. Good manuals and will-

ing support are invaluable. While selecting your engine, ask for a copy of the manual, drawings and photos. Some manufacturers seem to want to supply this information only to the privileged owners of their products. Others understand that you are not only evaluating their glossy literature; you need to know how easy it will be to maintain your new engine. If the manual is translated from another language, does the translation make sense? In the case of the Beta Marine manuals, written in UK English, I had to add terms like "calorifier" (hot water heater) to my vocabulary.

Parts availability and costs should also be considered. For example, Yanmar has worldwide distributors, so you can always find parts for their engines. On the other hand, if the base engine is a readily-available industrial engine—as in the case of the Kubota-based Nanni, Phasor or Beta Marine engines—you can buy parts from farm and industrial suppliers at very competitive prices. For all belts and filters, Beta Marine provides a crossover listing to part numbers you can find at any auto parts store.



Support comes in two flavors: pre- and post-sales. Check the Internet for post-sales user experiences. I found either consistently positive or negative stories for each of the manufacturers I considered. This turned out to be a very important part of my selection process.

MY PERFECT ENGINE

After speaking with all the large marine engine manufacturers and three companies who marinize Kubota diesels and reviewing piles of manuals, data sheets, drawings, and the like, it was an easy decision to go with the Beta Marine 50 hp BV-2203. Although Kubota engines have three potential locations for sea water pumps, only Beta Marine provided the flexibility to mount the “reverse” pump, so critical to my installation. As for the transmission, the Beta Marine kit for my transmission included everything right up to the fittings on the end of the cooling

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hoses that attach to the tranny.

Working with Richard Gerard Jr., president of Beta Marine US Ltd, I was able to specify my engine with a high rise exhaust manifold, fittings for the lines to my hot water heater (calorifier, that is), a 100-amp alternator with a serpentine belt and pulley system, and their standard full instrument panel.

Beta Marine’s commissioning policies and warranty also met the needs of our project, and they will prep the engine with Shell Ensis oil before it leaves the factory.

While I was waiting for the engine to arrive, Richard even sent me a can of matching paint for my transmission, presumably to get my blood running Beta Marine red. ≈

Pete Dubler has crewed offshore deliveries since 1999 and is an ASA-certified instructor. Experience on many boats led to his purchase of a one-owner Pearson 424 in June of 2004, re-named Regina Oceani. Worldwide cruising plans delayed by Ponzi losses, Pete and his wife Jill moved their boat to their home in Colorado—which Pete points out is strategically located between two oceans—for a complete do-it-yourself refit and restoration while they rebuild the cruising kitty. Pete’s next article will cover completing the engine installation.



Opposite, farm technology at work as a makeshift engine crane. Top, Jon Dory guiding the engine from above

Delayed Commissioning

It will be more than a year between the installation of our new engine and the splashing of the boat. Some engine manufacturers understand the reality of delayed commissioning and have warranties that do not start until after the engine is commissioned. Others tie the warranty start date to the delivery, order or even manufacture date. Be sure you cover the warranty start date in writing when you purchase your new engine. If you are delaying commissioning, ask if your engine can be run at the factory with Shell Ensis oil or equivalent. This is a non-drying, film-forming, corrosion-inhibiting oil that is intended for engines that will be placed into storage. Shell Ensis Oil 30 can be run in the engine until the first normal oil change.

