

## J/40 Engine Replacement Experiences

The original engine was a Volvo 2003T, which was installed under the galley sink and seat/table just forward of the sink. The prop shaft exits the hull much further forward than in the later models, and the rudder can be left in while pull the shaft out. Having the engine in that location has a few advantages, but constrains the interior layout compared to having it behind the companionway. Bear this in mind when reading the write-ups as the (2) different configurations have very different requirements. I am not sure which hull# was the switch-over, but when you look at the boat below-decks, you will have no difficulty figuring it out. (I am now wondering if the switch-over in engine locations happened when the J/42 came along – anyone know anything?)

Also when repowering, add in the cost of a new prop if required. Going from Volvo -> Yanmar means going from RH -> left-hand spinning prop. Hull #4 still uses a folding Martec 2-blade. Martec will switch out the feathers from one to the other. I also have a back-up prop to do if we switch.

The choices below include:

1. Repower the Volvo 2003T with a Volvo 2040B 40 hp engine
2. Repower the Volvo 2003T with a Yanmar 3JH3E (hull #9)
3. Repower the Volvo 2003T with a Yanmar 4JH (Alan preferred the 3JH)
4. Repower the Volvo 2003T with a Volvo D2-40 (hull#7)
5. There are also some Kobota based solutions (ie. Nanni and others), but I don't have any info on them.

### From Alan Kanegsbeg, J40 #9, ATLANTIS

Our original Volvo engine was replaced in Grenada (Caribbean) in 1997. A Volvo 2040B 40 hp engine was put in. We bought the boat in 1999 and the engine had 500 hours on it. Someone put regular antifreeze in the engine when it came north and the engine overheated due to silicone buildup in the heat exchanger. We fixed that and then the siphon break in the raw water system corroded and the engine "hydro locked". That is a common problem on the J40 because of the long exhaust run. We were faced with rebuilding the Volvo or installing a new Yanmar. Unwilling to wait the time it would take to rebuild, we chose to install the Yanmar. We did rebuild the Volvo and it sold crated for \$3,500.

After conversations with engine people, yards, and Bob Johnstone, we chose the Yanmar 3JH3E. The only other Yanmar available at the time was the 56 hp 4 cylinder 4JH that is in the J42. It would have been a total waste. We have friends with a J42 and we motor at the same speed in all conditions and use less fuel. Maximum speed is the same. We are also driving a 125 amp alternator but no refrigeration compressor (We use 12 volt refrigeration). We credit part of that success to the choice of a three blade Max Prop instead of the old two blade folding prop. When the engine is running at its designed optimum speed of 3200 rpm, the boat does 7.6 to 7.8 knots. Max speed under load is 3600 rpm and gives us 8 knots. If I could, I would have liked to have had a 47 hp Yanmar, but there were none.

The size of the engine is smaller than the Volvos but the position of the engine mounts fits the old pan perfectly. The engine is more compact front to back and we decided to move the engine forward to clear the raw water intake and the sink drain. To connect to the prop shaft, we had a custom flange made (\$400) that extends the shaft 2" further into the boat. We put a PYI flexible coupling in as well to take up some of the space. We had to

modify the main cabin engine cover on the port side to allow for the alternator. It was only about 3". The engine fits through the main cabin hatch and slips in easily. The only maintenance nightmare is that the raw water pump is on the port side of the engine and is extremely hard to get to.



The raw water intake through hull and Perko strainer must be changed to 1" for the Yanmar (the Volvo is 3/4"). We used the original size exhaust, but replaced the hose. The original was 2 1/4" and the Yanmar calls for 2". We did not want to change the lift tank or the through hulls. We routed it the same but anchored the aft loop much tighter to prevent movement.

The engine panel presented a slight problem. It is bigger than the one for the Volvo. I made an aluminum frame and fibreglassed to the back of the existing panel opening. Then I mounted the Yanmar panel from the back rather than the front with bolts threaded into the aluminum. You can just see the aluminum frame into which the bolts that hold the panel are threaded. I did the glass and gelcoat work myself. The clear lexan cover was obtained from a sign maker and is impervious to UV. It has been on for 3 years with no deterioration.

We now have over 300 hours on the Yanmar and are very happy with it. It ALWAYS starts instantly. I have a Marelon siphon break with a rubber valve so hydro lock should never be a problem (but I check it twice a year). I took the Mack Boring Yanmar Engine course for the full three days to help keep it in tip top condition and prevent failures at sea. I highly recommend it for anyone with any brand of diesel engine.

As I said, I have sent pictures of the Yanmar engine replacement on Hull #9 ATLANTIS after I have modified the installation to get it the way I wanted it. The insulation is new Soundown and has made a big difference. There are two teak cross bars that hold a closely fitted piece of insulation that goes under the sink.



The sink doesn't even get warm now. The Perko sea water strainer (needs to be 1") is now located over the bilge so the water does not run onto the hot engine and you do not have to remove the sink to clean it. The fuel filter is now under the sink with the fresh water overflow. The only negative I have found is that it is a huge job to change a sea water impeller because it faces aft on the port side of the engine.



In the aft view, there is a piece of thin mylar that covers the Packless Shaft Seal (PSS) to protect it from dirt - it does not leak a drop.



You do have to have the "high speed" model with the water injection tube otherwise water does not lubricate the cutlass bearing when the boat is under way.

**From Wesley Oliver, J40 #67, COVENANT**

I repowered 2 years ago with a Yanmar JH4. It performs really well, although it is a tight fit. Biggest problem I see is getting at the water pump impeller, which is on the port side of the engine and faces aft. I have to take off the Sea Frost compressor and alternator to get at it. The JH4 is probably more power than needed. If I were to do it again, I would select a JH3. I turn a 3 blade 19" Maxprop, and am still fiddling with pitch, to avoid what I refer to as cavitation, which sometimes occurs at speed. The Yanmar makes a lot of noise when running at speed, so be sure to insulate the engine box well. More info from Mike Wilson at Wilson Marine in Rowayton, CT. He did my installation and is a good mechanic. Mack Boring knows him. He is a Yanmar dealer.

**From Mike Steffenson, J40 #77, FIRSTAR**

I killed my Volvo last summer and had Wayfarer in Camden install a 3JH in its place. They did it in 4 weeks. Installed it came to something like \$23000. They did a very nice if not inexpensive installation. I do not see how you could get a 4JH in as the 3JH takes up all of the available space. If someone is really interested in how it went in, you might contact Tom Babbit at tom@ecys.com and sweet talk him into getting out his digital camera to take some pictures of Firststar's installation.--I'm in Iowa and she is in Maine. It came out very nice, and runs very smoothly. Tom may try to sell you a new J-42, but that may not be all bad. When they cut the new opening for a larger exhaust, they found the core in the transom was wet. They also found wet core and delamination in the port quarter below the deck locker. Apparently, screws that held a vertical bulkhead in place (during construction?) let water get into the core. So when they are all done with this "conversion" we are going to be into real money. So check your exhausts and other core penetrations. I hope this helps.

**\*\*\*\*\*Followup by Tom Babbitt, J40 alumnus and current J42 owner**

Regarding the installation of the new Yanmar in Mike's J/40, the biggest problem encountered was that Yanmar specifies a 3" exhaust and the original exhaust for the Volvo is 2.5" (I may not have the exact diameters). The Wayfarer mechanic expended considerable time and angst attempting to fit the specified large exhaust....a nearly impossible task. He finally contacted Yanmar and they told him that the originally installed smaller diameter was fine. I don't know what the back pressure is with the smaller than specified exhaust but it apparently has Yanmar's blessing. There is a Portland based owner who also had the same experience.

**From Brian Beaver, J40 #78, NORSKA**

Several years ago we had to rebuild our 2003T. It did come out the overhead hatch with little trouble. But Volvo parts are very expensive and the rebuild was \$6000 or just slightly less than a new engine ( at that time). The engine is running well, but it is my perception that Yanmars are less expensive to maintain and perhaps more reliable. I would certainly consider an alternative. An additional problem with the Volvo is that it does not easily allow upgrade to a very high output alternator. It will support an upgrade only to a (one belt) 90 to 110 amp alternator. We did this using a Balmar and the installation is working fine. However, if your electrical needs exceed 120 to 140 amps/day, You may need an alternator that requires two belts to handle the load . The Volvo will not easily do this.

**From Frank LoPresti, J40 #65, RESOLVE**

When I bought Resolve (2001 fall) the Volvo had just been replaced by a Yanmar 30. I don't know how much Rich Destrempe paid for the engine (Brewers @ East Greenwich, RI) but the alignment which I had later last summer was a couple thousand dollars plus hauling. The cutlass had to be replaced and its strut reattached probably because of the misalignment and my using the unaligned engine too long. I had been told by East Greenwich to wait until the end of that first summer but clearly that was too long. I should have had it done immediately after feeling the shaking. I like the Yanmar and have plenty of power (2 blade folding prop) - especially since my NY36 had 13 hp.

**Here is a note from Walter with Hull #7 on repower with the Volvo D2-40**

Our hull is #7 and had the Volvo 2003T under the sink. We repowered with a new Volvo D2-40. Four cylinder and very smooth and quiet. We really like it and the refit was not bad at all. Here is what was involved.

Installed some starboard on top of the rails that the motor mounts sit on. This was so the engine would align properly. The exhaust diameter did not match up. I had to do something with the exhaust hose, but can't remember exactly what. I think the new engine has a smaller exhaust than the old. I modified the muffler input by glassing some fiberglass tube onto the input (I think), but also added some smaller hose inside the exhaust hose coming off the engine, doubling it up (I think). I'll get a lot more details if you want. At any rate it was very easy. I made an engine panel for the cockpit out of a piece of starboard. Very easy and you'd probably have to do this with any new engine. We have a maxprop and it had to be re-pitched. That took a couple of tries but now I have the info and could pass it on to you! The water impeller is right in front and is very easy to get to. Also the oil dipstick is easily accessible through the side door. Both engines fit through the top hatch with no problem. I would highly recommend re-powering with Volvo, and I don't understand why more J40s are not. If you decide to do this, I can take some pictures and answer any questions. I'll also take a look the next time I'm at the boat to see if there's anything else I missed. (SEE Walter's notes/pix)

Walter - #007 "Shaken Not Stirred"