

THE REFIT OF ASTRAEA

The Refit of a Classic Cheoy Lee 41

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Re-Fit of Astraea

Here is a documentation of the work done by Svendsen's Boat Works in Alameda from November 2005 to the present. Click on each phase to see details of the work.

[Phase I: November 2005 through March 2006. Mast rebuild, new rigging, recoring the foredeck, new lifelines and lifeline stanchion bases.](#)

[Phase IB: The work of Phase I continues. From April 2006 through June 2006. New bottom, new shaft, new prop, new cutlass bearing, and a new transom paint job.](#)

[Phase IB Cont. July 2006. The work continues. New B&G instruments, new bilge](#)

Refit Phase III

Phase III: \$70,000

Svendsen's Boat Works, Alameda, CA

June 25, 2008 - September 23, 2008

Re-Powering (Replacement of Isuzu with a new Westerbeke)

Installation of new Furuno NavNet2 Electronics Suite

I had resisted for three years the temptation to replace the original Isuzu QD40 engine. This engine ran like a clock! It never failed to start, never ever smoked at all, and reliably powered Astraea along smoothly at 7 knots without. We had even put significant investment into this engine with all new hoses, rebuilt heat exchanger, and other rework. However there were concerns with this engine and the related transmission.

The previous owner, who had cruised Astraea for nine years, warned me that this engine was on it's third transmission and that he had replaced the engine mounts twice. He warned me that he would NOT take her offshore with the existing engine/transmission.

Also, this transmission had started to slip and it was getting worse and worse. During a recent visit to Petaluma the transmission had completely failed and we had to have people on the docks help us put her along the pier using her lines. That was both frightening and a little embarrassing! And, as the people at Svendsen's had warned us previously, it was just not possible to get replacement parts for the ZF transmission and it was very difficult to get replacement parts for the engine. They were apparently just so old that replacement parts were not readily available. I realized that if I could not get replacement parts while sitting in San Francisco then I would never get parts if something happened in some remote port in Mexico, the South Pacific, or other places I hoped to go. It was therefore decided to "bite the bullet" financially and just re-power. We decided on the Westerbeke 44, which was appropriate from a physical size and weight and power.

I made arrangements with Svendsen's to bring Astraea there on June 25. Bob was visiting on the East Coast so I had to take her over single handed. No big deal. She has been to Svendsen's so many times that I think if I just cast her adrift she would end

[pump system, huge new holding tank system, and repair of previous grounding damage from the Caribbean.](#)

[Phase II: Electrical System Update, New Force 10 Stove, Bottom Rework Part Deux](#)

[Phase III: Repowering with a new Westerbeke 44; Cleaning and repainting of bilge; Installation of new Furuno NavNet2 radar, GPS, and other electronics; refinishing of cabin sole; installation of a new Monitor windvane.](#)

[Click here to see the extensive refurbishment of her brightwork.](#)

up there by herself. Anyway, it was a beautiful Wednesday afternoon, perfect weather, and it was only a 90 minute trip.

Even when we are motoring we always set the sails so we can immediately sail if the engine has a problem. I hate to see people motoring a sailboat with the sail covers on! Of course I am just overly cautious. Combination of my personality (anal retentive) and 25 years of the US Navy. Anyway, the reason I am having the new engine and transmission put in is because I don't trust the transmission, hence even more need for caution. Anyway, while I was securely tied to the pier I tested the engine in reverse and forward several times, and it was fine. No slipping in the transmission and she pulled hard on the spring lines. I then cast off all lines and carefully backed out of the slip. I was backing to starboard and at the proper time I put her into forward to head out down the slip. Nothing! She would not go into gear! Here I was, all alone, at noon, nobody around, and I was drifting toward the boats on the next pier. Fortunately I was going very slowly and there was not much wind, so I was fairly certain that I could probably hold myself off any other boat until I could get help. In the Navy we called a situation like this "in extremus". I decided to go for broke and pushed the engine to max RPM's and suddenly the transmission grabbed and clanked loudly and I was able to get forward motion. So now I had to make a go or no-go decision. I decided that trying to get Astraea back into her slip was not feasible as that due to my present position this would require a lot of maneuvering and I was pretty certain that the transmission would not respond and I would end up in a very difficult and dangerous situation. I therefore decided to go for it. I headed out of the harbor and into the channel and into SF Bay. The channel out of the harbor is dredged and is very narrow, which is common in SF Bay as most of the Bay is rather shallow. As I was heading down the channel I just kept her at a medium speed rpm and hoped that since the transmission was now engaged it would stay engaged. On a wing and a prayer I made it out the channel, and then it was time to head for the channel under the SF Bay Bridge. Now this is a rather dangerous area as BIG container ships and oil tankers pass through here frequently. Also, if I were to lose the transmission at the wrong time (well, at this point ANY time would be the wrong time) I could get pushed up against the pilings of the old bridge or even into the construction work on the new bridge. Pucker factor was indeed high. However I just kept her on a steady rpm and motored through, ready to lunge for the sails to raise them if I had to.

Once I got through the bridge area I headed for the Alameda estuary. This is always a somewhat tense area as this is where the container ships load. The wind was blowing such that if I lost the engine it would blow me on to the ships (they were directly downwind from me as I headed up into the estuary). I therefore hugged the far shore to provide the maximum maneuvering room and hence reaction time if I lost the transmission. With the wind from the beam I knew that my sails would be effective if I had to raise them, however I would have to leave the helm to raise them and then try to control the sails and steer at the same time on a boat that is pretty large. Anyway, Astraea and I just motored right on by and she in fact motored well all the way to the yards.

When I got there I radioed the yard that I was coming in and I did not know if I had a backing bell available or not and I might very well be doing a crash landing at their dock. I was pretty certain that I had maybe one attempt at getting along the pier. Therefore when I got there they were ready and I made a smooth landing on the first try. Fortunately it was an upwind landing. However the wind had kicked up quite a bit by now, and there were boats everywhere with one small place for me. I was told to land astern of this huge 56 foot sailboat. If I came in too fast and could not back down I could slam into her stern. The diesel gods were with me and I made a perfect approach and landed her right alongside the pier. Adam, from Svendsen's, just had to reach over and grab my lines and secure them. Perfect landing! Of course I kept thinking that I only had one chance, so I could NOT blow it!

Anyway, we safely made it there. I spent Saturday taking up all the deck plates. The ones over the engine are made to lift up. The others are screwed down and had not been up for 27 years. It was a bit dirty under some of them. The yards are going to remove the engine, steam clean the entire bilge area throughout the boat, and then repaint the entire bilge area before installing the new engine. She is going to be pristine! I am SO EXCITED!

One thing about what happened on this trip, I realized that the new engine and transmission were really not an option. They were necessary if we were to keep Astraea safe to go to sea.

Bob went to the boat with me on Sunday and we started hauling the sections of teak and holly sole plates home. He is going to strip them and sand them on the terrace. Our terrace is large, about 450 square feet. This is going to be fine as long as the building manager does not find out or someone complain to the condo association. I was going to have the yards do it, however we hate to pay the yards to do work that we can do ourselves. Bob really wanted to do the stripping and revarnishing and he enjoys that kind of work.

Repowering

The REPOWERING Project. Here is Astraea with her original Isuzu QD-40. Good old faithful engine, but being three cylinders she was never very well balanced and had a lot of problems with engine mounts and anything attached to the engine. Also, she was 1981 vintage and hard to find parts for.

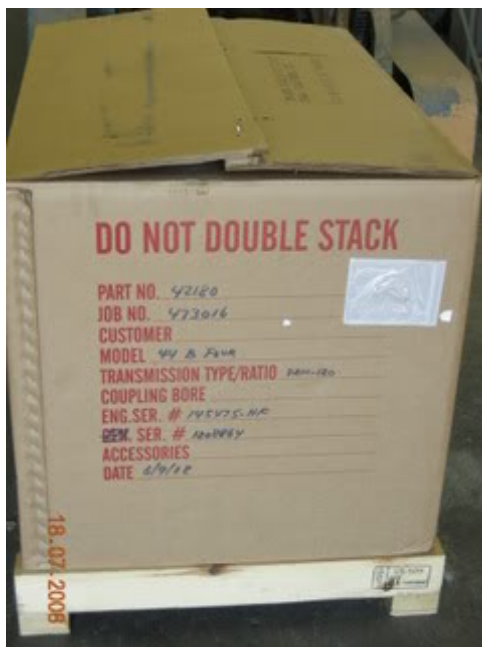


Here the cabin sole has been removed to provide access to the entire bilge area. The yards will be removing the Isuzu and replacing it with the new Westerbeke 44 and new transmission. This will also allow the electrician to more easily run some new wiring and install the the Furuno Navnet2 Network.



Once again Astraea is in pieces, however I am making sure to keep her neat and clean during this work. All parts are collected in plastic bags and carefully labeled. I also go by the boatyard daily at lunch time or after work to check on her, clean her, and wash her at least once a week.

18 July 2008. Finally the new Westerbeke 44 has arrived from the East Coast! The boatyard has assured me that starting next week, the week of July 21, they will start ripping out the old Isuzu, steam clean the bilges, paint the bilges white, and install this RED beauty.



My old faithful Isuzu sits in the shop ready to go to someone else. She has found a good home as one of the boat yard riggers is going to adopt her for his boat. I am sure he will get years of good use out of her.



July 25, 2008. Once again my friends at SeaShine are cleaning the bilges.

This time the engine is gone and all the deck sole is removed, so Astraea is getting a deep cleaning of all her bilges. The bilges will then be ready for repainting (white!) and the new engine.



The bilges are a mess. Some 25 years of grease and dirt were under the engine and will now be professionally cleaned out and repainted. Here she is with the bilge cleaning in progress.

Rod Kux of seashine hard at work at the very dirty job of cleaning the greasy and oily bilges and, of course, disposing of the oil waste properly.





BEFORE AND AFTER. Everyone likes before and after pictures. Here are the bilges before SeaShine cleaned them and the yard painted them, and then a picture of the "after" cleaning and painting. Quite a difference!!!

Before:

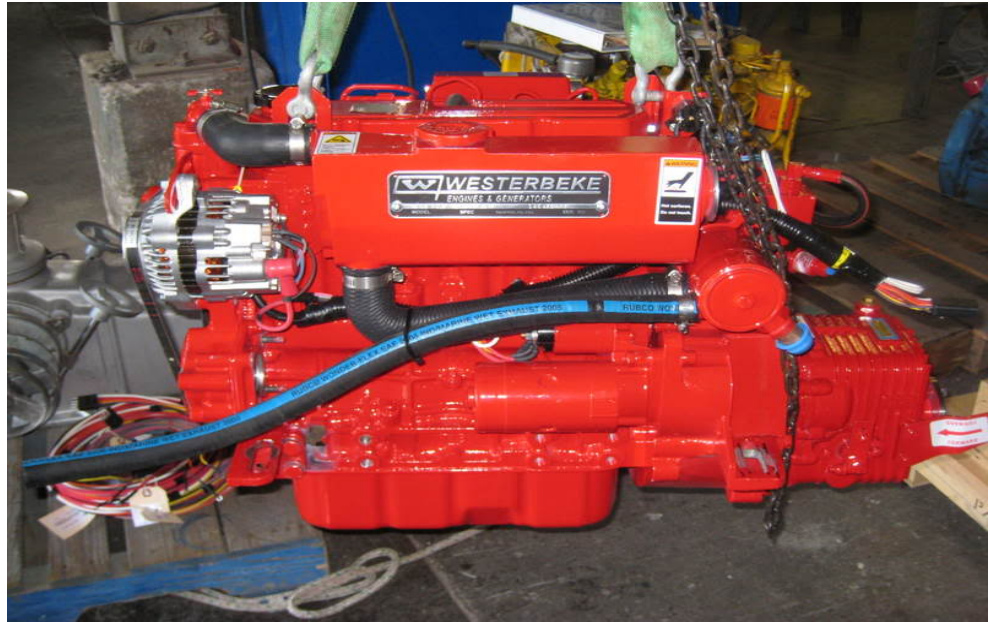


After:



Now that the yard staff has begun looking at the work to be done they have realized that the new Westerbeke does not fit on the same fiberglass bed the Isuzu used. This meant cutting out part of the old fiberglass engine bed and rebuilding it. Of course the pristine newly painted bilges will be trashed in the process and have to be repainted again.

The new Westerbeke is finally out of the box and is being modified with dual pulleys in order to handle a larger alternator and the reefer compressor.



New engine ready to be hoisted aboard. How will they do this? See below!



Here is the rigging as the new Westerbeke is rigged and put into place. Quite a complex procedure to get it into place. Note how

they suspended the pipe from crossbeams at the forward hatch and companionway.







Here she is sitting on the new engine base, ready to be installed.



Here is the prop, now a 14x10, previously 14x12. Note the feathering of the prop blade edges. This is some new technique which is supposed to make the blade more responsive. Interesting, I have never heard of this before.



Astraea waits for her new prop.



Friday, September 12th, 2008. Finally, finally, finally the new engine is fully installed. Scott, the diesel mechanic and I took her out on Friday after lunch and did a sea trial in the Alameda Estuary and it was sweet! Smooth, no vibration, all went perfectly. Only problem is that she cannot get over 2700 RPM and we need to get 3000, so it will be necessary to repitch the prop by an inch or so. Engine looks great! Catch the new dual Racor fuel filter. Sweet!



[Phase III Continues. Click here to see the continuation of the work.](#)
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All Content provided by Robert Moon

