

Fighting the Perkins windmill

(technical explanation of the fuel pump project)

Zeezwaluw is still moored bow to the Carenantilles floating pontoon in Le Marin. Riens decided to do some preventive maintenance on 36-year old Mr. Perkins to be sure the engine is in perfect working order for the west to east Atlantic Crossing in April/May this year.

Perkins maintenance

Now is the best time to do, considering the save place Zeezwaluw is moored and the official Perkins dealer/workshop on site who gave great advice on the alternator problems.



He orders a new diesel lifting pump (2004). This pump has 2500 running hours but still performs very well. But Better safe as sorry! The shopkeeper mentioned that nobody is using the mechanical driven pumps anymore but use the electrical driven pumps which fortunately were on stock. Happy with the 36-year proven technology Riens decided to keep things original and a special order was made. Riens noticed during the last sailing trip (Curacao to Martinique) the engine temperature was a bit lower as usual while running. So a new thermostat for the still original one was ordered too. It might take 2 weeks to arrive due to Christmas the crew was told. Nonetheless the parcel came in after a week. The job to replace the 2 parts was postponed till the first week of January.

Lifting pump renewing

The lifting pump replacement was not a new job as Riens had done it in 2004 as well. Before fitting the new pump the crew changed both diesel filters. Of course the pump is situated in an awkward place in the keel but it was not too bad.



Mr. Perkins in the Bilge



Fuel lifting pump in situ



The old lifting pump removed

The thermostat is located at the engine top side in a better place to reach. Unfortunately the bolts were very tight after 36 year but in the end both jobs went fine.

Mr. Perkins was started and ran perfect. To test the thermostat' working, the idea was to let the engine run for an hour or so. But, shit happened again! The engine stopped suddenly by itself after 25 minutes! What was this?? Mr. Perkins only has had this problem before when the diesel was contaminated with algae's or water.

How to solve this new issue?

Riens, in the previous century a Professional Marine/equipment Engineer by trade (this detail was not shared with the Perkins dealer/workshop on site), was surprised.

Not distrusting the new pump, he checked all connections, again and again. Even both the filters were detached, checked and re-attached again. The vacuum suction procedure of the bottom of the diesel tank did not reveal any water or sludge in it. So what's next?

The diesel fuel suction (hydraulic) hose contains a special "ball check valve" which might have failed, that's the only logical problem left after everything else was excluded. So with the hose and fitting in hand, Riens went to the Perkins workshop to buy a new valve. They looked at it but they did not have a replacement for the valve in the original hose. After they tested this special valve, they assumed it was OK, however advised to replace the hydraulic hose and fittings (still originals).

Following up the given advice ...



So the crew rented a car and drove to a specialized shop in Duclos near the airport. They waited while the hose and fittings were made. Unluckily they did not have a valve like the one was in the fuel line, to have as a spare. So the original valve was treated with WD-40 until it easily worked again and placed back in his designated spot in the fuel system.

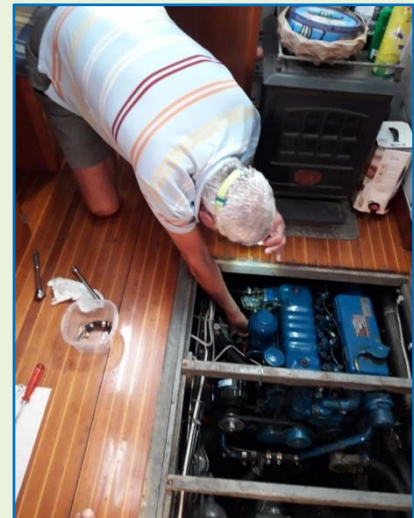
A second advice the head engineer of the Perkins workshop gave was isolating the pump from the system by making a direct suction connection with a clean canister of diesel. To exclude any failure of filters or connections was leading the surplus oil back to the canister.

Next try... and again

With this set-up, Mr. Perkins ran with the first try, but this time the crew could see, no excess diesel was coming back! As soon as we saw this, the engine was stopped by Riens.

No return diesel could only be possible when the pump was not working as it should, was Riens' conclusion. The old pump ran smoothly until Riens replaced it for the new one. So the new pump was taken off again and the old one on! Working up-side down during this session we invented a new Yoga position called; "Perkins petting".

To verify the old pump was giving return oil; the same test was performed when the old pump was back in place again. Mr. Perkins was started and ran smoothly while excess oil came back immediately. Conclusion: the new pump is malfunctioning or it is not the correct pump for our Mr. Perkins.



Trying to solve this strange problem

Trying to get more information Riens contacted Perkins UK about these experiences. But they replied they would only help customers in the UK and Ireland. Contacting Perkins in the Netherlands and Curacao revealed that they both had no data about these pumps and if the part number was correct their problem solving capacity was stretched to its outer limit.

So support was limited to the local dealer. With the information about the applied pump trials Riens went back to the Perkins dealer at site.



Although the lady in de shop speaks good English and was very helpful it is difficult to explain such a technical problem. She checked part numbers ordered and received and contacted the UK supplier by email. The numbers were correct for our Mr. Perkins 4108. So, what could she do next?

She gave the advice to go to the workshop to explain the problem to the head engineer. To be sure they understood the problem as all what was done to detect a failure in some place, Riens wrote-up the history in English and translated this information by Google translate into French.



(we know it is not perfect but it was the best we were able to do). The info in both languages on paper was given to the engineer. He understood it, could not find anything wrong in the procedures which were performed. He could not understand why the pump was not working. So, he said he was coming over to Zeezwaluw to see it himself at 9 a.m. the next morning. All this communication, testing and replacing old hoses, took 4 weeks so far. Lots of patience is required ...

The head of the maintenance department of Perkins checks Riens' installation

The next day Michael came and checked the installation, all the connections to the old pump which was installed again by Riens after the latest test failed. All was in perfect order he said. He replaced the old pump for the new one himself. Got rid of the air in the system by pumping diesel around by hand, this went well (the same as we experienced).

He was sure the pump would be OK as soon as we would start the engine. The test hoses were attached to see if excess oil was coming back to the jerry can. After starting Mr. Perkins, no surplus oil was coming back! The engine was stopped immediately by Riens. The Perkins head engineer was without words, he could not believe it was not running for it was the right pump and installation! Riens informed Michael about the difference in the "stroke" of the pump he measured. Riens wondered if Perkins did a design upgrade or outsourced manufacturing or was it just a malfunctioning pump. Michael left and said he would talk with the dealer about his findings the next morning.

The next morning the crew got an email from the Perkins dealer on site, asking to provide her with the information and tests in English so she could send it to her supplier in the UK, to ask for a solution. Riens send her a reply email within the hour (also in French so she could understand what she would send).

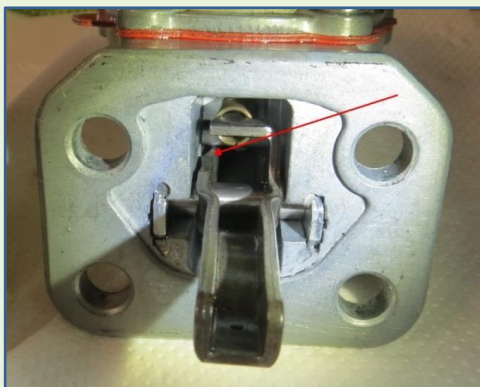
Riens took the new pump off Mr Perkins again to do some serious research and measurements.

We have now 3 pumps: 1-The original blue Perkins 1983

2-The replacement of 2004

3-The new one of 2019

He took them all apart and measured "the stroke" and looked for differences in all 3 pumps. Took pictures of them and studied them all. In the end he discovered a deep scratch on the inside of the new pump and a serious deformation of the drive lever. Riens sent by email the pictures of his discovery with extra information to the Perkins dealer on site, which she forwarded to the UK a.s.a.p.



Lever deformation lever next to scratch



Zoomed-in on the scratch

Problem solving by Perkins UK supplier

After 3 days and many requests of the Perkins dealer on site, a reply email was sent to her, which said:

"It is the right pump for the Perkins 4108 and they send the manual; "how to install the pump!"

That was all they could do".

Riens was pissed! So he wrote a reply how he thought about the UK supplier's customer service and denial of a detected problem and that shovelling the problem under the carpet. Sending an installation manual is not the right way to keep happy customers. He asked for the refund of the purchase cost or send another pump. The crew have no words to describe this un-ethical behaviour of the UK Perkins sales woman.

After a few days (cooling down period) we went to the Perkins dealer on site. She was very sorry she could not do more for us or solve the problem. It was now 2 months after ordering the pump it took too long in her opinion (and ours)! She asked us if we want our money back for the pump and delivery costs. Of course we wanted our money back for our patience had ran out by now. Later that same day we had the money back in our account.

We have no hard feelings for the Perkins dealer or the engineers of the Perkins workshop on site. Just the contrary, they did everything in their power nonetheless were not able to come to a solution. This problem was the first time in 32 years of her Perkins dealership the lady confessed to us. (It is always a first time when problems occur, isn't it?)

It over two months after ordering the new pump and the crew is even worse off as to square one. No working pump to do a preventive replacement of the pump with 2500 working hours nor given an alternative by the "professional" UK Perkins supplier how to proceed. The crew has lost her patience with and confidence in this representative of Perkins in the UK to argue further more.

Other approach to solve the problem

So after getting back to Zeezwaluw, Riens ordered instantly by internet a new Perkins fuel pump from another supplier in the UK (Parts4engines). Cost and delivery to Martinique was $\frac{1}{4}$ of the amount of the UK-supplier used by the Perkins dealer on site!

According the tracking information the ordered pump will be delivered on Wednesday March the 4th, but was delivered March the 2nd already!

New changes to get Mr. Perkins healthy

The new pump was a lookalike of the original one and made funny clicking noises when used manually. Nevertheless Riens installed this pump with high hopes and attached the set-up for checking the return oil flow. After starting Mr. Perkins, again NO RETURN OIL. On top of that a sound like the horn of the first cars accompanied the engine noise! We have no words to describe how we felt at that moment.



The hose of the check-up setting was removed and the hatch over the engine closed. The next day, Riens decided to re-install the "old pump" again as that one ran perfectly even with 2500 hours.

There has to be something different with the new pumps as they did not work on our Mr. Perkins. So, with the old pump in place again, hose attached to be sure the return oil flow was as good as before. Unfortunately however, the old pump' excess diesel was now a tiny flow, not the amount we were used to and produced the old horn sound too. Well this was a problem we had never expected. Riens needed time to think about how this was possible so we let the problem rest for a while.

In the meantime Corona pandemic had arrived, lock down situation with no foreseeable end to that. Because of all the repairing in impossible positions Riens suffered from a tennis elbow.

It was his right elbow and his dominant arm. No fiddling around at Mr. Perkins for a while. It's time to let his arm rest as much as possible. Luckily we have this amount of time due to Corona. During this lazy time he let the problem simmer for a while and dreamed-up a solution for the fuel pump story.

That illumination came to him, after a few weeks. He took the pump apart again to see if the membrane was fine and in the correct position. So checking that and putting it back in the position the manual told him to do. The other possible cause might be the old "ball check valve" in the fuel line. When the new hydraulic fuel hoses were obtained, the shop did not have the kind of valve which was in our system. (Perkins workshop did not recognize it either). So Riens cleaned and replaced the old one in the new fuel line. Testing the check valve (sucking and a lot of spitting) this time, he experienced a lot of resistance before the valve opened. This time he left this valve out to be certain there was not an unobserved obstruction inside that check valve.

Finally ...

So 1 week ago when the elbow was less painful, Riens attached the fuel line without the check valve. Checking the return fuel oil was next. So the checking set-up hose was attached and Mr. Perkins roared to life once again. And YES, finally return oil was coming again in a nice steady flow as in the "old" days without the horn noises!

Well, finally we have an engine as reliable as before again. We are very happy of that of course, but the whole exercise was not what we had in mind by: "*doing preventive maintenance*".

It is a bit strange though, no one knows why 2 brand new pumps (one a genuine Perkins) are not working while the old one does. At the moment we are relying on the pumps internal valves until we find a new check valve and are using the "new" pumps membrane as a spare back-up in case of a rupture.

Thus Zeezwaluw's 4 months inactive residence at the floating pontoon of the Carenantilles in Le Marin never knew a dull moment. Due to the location and the cooperation of the local shop we still had a wonderful time during the Corona lockdown but left us with mixed feelings about original spare parts.

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