Debris in fuel tanks

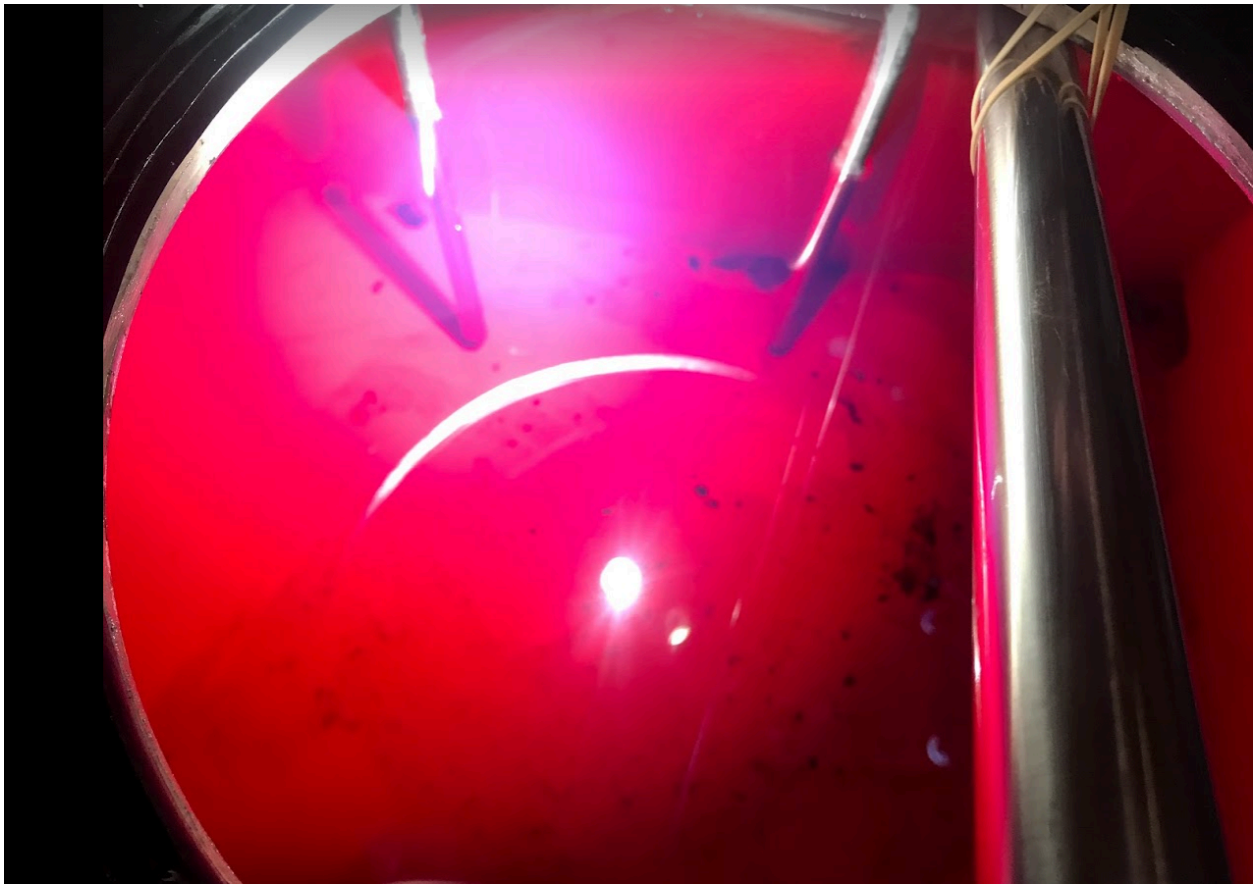
Our Story:

The story about our debris in our fuel. The yard did not clean the Diesel tanks properly when the boat was built. This caused problems down the line. For the first several hundred hours of operation, we had no problem. However the vacuum on the Racor gauge started to increase gradually. Cleaning the Racors and changing filters did not help. The engine stopped when the vacuum increased to 20 or above on the scale. The gauge showed the same value regardless of which filter we used, or if we used both at the same time. It also did not help to change the supply tank.
This led us to believe there was a blockage up-steam from the Racors, and that there must be a clog somewhere. It went so bad that the engine stopped several times. We used the dinghy pump to push the debris backwards, and could get the engine to work for some time by doing that.

Our gauges at the time. When it’s in the RED, there’s a big problem...

The process we used to fix the problem:

This was not done at once. But is in chronological order below.



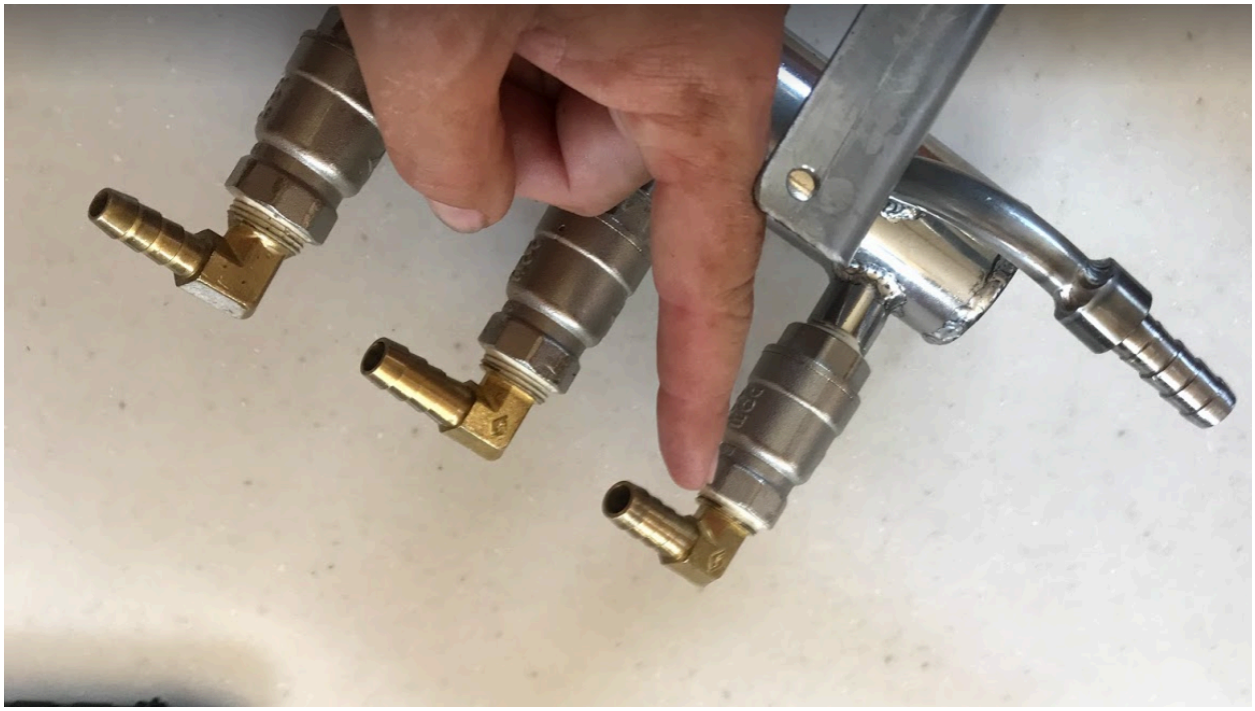
We opened up all the tanks, and some were clean and some were dirty. This is one of the dirty tanks. First we thought we'd filled bad Diesel somewhere. But the things we found in the tanks indicated that it was manufacturing debris, not sluggish Diesel. We found fibreglass parts and fibreglass strands in the tanks.

Anders in the process of polishing the fuel and cleaning the tanks, one by one. We used a battery driven fuel pump and a filter funnel. We pumped the fuel from one tank to another. Then cleaned the empty tank thoroughly before “polishing” the Diesel over to a third tank. Did this until all Diesel was polished and all tanks clean.

Those are some of the things we found in the tanks.

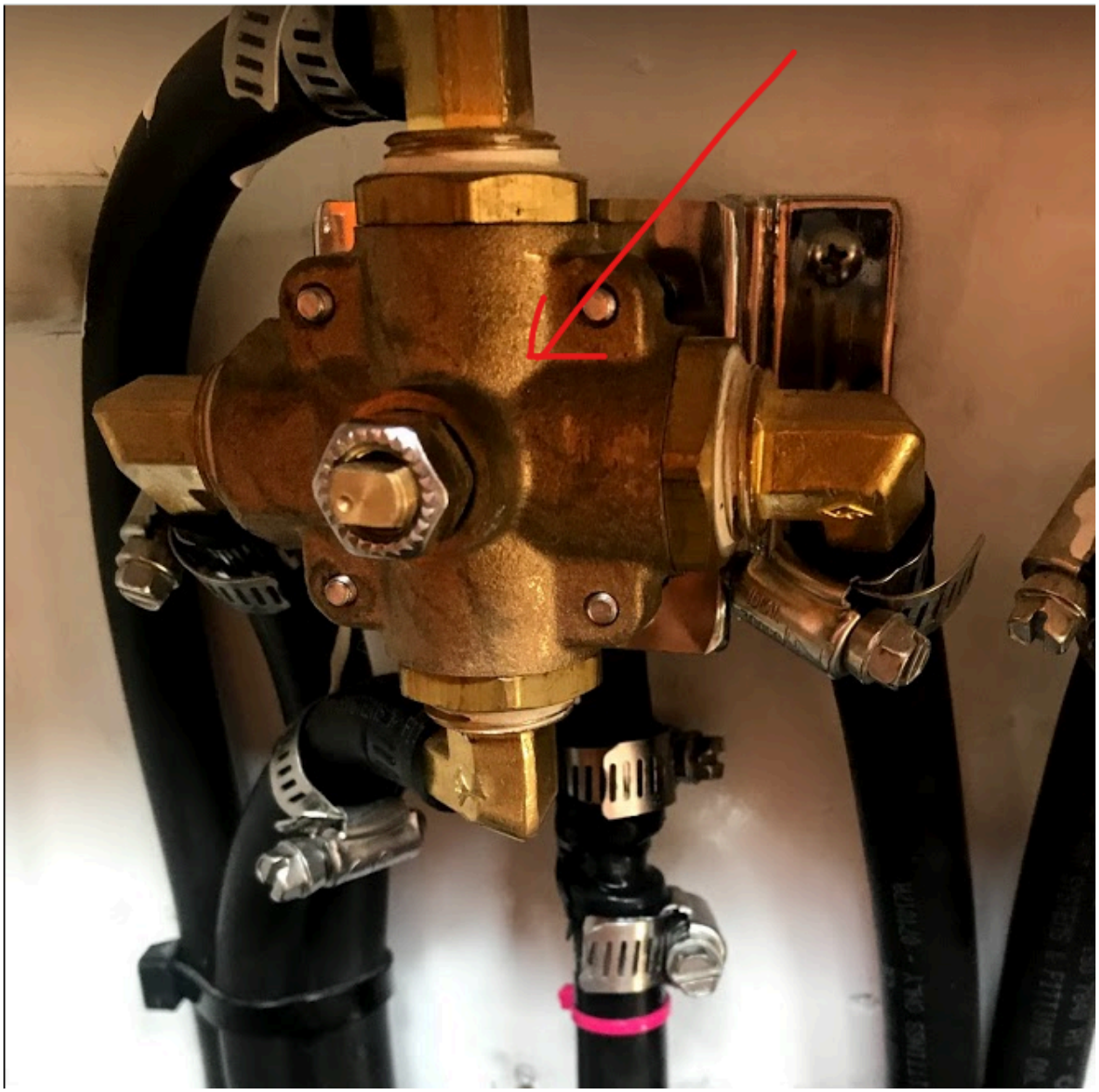
Then we moved upstream from the tanks and cleaned the fuel valves and the manifold on the supply side. Realising that the debris would never go through the Racors and the other fuel filter, the supply side must have the clog.

We removed the manifold and found debris in the elbow at the engine supply.



Here is where the debris was located.

Here is the debris from the elbow.



However, the biggest clog, and the root of the problem was in the supply valve, where we choose which tank to supply fuel from, the “Fuel Tank Supply Selector”. We took a short hose and tried to blow in all directions through the valve. It was impossible. We then took the dinghy pump and forced a big clog out of the valve (see below).

This is what came out of the valve when we used the dinghy pump to force it out. Fibreglass strands and some dirt.

After this came out, the system was “all clear” and the Racor gauge has stayed in the “white zone” ever since (1,000 hours later…). After mitigating the clog, we’ve never been close to yellow between Racor filter changes.

How to approach the problem:

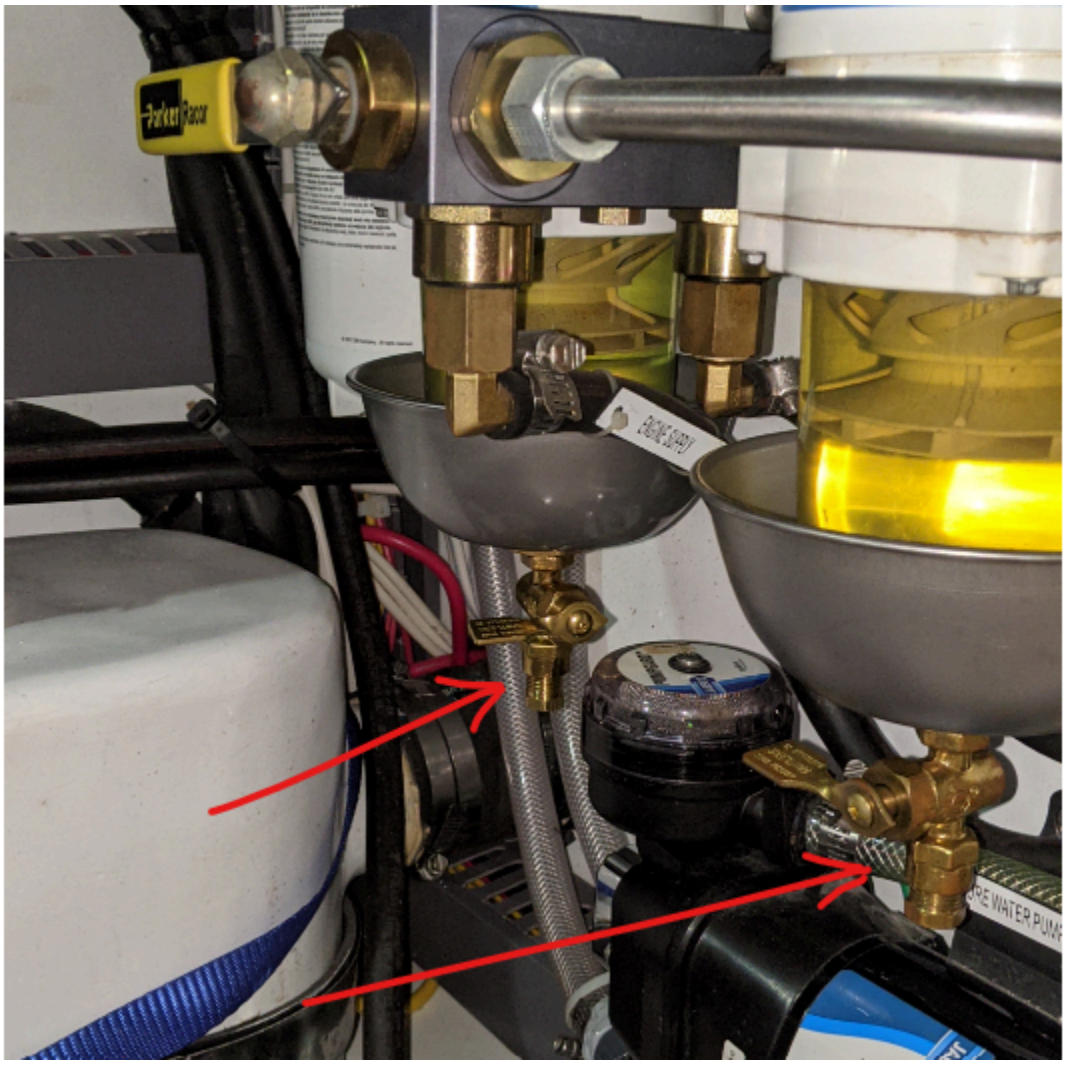
Here’s just some thoughts of how we would deal with this problem in the future.

1. If the vacuum is increasing on the Racor gauge.
    a. We would check if the vacuum went down by changing to Racor filter #2
    b. If so, then the Racor filter #1 needs to be changed. Problem solved.
    c. If not, then the problem must be upstream from the Racor filters.
2. Check if the vacuum is different depending on which fuel tank is used.
    a. If so, then the clog is between the “Fuel Tank Supply Selector” valve and the tank with the high vacuum. It can still be in the selector valve.
    b. If the vacuum is unchanged regardless of “supply tank”, then the problem is in the manifold or in the “Fuel Tank Supply Selector”, or in the hose between the two.

3. Check if it is in the manifold by removing the hose between the manifold and the “Fuel Tank Supply Selector”. (put a bucket for any fuel coming out).
    a. Remove the feed hose from the Racor and blow. If there’s a free air movement through the manifold, then the “Fuel Tank Supply Selector” must be the problem.

Racor Drain Valves:

Another good idea is to install drain valves on the bottom of the Racor bowls. This makes it easy to drain out any water and or slug that build up over time.



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