



NO. 5

THE SUMP - PART 3

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If I had a dollar for every time that a customer has told me, "There is no water in my filter separator sump," I would be very wealthy. I would be almost as wealthy if I had a dollar for every time I found water in a sump that had just been given its "daily drain".

Why is it that one man can find no water but another man can? Obviously, it's all in the way you do it.

The difficulty is that the area where the sump drain is located is usually flat. Water collects on the flat surface but it tends to lie in a "heap" until something happens to break the interface. Watch how water acts in a nearly flat-bottomed wash basin. Water lies on the surface for long periods of time when the water valve is turned off. If you touch it with your finger, at the edge of the drain hole, it suddenly begins to flow into the drain. (We strongly recommend doing this experiment in private, away from those who may not understand scientific studies).

Most filter sump draining seems to be done by cracking open the drain valve and collecting a pint or two. This does not disturb the layer of water enough to break its surface tension and so the water stays on the flat deck.

If you really want to do a proper job, you must get some velocity down the drain hole and the best way to do this is to turn on the pump to get pressure. Then open the drain valve as far as possible (without giving yourself a kerosene bath) and collect a couple of gallons in a white bucket.

I'll never forget how I learned this trick. One of the real old-timers in jet fuel met me at an airport where a severe surfactant problem had been found. I sumped the filter separator in the conventional way and got a nice clear bucket of fuel. After a few very critical remarks, he used the method described above and collected a sickening bunch of slime, water and crud with the fuel. (I wonder if T.C. remembers this episode?)

A doctor can see inside the human body only by looking in your eyes. He uses a bright light and a special glass. Doctors learn many things about your general health this way. The best method we have to learn about the "health" of fuels is to study the water sump.

This is why we should try to interpret what we see. So much can be learned but only rarely does anyone *really look*.

A. Water--if it is clear, you are lucky. If it seems to have a brown film on it, this is probably a surfactant layer. If you touch it with a straw, you can often see clear water under it.

Dark water--this is bad news! It generally means a severe surfactant problem but it can also indicate a problem at the refinery--or it may be water from dirty fuels (heating oils and crude oil) that were previously handled in the same ship, barge or pipeline. Dark water can also indicate microorganism growth. There is no more certain indicator of trouble than dark water. Does it have sulfur-like odor? More Bad News!

B. A white filmy thing seems to float around in the fuel, but you can't collect it or gather it. This is a form of surfactant. Air bubbles that meet it as they rise toward the surface have difficulty penetrating this film but in a few minutes they break through. I have never known of anyone who has successfully analyzed this film because it simply cannot be collected.

C. Globbs, slimes, jellies--microorganism growth. Remember, microorganisms cannot live in fuel. They live in water. If you eliminate water, you can have no growths.

D. Large dirt particles--either a coalescer element burst, was incorrectly installed or you didn't clean the sump properly when the elements were last changed.

What action should be taken when unsatisfactory sump conditions are found? The first step is to insure that contamination does not progress farther in the supply system because every time that a surfactant contaminated fuel passes through a filter separator, its life is shortened and its performance may be degraded. The second step is to trace the source of the contamination and insure that corrective steps are taken. The third step is to clean all of the contaminated equipment and change filters as deemed necessary.

In conclusion, look diligently for water in fuel systems. If you find it, inspect it carefully and report all details.