

## Hydraulic Troubleshooting, Is It Difficut?

The well designed and well manufactured Hydraulic machinery is very reliable; it is going to give you a lot of years of production without giving you trouble in most cases. This sounds good, but reality is that even you give your hydraulic machinery the best preventive maintenance, such as changing filters, oil on a regular basis, sometimes the machine is going to stop Typically, it will not be in a convenient moment, it may likely occur when you need it most, when you cannot stop production.

When you are facing a situation like this, the better prepared you are, the faster you are going to take your machine back working.

So, what do you need to do to perform a fast troubleshooting in your hydraulic machine that allows you to come back to normal?

I am going to discuss two different things, what to do before, and how to initiate some easy troubleshooting.

When I say before, I mean when the machine is working well, and you have time to work on the following:

- Learn Hydraulics. Yes, if you are not familiar with hydraulics, start from this point. If you want to resolve a problem fast, you need to learn how hydraulics works. If you have some knowledge, be sure of you know how all the hydraulic components work, how they handle FLOW, PRESSURE and DIRECTION. How all of them are connected to each other in your machine.
- Gather as much information related to the machine as you can, schematics, lists of components, manufacturers, catalogs, breakdowns, pressure settings and testing points.
- Familiarize with the machine, check the information you have gotten out, how many actuators (cylinders and motors), pumps and different valves the system have.

When the situation occurs- don't panic, and do the following:

- Talk to the machine operator; try to get as much information as possible in order to get a clear understanding about all the circumstances when the stop happened. Was it at the beginning of the cycle? In an intermediate point? Or which actuator was working when the machine stopped?
- Go back to the information about the machine you collected before. Check the hydraulic schematics, trace the path from the pump to the actuator, how many valves are there, what kind. Take into account that there are some components that are common for different movements or actuators, like pumps, relief valves, some directional valves, some flow controls.

o At this point, after comparing notes you should have in your mind two or three or even more possible causes. Now is the moment to act. Let's say you have two possibilities, and then you need to think in how you are going to perform a test to disprove or confirm one of them. To do so, you need to isolate the hydraulic element and use a Flow meter with pressure gauge and load valve built in (relief valve). For example: if it is a pump you are trying to eliminate, you connect the flow meter direct to the outlet, start the machine and check the flow, first without load and then with it, closing the load valve. If the reading of the flow at max pressure (setting of the machine) is around 90% of the flow without load we can say that the pump is good, so the problem is caused by the other element.

Off course, all of the actions I described above are quite general, but the idea is that in order to discard or confirm that a hydraulic element is the cause; you need to follow the path from the pump to the actuator that stopped and perform the flow and pressure test adding an additional element like the relief valve after the pump, and so on until you get to the cylinder.

In brief, hydraulic troubleshooting is difficult but with the hydraulic knowledge, machine information and equipment (flow meter) is much easier and definitely much faster. The last one is relatively easy to get, the second one is easy depending on the manufacturer, and the first one is going to take more time but is the most worth it.

Note: If you do not have a Flow meter, you can use a 5 gal bucket to discharge the flow with a relief valve and gauge timing with a watch, for example: If the bucket is filled in 15 secs, the flow is  $5 \times 60/15 = 20$  GPM.

## About the Author

Article written by Camilo Rueda. BS Mechanical Engineer, Universidad De Los Andes, Bogotá, Colombia 1980. IFP HS certified by The Fluid Power Society. USA 2003. With more than 28 years of experience in designing, manufacturing, repairing and troubleshooting of hydraulic systems. Visit:

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