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ENGINEERING SERVICES

[Storing hydraulic cylinders - Part 2](#)

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In a previous newsletter article, I discussed the procedure I use when preparing hydraulic cylinders for storage. If you missed it, it's [available here](#).

In response to this article, one of our members sent in this question:

"One issue I feel you left out of the cylinder storage issue is the orientation question. How should a cylinder be orientated for short term or long term storage?"

Our company repairs and evaluates cylinders and their associated failures. We try to provide solutions for breakdowns as well as repairing those that have failed. We evaluate and repair approximately 1000 cylinders annually. One common issue has been seal failure particularly in large pneumatic and hydraulic cylinders. We have found that allowing cylinders to lay flat has a direct effect on piston and rod seal failures. We have instituted a cylinder storage standard that adheres to your recommendations as far as ports plugged, rods wrapped but in addition mandates that all cylinders are stored vertically - in such a position as not to distort or place the weight of the cylinder on the rod seals. This verticality also helps, we feel, the piston seals.

I wouldn't mind hearing your argument on this issue."

Hmmm. I intentionally didn't mention it because I didn't want to do anything to perpetuate the myth. Because based on my experience, that's exactly what it is. Two cases I was indirectly involved in come to mind. In both cases the cylinders in question were off 400 ton mining-size hydraulic excavators. We are talking here about cylinders that weigh between two and three tons. The piston rod typically weighs well over a ton by itself.

So you have a situation where big, expensive, high-pressure cylinders are suffering premature seal failures. In both cases, the machine operators sought the advice of "seal experts". The recommendation of these supposed experts was to store the cylinders vertically.

Let's consider the reality of this nonsense:

Someone drops a three ton cylinder with a closed length of four meters at your feet and tells you to store it vertically - so it doesn't fall over and destroy itself - or worse still, kill someone. Not a five-minute job, but possible I suppose.

A truck arrives to transport the cylinder to a remote mine-site. The route consists of 1,000 miles of rough, unsealed road. Given you have gone to the trouble of storing the cylinder vertically in the warehouse, surely you must insist that it is transported in the same orientation? I mean, if it can't be stored horizontally in a shed, then surely the pounding it is going to get if it's laid down on the back of a truck will turn the seals into mush, right? The truck driver thinks you're crazy but he doubles his rate and obliges anyway.

The cylinder arrives at the mine-site in the mandated vertical position. Trouble is it's a stick cylinder so it's orientation on the machine is horizontal. If the bearing bands on the piston and in the gland can't adequately support the piston rod and prevent it from distorting the seals when the cylinder is sitting in a shed or bouncing around on the back of a truck, how on earth will it cope with the thrust developed when it goes into service on a 400 ton excavator?

Common sense would tend to suggest that if the bearing bands have sufficient area and are correctly tolerenced to adequately support load-induced thrust without distorting the seals, then surely they will cope with the static weight of the piston-rod in storage and any dynamic loading that may occur during transport?

Whether you agree with this assessment or not, you know troubleshooting is a process of elimination. So when seal failures continue to occur even after the cylinders have been stored vertically ... well it's safe to say that's not the root cause of the problem. And that was the outcome in the two situations I mentioned above. No surprise to me.

ABOUT THE AUTHOR: Brendan Casey has more than 25 years experience in the maintenance, repair and overhaul of mobile and industrial hydraulic equipment. For more information on reducing the operating cost and increasing the up-time of your hydraulic equipment, visit his web site:

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