

What causes hydraulic system temperature problems?

What are the main causes of temperature problems:

- The biggest cause I have seen is flow over a pressure relief valve at pressure. Sometimes this is a commissioning problem where a pressure compensated pump setting is at a higher pressure than the relief valve. Another reason is that the pump is not unloaded at low pressure enough times during the duty cycle and hydraulic fluid flows through the relief valve.
- Poorly maintained hydraulic coolers don't cool the oil effectively. Water/oil heat exchangers have water flow restricted through partial blockages due to poor quality water. Air blast cooler matrices can easily be blocked with dust and other debris. Fit a flow meter or sensor to water lines to indicate the water flow and clean air blast cooler matrices.
- Damaged hydraulic valves leaking oil back to tank, which has the same effect as oil passing over a relief valve. The return line should be hotter than the other pipe in the system if this happens and you should see a reduction in system pressure if this occurs.
- Servo valves have a higher pressure drop across them than other valves due to their speed of operation requirements. You need more cooling with a servo valve system.
- No cooler fitted to a system, due to designers believing that any heat generated would be dissipated by the oil reservoir. You don't get much heat dissipation through oil reservoirs!

High oil temperatures can be a hazard to personnel and can cause oil integrity problems. A temperature switch should be fitted to each hydraulic system to warn and shut down if high oil temperature occurs. Some of the main causes of high oil temperatures are discovered at the commissioning stage and are due to either poor design decisions or incorrect hydraulic system set up.

For systems that have been running well, then maintenance is always required to keep the system running. For example, does your water system have a strainer and has it been cleaned? Do you have water flow indication that you could check on a maintenance schedule? Do you clean the matrix on your air blast cooler? Some of the worst I have seen is a matrix covered in dust that has been sprayed with oil, due to a hose failure. This was left and the dust hardened to a concrete like state and could not be removed so the cooler had to be replaced.