

What is oxidation?

As hydraulic fluid deteriorates over time, it oxidizes and produces deposits that may cause servovalves to stick. Signs of this natural process include changes in fluid color, odor, or acidity level. Sludge, gum or varnish in the system are further evidence that oxidation has taken place.

A fluid analysis with an ultra-centrifuge test can detect the level of oxidization. The rate of oxidization increases significantly at operating temperatures higher than 150° F (66° C). Oxidation is irreversible, and fluid must be changed when oxidization is detected.

Why check for water content?

Water is highly undesirable in hydraulic systems. It can cause emulsions to form, and it can lead to corrosion. More than a trace of water may indicate an improper mechanical condition, poor performance of a heat exchanger or ingestion of water through the breather filter.

During system operation, gross contamination of hydraulic fluid is indicated by a milky color. If the system is not in operation, contamination can usually be detected by sampling the fluid at the bottom of the reservoir, where water normally settles as it separates from the hydraulic fluid.

A simple test for water contamination is the "spat" test: Place a few drops of oil on a hot plate heated to above boiling, but less than 350° F; if the oil bubbles or sizzles, there is an unacceptable amount of water in the oil.

If water contamination exists, fix the leakage and remove the water from the system immediately. Water can be removed by passing the fluid through water-absorbing filters, or by flushing or draining the entire hydraulic system.