

Oiler for Vertical Pump Lineshaft Lubrication

This document provides technical advice for controlling the dripping of oil for oil-lubricated vertical lineshaft pumps for irrigation.

Typical Configuration

Figure 1 illustrates a typical pump oiler configuration. A small oil tank is used. A manual drip rate adjustment valve is used, and the operator will adjust the drops per minute. Almost all pump oiling systems now have automatic on/off valves that begin/stop the oil flow as the pump is turned on/off.

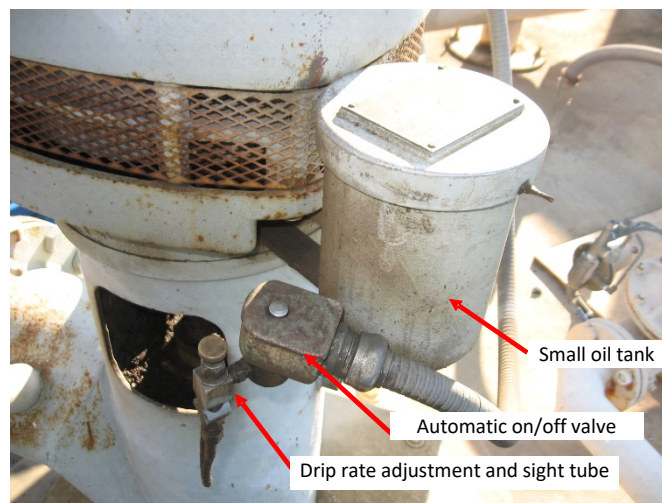


Figure 1. Typical configuration of lineshaft oiling equipment

On/Off Valve for Oiler

An automatic on/off valve for the oiler is standard in California. An oiler nameplate is seen in Figure 2.



Figure 2. Nameplate for a typical automatic on/off valve for pump oilers

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Oil Drip Rates

Table 1 provides some guidance for the drip rates. The drip adjustment valve needs to be used over the season as the temperature changes.

Table 1. Oil drip rate

(from Christensen Pumps *O&M Manual Deep Well Turbine Pumps*)

Shaft Diameter (inches)	Basic Drops per Minute	Additional Drops per Minute per 100 ft. Setting
.75 – 1.19	5	2
1.50 – 1.68	7	3
1.94 – 2.43	10	4
2.68 and larger	12	5

Size of Oil Reservoir

A gallon of oil (size of many standard oil reservoirs) holds about 150,000 drops. This corresponds to about a two-day to two-week supply of oil in a typical one-gallon oil reservoir. ITRC recommends using a reservoir holding a minimum of about 4 gallons.

Maintaining a Constant Oil Drip Rate

Oil drip rates change over time for three reasons:

- The level of the oil in the reservoir drops, decreasing the pressure on the adjusting valve. This is an absolutely huge factor.
- The temperature of the oil changes, which changes the viscosity.
- The adjusting valve, or its entrance, becomes plugged.

A design by ITRC shown in Figure 3 overcomes all of these problems except the temperature factor by:

- Raising the oil reservoir several feet above the adjusting valve. Therefore, a change in the oil level in the reservoir itself only represents a small percentage change in the total pressure on the valve.
- The size of the oil reservoir is 4-5 gallons, so it does not need to be refilled as frequently as conventional oil reservoirs.
- The bottom of the oil reservoir is drainable so that sludge, contaminants, and water can be removed easily.
- The intake pipe to the flow adjusting valve is located several inches above the floor of the reservoir to minimize the chance of contaminants entering the adjusting valve.

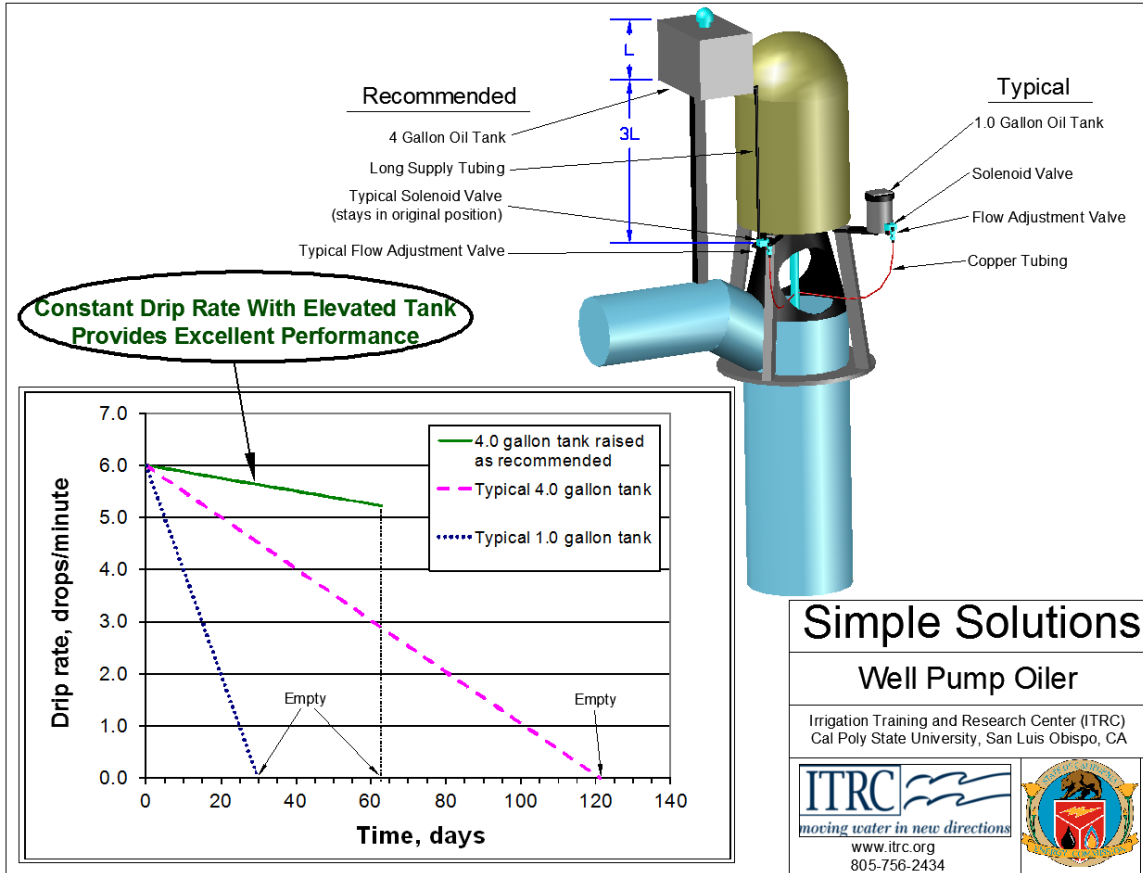


Figure 3. ITRC well pump oiler

An example installation with good features is seen in Figure 4.



Figure 4. Properly configured oil system