

## The Lease Pumper's Handbook

### Chapter 8 Hydraulic Lift

#### Section C

#### THE CENTRAL POWER HYDRAULIC LIFT SYSTEM

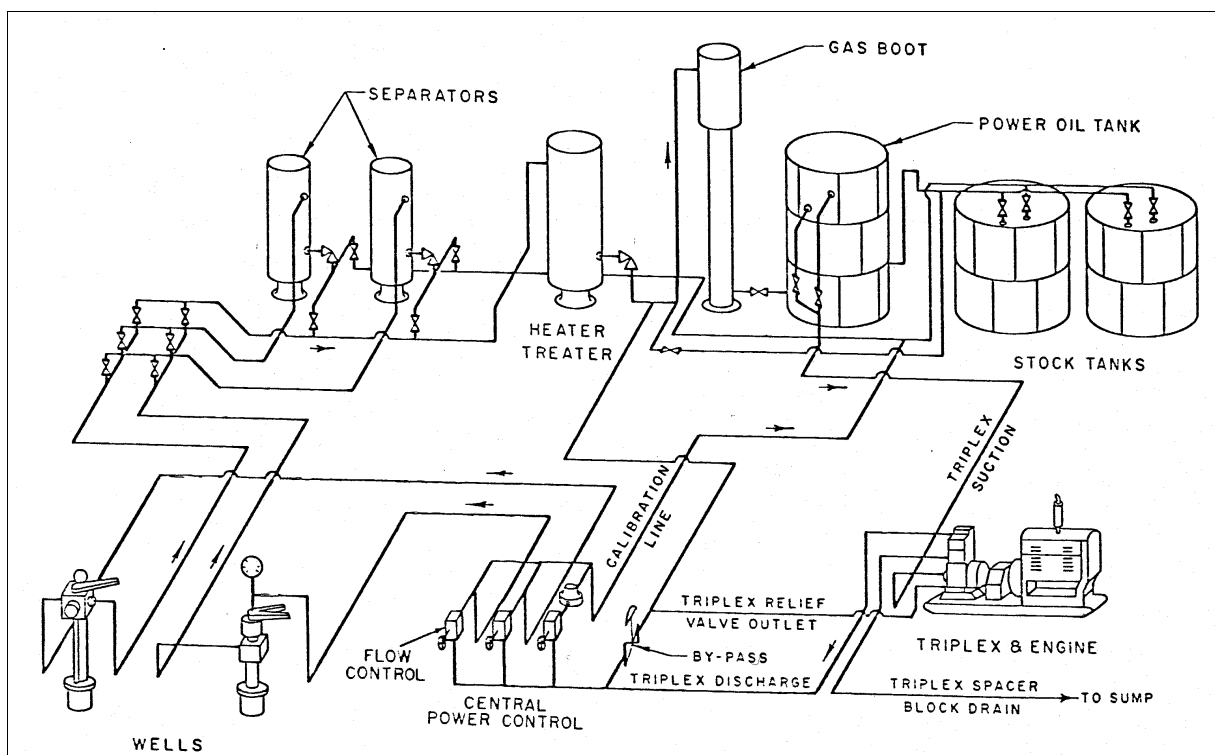


Figure 1. Diagram of a central power hydraulic lift system.

#### C-1. Central Power System from the Tank Battery.

Some operators prefer to use a central hydraulic power system over providing each individual well with a separate system. One triplex pump may supply power oil for as many as eight wells, depending upon the required power oil volume needed. The gas boot in Figure 1 is usually part of the heater/treater, so a power oil tank is needed.

The power oil tank is the last tank in the oil processing system and is located just before the crude oil stock or sales tanks.

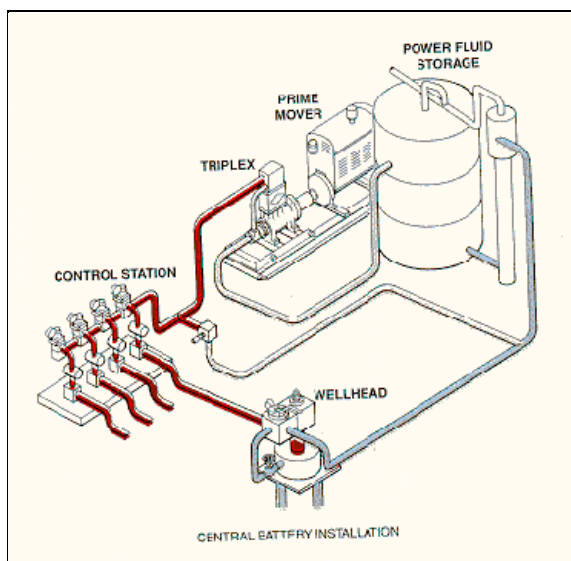
#### C-2. Crude Oil for Power.

Crude oil is the most common source of hydraulic power for hydraulic lift. A special tank to supply this oil is installed in the battery at the end of the treating system, but just ahead of the oil sales system.

The supply line from this tank is located about two feet below the line where excess production equalizes over as sellable production. To achieve this reserve the power oil tank in Figure 1 is taller than the sales tanks.

An emergency power oil supply line is provided with a valve located about two feet below the regular supply line. This gives emergency operating oil for use by opening a valve. After the emergency is over and produced oil begins to equalize into the sales tanks again, this lower line is closed again until needed. When needed, additional oil can be pumped back from a sales tank.

**The power oil lines.** The hydraulic triplex system is located near the tank battery (Figure 2). After the header has been installed near the triplex, a separate power oil supply line is run to each oil well. Usually a 1-inch line is satisfactory. A flow line is then run from the well back to the tank battery. This means that two lines connect each well into the system.



**Figure 2. The central power system showing the oil lines to individual wells.**  
(courtesy of Trico Industries, Inc.)

### C-3. Produced Water for Power.

Some operators have been very successful utilizing produced water for hydraulic power. However, to be suitable, the water must not contain scale and corrosive compounds that can not be satisfactorily controlled.

The advantages of this type of system are obvious at a glance. Water is much easier to control or neutralize than oil. The system can draw water by installing a special fitting on the heater/treater or by tapping directly into the produced water disposal system. The tank battery does not need to be modified, and the power oil tank does not have to be installed.

### C-4. Closed Power Oil Systems.

By the addition of a third line installed from the surface to the hydraulic pump at the bottom of the well, the power oil is contained in a sealed system and is retained and used over and over again.

This type of system can make the well perform satisfactorily when the produced fluids are too corrosive to be used for power. This system requires that a special power oil tank be installed near the triplex unit to be able to pull power oil as needed, as well as to be able to return it to the tank for re-use.

### C-5. Analyzing Production and Testing the Wells.

To be able to know where production is coming from and identify production problems as they occur, a satisfactory distribution manifold must be assembled. The diagram on the next page (Figure 3) illustrates a typical installation.

The power oil enters the manifold from the front lower right corner as shown in the

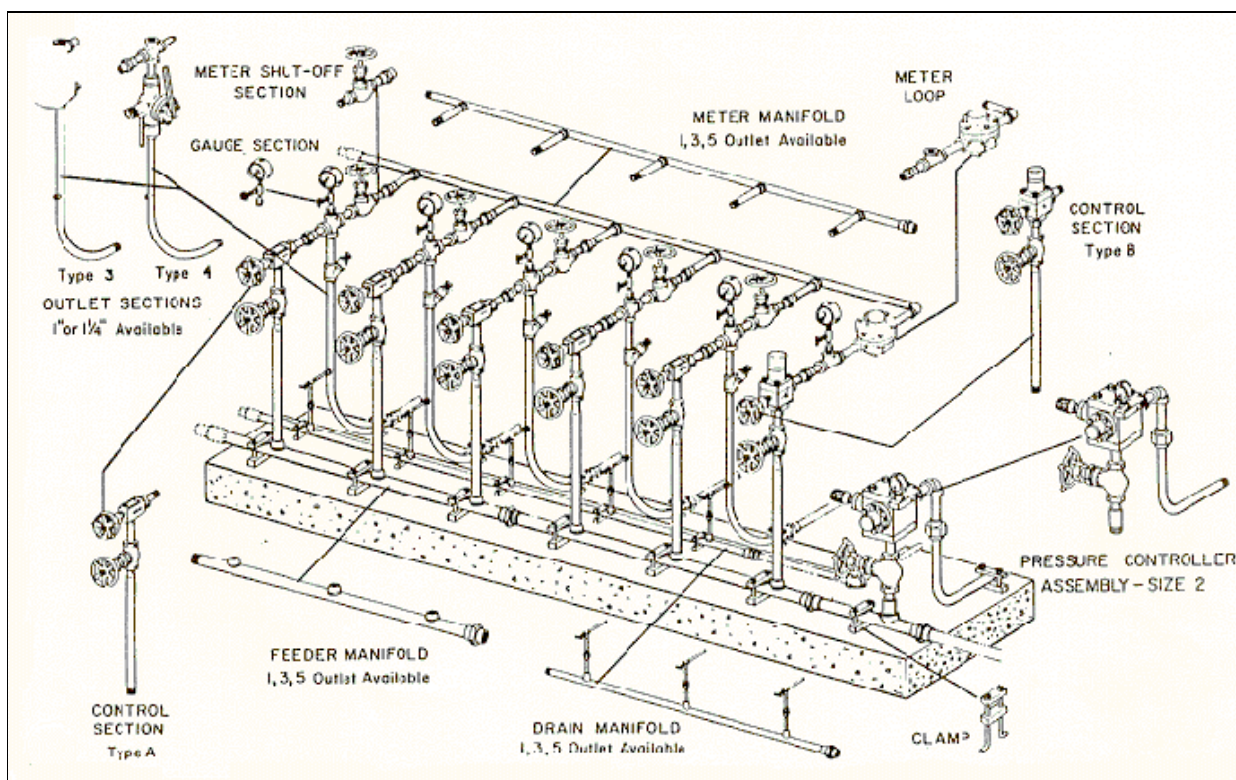
illustration. The first low manifold on the right is the automatic bypass. The second header from the right is the individual well test line. By opening this system, the power oil will first go through volume regulating valves, then through a meter that tracks the number of barrels that have gone through it in a given period of time. After the oil goes through the back line and comes forward again to the selected well header, that valve is opened and the front valve closed so that the test can begin. After the test has been completed, the valves must be returned to their original settings.

The five front risers from the left side of the manifold are the five wells being supplied with power oil from this manifold. The sixth

riser from the left is the test line, which was described above.

**Modifications to the manifold.** The header may be modified in many ways to meet the needs of the lease operator. As an example, openings can be added to allow the injection of soluble plugs or scrapers to combat paraffin buildup. Treating chemicals may also be easily added.

**Advantages and disadvantages.** Many of the advantages, such as having to maintain only one system, can also be disadvantages, because when shut in for repairs or maintenance, all systems are down.



**Figure 3. Diagram of a central power system supporting five wells. The manifold has provisions for testing the wells along with an automatic bypass to use when wells have problems.**

*(courtesy of Trico Industries, Inc.)*

