Hydraulics

A hydraulic system enables a tractor to lift machines during field operations, to operate accessories such as front-end loaders, to power hydraulic motors and much more.

A hydraulic system consists of several elements.

A pump that is driven by the tractor engine.

Oil and an oil reservoir that supplies oil to the pump.

High pressure hoses that connect the pump to a load.

Valves that direct pressurized oil to a load.

The load, which can be an expandable cylinder that lifts implements or a motor that drives another machine such as an auger.

The principals of hydraulics were known and utilized since the 1600s.

The tractors of the 1920s did not have hydraulic systems.

The two row mounted cultivators, which were very common on early Farmalls were lifted by the farmer using levers. The levers were operated from the drivers seat.

IH introduced hydraulic systems on its H and M models in 1939. This low power but effective system was branded "Lift-All".

IH also introduced a pneumatic lift system on the 1939 Farmall A and B models. The pneumatic system was driven by exhaust gas pressure. I know from personal experience that the pneumatic system was hard to maintain and use. It was short lived and soon superseded by hydraulics.

The Lift-All system was powered by a belly pump within the frame of the tractor. The pump was post-clutch, so it was only active when the clutch was released. That meant the tractor needed to be moving or resting in neutral. That was a big limitation.

For example, if the load could not be lifted on the go, the tractor needed to be stopped and placed in neutral in order to lift the implement.

Low system pressure was also a limitation.

IH developed an improved hydraulic system, branded "Touch-Control", by the mid- 1940s.

That system was initially used on the Super A, the Cub and the Farmall C, all of which were introduced in the later 1940s.

The Touch-Control system was driven directly by the engine. That meant the hydraulic system was "live" anytime the engine was running. A big improvement.

On the smaller tractors, the Super A, the C and the Cub, IH provided hydraulically actuated lift arms mounted to the tractor bodies. Those arms were fine for lifting mounted implements.

Unfortunately, the system, as designed, was very limited in oil supply. There was not enough oil capacity to drive extra cylinders. Cylinders like those needed for a front end loader.

Nevertheless, many Farmall Cs and Super Cs were used with front end loaders.

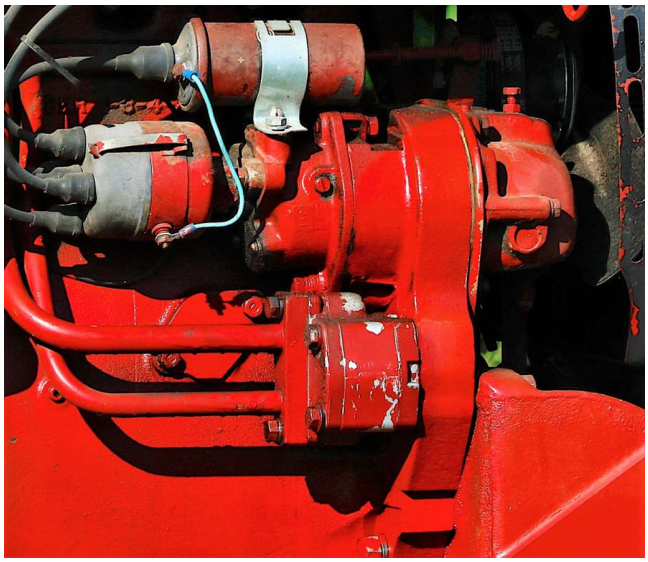
To use a loader, farmers added an extra oil reservoir and more valves.

By the early 1950s IH produced a more capable hydraulic system branded "Hydra-Touch".

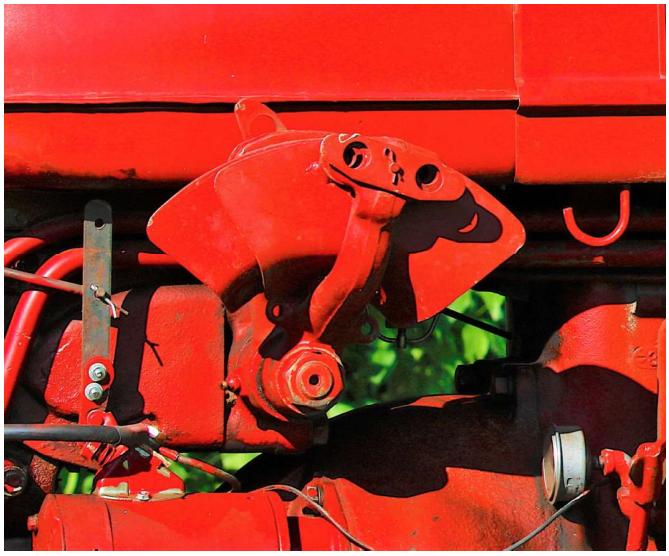
That was a fully modern system by the mid 1950s.

With Hydra-Touch, IH offered adequate pressure, sufficient oil volume, plenty of valves and numerous accessory outlets.

The rod in the top center of this photo is the hydraulic control lever. It operates the single, one way hydraulic valve on this Farmall M. The pump and reservoir are both in the belly of the tractor near the far end of the lever. This Lift-All is virtually identical on other contemporary models such as the H or W versions.



ABOVE: The rectangular module in the lower center is the hydraulic pump. It is driven directly by the engine to produce "live" hydraulic power. The metal tubes to the left are oil "in" and oil "out". A very similar looking pump was used on all models.



ABOVE: The mechanism in the center of this photo consists of two hydraulically controlled arms. The arms rotate on the central shaft. Each arm is operated by a separate lever. The hydraulic system on this Farmall C was primarily designed to lift a mounted cultivator.
To do so, one side of the mounted cultivator was connected to each arm with appropriate metal linkage.

ABOVE: This view of a Farmall Super C shows the remnants of hardware which was added to operate a mounted loader. The two levers just right of the steering column are the factory supplied controls for lifting a cultivator. Everything else, valves, hoses, and a since-removed reservoir tank, was added by a former owner for use with the loader. The angle-iron brackets held the extra two gallon oil tank.
Messy, but effective.

ABOVE: Three levers control the Hydra-Touch system on this 1958 Farmall 460. Two operate auxiliary systems. One controls the FAST HITCH drawbar.