Brakes

There are two brake topics.

One is about the braking mechanisms.

The other is the evolution of the dual brake pedal.

Tractor brakes work by applying force to a drum or disc-like device that is connected directly to the rear wheels. The drums or discs, turn whenever the rear wheels are moving.

The brake puts a restraining force on the spinning drum or disc restrain the rear wheels.

During the period we are concerned with, from 1921 until 1960, brake mechanisms were pretty simple.

Initially, the restraining device was a metal band that wrapped around the drum. The metal band was lined with a very tough, high friction materiel.

When the brake mechanism was engaged, the band was tightened around the drum. That slowed or stopped the drum and did the same to movement of the tractor. A side effect was heat. Normally the heat is not a problem. But, if used continuously the brake mechanism could get very hot.

Band brakes were not new in 1920. They had been around for some years. They were normally open to the elements, and they failed quickly. The first IH Standards and all the Farmalls enclosed the brake mechanism. That by itself was a significant improvement.

A later innovation, disc brakes, came with the "Super" models.

Disc brakes are an improved design that provides more brake-friction-surface. That helped to reduce heating by spreading it over a larger area. The disc design was also a major improvement in brake maintenance. Disc brakes are much easier to work on than the older band brakes.

In the 1920s all tractors had steel wheels, normally with aggressive steel lugs.

Steel lugs minimize the need for brakes. The rolling friction of a tractor with lugs is very high. Under normal circumstances it will remain nailed in place as soon as the driving force is stopped.

For an early Standard tractor, the greatest need for a brake came when powering a stationary machine via a belt. Then a wheel brake was required to prevent the force of the belt from creeping the tractor and thus loosening the belt.

For that, only one brake mechanism was required. In the early tractors that mechanism was engaged by a lever, not a pedal. That lever had a latch lock like the emergency brake on automobiles.

The Farmall Regular introduced a new concept. The designers saw the need to brake each wheel independently. The row crop tractor needed to spin in a very short radius at the end of the row. This was necessary so that the farmer could turn and cultivate the adjacent two rows. That pattern was followed from one side of the field to the other, until all rows were cultivated.

There were other possible patterns of course. For example the farmer could skip every two rows and then do those rows on a returning pattern.

The problem was that horses could do the every-two-row pattern.

To sell farmers, the tractors needed to do what horses could do.

A similar issue was with mowing hay. Horses could make square corners. To replace horses, tractors needed to do at least as well.

For the first Farmalls, IH engineers developed automatically engaging brakes. The inside wheel was braked automatically by a cable during the end-of-row turn. The brakes were essentially driven by the steering wheel.

The cable system was operated when the front wheels were turned.

Braking the inside rear wheel to effect a tight turn was the right idea.

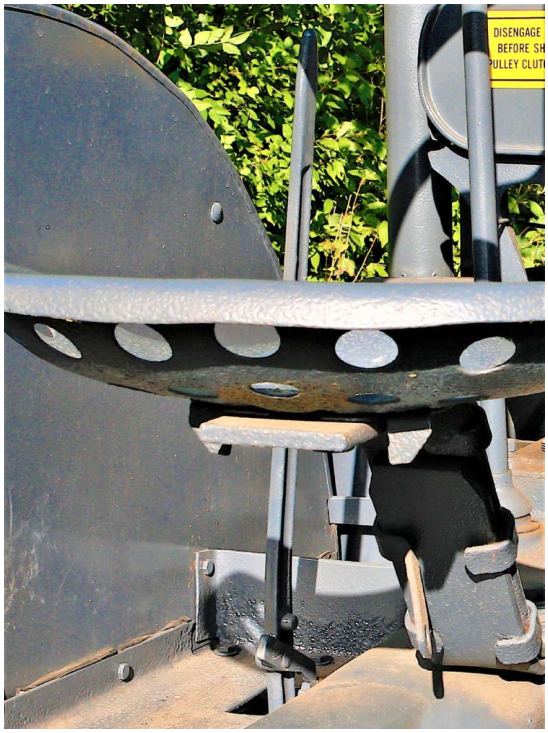
The implementation was wrong, however.

The original Farmall had the automatic cable system plus a hand lever on each side for the operator. Apparently the engineers did not think farmers would use the brakes much. The levers were hard to reach and hard to use.

There is a correlation between steel wheels and levers; rubber tires and pedals. Apparently if a

tractor was sold with steel wheels, it came with levers. If sold with rubber tires, it came with pedals.

Rubber tires were not available in 1930. They were perfected for tractor rears in the mid -1930s. By 1940, steel wheels were rare.



ABOVE: This 10-20 Standard, made in 1929, has a single brake lever. It is vertical in the center-left of the photo. The locking latch is near the floor.

ABOVE: This F-30, made in 1931 is still cursed with hard-to-reach, hard-to-use, hand-brake levers.

Farmers often welded pedals to the levers.

By 1939, conveniently located, dual brake pedals, became absolutely standard on all models and all brands of farm tractors.

ABOVE: This Farmall Regular, made in 1927 has pedals welded onto the original hand levers.

ABOVE: This 1938 F-20 has the clutch pedal on the left and two nicely placed brake pedals on the right. This is the final configuration.