

Electricity and Tractors

Modern tractors are started by electric motors.

The electric-starter-motor is powered by the tractor's battery. Whenever the engine is running, the battery is being recharged by a generator.

Accessory uses such as lights, draw power from the battery and/or the generator.

In 1920 tractors did not have starters, batteries or generators.

Gasoline engines use spark plugs for fuel ignition.

Without batteries, early tractors used a device called a magneto to develop electrical energy and deliver a spark to each plug at exactly the correct time.

A magneto is actually very similar to the mechanism used in wall telephones until the 1950s. Those wall phones had a small crank, which the caller used to generate electric energy that produced the ring tones.

Without a starter motor, all tractors before 1930 had to be crank started.

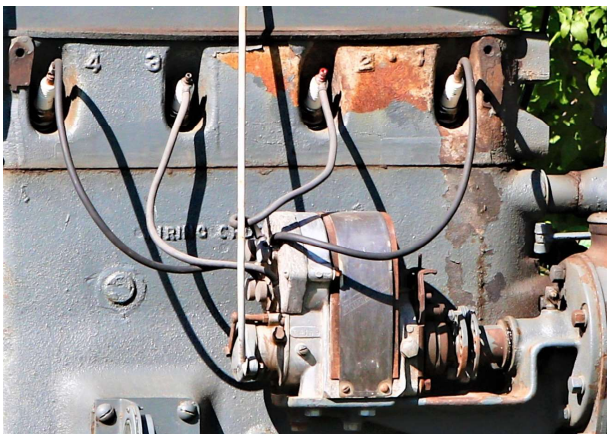
That worked pretty well, if the tractor was perfectly tuned up and if the weather was warm.

That was not always the situation, however.

I broke my arm in three places crank-starting our Farmall B when I was ten.

Starter motors work by engaging with a large diameter ring-shaped gear that is attached directly to the motor. It turns the engine over just as cranking does.

By 1940, most tractors had batteries, electric starters, lights, and generators.



In the mid-1940s, magnetos were replaced by improved devices that used the battery power to supply a hotter spark. The new devices are called "distributors" but that is an informal title.

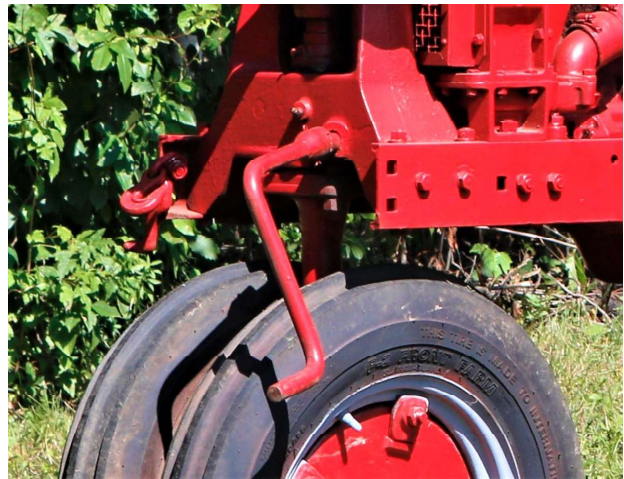
Magnetos are actually distributors also. The difference between magnetos and distributors is not in distribution of the spark but rather the source and method of spark development.

Many tractors that were built with batteries and magnetos, have been upgraded to distributors.

Magnetos are used primarily on battery-less, crank start tractors.

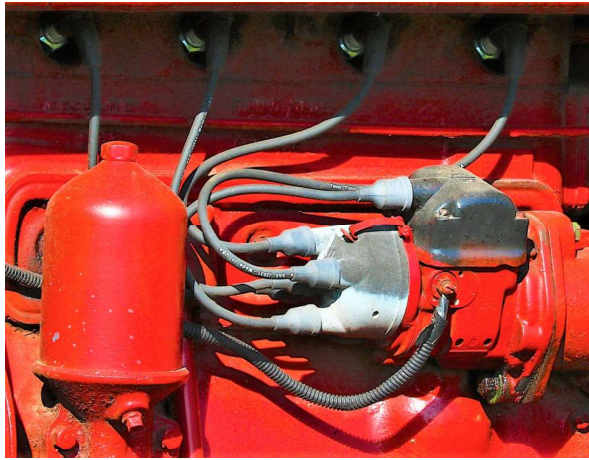
Around 1960, generators were replaced by alternators on most newly manufactured engines. Alternators, which are actually a type of generator, are far superior to simple generators. Alternators produce much more power, they are substantially longer lasting and, they are cheaper.

Many older tractors have been upgraded from the original generator to an alternator.



ABOVE: *The starting crank is left to hang in place on tractors without a starter motor. The crank is disengaged in this position. It actually rests in this location quite securely. The spacing is such that the front wheels clear it on turns. An internal spring must overcome to engage the engine.*

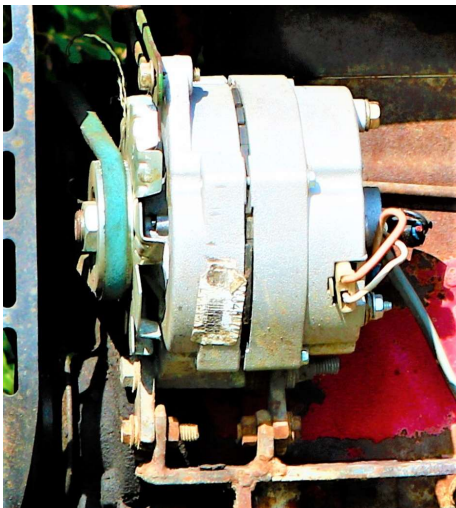
LEFT: *This device is the magneto on a Farmall Regular. When the engine turns over it causes the magneto to generate sparks. The sparks are timed to occur exactly when required to ignite the fuel in the cylinders.*



ABOVE: This is a later version of a magneto on a W-4. It is original equipment. Identifiable not by the distributor cap but rather by the black hemi-cylindrical box from which the single spark wire emanates.



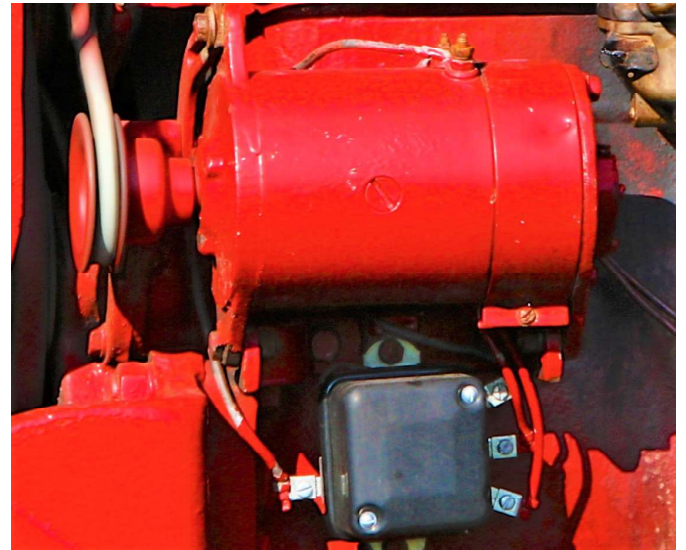
ABOVE: This distributor can be identified by the ignition coil. The ignition coil, which is powered by the battery, is the black cylinder from which the single spark wire emanates to the distributor cap.



LEFT: This an alternator. It is on a Farmall H. An alternator does the same function as a generator but in a different way. Modern alternators are significantly better, more reliable and less expensive than old style generators.



ABOVE: The starter motor is in the center of the photo. This motor is securely mounted near the rear of the engine. When activated during starting, the motor drives a small diameter gear that meshes with a large diameter ring gear. The ring gear is fixed directly to the engine and causes the engine to revolve.



ABOVE: This generator happens to be on a Farmall Super C, but all generators look like this one. The generator is mounted to run off a fan belt at the front of the engine. The rectangular, black box below the generator is the voltage regulator. It contains a set of voltage and current sensitive relays that regulate the power to the battery. Alternators do not require an external voltage regulator.