

## Extending the Life on The Farm Tractor

Why Good Oil is Always Cheaper  
Than Repairs for Tillage Tools.

H. L. Thomson

**T**HE life of a tractor is in a large degree dependent on proper and timely lubrication. In the earliest conveyances and machines of man, friction appears. The squeaking axles of the wooden wheeled ox-cart were lubricated with crude animal or vegetable fats and greases.

With the increasing use and improvements in modern machinery, with higher speeds and bearing pressures, the lubrication problem has demanded increasing attention.

In the early development of the auto, breakdowns, rapid wear and heavy repair bills were due in a great part to poor lubrication. Most of the bearings had to be "spoon fed," that is, they needed frequent oiling and attention, which, of course, they did not get.

In the tractor, with its heavy pressures, good lubrication is even more essential. Just what oil or grease do in a bearing to reduce the friction? The smoothest surfaces, when looked at under a microscope, are shown to be rough, covered with high and low spots—"corrugated." Under pressure these depressions in the two surfaces fit into one another and offer resistance to sliding motion. When an oil film is placed between the two surfaces, so that they cannot touch, the friction and wear is greatly reduced so that there is but the friction of the oil. If the bearing pressures are heavy it will be necessary to use a grease as the oil film will be squeezed out. Hence, in a bearing of light pressure and high speed, an oil of light body is used; in a slow-speed, heavy-pressure bearing, a thicker oil is used with more body, and for very slow speeds and heavy pressures a grease is used.

### The Proper Transmission Oil

The selection of a proper oil for transmission is not so difficult as for the engine cylinders. In most cases when a considerable part of the gears and bearings are enclosed, and are intended to run in oil, a good grade of fairly heavy automobile transmission oil will do. If your transmission case leaks oil through small joints, when changing oil next time put in part grease and let it run for a short time and then add steam engine cylinder oil or auto transmission oil. This more fluid lubricant is often needed when there are ball or roller bearings to which the grease would not get so rapidly. The grease will stop the oil leaks from the transmission case. A common light machine oil should not be used as it has hardly enough body.

Do not use a cheap machine oil. It often has some adulterant added—sometimes a cheap, soapy ingredient, to give it a body. Feeling an oil is a poor way to test its actual body unless it is put out by a well known company, and even then it is not always a sure guide.

Old cylinder oil from the engine crank case, when strained, makes a good oil to use in the bull gears. Cheap fuel oil or black machine oil is often used for this.

Another vital point in lubrication is the necessary continual presence of the lubricant in the bearing. An overdose of oil or grease at one time won't make up

oil for any use in a dusty pail. Keep the oils and greases clean and free from grit. It does make a difference.

### Good Oil is Cheaper Than Repairs

Cylinder lubrication is a different and more difficult problem, as oils must work at higher temperatures. Poor qualities in oil show up most rapidly here. This oil must stand up to a temperature of about 450 degrees, leave no carbon deposit or gum in the cylinder and have a body of the proper weight to keep it from being blown past the piston. Few tractor operators realize how thin the film of oil is between the cylinder walls and the piston. Without oil the

rather thick. The carbon formed by improper mixtures is soft and fluffy like soot. Much material which is apparently carbon is in reality road dust and, of course, tends to damage the engine. All tractors should have a good air strainer attached to the carburetor.

If an engine continually smokes at all oil levels it is evident that too much oil is leaking up past the piston. An oil of higher viscosity is needed; that is, thicker. An oil when cold may appear thick, but when heated may be very thin. If, in spite of a very thick oil, much leaks past the piston into the cylinder, try using a lower fire test oil of the same thickness. This will allow the oil to burn out of the cylinder quickly. If the engine still smokes badly, and the cylinder floods with oil, new piston and rings will be needed and perhaps the cylinder rebored.

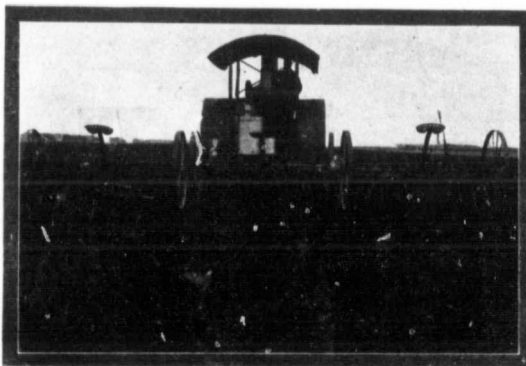
### Follow the Tractor Man's Advice

As the engine gets older and the piston rings and cylinder more worn, thicker oil is needed. The proper oil can be determined after a few trials. But, most all tractor manufacturers have done this testing in a much better way than the farmer can. So the safest way is to be sure to use the oil recommended by the tractor manufacturer. Don't let some garage or oil man talk you into changing oils when the one the makers recommend has proven satisfactory. It may be "just as good," but experiments are expensive.

Operators of tractors burning kerosene should be particularly careful to use a good heavy grade of oil. Tractors run on full throttle a good part of the time, and a thin "light car" oil will cause trouble.

The oil in the crank case should be drawn off every two or three days of continuous work, a gallon or so of kerosene put in the engine crank case, then the engine run for about 30 seconds and the kerosene drawn off. The new clean oil should then be put in. A dirty oil, full of carbon and metallic particles, makes a poor lubricant. With a four-cylinder vertical kerosene engine this is particularly important, as some of the unburned distillates will work down past the piston and make the lubricating oil thin and inefficient.

The secret of successful lubrication is to find the right kind of lubricants needed, to keep them clean and free from grit and to use them regularly. A "lick and a promise" in lubricating a tractor is a short cut to grief.



A Dusty Job That is Hard on the Grease Cups.

for the lack of it at another. "Squirt can" methods on the important bearings of a tractor transmission are not a success.

One of the greatest advantages ball or roller bearings have over plain bearings, besides reducing the friction, is, that they carry enough oil in themselves to run for weeks at a time, and are in no danger overheating due to the neglect of the operator tightening up the grease cups every hour or so. These bearings have greatly helped to make the automobile the reliable machine it is. However, the grease cups in these bearings should be screwed down a little every day. This will work the clean, fresh grease into the bearing and work out the worn-out grease which will carry with it any of the dirt and grit out of the bearing. A good grade of grease, such as is used in automobiles, is best. The cheap grades sometimes have a little acid in them which will attack the balls or rollers and etch them, causing them to wear rapidly.

Keep the grease can cover on tight. Do not carry lubricating

tractor would hardly travel a hundred feet before the cylinder and piston would swell, score and bind.

Many confusing terms are used in describing an oil. There is the base of an oil, the carbon content, the cold test, the flash test, the fire test, the viscosity, the gravity, and the light or carbon filtered oils, and it takes an expert to tell the relation of these various terms to the suitability of an oil for a particular motor. In fact, at different periods in its life a motor demands different kinds of oil. The two main things to be looked after are the fire test and viscosity.

"Fire test" will indicate the rapidity with which any oil will be burned out if it reaches the combustion chamber in excess. "Viscosity" is a measure of the rapidity with which any oil flows to the parts to be lubricated.

There are three kinds of carbon that may be formed in the engine cylinder. The carbon formed by high fire test, slow-burning oils is very hard, thin and glossy in appearance. The carbon formed by lower fire test, fast-burning oils is porous, dull in appearance and