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TRACTION OF FARM TRACTORS

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One of the problems presented by the introduction of the tractor on the farm is that commonly referred to as traction. The power of the engine is transmitted through the clutch and various other transmission members to the drive wheels and is thus available for drawbar purposes provided the drive wheels do not slip on the surface over which the tractor is supposed to move. Various means have been used to prevent such slippage. The earliest machines depended largely upon weight to maintain traction. This was not satisfactory because of the packing of the soil and of the power consumed in propelling the tractor over the ground.

LUGS FOR TRACTION

Tractors of less weight were introduced and with them the problem of lug equipment. It was necessary by some means to gear the drive wheels to the ground if the tractors were to be successful as drawbar power units. Lugs of various shapes, sizes, and lengths were tried. Some which were satisfactory for one type of soil or soil conditions would not hold under other conditions. The use of wheels with wider faces or extension rims was necessary in some instances. Wheels which did not have solid faces but were of the open or skeleton construction were devised for certain conditions. Another type of wheel which had practically no width of rim but depended upon the action of the lugs for support was found best suited for still other traction and soil conditions.

Another means for obtaining traction is illustrated by the crawler or track laying type of construction. This type is usually rather heavy but because of the larger area of the supporting track has less weight per unit area of soil contact than is found in the wheel type tractor of equal power.

RUBBER TIRES

The application of the tractor to a greater variety of work on and about the farm has both changed and increased the traction problem to some extent. The use of low pressure rubber tires on the wheels of farm tractors is an attempt better to adapt the tractor to its broadened field of activities. From

the manner in which these tires have been accepted, their place on farm tractors seem definitely assured. However, as one writer states "the present problems consist in finding the best ways and means of applying this type of tire to both farm tractors and implements."

The first requirement of rear wheel equipment on a tractor is to assure traction. Rubber tires secure this through the fairly large diameter and cross section together with a rather low inflation pressure. Different non-skid treads are available better to adapt the tractor to working conditions. It is usually necessary to add weight to the rear wheels in order to give necessary traction. Certain tire sizes are usually recommended for the various tractors although there are some optional sizes available.

Tire inflation is an item to which the operator must pay strict attention, and a low pressure gauge is a necessary part of the equipment. If the pressure gets too low, the tire is very apt to creep on the rim, either tearing the valve stem out of the tube or drawing it in through the hole in the rim. If the pressure is too high, there will be loss of traction. When replacing a tire, after removing for any reason, it is recommended to inflate the tire to perhaps 30 pounds pressure to set the casing securely on the rim. Then reduce the pressure to the proper amount which is usually about 12 pounds depending somewhat on the weights in the wheels. Because of the low pressure carried in the tires, it is not advisable to try to estimate the correct amount but rather to use a gauge.

WHEEL WEIGHTS

Weight may be applied to the wheels in various ways. Castings are available in approximately 150 pound units which may be applied one, two, or three to each wheel, depending on conditions. Use as little weight as possible for planting and seedbed preparation to prevent packing of soil, and when plowing with one wheel in the furrow, less weight should be added to the furrow than to the land wheel. Substitutes for the cast iron weights are sometimes used. They may be made from concrete with provisions for attaching to the wheels. Because of the need of some added weight, many of the companies are making cast wheels which are considerably heavier and so made that additional weights may be

attached. Still another method which is being used is the partial filling of the tires with water. Instructions as to the use of water, filling the tire, non-freeze precautions, etc., may be obtained from any of the tire companies.

For most purposes the adjustment of the inflation pressure and changing of wheel weights may be sufficient to give necessary traction. It may, however, be necessary to make use of chains to prevent excessive slippage under some drawbar conditions. By means of these various things, it seems quite as possible to obtain traction with rubber tires as with steel wheels and lugs.

ENLARGED SCOPE

Many drawbar operations which in the past were not considered advisable with a lug equipped tractor are easily accomplished through the use of rubber tires. These include hauling on the road, haying operations, and the harvesting of grain crops with which nurse crops have been planted. Rubber tires, on both the tractor and various implements, have facilitated their movement from place to place, not only about the one farm but also from farm to farm in custom work. In many instances the speed with which the work may be accomplished with rubber tires is a large contributing element in their favor.

In addition to the enlarged field of operations and the increased speed with which most, if not all, of the operations may be done through the use of rubber tires, several other advantages are claimed. Because of the reduced rolling resistance under most conditions, the tractor equipped with rubber has more power available for drawbar work. A decreased fuel consumption has also been shown under most conditions. Other items not quite so definitely proven are increased life of the tractor due to lessened shock and vibration and greater comfort to the operator due to easier riding and less dust in dry field conditions.

Tires and wheel equipment are now available for most tractor-drawn implements. An important problem in connection with this seems to be the standardization of wheel sizes for different pieces of equipment so that tires and rims may be moved from one to the other as seasonal operations make necessary the use of the equipment.