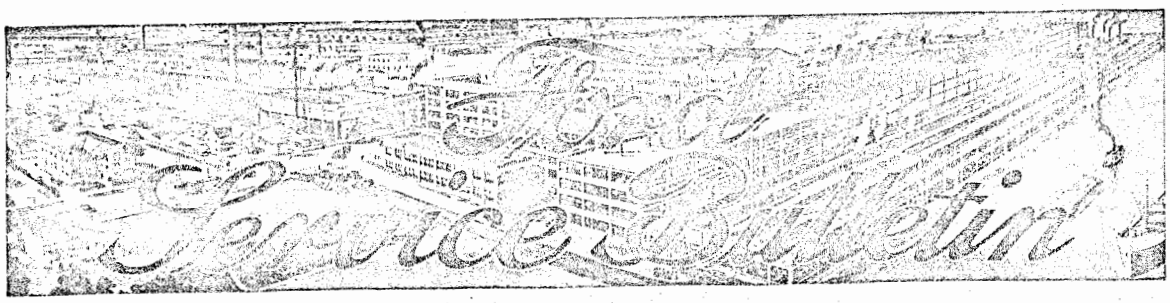

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No. 4 SEPTEMBER, 1924 Vol. 6

Winter Business

The past few cool days are a reminder of the coming winter. They are a timely reminder that it is high time for you to plan your winter service campaign.

There are many owners who can better afford to tie their cars up for repairs during the winter months. You should be able to make your customers a good proposition for winter repair work as it will help keep your organization together and reduce your otherwise increased overhead. You can't afford to close your doors during this coming winter.

Winter driving is coming more and more into prominence, and owners are demanding winter service. You should endeavor through your advertising to sell more owners on winter driving.

Advertise for winter business; advertise your flat rate labor charge; circularize other Ford owners telling them what you are doing to keep open all winter; drive all winter yourself; keep your parts stock up to standard; keep your organization together; reduce overhead; operate on a cash basis; give real Ford Service during this coming winter.

Ford Mechanics' Section

(Continued from page 21, August, 1924, Service Bulletin)

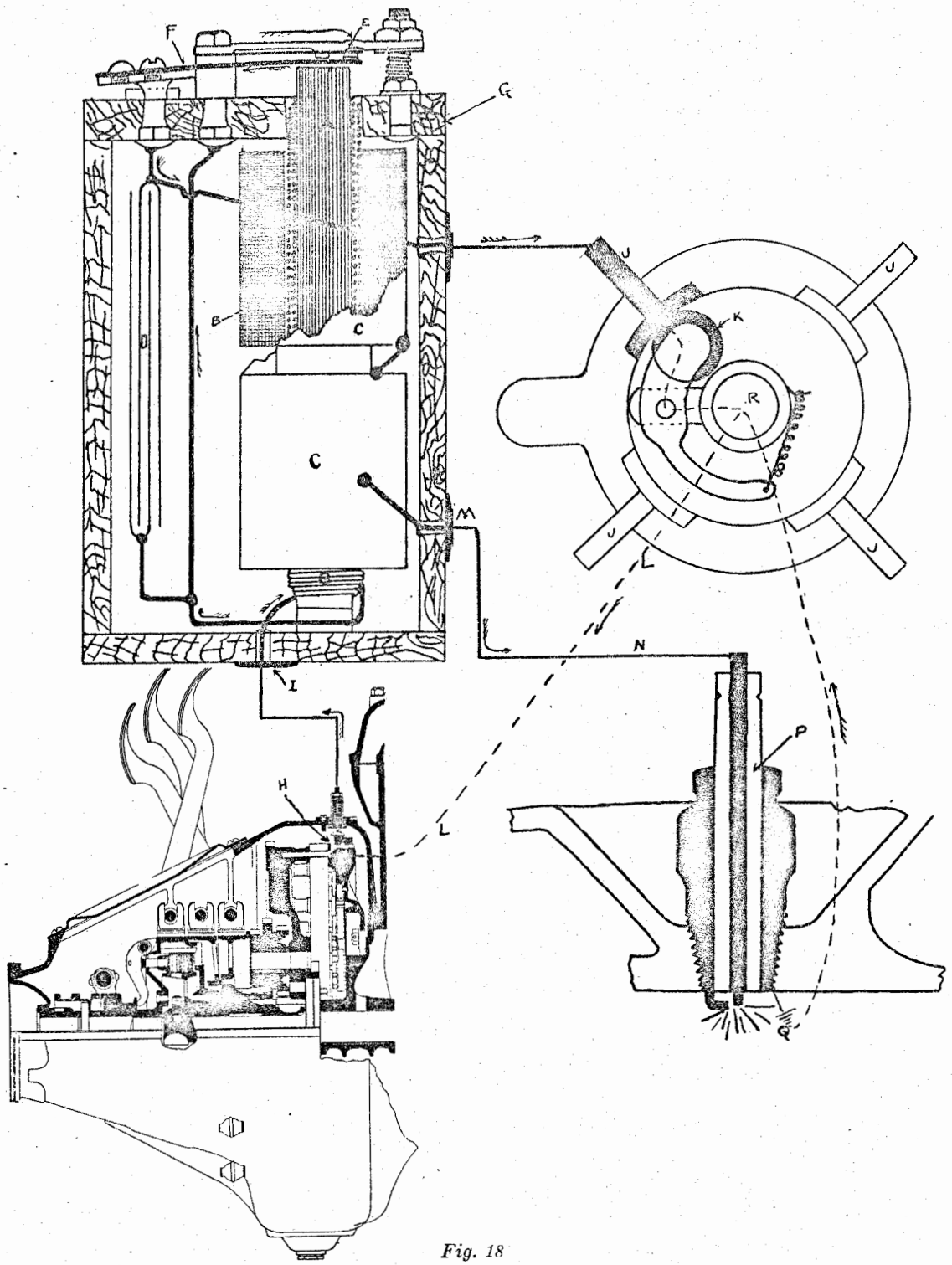


Fig. 18

The High Tension Jump Spark System

The Ford ignition system is known as the high tension jump spark system. It includes the following parts:

Magneto to Provide Current

Induction Coil or coil units to transfer the primary or magneto currents of 8 to 30 volts into a secondary current of from 8,000 to 20,000 volts. This is necessary as a current must be provided which can jump an air gap of at least one-quarter inch.

Commutator or Timer

To close primary circuit and produce a spark in a cylinder at the proper time.

To fire the charge and start the power stroke.

To control passage of current through the different coils, according to firing order.

To advance or retard the spark.

Spark Plug

To conduct high tension current into the combustion chamber and provide a gap across which it can jump, so as to set fire to the explosive mixtures.

The Magneto

Type: Flywheel type, rotating magnetos, stationary field, alternating low tension current.

This magneto is of the inductor type, but unlike the other inductor type magnetos, the magnets themselves serve as inductors. It is designed to be mounted on the flywheel, thereby becoming a part of the power plant. It is protected from mechanical injury and moisture which tend to short circuit and damage it, by the same case that houses the transmission. The coils are stationary to avoid trouble from commutation or moving contacts.

The Magneto is composed of sixteen "V" shaped permanent magnets, mounted on the flywheel, and sixteen coils wound of insulated copper tape, $\frac{3}{16}$ of an inch wide and .015 thick, twenty-five turns to a coil, mounted on bosses on the magneto frame. The coils are wrapped with cambric with fibre inserts in the center and bristol board insulating washers beneath when mounted on the bosses. The coils are connected with the winding of consecutive coils in opposite directions.

After mounting the coils and connecting the terminals, one being on the fibre contact block, the other grounded to the frame, the coils are impregnated with insulating varnish. They are given three coats and thoroughly baked to insure perfect insulation from moisture, oil and electrical leak. The coils are tested with an iron yoke carrying a secondary winding which indicates on a voltmeter the existence of short circuit or ground.

The Magnets are mounted with similar poles of adjacent magnets together, making sixteen magnetic poles each having twice the strength of a single magnet pole, so in each revolution of the flywheel the magnetism in the boss of each coil reverses sixteen times, producing sixteen electrical impulses, which at ordinary engine speed produces a continuous alternating current of a much higher frequency than is used for house lighting. Because of this fact it is possible to operate small voltage lights from this magneto.

The Coil Unit

The coil unit consists of a soft iron core A, primary coil B, secondary coil C, condenser D and the upper and lower bridge E and F. The coil unit is also called an induction coil.

Construction

The Soft Iron Core A is made up of 160 to 170 pieces of No. 20 Swedish soft iron wire and well insulated from the primary coil, which is wound around it, by a heavy paper tube in which the core is packed.

The Primary Coil B is made up of two layers of No. 19 copper insulated wire. The first layer having 112 turns and the second 110 turns. The primary coil is then impregnated in hot paraffin and resin for twenty minutes. This cements the pieces of wire in the core together, insulates and holds the windings of the primary in place.

The Secondary Coil C is composed of 16,400 turns of No. 38 enameled copper wire, and between each of the eighty-two layers are three layers of paper insulation. The coil is wrapped in two spools with forty-one layers on each spool. The reason for building the coil in two spools is because there will not be as many volts between the consecutive layers at the same end of the coil as if it was wound in one spool. By wrapping in two

spools the difference in voltage between the consecutive layers at the same end is half as much as if it was wound in one spool, and consequently the thickness of the insulation between the layers is reduced one-half and the diameter of the coil is reduced proportionately. The secondary coil is then placed in a vacuum tank for twenty minutes at 220 degrees F. to make sure all moisture is drawn out, and then it is submerged in hot wax. A heavy piece of wax paper is wrapped around the primary coil and it is placed within the secondary coil making the induction coil complete.

The Upper Bridge E is stamped out of brass and to this at the terminal post end is riveted a cushion spring which is stamped from bronze. The other end of the cushion spring contains a tungsten steel point and this end is held from .003 to .005″ from the upper bridge by a spacer rivet.

The Lower Bridge F is a copper spring by means of which the amperage can be adjusted in increasing and decreasing the tension on the armature which is attached to the lower bridge by means of two screws. The armature is tamped out of Swedish steel and has a tungsten steel point on the free end, directly under and in line with the tungsten steel point on the cushion spring.

The Parts are placed in the coil box G, with the exception of the upper and lower bridge which is placed on top, in their relative positions and tar from 300 to 250 degrees F. is poured around them, holding them in place, insulating them from each other, and protecting them from dampness. The space between the points is adjusted to .025″. The coils are adjusted to 1.3 amperes.

Path of Primary Current

The current flows into the coil unit from the magneto H, through the bottom contact I, through the inner layer of the primary, then back through the outer layer of the primary, through a wire to the lower end of the condenser D, where it meets a wire leading it to the terminal post supporting the upper bridge E, from there through the cushion spring, through the points, back through the armature, through the lower bridge F terminal post to the upper side contact on the coil box, from there to a commutator segment J, through the roller K which is grounded, through the ground L to the magnet or battery. This completes the primary circuit which magnetizes the core. The core attracts the armature and breaks the primary circuit by separating the contact points. At this moment the core is demagnetized and the armature returns to its normal position, again completing the primary circuit, and the operation described above is repeated.

Path of Secondary Current

The secondary current flows from the coil to the lower side contact M on the coil box, from there through a high tension cable N to the spark plug P, jumps the air gap in the spark plug, and grounds to the engine Q, through the metal of the engine to the commutator roller R, and back through the primary wire to the upper side contact on the coil box, and from there to the other end of the secondary coil, completing the secondary circuit. There is no electrical connection between the primary and secondary circuit. The current is induced into the secondary coil by the increase and decrease of the lines of magnetic force around the primary coil caused by the making and breaking of the primary circuit at the contact points. When the points are closed induced current is entering the secondary coil but it does not attain strength enough to jump the spark plug gap until the points break, this gives the induced current an added impetus which then jumps the gap in the spark plug and completes the circuit.

The Commutator

The commutator effects the make and break in the primary circuit. It determines the moment the spark plug must fire.

The commutator roller is attached to the end of the camshaft and revolves with it at half the speed of the crankshaft. The brush or roller makes contact with the insulated contact points, of which there are four in the commutator cover. When roller comes in contact with one of the insulated points, the coil unit connected with it becomes operative. After the roller passes over the point the coil unit is inoperative. The commutator cover is connected with the spark lever on steering wheel by a pull rod connection. By this lever the spark is advanced or retarded. By advancing the spark, the charge in the cylinder is ignited earlier, that is, at the end or slightly before the end of the compression stroke. This gives the piston the full force of the explosion on the power stroke. By retarding the spark the charge is ignited later, or after the piston has started down on the power stroke.

To be continued

New Design Triple Gears

Fig. 19 illustrates the New Design Triple Gear which we are now supplying as standard equipment. The old type of riveted gear has become obsolete.

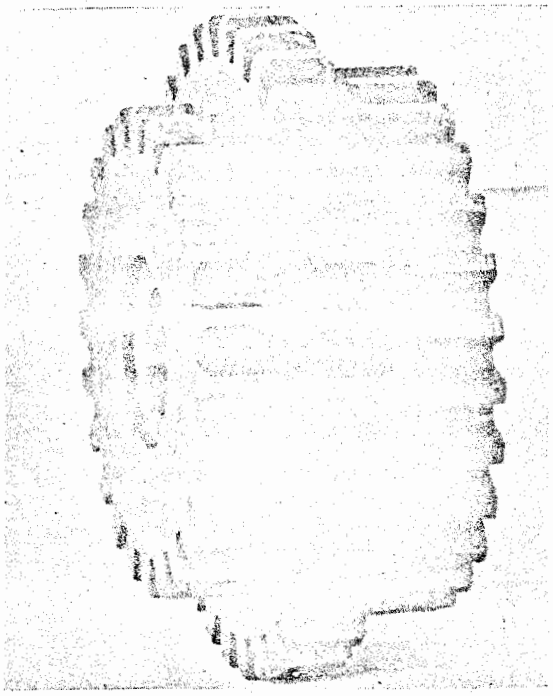


Fig. 19

Crank Case Front Bearing

Fig. 20 illustrates part No. 3076-B or 3076-D Crank Case Front End Bearing and Spring Clip. This part is now being supplied with the cap and screws assembled. The assembly comprises the following parts:—

1—No. 3076-B or D.
1—No. 3077 Front Bearing Cap.
2—No. 3078-C Lock Washer.
2—No. 3008 Screw.

The Bearing Cap numbered 3077 can be obtained separately.

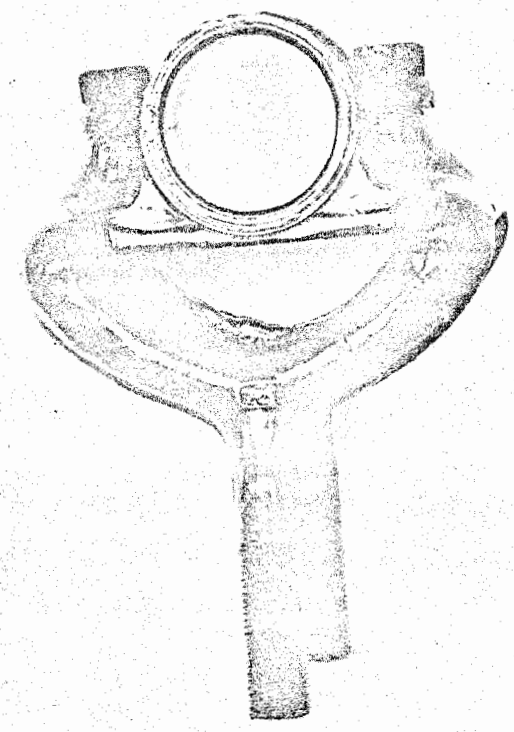


Fig. 20

Is The Risk Worth It?

Can you afford to run the risk of causing damage to property or perhaps loss of life to your customers who depend on you to give them service?

Fig. 21 illustrates spurious Spindle Body Arm that caused just such damage as mentioned above. You will notice from the illustration that the arm is ruptured in several places. These ruptures showed up quite plainly when the arm was slightly bent. Is the risk worth it?

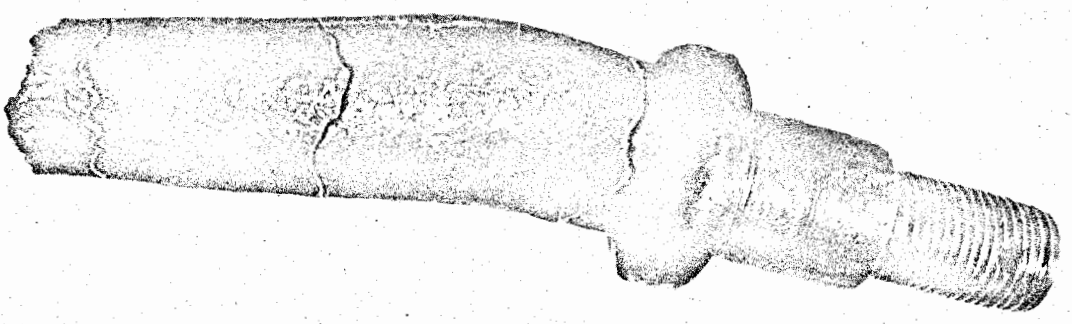


Fig. 21

Lincoln Fan Belt

We have received several reports of Lincoln Fan Belts being installed incorrectly, that is, so that the belt ran in the wrong direction. On account of the construction of the belt this greatly shortens its life.

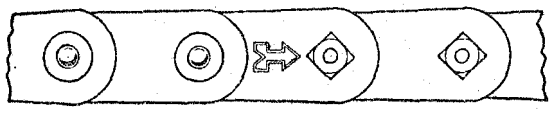


Fig. 22

The belt is stamped with an arrow showing the direction of rotation, on the outer face of the link next the bolt which fastens the

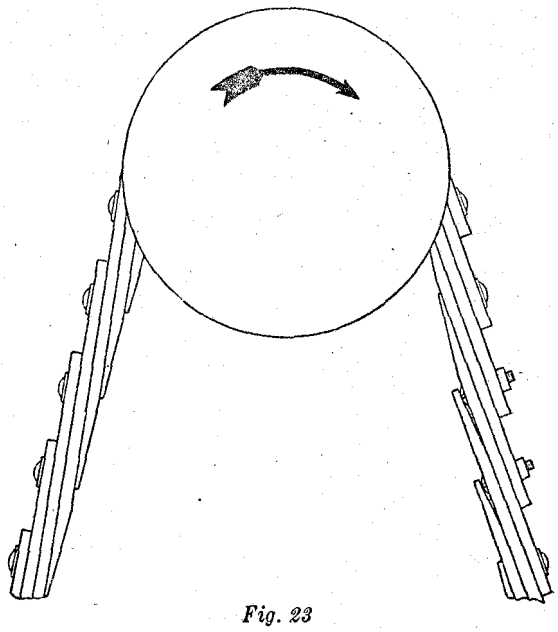


Fig. 23

ends of the belt together. See Fig. 22. In case that this marking is obliterated install the belt so that it will run as shown in Fig. 23.

Shipping Weights of Lincoln Cars

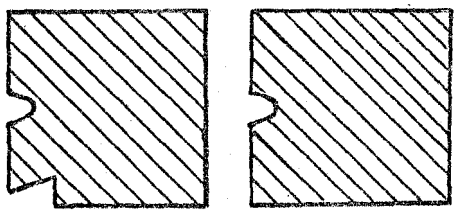
Type	Body	Pass.	Weight
124	Touring	7	4290
123	Phaeton	4	4215
130	Roadster	2	4050
126	Coupe	5	4380
125	Sedan	4	4375
127	Sedan	4	4375
129	Sedan	5	4600
117	Sedan	7	4660
118	Limousine	7	4720
122	Chassis		3205

CUSTOM JOBS

Type	Body	Pass.	Wt.
702	Coupe (Judkins)	2	4200
128	Berline (Judkins)	4	4510
120	Town Car (Brunn)	7	4475
121	Open Drive Limousine (Brunn)	7	4475
131	Cabriolet (Brunn)	7	4655
2451	Cabriolet (Fleetwood)	7	4630
2473	Town Car (Fleetwood)	7	4630
119	Limousine (Fleetwood)	7	4690

Piston Rings

All Lincoln engines after No. 13788 have the new type piston ring L-8325-T installed. The ring does not have the small oil scraper groove on the bottom edge which the former ring L-8325-N had. See Fig. 24.



Old Type *New Type*

Fig. 24

The elimination of this scraper groove insures an increased oil supply for the cylinder walls, pistons and rings with a resulting reduction in wear on these parts and the heavier oil film on the cylinder wall increases the effectiveness of the compression seal.

Rings of the old style with the oil scraper groove should not be installed on alloy pistons.

Oversize rings are now listed as follows:

.0025 oversize.....L-8325-UR
.015 oversize.....L-8325-VR
.030 oversize.....L-8325-WR

Rubber Fan Belt

All cars after car No. 15700 are equipped with a rubber-fabric vee type fan belt. Our laboratory tests have demonstrated that the slippage with this type of belt is much less than with the leather one. We suggest that in cases where complaints of over-heating are encountered that you install one of the rubber belts.

Improved Fordson Tractor Worm and Large Transmission Gear

An improvement was made sometime ago in the design of theFordson tractor worm and large transmission gear by deepening the splines in these parts.

No change was made in the dimension "C-D" (Fig. 25), but by deepening the splines the diameter at "A-B" was reduced.

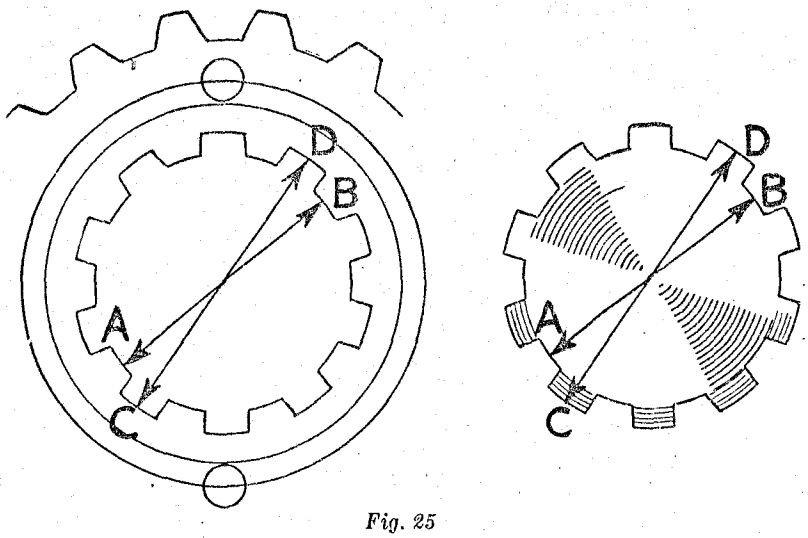


Fig. 25

In view of this change it will be necessary, when replacing a large transmission gear on a tractor equipped with F-1528-B shallow splined worm, to use F-1540-AR shallow splined gear, or replace both worm and gear with deep splined parts F-1528-C and F-1540-C.

When replacing a worm on a tractor equipped with F-1540-AR shallow splined gear, you may use either F-1528-B shallow splined worm or F-1528-C deep splined worm.

We have discontinued the manufacture of F-1528-B and when stocks of this part are exhausted F-1528-C must be used.

Reboring Ford and Fordson Cylinders

Inquiries are frequently received from dealers as to the advisability of installing equipment for regrinding Ford and Fordson cylinder blocks.

Both Ford and Fordson cylinders are bored, reamed and rolled or burnished in manufacturing. We have always recommended that our dealers rebore cylinders in reconditioning them, because it is felt that reboring cylinders is a much better proposition from the dealer's standpoint.

The relative cost of cylinder grinders and boring machines is the first point to be taken into consideration. A high grade grinder will cost in the neighborhood of $2000.00, which is at least twice as much as a large power-driven boring mill. As good boring equipment can be bought at an approximate cost of $200.00, it will readily be seen that a grinder will average nine or ten times the cost of a boring tool.

The use of a grinder necessitates the employment of a very competent machinist, experienced in internal grinding, which is in itself difficult work, and something that should only be undertaken by one who thoroughly understands work of that kind.

The operation of a grinder is affected by a number of conditions, such as spindle speed, tightness of the belt, and hardness of the grinding wheel, thus making it more difficult to turn out a satisfactory job of regrinding.

In addition, the possibility of not properly cleaning the cylinders after they have been reground is very great, and in some cases the expense of clean-up is equal to the expense of reboring. If this work is not done satisfactorily there is always the possibility of abrasive from the grinding wheel becoming imbedded in the cylinder walls, with the result that very rapid wear sets up as soon as the engine is put in service. We have also known of cases where the abrasive has not been properly removed, and has gotten into the oil in the crankcase resulting in burned out bearings, and rapid wear of the cylinder walls, pistons and rings.

We do not mean to imply that it is not possible to turn out a satisfactory job of cylinder grinding. The point we wish to make, however, is that cylinder regrinding should only be undertaken with high grade equipment in the hands of skilled mechanics, who thoroughly understand the work. Both from the standpoint of equipment and labor it is more expensive than reboring, and likewise from the matter of inspection, because the number of rejections will necessarily run higher.

Improved Tractor Coil Box

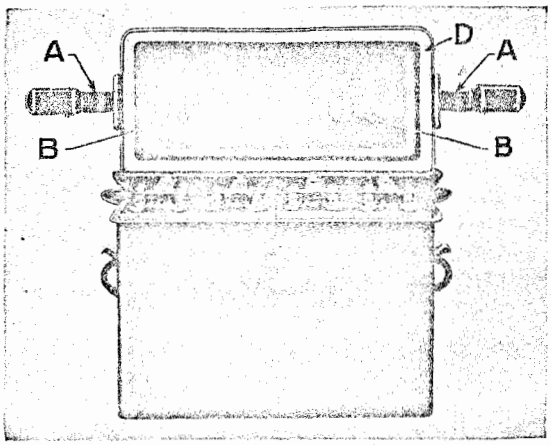


Fig. 26

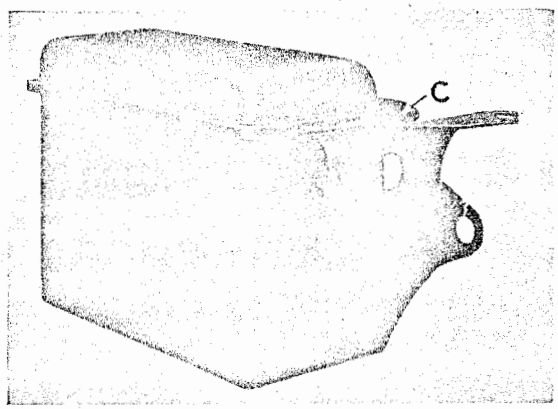


Fig. 27

In Figures 26 and 27 is shown the new type dust and waterproof coil box and cover that is being used as standard equipment on Fordson tractors. Both the bottom and back of the new type coil box are made of reinforced heavy rubber, while all joints have been made absolutely tight by means of felt packing and the use of a cork gasket between the cover and box.

"A" shows the improved type spring latches which hold the cover so firmly in place as to form a dust and waterproof joint between the cover and box.

"B" illustrates the improved type hold-down springs which are placed in the coil box cover and which hold the coils tightly against the box contacts insuring perfect contact at all times regardless of conditions under which the tractor is operated.

"C" is the trough which is located at the back of the coil box cover. This trough, eliminates any possibility of water reaching the terminals on the back of the coil box and interfering with the proper action of the coils.

"D" is the new cork gasket which is fitted between the cover and coil box. The use of a cork gasket at this point prevents any possibility of dust or foreign matter working into the coil box and affecting the Tungsten points on the vibrators.

The improved features that have been incorporated in the new design coil box and cover, not only constitute a real advancement in coil box construction, but insure efficient action and long life from the coils.

Furnish Car Number when Ordering Lincoln Service Parts

To secure prompt, accurate service on shipments of Lincoln parts it is absolutely necessary that the number of the car for which the parts are intended be furnished.

This applies especially to body fittings, interior hardware, etc., where a number of different designs and finishes have been used. When ordering top material, body trim, cushions, or upholstery, specify pebble grain or long grain, bright or dull finish. When ordering Spanish leather for Phaetons and Roadsters specify blue, brown, or gray.

The car number is stamped on a plate on the front of the dash under the hood on the right hand side. The motor number is stamped on the left side of the crankcase between the first and second cylinders. Previous to car number 6585 the car and motor numbers were different and much unnecessary delay and confusion has resulted from dealer's carelessness in ordering parts for these cars and giving the motor number as the car number.

We ask your cooperation in this respect that we may give better and quicker service.