What the Coming Season Means to Ford Dealers and Service Stations

There are now in operation nearly eight million Ford Cars and Trucks, and the contemplated output for this year will add over two million more. This means that during the coming season Ford Dealers and Service Stations will be called upon to service between nine and ten million Ford Cars and Trucks. Notwithstanding the comparatively low cost of maintenance, it is apparent that with this enormous number of cars in operation the possibilities of profits through the sale of parts and labor are greater than ever before.

With this tremendous business in sight every Dealer and Service Station is warranted in making greater preparations than ever before to handle the volume of service work that is bound to follow.

As the first step in this program, every dealer should stock an adequate supply of repair parts so that he will be prepared to guarantee prompt service to his customers during the early spring months. This applies equally to Ford Service Stations and Garages who are bound to share in the growth of this repair business according to their facilities. The concern who maintains a full stock of parts and has sufficient tool equipment to properly handle repair work, is in a position to secure a larger percentage of this service work than ever before, and realize profits in proportion.

This is an opportune time for every Service Station to take stock of their facilities for servicing Ford owners in their community and take whatever steps are necessary in the way of increasing floor space, securing up-to-date tool equipment and making such other improvements as will justify the car owner in feeling that he may expect proper returns for the money spent with the dealer.

The coming season presents a wonderful opportunity for the well organized Service Station, that is operated in a clean-cut business-like way. The business is there—it is running past your door every day. The needs of service are unlimited and every Dealer who is in a position to meet this service demand can view the future with confidence that profits will be returned in proportion to the quality of the service given.
The Ford Piston Ring

There is probably no more important factor in the successful operation of an automobile motor than the piston rings. Their value, however, depends upon a careful selection of the metal; the methods used in the casting and machining, and what is most important rigid tests and inspection.

Appreciating this, the Ford Motor Company safeguards the production of model “T” piston rings with the utmost care from the time that the iron is heated in the foundry cupola until the finished rings, applied to the pistons, are finally fitted to the cylinders.

A chemical analysis is made at the foundry to insure that these elements are present in the desired proportions and a physical test is also made with the Brinell testing machine.

At the foundry the rings are cast in the form of “pots”, see Fig. 1, a single casting providing material sufficient for twelve rings.

The test pots are in the care of an inspector who carries the rings made out of them from machine to machine through to the final operation. He then tests all of these sample rings in specially designed apparatus.

In the first test the ring is secured in a fixture at one end and a seven pound weight is attached to the free end. See Fig. 2. This weight will spring a good ring from $\frac{2}{3}$" to $\frac{3}{8}$". A ring that springs less than $\frac{1}{2}$" is too hard, while one that springs more than $\frac{3}{8}$" is too soft.

When the weight is removed the ring should spring back to within $\frac{1}{32}$" of its original shape.

A graduated scale incorporated into the machine shows the amount that the ring is sprung.

Each of the sample rings is then placed in a machine which compresses it until the gap is closed. See Fig. 3. This machine is equipped with a scale that shows the force necessary to compress the ring which stated in another way would be the amount of pressure exerted by the piston ring against the cylinder walls, when assembled on the piston and in position in the cylinder.
It is interesting to note here that while the limits given by the Engineering Department on the blueprints are from ten to fifteen pounds pressure, the Production Department is actually holding the limits within eleven to fourteen pounds.

If the rings from the two sample pots do not come up to the standard then the foundry is notified and the remaining pots of that heat are scrapped. Only when the tests prove satisfactory is the heat released and brought to the piston ring department for machining.

In the first operation the pots are set up on a lathe and the boring and first turning operation is performed and the twelve rings cut off separately from the pot.

The boring operation involves the machining of the inside diameter of the ring. The limits permitted on this operation are from 3.595" to 3.603" or a permitted variation of only .008".

The first rough turning involves the machining of the outside diameter of the ring to between 3.891" and 3.895" or a variation of only .004" on this preliminary operation.

It should be mentioned here that the ring pots are cast .040" eccentric; that is, the center line of the outside diameter is .020" to one side of the center line of the inside diameter. In the first operation the pots are centered in the lathe in relation to the inside diameter. Now since the boring and turning operations are performed simultaneously some provision must be made to machine the outside diameter eccentrically. This is provided for by a cam operating the cutting tools.

The second operation consists of facing or cutting the tops and bottom of the ring down to the finish thickness. This dimension is held between .246 and .248". In order that the faces of the ring will be parallel, the facing is done on both sides at the same time.

At this point the character of the work is checked in three ways:
1—By the machine operator himself.
2—By the ring inspector who examines the rings coming off of each machine to see how the work is progressing.

3—The inspector selects a number of rings from each machine and passes them through a gauge, (Fig. 4) which gives a check on the thickness.

In the third operation the rings are now put on a rod in the same fashion that heads are strung on a wire and then the rod is placed on a vibrating machine, which with the aid of gravity quickly brings the heavy side of each ring to the bottom. It is an easy matter therefore to take a rule and make a line across the surface of all the rings at the top and the thinnest point. This chalk mark locates the point for the next operation.

Operation number four consists of punching a gap .38" wide out of the ring at the chalk mark.

In the fifth operation the ring is placed in a fixture which holds it while both faces of the gap are milled so that their surfaces are smooth and the gap becomes .36" wide.

The sixth operation consists of stamping the name "Ford" in script on one surface of the ring. This identifies that surface hereafter as the top of the ring and also marks the ring as a genuine Ford part.

Operations 7, 8 and 9 are hand operations in which the rings are placed on arbors with steel plates between each one. Then the rings are compressed so that the gaps are closed and then the nut on the arbor is tightened up holding the rings in place for further machining.

Care is taken here to see that the rings are placed on the arbor with the stamped or top faces upward. This is important because they are to remain in the same position on the arbor for the next three operations, during which the taper is cut on the rings. If a ring should be reversed it is evident that the taper would be toward the unstamped end. However, if this mistake should occur here it would be discovered in a later inspection.

In the tenth operation the rings (mounted on arbors with the gaps closed) are placed in a lathe and the first finish cut is taken off of the outside diameter.

For the eleventh operation the rings are moved to another lathe and the second finish cut is made.

The rings are taken to the third finishing lathe for the twelfth operation where the final turning operation is performed and the taper established.

The final turning is done in three operations so that only a small cut is made in each. If this were done in one operation considerable metal would have to be removed in one cut and the pressure of the cutting tool might force the rings out of place on the arbor.

The diameter of the finished ring is 3.750" to 3.751". The taper is .003" or .0015" on each side. The taper on the rings is checked in the fixture shown in Fig. 5. The rings (clamped in the arbor) are mounted on centers in the fixture. A button operating the dial indicator rests against the face of the rings. The taper on each ring may be checked by moving the carriage back and forth.

Since the rings were assembled on the arbor with the gaps closed they are now perfectly round and remain so until released from the arbor when their natural tension will cause them to open up at the gap. Later when the rings are in place in the cylinder the gap will be practically closed.

Each hour a test is made on an arbor load of twelve rings from each finishing lathe. First a micrometer reading is taken on each ring to check up on the final diameter. The twelve rings are then disassembled from the arbor and placed in the fixture shown in Fig. 6 and compressed until the gap is closed. A strong light shines through between the outside of the ring and a perfectly round surface. Any variation in the circum-
ference of the finished ring is easily discernible. This test is made chiefly to check the precision of the lathes and cutting tools and therefore is not made on every ring. A machine tool in proper shape will turn out a proper ring. Every ring, however, must pass an individual inspection by expert inspectors.

A substance called “Prussian Blue” is applied to a straight edge and the rings with the stamped surface downward and resting squarely on a surface plate are rubbed against the straight edge. Some prussian blue will adhere to the high spots on the rings and thus all irregularities are discovered.

For example, a ring which was mounted on the arbor for final turning with the stamped side the wrong way would have the taper reversed and when rubbed against the straight edge with the stamped side downward will receive a coat of prussian blue on the bottom edge instead of the top.

Rings which are not tapered sufficiently or which might be entirely flat will show up in this test by an even distribution of prussian blue from top to bottom. Twisted rings will show prussian blue at the top on one place and at the bottom on another. Rings showing any of the above defects are scrapped without question.

The inspectors also examine each ring for tool marks or blow holes. Either of these imperfections will cause rejection.

Inspectors are not under the direction of the Production Department and therefore need not hesitate to reject every ring that does not come up to standard.

But Ford inspection does not stop here. There are still inspectors who check up on the work of the original inspectors.

Each hour a supply of rings inspected and passed by the regular inspectors is taken by these super inspectors and subjected to all the tests described above for sample rings and the general production as well. These men work with master instruments and gauges and will detect the slightest imperfections.

The thoroughness of Ford inspection methods and the sincerity with which the quality of the produce is guarded are best illustrated by the fact that though every precaution is taken all thru the foundry and machine shop operations, out of 180,000 to 200,000 model “T” piston rings produced daily the number of rejections sometimes run as high as 35,000 to 40,000—practically 20 percent.

The perfect rings are sent to the motor assembly line for use in new motors or boxed and shipped to the branches as “standard” replacement rings.

Oversize rings are not the result of errors in machining, but are especially made in predetermined sizes.

The care in manufacture and inspection expended on the piston ring is not confined to that particular part, but is merely typical of the methods used in maintaining QUALITY in every single article that enters into the construction of Ford products.

Tightening Ford Spark Plugs

Never draw a spark plug down tight into a hot cylinder head. When the cylinder head is hot the diameter of the spark plug hole is slightly enlarged, while the spark plug which is comparatively cooler is nearer its normal diameter. When the engine becomes cool the cylinder head shrinks onto this plug making it almost impossible to remove it. Correspondingly if the repairman finds a tight spark plug he may be able to remove it by running the engine until it becomes thoroughly warm.

If considerable trouble is experienced with plugs sticking, it is advisable to wipe the threads with some flake graphite which has been mixed with a little oil, before screwing them into the cylinder head.
Winter Care of The Storage Battery

The demands made upon the storage battery in winter are much greater than during the warmer months. This is due, to two causes: first, more current is required for starting at low temperatures on account of congealed oil, and second, owing to less daylight, the lights are in use considerably more than during the summer months.

The battery and electrical system should be inspected regularly during cold weather to see that there are no leaks, grounds, loose connections, or, in fact, any conditions that might have a tendency to discharge the battery.

When starting an extremely cold motor it is good practice to give it several quarter or half turns with the hand crank before using the starter. This relieves the battery of the initial load due to pistons, bearings, etc., being held fast by the congealed oil.

Although a low temperature temporarily reduces the lighting and cranking capacity of a storage battery, it does not damage the battery, providing the electrolyte is not allowed to freeze. The freezing points of electrolyte are shown in the following table:

<table>
<thead>
<tr>
<th>Specific Gravity</th>
<th>Temperature below 0 Fahrenheit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
<td>94°</td>
</tr>
<tr>
<td>1270</td>
<td>82°</td>
</tr>
<tr>
<td>1250</td>
<td>62°</td>
</tr>
<tr>
<td>1230</td>
<td>40°</td>
</tr>
<tr>
<td>1200</td>
<td>17°</td>
</tr>
<tr>
<td>1150</td>
<td>5°</td>
</tr>
</tbody>
</table>

It is evident that there is no danger of a fully charged battery freezing. If, however, the battery is allowed to become discharged, the electrolyte may freeze, necessitating expensive repairs.

When adding water to the battery in cold weather, the engine should be run at charging speed at least five minutes after the water is added, in order to mix it with the electrolyte. If this is not done, the water will lie on top of the electrolyte and freeze at a temperature much higher than that at which the electrolyte would freeze.

When a battery is to remain idle, for any extended period, it should be examined once a month, distilled water added to all cells and a freshening charge given. Always disconnect the wires from the battery as even a slight leak will cause the battery to discharge.

Door-Locks for Ford Closed Bodies

Figures 7 and 8 shows two types of locks used on Ford closed bodies.

We used a limited number of Baird type locks (figure 7), but have since discontinued the use of this type lock. When replacing a complete type Baird lock it will be necessary to use the latest type Yale lock (figure 8).

To prevent any delay in filling orders for keys always specify the make of lock for which the key is ordered, as well as the lock number.

We will not supply Baird lock keys for stock purposes but will ship as required.

Discontinued Service Parts

The manufacture of T2733 Front Radius Rods, used prior to 1919, has been discontinued, and in making repairs on these older cars it will be necessary to substitute the present T2733B radius rod, also the right and left spring perches. This change gives the car owner an improved front axle system at very little extra cost.

We have also discontinued supplying tapered front spring leaves used prior to 1916, Nos. T3803, 3804, 3805, 3806, and 3807. Demand for this material has practically ceased and as soon as the dealer’s stock is exhausted it will be necessary for him to sell the owner a complete spring of the latest design rather than individual leaves.
Demountable Rims Used on Ford Cars

Figure 10 shows cross sections of the various types of demountable rims used on Ford cars. 2845 represents the rim used on Kelsey wheels; 2845B the rim used on Hayes wheels, whereas 2845C and 2845D represent the rims used on wheels manufactured by the Ford Motor Company.

Approximately 100,000 rims similar to the 2845B were used on the first wheels manufactured by the Ford Motor Company and replacement of these rims can be taken care of by using the 2845B Hayes or Ford rim. 2845B-Ford represents the rim which will soon be used on all Ford wheels. This rim is interchangeable with the Hayes rim, and will be listed in the Parts Price List under the same catalog and factory numbers, viz: 2845B—8774B.

Four Pinion Differential in Ford Truck

In the manufacture of truck axles we are now using a 4-way spider carrying four pinions, as shown in the illustration below, instead of two as in the previous design. This improvement reduces the stress to which the differential pinions are subjected, particularly when trucks are loaded beyond their normal capacity.

Fig. 9

Dealers will find it necessary to carry in service stock both types of spiders, but as the new differential case can be substituted for the old type, it will answer for all service purposes. Every dealer should make it a point to see that he has the new spiders and differential cases in stock to take care of any possible demand.

Fig. 10
Check Electrical Connections

In order to prevent headlamp bulbs burning out prematurely, dealers should make it a point to see that the connections on all electrical circuits are clean and tight before delivering a car to an owner. This is especially true of the connections on the battery circuit, such as terminals on battery; ground connection of battery, and battery wire terminals on terminal block.

In Fig. 11 are shown the connections which should be inspected by dealers. Any loose connection at these points is bound to affect the lamps, as it adds to the resistance in the battery circuit, which in turn increases the voltage at both the generator and lamps, and consequently shortens the life of the lamps.

It is also extremely important that all connections on the back of the switch be checked to insure their being in correct position and that the rubber insulation on the different wires is sufficiently near the end of the terminals so that it is impossible for the metal part of any of the terminals to come in contact with each other. Should the metal part of the terminals touch each other at any time, serious trouble will result, such as burning out lamps, demagnetizing magneto, or short-circuiting the lighting system.

If dealers will check these points carefully long life from the bulbs is assured, as regardless of price, there is no headlamp bulb on the market that is the equal of the bulbs we are using either from a standpoint of light efficiency or length of service.

The Starter Ring Gear

When the engine is stopped, the piston under compression tends to turn the crank shaft back until the compression is relieved, thus the crank shaft stops in one of two positions. When the Bendix gear engages, upon starting the engine again, the wear on the ring gear will therefore be at two points on the circumference. The repairman, when overhauling a motor, should remove the ring gear from the flywheel and replace it after turning it \( \frac{1}{4} \) of the way around. This will bring the wear on a new section of the gear.

Cars bearing Motor Numbers 9,008,382 to 9,232,671 were shipped during January

Serial Number of Tractors Assembled during

January 370,352 to 375,190
The Ford carburetor is a plain tube type which eliminates moving parts such as air valves, cams and springs for controlling air to fuel ratios at varying speeds. This control of proper mixture at all engine speeds is obtained by means of fixed dimensions and under no circumstances should they be altered.

The extreme idle and low engine speeds are obtained by means of two drilled holes "D" and "E" (Fig. 12) which communicate with the \( \frac{3}{4} \)" drilled hole "F" that leads to the \( \frac{3}{4} \)"

well "G" in which the spray nozzle "H" is located.

When the motor is idling the throttle plate "C" is nearly closed which directs the entire vacuum of engine on the forward hole, and this in turn causes air and fuel to be drawn into cylinder. The second hole is used as an air bleeder until the throttle is opened sufficiently to obtain twenty miles per hour and then air and fuel discharge from same. As the throttle is opened and the engine speed
increased the vacuum on the holes decreases. The mixture cuts out entirely above 25 miles per hour and a reverse action takes place, due to the high vacuum in the venturi “A.” Below 10 miles per hour the vacuum in the venturi is not sufficient to draw fuel for engine requirements, which is the reason for employing the above mentioned low speed holes.

The spray nozzle is centrally located in the \( \frac{1}{4}\) ” well. This well communicates with the \( \frac{1}{6}\) ” primary air passage, which has a fixed amount of air flowing by the nozzle and causes a constant flow of fuel.

Do not screw the needle “B” down against the nozzle seat with any pressure. If force is used the nozzle hole will become enlarged or the needle will be deeply scored, causing imperfect operation. The correct opening is \( \frac{7}{16}\) to \( \frac{1}{4}\) turn of the needle.

The friction in the nozzle due to the size and length of passage, is balanced with the vacuum in well, and should not be changed. When the engine is stopped the nozzle overflows, causing the well and primary air passage to fill with fuel. This permits easy starting.

The Ford carburetor has only one adjustment, which takes care of the entire range. A rich or lean mixture for idling speed is obtained by raising or lowering the float.

There are only three points that need to be checked in service; namely, the spray needle, spray nozzle and proper setting of float. The distance from the top of the float to the machined flange on the mixing chamber should measure \( \frac{1}{4}\) ”.

The Hand Brake Lever

The hand brake lever has a two-fold purpose, namely, to hold the clutch in neutral position and to act as an emergency brake.

Owing to the exceptionally efficient action of the Ford transmission brake, very few drivers have made any attempt to familiarize themselves with the use of the hand brake lever as a brake for emergency purposes. Consequently when the average driver is suddenly confronted with a situation which demands all the braking facilities of the car being instantly applied, he rarely ever thinks to make use of the emergency brake.

Dealers should impress upon owners the importance of so familiarizing themselves with the use of this lever as a brake for emergency purposes, that its use will become practically automatic when instantaneous action is necessary, explaining to them that a little effort on their part along this line will amply repay them should a real emergency arise.

Repairs for Window Regulators

![Repairs for Window Regulators](image)

We supply repair parts for the diagonal screw type regulator, but do not supply internal repair parts for the other types of regulators used on Ford cars.

We have had some call for the bronze gear used in the diagonal screw type regulator, but as this gear is pressed onto the shaft and there is a possibility of breaking the new gear in pressing it on, we will furnish the gear and shaft assembly instead of the gear only.

Figure 13 shows the T-17638X handle shaft and gear assembly, and T-17639X universal shaft and gear assembly. T-17640X window regulator universal joint pin is used to fasten the universal shaft and gear assembly to the window regulator universal joint.

Steering Column Support Upper

The T-7655X steering column support-upper, used on open cars is riveted to the instrument panel, whereas the T-7657X steering column support-upper, on closed cars is bolted to the instrument panel.

When replacing a steering column support-upper, on an open car, the T-7657X closed car steering column support-upper should be used as in making repairs this support can be bolted to the instrument panel more satisfactorily than the T-7655X support can be riveted.

In order to fasten the T-7657X support to the open car instrument panel, you should use three T-7018X bolts, three T-1966X washers and three T-1068X nuts. The T-7657X support is fastened to the closed car instrument panel by three T-1941X bolts, three T-1034X washers and three T-1068X nuts.
Remagnetizing Magnets

If not subjected to misuse, Ford magnets will retain their magnetism indefinitely.

By far the larger part of trouble that is attributed to weak magnets is in reality due to entirely different causes. For example, some foreign substance may be grounding the magneto coils to the cast iron support, or particles of foreign matter picked up by the centrifugal movement of the oil are occasionally deposited upon the spring contact of the magneto terminal. When sufficient particles are lodged at this point to bridge the space between the magneto terminal and ground, a leakage results, which materially affects the output of the magneto. Another condition incorrectly attributed to weak magnets, is caused by excessive end play of the crank shaft which results in too great a gap between the magneto coils and magnets. All of these points should be carefully checked before attributing the trouble to weak magnets.

If through misuse it should become necessary to remagnetize the magnets, far better results will be obtained by remagnetizing each magnet individually, rather than attempting to remagnetize them while assembled on the fly wheel.

One of the principal reasons why magnets cannot be remagnetized successfully while they are assembled on the fly wheel, is that the fly wheel being made of cast iron, is naturally considerably softer than the specially treated steel magnets, and the magnetism following the line of least resistance is absorbed to a large extent by the fly wheel.

Ford methods of remagnetizing each magnet individually, as compared with results obtained by remagnetizing magnets with some of the so-called magnet chargers, now on the market, which attempt to remagnetize magnets while they are assembled on the fly wheel, is illustrated in the curves shown in figure 14, which shows the results of comparative tests conducted at this plant.

The chart discloses that the best results we were able to obtain from the use of such devices, was to bring the magnets within approximately 60% of their original strength, which means there was a direct loss of 40% magnetic strength in magnets that had been remagnetized by such devices.

A great deal of trouble has been experienced by Ford owners as a result of attempts having been made to remagnetize magnets while they were assembled on the fly wheel, owing to the polarity having been changed. In other words the magnets were magnetized in the opposite direction, which of course, greatly reduces their efficiency.

We do not recommend that dealers and service stations purchase any of the devices on the market for remagnetizing magnets in the car, as extensive experiments conducted at this plant have proven that the results obtained are far from satisfactory.

New magnets will be furnished by us on a liberal exchange basis in replacement of old ones; the new magnets at time of shipment being placed on a board in identically the same relation to each other as when installed on the fly wheel. Extreme care should be exercised in assembling the new magnets, and lining up the magneto so that the faces of the magnets are exactly $\frac{3}{8}$" from the faces of the magneto coil cores.
The Ford generator is of the simplest possible construction. Figure 15 shows the parts in their relative position.

Indications of trouble in the generator are first seen in the ammeter on the instrument board. At normal driving speeds (about 20 miles per hour) the instrument should register between 8 and 12 amperes charge. If there is less charge than this or no charge, the trouble lies in the generator, the cutout, or the wiring.

Trouble in the wiring is due to one of the following causes, which may be found by visual inspection:

(a) Poor or loose connection in the wiring between the generator and the battery.
(b) Broken wire.
(c) Grounded wire.

do determine whether or not the trouble lies in the generator, attach the positive (+) wire of a direct current (D. C.) meter registering from 0 to 30 volts, to the terminal on the generator, and the negative (-) wire to the yoke (housing) of the generator. With the engine running at a normal speed (20 miles per hour) the instrument should read 7 volts or more.

If a voltmeter is not available another method used for determining whether or not the trouble lies in the generator is by grounding the generator terminal by connecting it with the generator yoke, using a screw driver or some other piece of metal. If no spark occurs at the moment of grounding, the generator is not generating.

Testing and Repairing

The trouble may be due to one of the following causes: (1) dirty commutator, (2) brush springs weak or binding (3) brushes not seating properly, (4) brushes not touching commutator, (a) held up by spring, (b) sticking in holder, (c) worn too short, (5) short-circuited in the armature or field, (6) ground in brush wires, field or armature (7) open circuit in field, armature or brushes.

Besides the electrical trouble, the generator is subject to mechanical wear, as follows: (1) commutator, (a) rough, (b) undersize (brushes rubbing on mica), (2) bearings broken or worn, (3) brush ring shifting, (4) third brush shifting.

To Position Brush Holder Assembly

First, shift the third brush "A" (Fig. 16) to the left as far as possible, that is, toward the engine; then loosen the four screws "B" (Fig. 17) approximately half a turn which will allow the brush holder assembly "C" to be moved freely in each direction; care should be taken not to run out these screws more than is actually necessary to allow the brush holder assembly to move freely. (If the screws are run out too far, the clamp ring "D" will fall off inside the generator, and to replace it would necessitate removal of the generator.) Next start the engine, opening the throttle until the engine is running at a speed equivalent to approximately 20 miles per hour; then rotate the brush holder assembly until the ammeter indicates the maximum output; tighten the four screws which hold the brush holder assembly in position, next shift the third brush until the ammeter shows twelve amperes charge and then tighten the third brush nut.

Removing the Generator from the Engine

If the generator tests less than 7 volts, disconnect the wire attached to the cutout and run out the three cap screws which hold the generator to the gear case. The generator is now free and may be removed by prying it off with a screw driver, forcing the generator out and down until the gears disengage. The generator is then taken to a bench to be tested and inspected.
Once the adjustment has been set and the four screws tightened, the adjustment should never be changed unless a new armature or brush holder assembly is installed. It is of course understood that the third brush can be shifted to meet varying conditions, for instance, a car that is driven only on short trips, necessitating frequent starting with consequent drain on the battery, would require a higher charging rate than the car that is driven only on long runs. For average conditions however, a charging rate of 12 amperes is the most suitable.

New Design Transmission Cover Gasket

The September 1923 Service Bulletin, contained an article emphasizing the importance of using the correct type gaskets between the transmission cover and cylinder assembly, and illustrating the damaging effects of using gaskets other than the type that was designed for use at that point.

Since publication of the above mentioned article, T-3363-872-B transmission cover gasket has been redesigned and instead of using one T-3363-872-B gasket and one T-3363-B-4358 gasket, as formerly, we now use one T-3363-872-B gasket of the new design “A”, (Fig. 18).

The new design single piece gasket is both heavier and wider than the old style gasket, and this, together with its improved quality, prevents any possibility of oil leakage between the transmission cover and cylinder assembly. Change in the width of the new gasket eliminates the trouble that was sometimes experienced by repairmen, when it was necessary to install this part, owing to the tendency of the old gasket to slip off of the cylinder block.

The improvement that has been made in this part also insures correct alignment of the universal ball cap with the transmission cover and crankcase, thereby preventing any possibility of distortion, with consequent strain upon the crankshaft and bearings.

It is of course understood that only one of these gaskets should be used between the transmission cover and cylinder assembly. Under no circumstances should dash to body gaskets be used between the transmission cover and cylinder, which we understand has been the practice of some dealers in the past.
Branches have been instructed to supply all dealers with a few sample "Ford Emergency Kits" as shown in Figure 19. This outfit which contains one Champion Ford spark plug, one tire repair outfit, two headlamp bulbs and one tail lamp bulb, will make a strong appeal to every customer, as it provides a convenient means of carrying articles which are necessary for every motorist. Every Ford owner is a logical prospect for one of these outfits, and the volume of business you will be able to obtain depends largely upon the efforts of the parts salesman, who meets the trade over the stockroom counter.

Following are a few outstanding features that may be used as selling arguments in promoting the sale of this kit:

1. Metal container can be carried safely under rear seat.
2. In emergency when customer needs any of these articles they are worth many times the price paid for them.
3. As this kit retails at $1.50, the customer saves 35c by purchasing in this manner, over the per piece prices of the various articles included in the container.
4. If dealer does not sell customer when he delivers the new car—chances are that some accessory store will get the business later on.

There is no question but that the car owner appreciates having his attention drawn to the value of carrying accessories of this type in a convenient manner.

Dealers must appreciate that there are small accessory stores, tire repair shops, oil stations, etc., anxious to obtain this business, and the dealer should not lose sight of the fact that his opportunity for making extra profits lies in selling the owner when he buys a new car or comes in for repair work.

**Locating a Grounded or Shorted Coil**

To locate a grounded or shorted coil use electricity current, (110 or 220 AC or DC), first passing it through an electric soldering iron or other electrical resistance, which draws between three and five amperes. Fasten one wire of this testing outfit to a bare spot on the coil support, (points "D" Figure 20). With
the other wire touch contact “B”. While
the current is passing through the coil as-
semble, lay a piece of steel, about four
inches long, across the cores of adjoining
coils, as shown in Figure 21, until all cores
have been touched, starting with the one that
is attached to contact “B”. If a coil is found
where all the coils beyond it give no mag-
netic pull, that coil (the last live one) is
 grounded. Examine it to see if the wire lead-
ing from it to the first dead coil is grounded
on the casting. If not, the last live coil is
grounded on its core “A”, and by lifting it off
of the casting, the dead coils will become alive,
unless there is another grounded coil.

If all the coils are dead and there is a spark
produced when contact “B” is touched
with the test wire, contact “B” is grounded.
If there is no spark at contact “B,” there is an
“open” which may be located by taking the
test wire off contact “B”, and placing it
upon a bared spot on each coil, until a spark
can be produced. The “open” will be just
ahead of this point. If a spark cannot be
produced at any coil, the last coil is not
grounded at point “C” as it should be.

While very improbable, it is possible that a
coil may be wound in the wrong direction.
This would be the case if two adjoining cores
were magnetic when touched separately with
the test bar, but offered no magnetic pull
when the bar was placed on the two cores at
the same time.

Crank Case Arm Bolt-side
In checking repair work performed in
dealer’s shops we have noticed that some
mechanics make a practice of using a great
deal of force in tightening the crank case arm
bolt-side (T-479) which enters the side of the
frame and extends through the crank case
arm, “A” (Fig. 22).

This is very poor practice as there is a
possibility of drawing the crank case arm so
tightly against the frame that it becomes
imbedded in that part eventually resulting
in crystallization of the frame.

Under no circumstances should force be ap-
plied when installing a crankcase arm bolt-
side. The nut on the end of the bolt “B” (Fig.
23) should of course be run down as far as it
will go but absolutely no force applied in
tightening it. The only purposes of this bolt
are to prevent the crankcase arm spreading
away from the frame, and to eliminate any
vibration at that point.

“C” shows the point where unnecessary
strain is placed on the frame when excessive
force is applied in tightening this nut.
Improved Fordson Tractor Worm and Large Transmission Gear

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

No change was made in the dimension "C-D" (Fig. 24), but by deepening the splines the diameter at "A-B" was reduced.

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.

Increase Your Sales of Glass

The attention of all dealers and service stations is again called to the opportunity afforded for developing a profitable business in selling windshield and closed body glass, and that we are now in position to furnish their entire requirements of this item.

Undoubtedly due to the fact that we were unable to supply glass for service requirements sometime ago, dealers have not been giving this end of the business the attention it deserves.

Our present prices are considerably below the market on quarter-inch plate glass, and from a standpoint of quality, there is no comparison between Ford glass and that handled by the average jobbing house.

However, in order to sell glass or any other commodity it must be properly displayed. You cannot hide the material back in the stock room and expect your customers to inquire "Do you sell glass here?" when perhaps they have been disappointed in obtaining their requirements from you during the last two or three years.

One windshield glass placed in your window or on your counter with the price chalked on it will help bring back this trade.

We are preparing to distribute cardboard signs to all Dealers and Service Stations, calling attention to the fact that you have glass for sale at reduced prices. Be sure these are displayed in a conspicuous place, and we believe you will be well repaid by increased business.

REMEMBER—ADVERTISING SELLS GOODS.

Cars bearing Motor Numbers 9,232,672 to 9,427,721 were shipped during February

Serial Number of Tractors Assembled during

February 375,191 to 382,281
Why is it that Some Dealers Sell So Many More Parts Than Others?

Mr. Dealer, did you ever ask yourself this question? The answer is easy. **Analysis** and **work**. The first requisite of any undertaking is analysis.

This applies to the merchandising of parts as well as any other commodity. In order to build up your parts business beyond the point of just selling what the customer comes in and takes away from you, it is necessary to analyze the possibilities. Let’s see what these possibilities are and how we can make the most of them.

1. **Every owner of a Ford car, truck or Fordson tractor, is certain to need parts of some nature sometime or other.** If he walks in and asks for a part and you don’t have it, you have lost a sale and the resultant profits. Therefore, the first thing you should analyze, is whether your stock is being kept up to a maximum at all times.

2. **Are “hit and miss” stock keeping methods cheating you out of profits?** Does your parts salesman have Ford Batteries, Tire Repair Outfits, and Emergency Kits prominently displayed on the parts counter or in a neat show case? These items should be kept before your customers at all times. Displaying them is not enough. To accomplish real results your parts man must get behind them with convincing sales talk. Every customer of your parts department is a prospect for the Emergency Kit. In selling this kit your parts man should approach his customers in some such manner as this:

   "Mr. Jones, did you ever see one of these Emergency Kits?"
   “Undoubtedly his answer will be “No.” The partsman should then open the box and show the customer the contents, emphasizing the value of each and every article.
   “What is it worth to have an extra bulb along in case your lights fail while driving at night?”
   “Wouldn’t tire patching material come in handy, if you have occasion to replace more than one tire on the road?”
   “Isn’t it worth something to have an extra plug to slip in place of a dirty or broken one, rather than soiling hands and clothing by cleaning the old plug on the road?”

3. **Does your service salesman thoroughly inspect every car that is driven into your garage? If he doesn’t, you are losing money.** Analyze this end of your business. Check up your salesman and see if he tries to sell the customer more than he comes in for. Nine times out of ten, if a man is approached, calling his attention to something that should be repaired, he will say, “Go ahead, and fix it.”

4. **Are you following all Ford owners in your territory to see if they are coming to your place of business for service, or are you depending on them to come of their own accord?** If you are not following owners systematically, some of them are bound to forget you. Possibly you couldn’t take care of the repair needs of all the Ford owners in your territory if they did come to you—if so, you should be sure these customers are supplied with genuine Ford parts through the local garages.

5. **Are these small garages installing genuine Ford parts?** You don’t know unless you analyze the situation by calling on them at least once a month. How do you know where these garages are and the volume of parts they are buying? You don’t, unless you keep a card file. Why not sign this garage man as an authorized service dealer, and then have him post a proper sign in his parts department. We have enumerated five items that with the proper analysis, should point out to you why you are not (perhaps) selling as many parts as some of your brother dealers. But, after you have made this analysis, you will not accomplish much without WORK, and work you must, or you will always be one of the tailenders.

You Owe It To Yourself “To Employ Wide-Awake Salesmen Behind the Parts Counter and on the Service Floor.” The Results Will Surprise You!!
Why the Genuine Ford Rubber-Fabric Fan Belt is Superior

After several years of experimental work the Ford Motor Company are equipping all of their cars with rubber-fabric fan belts. Tests conducted under every conceivable condition have demonstrated beyond all question of doubt the marked superiority of this type of belt over both the leather or old style fabric belts. These tests have shown that as a general rule, there is at least three to four times as much service in the rubber-fabric belt as in the straight fabric belt, and it is not unusual now for owners to drive their cars a year before it is necessary to replace a fan belt.

In bringing out this belt, we have had the co-operation of two of the largest tire companies, who have applied the same principles to the manufacture of the rubber-fabric belt as have proven successful in the manufacture of both fabric and cord tires. In fact the rubber-fabric fan belts are made the same as tires by combining fabric and rubber compounds. The fabric gives strength and alignment, two very necessary essentials to a fan belt, while from the rubber we obtain elasticity and long life, and a cushioning effect between the layers of fabric in the belt.

In developing the rubber for these fan belts special attention has been given to its oil resisting properties. The high quality of the rubber skim used between the layers of fabric is indicated by the fact that our specifications require that after the fan belts have been heated to a temperature of 220 degrees Fahrenheit in engine lubricating oil for four hours, a pull of from four to eight pounds is necessary in order to separate one fabric ply from the other. Oil resisting properties in a fan belt are particularly desirable due to the fact that belts are very often run under exceedingly oily conditions.

Ford specifications also call for the tensile strength of the belt to be at least 350 lbs., which precludes stretching out of shape, and provides against permanent set and elongation when belt is tightened.

In order to be doubly certain fan belts are tested against elongation and stretch with specified weights, and held within the following limits:

- 100 lbs. 1/4 to 3/8”
- 200 lbs. 1/2 to 5/8”
- 300 lbs. 3/8 to 1/2”

The use of a first class rubber skim between all layers of fabric in these belts reduces internal friction and prevents wear of one ply of fabric against the other. This increases the life and service of the belt, in exactly the same way as a similar construction does in the case of the best automobile tires.

The above mentioned specifications for tensile strength, elongation and stretch provide at once a belt of satisfactory elasticity which instead of stretching and slipping in service will maintain satisfactory tension and drive on the pulleys over a long period of time.

Even under the most extreme conditions of oil spray in the motor tests have shown the slippage of the present rubber-fabric design to be less, and life to be longer, than the straight fabric or leather belt.

Rubber-fabric fan belts are all made on long cylindrical mandrels, and cut to width with precision machinery, thus insuring accuracy and uniformity, which insures true running in service. This method of production adapts itself both to extremely high quality of finished product and low cost.

In view of these facts, dealers have no excuse for handling other types of belts. Sell your trade on the advantages of the genuine Ford belt, and the service which you know will be obtained from it.

Successful merchandising today in the automotive field consists of your selection of the best value for your customers and convincing them of this fact.

By duplicating stocks you increase your investment and decrease your turnover and consequent profits.

Stick to the genuine Ford rubber-fabric belt and SELL IT.

Play it safe—Buy genuine Ford parts
“Pride of Ownership”

The service rendered by a dealer can be more readily judged by the general condition and appearance of the Ford cars operated in his community, than in any other way. If a large number of cars are being driven with torn tops and curtains, broken or damaged fenders, and are generally shabby in appearance, it clearly indicates that the dealer has not been active from a service standpoint, and does not appreciate the sales value of well maintained cars.

“Pride of ownership” is as applicable to Ford cars as pride in one’s home or personal appearance. If properly fostered, the general standards of appearance of all Ford cars in service can be raised to the extent that even the most careless owner will not crave the distinction of being pointed out because of driving his car in a dilapidated condition.

Much can be accomplished by the dealer towards instilling “Pride of Ownership” in a service customer’s mind, by suggesting that needed repairs be made, which will improve the condition and appearance of the car, at nominal cost. It is largely because the service floor man hesitates to call “Jones” attention to the fact that he can install new lights in the rear curtain, replace the damaged fender, or paint the front and rear axles and radiator, that “Jones” car keeps on running in an unsightly condition. The service floor man has unlimited possibilities for salesmanship, if he will but analyze the customer’s needs, and then point them out in a diplomatic manner.

Dealers should bear in mind that many sales are lost every year because the appearance of too many Ford cars in service is below standard.

Over nine million Fords have proven their worth from the standpoint of utility, serviceability and performance. Certainly the owners of these cars have reason to be proud of them.

Dealers, point out the advantages of proper care, to the Ford owners in your community. Develop “Pride of Ownership.” It is worthy of your attention. It promotes good will. Good will means increased sales of both cars and parts.

The Glass Situation

Judging from the flood of circulars and quotations put out by various glass jobbers, it is evident they are making a frantic effort to unload a lot of inferior stock. The majority of this glass is below standard and is only salable when a genuine shortage of plate glass exists.

At the present time, there is no occasion for any dealer handling anything but genuine Ford polished plate glass, which our Branches are now supplying at very reasonable prices.

Battery Sales Hints

In promoting the sale of batteries, why not place a card in your show window calling attention to the fact that the Ford battery is ideal for radio purposes?

An allowance not to exceed one dollar should be given for junk batteries when taken in exchange against a new battery. These old batteries usually contain about 25 pounds of lead which at the present market price of scrap should enable the dealer to recover the allowance above mentioned.

Insist upon the junk dealer giving you a fair price, which he can well afford in view of the present market price of lead.

Do You Oil The Commutator?

Keeping the commutator well oiled is a matter of far greater importance than many drivers believe, and is necessary in order to have a smooth operating engine. Don’t be afraid to put a little oil into the commutator every other day, say every 100 miles. Remember that the commutator roller revolves very rapidly, and without sufficient lubrication the parts soon become badly worn.

When in this condition perfect contact between the roller and the four contact points is impossible, and as a result the engine is apt to misfire when running at a good rate of speed.

Demand for Emergency Kits Grows

The Ford Emergency Kit shown in a previous issue of the Service Bulletin has proven tremendously popular with the majority of our dealers.

In many cases, the dealers sold the allotment given them on the first day, and tell us that practically every new car buyer can be sold one of these packages.

Customers calling at the parts counter are also ready purchasers.

When a dealer sells his customer one of these emergency kits, he is rendering a genuine service, and has the customer’s best interests at heart.

He who serves best profits most.

Courtesy goes hand in hand with selling efficiency
Repainting of Tractors

Every tractor should have a fresh coat of paint before beginning the season's work—
for the sake of appearance as well as to preserve the life of the machine.

Tractors overhauled in the dealers' shops should be refinished before being returned to
the owner, so they will look well in addition to being in proper mechanical condition. The
expense of painting is insignificant in comparison with its advertising value.

We also recommend that the dealer circularize the owners in his locality, calling
attention to the benefits derived by keeping the paint on the tractor in good condition.

Branches can now supply dealers with the proper quantities of tractor paint in the standard colors, packed in cartons for owners. The carton contains the following material:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price to Dealer</th>
<th>Price to Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-210</td>
<td>Gray Paint, size of can one-half gallon, used on motor, fenders, rear axle, dash, fuel tank, etc.,</td>
<td>$1.20</td>
<td>$1.80</td>
</tr>
<tr>
<td>M-212</td>
<td>Red paint, size of can one quart, used on wheels.</td>
<td>$.60</td>
<td>$.90</td>
</tr>
<tr>
<td>M-213</td>
<td>Black paint, size of can one-half pint, used on vaporizer, seat, exhaust pipe, etc.</td>
<td>$.20</td>
<td>$.30</td>
</tr>
</tbody>
</table>

One 2” Varnish brush $.21 net to dealer.

These paints are the same quality as used at the factory and are being offered at these exceptionally low prices to encourage owners to keep their tractors in proper condition.

One can of each color is sufficient to repaint a tractor not equipped with fenders. If the

*The salesman's courtesy is the best antidote for the customer's crabbiness*
tractor has fenders, an additional one-half gallon can of M-210 gray paint is required.

We will supply the carton containing paint and brush as listed above at $2.00 net to dealer, and $3.00 to owner.

So far as possible, complete assortments of paints should be sold, but when less than a complete assortment is sold the prices listed above apply. By purchasing a complete assortment of paint in carton, the owner receives without extra charge a suitable brush for applying the paint.

There is a market for tractor paints. Solicit tractor owners for this business; see that genuine Fordson tractor paints are properly displayed in your parts department. In addition instruct your parts salesmen to approach every tractor owner.

Selling tractor paint can be made a profitable source of revenue to the dealer. Every dealer should get behind Tractor Paint 100%.

**Battery Sealing Compound**

The use of a high-grade sealing compound is essential in any battery repair department.

Dealers can be certain of obtaining sealing compound that will give satisfactory service by placing orders for this material with our Branches.

Battery sealing compound is furnished to dealers in ten pound packages at a list price of 15c per pound.

This price is subject to dealers' regular discount.

In ordering specify M-6022, Sealing Compound.

**Counterfeit Parts A Menace**

The following photograph shows two broken offset spindles of counterfeit manufacture, which were recently the cause of a very serious accident near Oklahoma City, Okla.

A comparison of these parts with genuine Ford parts shows very plainly the reasons for their breakage.

First the counterfeit spindles were made from machine steel, whereas the genuine Ford parts are manufactured from special alloy steel, scientifically heat treated, to give the proper strength and hardness, to insure an exceptionally high safety factor.

The superiority of the Genuine Ford spindle is further shown by comparing the following physical properties.

<table>
<thead>
<tr>
<th></th>
<th>Genuine Ford</th>
<th>Spurious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastic limit</td>
<td>130,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Ultimate limit</td>
<td>150,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>60%</td>
<td>50%</td>
</tr>
</tbody>
</table>

This shows that the counterfeit spindle is about 3/4 as strong as the genuine Ford spindle. It proves further that counterfeit parts are unsafe.

Owners who permit the installation of imitation parts are doing so at the risk of life and limb.

Point out the advantages of genuine Ford parts to your customers and call the attention of garages to the responsibility they assume when installing inferior material in their customer's cars.

This is a matter of vital importance and dealers should not overlook any opportunity to drive this fact home.

*A real parts salesman creates a demand—an order taker supplies a demand already created*
Battery, Spark Plug, and Plate Glass Advertising

ON THIS page are shown illustrations of an outdoor battery sales and service sign and three show card displays for Ford spark plugs, batteries, and plate glass, which will be distributed in the near future.

The battery sign at the top of the page is of heavy gauge steel 22" x 15" and covered with a porcelain coating which renders it impervious to rust and discoloration and which will preserve its original appearance for many years.

The spark plug, plate glass, and battery counter and window display cards are made with easels so that they can be displayed on the dealer's parts counter or in the show window. The spark plug display is provided with a pocket for carrying a genuine Ford spark plug. A pocket is also provided on the battery display card for folders containing a convincing sales talk on the Ford battery.

The show case and window display cards will be distributed to both dealers and service dealers, while the outdoor battery sign will be given only to dealers who are equipped to properly service Ford batteries.

When these are received, put them into use immediately. They will stimulate interest and help you to increase sales.
The Real Employer

We are indebted to the Memphis News Scimitar for the following excerpts from a letter addressed by the head of a Fort Wayne, Indiana firm to his employees:

"For several months past we have been placing certain advertising before the public in which we have said much about the character of service we were prepared to give our customers—courteous service; service with a smile; service that is earnest and just the sort each of us would want from a gas company employe were we the customer; in other words, a service that means courteously furnishing a customer what they want, when they want it, as they want it.

"It is planned to publish additional newspaper announcements along similar lines during the coming year, and this letter is directed as a personal appeal to all employees of the company who come in frequent contact in some form or other with our customers; for it is those of us who occupy such positions who should realize constantly that the ruling principle of this company's business is the principle of proper service and that all members of this organization are expected to observe this principle, remembering that we, the individuals, are looked upon as the company by our patrons.

"We realize that our service is judged largely by little things—the courteous word spoken at the right time—the helpful suggestion offered in a friendly manner; the sympathetic consideration of a complaint; the acknowledgment of a fault when we are at fault—these and other little things are in the aggregate what make up the great structure of service.

"If an inquiry is made of you for information use every resource to get same. If someone asks where they will find a certain department in the office or any other place, do not point it out by jerking thumb over shoulder, but, if reasonably possible, walk with them to the person they want to reach, advising them by way of introduction of the name of the person who will take care of their wants.

"This holiday season we are adopting this principle of unselfish service as a rule of general conduct for all time in this organization.

"One of the things often overlooked by an employe is that it is the public which finally pays his salary. No person would be disrespectful to his employer, because he is considered the source of his income; but if patronage falls off, if the public takes its business elsewhere, the result is a reduction of employes or a reduction in salaries. When those who are employed to meet the public and please it come to a full realization that they are working quite as much for the public as for the person to whom they are obligated for employment, there will be a different attitude and a more consistent effort to please and satisfy. The public finally provides the pay check, and the best way to satisfy an employer is to satisfy the public".

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 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.

When business is brisk, push all the harder. It's a lot easier to keep a ball rolling than to start it again
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.

Buy Electrolyte From Ford Branches

In handling service work on Ford batteries or batteries known as the lead acid type, it is of the utmost importance to pay special attention to the quality of the storage battery acid used for refilling. No matter how well a battery is constructed; its life will be materially shortened by the use of acid that does not come up to specifications.

Dealers should use only the Electrolyte which is supplied through Ford branches. Ford Electrolyte is already mixed and of the proper strength to give satisfactory results under all climatic conditions.

Under no circumstances should ordinary commercial sulphuric acid be used, as it contains impurities such as iron, chlorine, nitrogen, etc., which will break down the positive and negative plates of the battery.

Also, there are a number of special electrolytes, powders and battery solutions advertised. Some of these are nothing but ordinary electrolyte of very poor grade, while others are electrolyte containing acids and salts which are distinctly injurious because of their corrosive or rotting action on the plates, thus reducing the voltage and capacity of the cells. As a matter of fact, analysis of these preparations fails to disclose anything to warrant their sale and proves that they are simply schemes to take advantage of the inexperience of battery Dealers and Owners.

Salesman Carries Tractor Parts

A tractor salesman for one of our dealers uses a Ford Roadster with a box in the rear containing an assortment of repair parts.

In addition to calling on prospects, this man calls on Fordson owners, giving their tractors an inspection, and suggesting necessary repairs. The dealer reports this has been the means of selling a great many Fordsons; in fact, this dealer stood second on the sale of tractors last year.

Service of this kind is surely appreciated in farming communities, and it is a most effective way of advertising.

Selling Visors for Closed Cars

Dealers, are you taking advantage of the opportunity to sell T-18150 Visor and Bracket Assembly to your customers who purchased closed jobs before this equipment became standard?

Articles of this kind should be exhibited in the dealer's show window or hung up in the parts room so that they will attract the attention of the trade. There still remains a vast number of sedans and coupes that have not been provided with this equipment, and at a retail price of only $3.00 it should be possible for you to secure the bulk of the business in this line.

The public are at present going elsewhere for these articles because the dealer does not make any display of his goods.

Specify Parts Wanted

To insure delivery of the right parts always specify the prefix letter "T", "TT", "S" or "L" as follows, when ordering repair parts:

"T" for Ford Car parts.
"TT" for Ford Truck parts.
"S" for Fordson Tractor parts.
"L" for Lincoln parts.

The Battery Filling Plugs must be kept tight, so as to avoid spraying out the solution.

It may take a little longer to be polite, but it takes a lot longer to count the money pleased customers leave with you.
Attractive Display or Just Ordinary Display??

    Which appeals to you?
    Which describes your parts counter, as it appears to the public?
    Attractive display plays an important part in the program of the successful merchant.
    Effective display is creative—it creates a desire in the mind of the observer, it makes him want something.
It creates the favorable impression that you are neat, clean, and systematic, and that your business is conducted along lines in keeping with the appearance of your establishment.

The next subconscious thought is that yours is a good place to trade, because you have silently proven to the public that you have mastered the first principle of good business.

Contrast your parts display counter or window with the displays of successful merchants in other lines of business in your town. How does it measure up? Some dealers unfortunately mis-use what should be their parts display by making it a storeroom for an endless variety of gaudy accessories or an unattractive maze of “knick knacks”—articles that a clever salesman has sold them.

Not only is this a loss of good advertising space, but a direct loss to the dealer on account of the slow turnover on his investment.

Your appeal to your prospective customer must be made and backed up by a real, sincere and honest desire to serve him by supplying him promptly with those articles he will have use for.

Displaying trinkets, that an occasional owner may desire in order to satisfy his fancy is not good business, as it may create the false impression that such things are essential to the successful operation of the Ford car.

To obtain best results your parts display must be correctly located, it must make its appeal to the greatest possible number of observers, above all it must be neat and attractive, it should be changed frequently and should not contain too great a variety of articles.

An attractive arrangement is one in which a few parts are displayed in such an effective manner that the passers-by attention is immediately drawn to the pleasing display. Too large a parts display requires a certain amount of mental effort to segregate and analyze, and as a result, its effectiveness is lost.

Furthermore, we cannot lay too much stress on the importance of employing men behind the counter who are neat in appearance, courteous, and helpful, and inspired with a real desire to serve.

Remember selling service satisfaction creates confidence and paves the way to future car sales.

Attractive Display or Just Ordinary Display?

Which?

You Have the Power to Determine
Merchandiser For Tire Repair Kit

Fig. 29

Fig. 29 shows the Merchandiser, (or Display Can), for Ford Tire repair kits.

One of these merchandisers standing on the dealer's parts counter will create interest and serve as a silent salesman for this product. In fact, every dealer who has given the merchandiser prominent display has found that sales of Ford tire repair kits have materially increased, showing that Ford owners appreciate having their attention called to a high grade article.

Branches are at present distributing these merchandisers free of charge to Dealers purchasing \( \frac{1}{2} \) gross or more Ford tire repair kits.

Ford Transmission Bands

One of the greatest control advantages of the Ford car is the facility with which gear changes are made, and the ability to control its speeds through foot pedal and brake band action. Gear shifts are readily made without removing the hands from the steering wheel and by automatic action of the feet, allowing the driver's attention to be concentrated on the road ahead, on traffic, steering or road conditions, as the case may require.

Another outstanding feature of the Ford Planetary Transmission is the impossibility of clashing gears or failing to accomplish gear shift, thereby eliminating any possibility of the driver being caught in traffic with his engine disengaged.

In order to obtain the most satisfactory Transmission action, Ford owners should use only genuine Ford transmission band linings. Experiments conducted for several years, have proven beyond all question that the GENUINE "Ford" bands are best adapted to the Planetary Transmission.

In the manufacture of the GENUINE "Ford" Transmission band lining, we use the highest grade cotton yarn, since cotton has been found to give the best co-efficient of friction against cast iron drums. In addition we use a special weave to provide as much elasticity as possible, and yet maintain the necessary body and strength in the band lining. This gives positive action without excessive pedal pressure or travel. The weave specifications call for the use of the best long fibre cotton that can be obtained for the purpose. The warp and the filler are in accordance with specifications which have proven satisfactory both from the standpoint of life and resiliency of action.

In this connection, the life of transmission bands can be materially lengthened if care is taken in their installation and adjustment, the manner in which they are applied and changing the oil in the crankcase at regular intervals.

First of all, band linings should be riveted so that they conform exactly to the bands. Otherwise an equal pressure will not be exerted on the drums around the whole circumference of the bands. In other words, the bands proper must present a true circle to the drums.

Before installing the linings it is advisable to soak them in lubricating oil for at least
eight hours. In fact, many dealers make a practice of soaking transmission bands in castor or Neat's-foot oil, prior to installation and report excellent results. When new bands are installed care should be exercised to see that they are not adjusted too tightly, which will cause a continuous dragging on the drums, with resultant glazing and perhaps burning out of the linings.

Bands should not be adjusted too loosely, however, as this will create a tendency to slip on the drums, which will also glaze them and eventually cause them to become burned. Undoubtedly many transmission bands are ruined before the car has been driven many miles, due to the practice of dealers and service stations adjusting new bands too tightly. The proper procedure in replacing bands is to adjust them as loosely as possible without causing them to slip on the drums, then after the car has been driven for one or two days, tighten the adjustment.

The serviceability of transmission band linings is also greatly reduced by the failure of owners to drain and replenish the crank case lubricating oil at regular intervals. The Ford Manual specifies that the oil in the crank case should be changed every 750 miles. This does not mean that new oil is to be added, but that the oil supply is to be drained off and new oil put in. If owners will follow this suggestion, far less trouble will be experienced with transmission bands.

Applying brakes without closing the throttle is another cause for band linings wearing out; likewise sudden stopping will cause the bands to burn and become glazed, with resultant chatter. The proper action, except in cases of extreme emergency, is to apply the brake then relieve the pressure and re-apply.

Durability and strength are embodied in the design and construction of the Ford planetary transmission, consequently owing to its efficient design and rugged construction it is not as susceptible to the damaging effects of improper operation, as is the case in a sliding type gear transmission.

Owners, however, should understand that to obtain the best results from their cars, reasonable care and thought should be given in the operation of the Ford transmission, as the best performance cannot be obtained from any piece of mechanism when subjected to continuous abuse.

In the case of the sliding gear transmission, if the driver fails to exercise proper care and thought in making shifts from one speed to another, the gears clash and the resulting noise makes his poor shift evident not only to himself but to everyone within hearing distance as well. In the Ford transmission, a poor shift is not indicated by objectionable noise, but the resulting action in the way of damage to the transmission bands is of sufficient importance to warrant the careful attention of the driver.

The Ford owner must realize that abuse and lack of thought in the operation of the Ford transmission is practically always responsible for any transmission or brake band troubles that he may have, and that if reasonable care is exercised more pleasure and comfort will be obtained from the operation of his car.

In addition to the standard Transmission Band Linings, Branches can supply specially asphaltum treated bands, including rivets, in cartons at one dollar per set, subject to the customary discounts. These will enable dealers and service dealers to meet the demand from owners who prefer treated bands.

Value of the Name Ford

What does the average person think of when he hears the word "Ford" mentioned—of but one, or possibly two things—the Ford automobile or its designer and manufacturer, Henry Ford? And what has brought about this situation? The answer is obvious—the greatest automobile value on the market and continued satisfaction of millions of owners. No wonder then that the name "Ford" assumed the proportions of a magical term—a universal term, and one to conjure with in the advertising field. When we consider these facts it becomes only too obvious why the Ford Motor Company is so zealous in protecting this invaluable word—the principal part of its corporate name, as well as its common law and registered trademark. The proprietary interest which the Ford Motor Company has acquired in the word "Ford" should be disputed by no one. The name itself has in
fact acquired a secondary meaning. We have obtained from the United States Patent Office protection for the name Ford in all of the 49 classifications in the Patent Office.

What is the actual state of affairs? There are thousands of reputable individuals, partnerships, corporations, etc., not connected with the Ford Motor Company, who are inadvertently making use of the word in connection with their various enterprises, and who, because they are reputable and consider fair dealing and clean competition paramount, readily discontinue the use of the name "Ford" when our rights and their corresponding obligations have been called to their attention.

On the other hand, however, we find an appreciable number of individuals, partnerships, corporations, etc., whose motives are not, we regret to state, as clean and as fair as those referred to. It is this latter class that cause trouble. They see at a glance great advertising value in the word "Ford" and invariably allow their own selfish interests to assume control of their conscience and with what results—a multitude of cases of unfair competition and infringements, which if allowed to continue unabated would lead to the inevitable—complete dissipation of our trademark rights and irreparable damage to our business. This latter class of infringers are a real menace to good wholesome business and should be removed. Frequently we are forced to adopt rather strong measures against some of these individuals and even though this is an expense in some cases, we are more than compensated by the results obtained as we have as yet to lose a lawsuit involving our trademark or trade name rights.

This is merely a brief resume of our struggle to date to prevent the dissipation and appropriation of our trade name and trademark by promiscuous use.

The Merchandising Viewpoint

The true merchandising idea is the ability to see the opportunities offered to be of service to one's customers, and the power to follow this vision up with definite action terminating in mutual profit or betterment.

The man behind the parts counter has an unusual opportunity to serve a large number of Ford owners either directly or through service stations and garages.

The first essential for the parts man is to get a correct perspective of his exact relationship to his employer and the Ford driving public.

This perspective will show him the value of courtesy, the proper appreciation of adopting a pleasing attitude and the consequent result on the customer.

The most important point, however, in this stockman's work is his duty to the customer in suggesting correlated parts.

For example, when a Ford owner comes in to purchase a front spring, if the stockman suggests a spring pad and explains its use to the owner, invariably the customer will purchase one and by installing same will get longer life from the spring and consequently greater value and more satisfaction.

The purchase of a front spring also suggests new spring perch bushings and possibly a set of front spring hangers, because it would be an injustice to the spring bushings to put a worn set of spring hangers into them to exert pressure and wear on only two points of contact, etc, etc.

This live wire parts salesman is in reality a specialist in his line. He should know what parts are needed to complete a job, and should diplomatically impart this information to his customers, thus rendering them a greater service by preventing a second trip to the stockroom by the owner to purchase another part that he discovers later he needs to complete his work.

It also insures a maximum of service from the parts installed.

Have you a stockman of this calibre in your organization and if so has he the merchandising viewpoint? If not what have you, as his employer, ever done to educate him along these lines? Don't forget that profits are in direct proportion to the degree of service rendered.
### Revised List of Ford Car and Truck Parts

#### Bearing the Copyrighted Word

**FORD SERVICE BULLETIN**

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owners and Service Stations indicating that
men make it a point to see that their
promptly discarding all obsolete lists. Further­
stands and quotes the
lists—the latest wholesale and retail
garage trade. These quantity lot prices will
list when supplying parts in quantities to the
parts counter.

Complaints are often received from Ford
owners and Service Stations indicating that
they are being charged more than our current
list prices for repair parts. Upon making
investigation, it usually develops that the
Dealer’s stock clerk is using out-of-date price
lists—the latest wholesale and retail cata­
logs being kept in the office instead of on
the parts counter.

The Branch distributes these revised price
lists at regular intervals and Dealers should
make it a point to see that their Parts Sales­
men are provided with the latest copies,
promptly discarding all obsolete lists. Fur­
thermore, see that your Parts Salesman under­
stands and quotes the “ten, hundred, and
thousand lot” prices shown in the wholesale
list when supplying parts in quantities to the
garage trade. These quantity lot prices will
enable you to increase your volume of business
and at the same time encourage the garage to
purchase fast moving parts in larger
quantities.

Our latest wholesale and retail parts cata­
logues were issued March 1st, 1924, and may
be obtained from any Branch upon application.

Selling Tractor Paints

The attention and care an operator gives a
tractor is materially influenced by its general
appearance. There is always an inclination
to abuse a tractor or car that has been allowed
to become rusted through exposure. In pro­
moting the sale of tractor paints, parts sales­
man should call this fact to the attention of
tractor owners, particularly those who depend
upon hired operators.

Keeping a tractor well painted is a very
good investment from the owner’s standpoint,—for one thing the life of the machine is
lengthened. Furthermore, an operator of the
well kept tractor takes more interest in his
work and gives his tractor much better care.

If tractor owners can be educated to the
importance of maintaining the general appear­
ance of their tractors, there will be fewer cases
of tractors giving trouble because of being
abused.

Every owner of a Fordson tractor is a
prospective purchaser for tractor paints.

Are you securing your portion of this busi­
ness?

Tractor Cylinders and Assemblies

The attention of Ford dealers is called to
the fact that Branches carry stocks of the
following tractor parts:

S 200-C Cylinder-machined .031 Oversize
S 200-E Cylinder Assembly .031 Oversize

These cylinders are new and will give just as
good service as standard stock. Further­
more, the difference in price of $15.00 on the
cylinder and $25.00 on the assembly saves the
tractor owner considerable money on an
overhaul job.

It is to the interest of the dealer to call his
customers’ attention to any economy that will
reduce tractor operating costs to a minimum.

### Parts Price Lists

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Increase Your Parts Turnover

LOSING sight of the fact that sales profits are in direct proportion to the frequency with which stock is turned over, has prevented many dealers from obtaining profits easily within reach.

To increase stock turnover two factors are essential. (1) Systematic ordering, (2) Effective selling methods.

Purchasing stock on a "hit and miss" plan without having reference to correct stock records, and making no effort to sell stock, but merely supplying those parts which are asked for by customers, reduces stock turnover.

Having a definite plan for ordering stock, soliciting parts sales orders, and advertising your merchandise through the medium of effective window displays and direct-by-mail advertising, increases stock turnover.

Examine your stock. See how much stock you have that does not turnover at least once a year and then take the necessary steps to prevent over stocking such items in the future. If you need help to install an adequate stock system in your organization, call on the Service Manager at your Branch.

When you carry in stock various brands of transmission band linings, for example, you are merely duplicating stocks, and decreasing turnover. If you were to sell all your customers on the GENUINE "Ford" brand you could decrease your investment, speed up your turnover and make more money.

Catering to various fancies of the buying public as to the brands, styles, shapes, etc, that they think they want, is not merchandising, it is merely vending.

By endeavoring to supply every brand of material or every article asked for which is not essential to the proper operation of the car you not only run into difficulties in over-stocking but you indirectly admit that you know less about your business than your customer does. Both you and the man behind your stock counter should be sold on the superior merits of the goods you handle and explain their advantages to your customers.

A courteous parts salesman who thoroughly understands Ford stock and the importance of diplomatically suggesting the purchase of additional items which an owner may require is of valuable assistance in increasing your parts turnover.

Courteous treatment is the oil that lubricates the wheels of business.

You know the value of oil to machinery—try it out, starting today, all through your organization—oil up the points of contact with the public.

GOOD GOODS, GOOD SALESMANSHIP, GOOD SERVICE—SATISFIED OWNERS—REPEAT BUYERS

The Foundation of all real service is courtesy
Ford Black Enamel

Fig. 1

There is a real demand among Ford owners for a high grade black enamel which will insure a satisfactory paint job on the entire car, and which retails at a price in keeping with Ford products. This demand is best met by Ford black enamel, which carries our own endorsement and which retails at a price of $1.00 per quart, this price being considerably below that charged for most automobile finishes. (When it is only necessary to touch-up rusted or marred spots on a car we recommend using Ford Touch-up Black mentioned in the accompanying article.)

Ford black enamel is supplied in attractively labeled one-quart cans, as illustrated in Fig. 1, complete directions for applying being given on the label; one quart of enamel is required for the body and one quart for the chassis.

This enamel was selected as the most suitable for refinishing Ford cars only after a series of thorough tests had been conducted at this plant in our paint department. It has the advantages of being easily applied, drying quickly and leaving a high gloss finish—the car being ready for use within 24 hours after the enamel is applied.

Dealers will find it to their advantage to refinish used cars with Ford black enamel. A coat of this paint will add considerably to the resale value of any used car, while the slight cost involved will yield far better returns than a similar sum expended in any other manner.

Financial return is in direct ratio to the courtesy back of the service given

Ford Touch-up Black

To supply the demand for a quick drying high gloss black enamel paint for touching-up rusted and marred spots on cars, we are now marketing Ford touch-up black, put up in half-pint bottles, retailing at a price of $1.00.

Ford touch-up black will dry thoroughly within a period of half an hour after it is applied, leaving a high gloss black enamel finish.

An added feature of this product is the extra fine quality brush 1 in. in width which forms part of the cover of the bottle (See Fig. 2). The brush being on the inside of the bottle is kept in a moist and soft condition ready for immediate use at all times.

The improved appearance of a car after a few minutes time has been spent in touching up rusted and marred spots with Ford touch-up black, will more than compensate the user for the small expenditure involved.

Display several bottles of Ford touch-up black in your window and in a prominent place on your counter. Draw the attention of everyone entering your place of business to the advantages obtained from its use. With very little effort you can make the sale of this item yield considerable profit and at the same time improve the appearance of many cars in your community.
Ford Battery Sealing Compound

A battery cannot operate efficiently unless properly sealed. An improperly sealed battery permits the electrolyte to seep out and shorten the life of the wooden case. Grounds may result from this condition which would cause excessive drain on the battery. One cell may leak, while the others do not, ultimately resulting in failure of the cell.

A satisfactory battery sealing job can be obtained only when the following conditions are observed:

1. The jar and cover surfaces must be thoroughly cleaned before applying the compound. (See Ford Battery Manual, Answer No. 84.)
2. The compound must be properly applied. (See Ford Battery Manual, Answer No. 84.)
3. A high grade sealing compound should be used.

Recently we conducted a series of tests at this plant for the purpose of comparing various makes of battery sealing compound with that of our own. In each instance the superiority of the Ford battery sealing compound was quite apparent.

Fig. 3 shows three batteries which we subjected to a cold test by keeping them in a refrigerator at a temperature of zero, for one week. The battery marked "A" was sealed with Ford sealing compound, while those marked "B" and "C," were sealed with ordinary sealing compounds.

It will be noted that the sealing compounds used on the batteries marked "B" and "C," are badly cracked and checked, while the battery marked "A," which was sealed with Ford battery sealing compound is in perfect condition.

Ford battery sealing compound is strictly a quality product; its use not only insures freedom from defects in battery sealing, but it guarantees a permanent and satisfactory job.

Our sealing compound is sold in 10-pound cartons (see Fig. 4), and retails at a price of 15 cents per pound, subject to regular discount. While this price is a trifle higher than that which is charged for ordinary sealing compounds, the slight difference in cost is in no way indicative of the actual difference in quality. Furthermore when it is taken into consideration that it costs only one and a fraction cents more to seal a battery with Ford battery sealing compound, which is a quality product, than it does to seal a battery with ordinary brands of compound, we believe no dealer will risk jeopardizing his prospects of building up a successful battery repair business by using anything but the highest grade battery sealing compound.

Real service is rendered without thought of immediate financial return but such service inevitably creates profit.
Battery Repair Work Presents Excellent Opportunities to Dealers

The repairing and servicing of batteries has opened a new and profitable field to every Ford dealer. When it is taken into consideration that the dividends which this class of work will yield in comparison to the investment involved no dealer can afford to overlook the opportunities it presents.

To build up a successful battery repair business there are several factors that must be observed.

1—A well equipped battery repair shop maintained in a neat, clean, and orderly manner.

2—Competent and courteous battery repair men.

3—Notification to all car owners in your vicinity that you are operating an up-to-date repair station and are in a position to give prompt and efficient battery service on a flat rate basis.

4—Maintenance of a card record showing owners’ name, condition of his battery, when it was last serviced, nature of work performed, and date it should again be tested.

5—Check card records at regular intervals, notifying owners when it is time their batteries need attention, and suggesting that they bring their cars into your shop where they will receive prompt and efficient service.

In Fig. 5 is shown a facsimile of a notification which D. F. Prime & Sons, Ford dealers at Arapahoe, Nebraska, send to car owners in their community at regular intervals. Mr. Prime advises that this method of advertising coupled with courteous treatment of customers has been largely instrumental in building up the successful battery repair business he has acquired.

When a car owner experiences trouble with his car and brings it into your shop for repairs, his principal thought is to obtain service. While he is in this frame of mind he is interested in any suggestion relating to service that may prevent his experiencing further trouble. Take advantage of this opportunity to emphasize to him the importance of having his battery checked periodically by a competent battery repairman explaining to him your facilities for performing such work in a prompt and efficient manner. The fact that he has brought his car into YOUR shop for service is an indication that he has confidence in your ability and under such circumstances your statements will make considerable impression upon him.

There are plenty of opportunities for every dealer to build up a successful battery repair business, it is simply a question of conscientiously going after the work and obtaining the benefits that are easily within reach.

Parts Required to Install New Type Tractor Fuel Tank Assembly

In response to requests received from dealers, we are listing below parts required to install the new type tractor fuel tank assembly on tractors equipped with the old design kerosene and gasoline tanks, S-150-F-1618 AR and S-175-F-2026R, respectively:

1 S-186 F-1618B Fuel tank assembly
2 S-187 F-1800 Fuel tank filler plug, with gasket
1 S-189 F-4286 Gasoline tank elbow
1 S-190 F-1932 Gasoline feed pipe
1 S-191 F-1933A Fuel feed pipe
1 S-192 F-2900 Sediment bulb assembly
4 29"O-T-1374 Feed pipe packing nut

Commencing with tractor No. 393410 assembled April 9, 1924, all tractors are equipped with the new design fuel tank assembly part F-1618-B.

To be successful in any business you must have the Good-Will of your customers. Courtesy is the foundation of Good-Will.
Inspecting the Time Gears

New time gears are assembled with from .0005 to .003 "back lash" (space between teeth), while repair jobs may have as high as .006. The experienced man may judge the back lash by twisting brass bars between the teeth of the gears and watching the movement, as shown in Fig. 5. The accurate way of checking this is to hold the teeth to one side with a brass bar and insert a feeler between the free sides of the teeth as shown in Fig. 7.

Try the gears at several points to find any high spots, that is, a spot where the gears mesh tighter than in other parts of the gears. If a high spot is found, mark the gear with a piece of chalk at the point where it meshes with the small gear. Remove it from the camshaft by running off the lock nut with a 5-Z-162 wrench, after which it may be pulled off with a gear puller, as shown in Fig. 8.

When the gear has been removed it should be examined for a burr (raised spot) on the teeth. If there is a burr, remove it with a file, replace the gear in its original position and try it again. If no burr is found, replace the gear on the camshaft turning it to a position opposite to the one in which it originally meshed with the small gear. Force the cam gear onto the shaft with the nut and try the play between the teeth. If the high spot still shows, the trouble is probably in a sprung camshaft. If there is considerable play between the teeth, the trouble lies in the gear and will be overcome by replacing it with a new one. On cars that have been in service for long periods, it is advisable to replace both large and small time gears.

The Piston Pin and Bushings

The piston pin, when properly fitted will wear very slowly but when carelessly fitted will wear the bushing in a very short time, causing a noisy motor and excessive wear on the crankshaft bearing.

To check the play between the piston pin and the piston bushings, hold the piston with the piston pin perpendicular to the bench (Fig. 9) with the left hand, while with the right, the connecting rod is forced up and down in such a way as to cause the pin to be forced against one side of the bushing and then the other.
If there is any play, a new pin should be fitted and if necessary, the piston bushings should be replaced.

The pin is removed by running out the connecting rod clamp screw, after which the pin may be pushed out.

A piston clamp should be used for holding the piston while performing these operations, as the practice of holding the rod in a vise, invariably results in a twisted rod and a scored cylinder.

The piston pins are fitted in the bushings by selective fit. A pin is tried in the bushing. If it turns freely, another pin is selected until one is found which requires a fair amount of effort to force it in and turn it. Since the piston pin is harder than the bushings, it is usually necessary to renew the bushings to insure a properly fitted pin.

The bushings should be removed on an arbor press. Care should be exercised that the piston is not distorted. Driving the bushings out with a hammer invariably throws the piston out of round. The arbor press should be provided with a fixture for supporting the piston. The arbor press should be provided with a pilot which will line it up with the bushing. Such a fixture, also a piston clamp can be purchased from any up to date equipment company. The bushing is removed through the inside of the piston. When pressing in the new bushings, it is important to have them line up properly with the hole in the piston, as a cocked bushing requires considerably more pressure to force it in, throwing the piston out of round.

The bushing should be pressed in until about 1/16 of an inch of the bushing shows on the inside of the piston or until it is 1/32 of an inch inside the outside diameter of the piston. When the bushings are in place they should be line-reamed to size with a standard Ford pilot type reamer 12-Z-37.

Before performing this operation, the reamer should be carefully examined to make sure it is in first class condition. If a reamer is used in which the flutes have been slightly chipped there is a possibility of leaving high spots in the bushing which will soon wear down and result in a loose fitting pin.

When the new pin has been fitted, as described above, it is removed and oiled. It is well to rub a little oil in the bushings as well. Hold the rod in the piston and force the pin into place. Turn the pin until the groove lines up with the connecting rod clamp screw hole and insert the clamp screw. Run the screw down with a speed wrench, remove the piston from the clamp and press the rod from one side of the piston to the other to see that the pin does not extend outside the diameter of the piston. If it does, remove the rod and pin and press the bushing on that side in a little further. If it does not, set the piston in the clamp and tighten down the cap screw with a 5-Z-209 wrench, and insert the cotter pin.

The assembly may now be tried out by holding the piston as shown in Fig. 10. The rod should hardly be able to turn of its own weight, but should drop gradually when the piston is held in both hands and given a quick shake.
Backfiring

Backfiring should not be confused with an explosion in the exhaust muffler. Backfiring is setting fire to a charge of gas and air before the piston arrives near enough to top center for the momentum of the flywheel to carry it over, or firing the mixture in the inlet manifold and carburetor.

There are three causes for backfiring, given below, listed in the order in which they are most likely to occur:

No. 1—Backfire caused by a slow burning mixture.

No. 2—Backfire caused by a pre-ignition due to a faulty ignition system.

No. 3—Backfire caused by incandescent carbon in the cylinders.

A slow burning mixture may be caused by poor compression in the cylinders, faulty valve action, or a faulty carburetion system. A slow burning mixture may be either too rich or too lean. A rich mixture will show a dark smoke at the exhaust. It causes a carbon deposit in the cylinders, eventually resulting in continual backfiring due to incandescent carbon.

Backfire due to faulty ignition is usually caused by a ground in the primary system between the coil unit and the commutator roller. However, it may be due to the secondary systems shorting one into the other, the commutator being worn or dirty.

Pre-ignition may be due to incandescent carbon, faulty cooling system, or the spark being advanced or retarded too far. The order of testing given above should be varied according to the conditions under which the tests are made and the previous knowledge of the car available to the party making the test. Often the trouble may be located quickly by changing the carburetor adjustment, tapping the carburetor to loosen a sticking float, finding the ground in the ignition system, or cleaning the commutator.

If changing the carburetor adjustment does not overcome the trouble, drain the carburetor bowl and sediment bulb. The engine may be raced to draw any small quantity of dirt or water through the carburetor jets. Racing the engine may also blow a piece of carbon out from under the valve.

The first thing to do in locating the cause of the backfire is to determine whether or not it is being caused by pre-ignition due to incandescent carbon. Throw off the ignition switch and if the engine continues to fire, the trouble is pre-ignition due to incandescent carbon. See if the cooling system is overheated. If it is, allow the engine to cool. When the system is cool, start the engine and note whether the backfire occurs before the water boils. If it occurs before the system boils, the trouble is due to hot carbon. If it boils before the engine backfires the fault lies in the cooling system. If the backfire occurs immediately on starting the engine, after the system has been allowed to cool, it is due to ignition or valve trouble.

While the engine is running, short the spark plugs until a cylinder is located where shorting eliminates the backfire. Test the ignition wires of this cylinder for a ground, or the valves for failure to seat.

See that there is no gasket leak, and that cylinder head bolts are drawn down tightly. See that the spark plug is tight by pouring a little oil around it and watching to see if gas blows by. In extreme cases, the sound of escaping gas may be heard.

Remove the valve door and examine the valve action. When examining the valves, see that the stem of the inlet valve is not too loose in its guide. Too much clearance at this point allows the cylinders to suck in an excessive amount of air.

If the compression is even in all cylinders, but the backfiring occurs steadily in one cylinder, the trouble lies in the ignition system (look for a short in the commutator wire) or less frequently, a leak around the inlet valve stem. If the leak is bad, the cylinder will not fire.

If it is necessary to short one and two, or three and four cylinders, to overcome the backfire, the trouble is probably due to a poor gasket between the inlet manifold and
the cylinder or an air leak in that branch of the inlet manifold.

If the backfire is irregular and cannot be located by shorting one or two cylinders, the trouble probably lies in the carburetor system. Having tried the carburetor adjustment, examine the inlet manifold and gasket for an air leak, by pouring a little oil on any doubtful spots. Drain the gasoline from the sediment bulb on the gasoline tank and carburetor bowl. Open the valve at the gas tank and the drain cock on the carburetor to note whether there is a steady flow of gas through the feed line, next race the engine. If this does not overcome the backfire it is necessary to remove and examine the carburetor.

The typical indication of backfiring due to ignition trouble is the coil buzzing continually. However, backfiring may be caused by the commutator not being set properly, dirty commutator, secondary wires shorting one into the other, or a wet coil box. With the exception of a wet coil box, these troubles may be located by visual inspection. This inspection should usually be made immediately after trying the carburetor adjustment, as backfire due to a faulty commutator, may indicate on a test the same as a carburetor trouble. The trouble with a wet coil box is best noted by weather conditions.

If the coil vibrates continually, examine the wire between that coil and the commutator as the trouble must necessarily lie in this part of the system. In the majority of cases, it is due to faulty wiring at the commutator or shorted commutator.

**Correct method of using Curtain Fastener and Carpet Catch Riveting Tools**

From inquiries received at this office it is evident that some dealers are not thoroughly familiar with the use of all tools that comprise the curtain fastener and carpet catch riveting set, shown in Fig. 11.

In order that there may be no misunderstanding regarding the correct use of these tools, we are outlining below the manner in which they should be used:

Use tools 2 and 7 to put fasteners in carpet; Insert No. 2 tool in block 11 and place T-10415X on same with points up. Place carpet over points, upside down and force points through. Then place T-10419X on points and set with tool No. 7.

Use tools Nos. 3 and 4 to put glove fastener in side curtain. Insert No. 4 tool in block and punch hole in curtain by striking with wooden block. Place cap T-3513X in recess on block; put socket T-3514 through hole in curtain and into cap; set with tool No. 3.

To put glove fastener in gypsy curtain follow same procedure using T-6904X and T-6902X and set with tool No. 10.

Use tools Nos. 5 and 6 to put glove fastener stud in visor. Insert No. 6 tool in block and punch hole. Place T-3515X stud on flat surface with visor over. Place T-3519X ball, over stud and set with tool No. 5.

Use tools Nos. 1 and 8 to insert side curtain grommet. Punch hole with tool No. 8. Lay T-6903 on flat surface with curtain over; then put on washer and set with tool No. 1.

Use tool No. 9 to rivet side curtain hook. Place rivet through curtain and hook with head of rivet on outside. Set with tool No. 9.
Three New Sales Opportunities

THREE new quality items possessing exceptional sales possibilities have recently been added to the list of genuine Ford products. The new items consist of a Ford dashlight; Ford adjustable rear view mirror and Ford windshield wiper.

The dash light is strongly constructed and is finished in black enamel to match the instrument panel. A feature of this dash light is that it is so designed that the base of the light fits into the instrument panel instead of simply being held against the surface. The dash light retails at 60¢ subject to regular discount.

The rear view mirror is made from silvering quality plate glass, which is the highest grade glass obtainable, it is amply large and is firmly held in place by means of a bracket of sufficient length to permit the mirror being adjusted to suit the convenience of the driver and locked in that position. The rear view mirror assembly lists at $1.50, subject to regular discount.

The windshield wiper is so designed that the rubber wiper is firmly held against the glass, insuring clear vision and total absence of vibration at all times. The list price of the windshield wiper is $1.25, subject to regular discount.

Every owner of a closed car is a prospect for high class accessories of this kind, and Ford dealers marketing these genuine Ford products are in an excellent position to secure the bulk of this trade. Furthermore, the immense volume of our business is an assurance to the purchaser of receiving exceptionally high grade articles at low retail costs.

The adoption of these items as genuine Ford products presents a real profit making opportunity to every dealer. Capitalize this opportunity by inaugurating an intensive selling campaign of these items; the additional profits you will receive will amply repay your efforts.
In Figures 13 and 14 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 ensuring 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.

Ford Batteries Superior

That nationally known concerns using Ford products are quick to realize the superior qualities of genuine Ford batteries is evidenced by the following voluntary recommendation received from the Western States and Electric Company of Stockton, California.

"We take pleasure in advising you that after a thorough test of Ford batteries, extending over a period of approximately two years and applied to various types of equipment, we find that same has met our requirements in every respect.

WESTERN STATES & ELECTRIC CO.
C. R. Eccles—Purchasing Agent."

NOTICE

The Tide Water Oil Company have been manufacturing and marketing a motor oil for use in Ford cars known as VEEDOL FORDOL.

At our request they have discontinued the use of the word FORDOL in connection with their Veedol motor oil for Ford cars.

This is to advise you that the new name adopted by the Tide Water Oil Company and to be used by them for their product heretofore known as VEEDOL FORDOL will hereafter be known as VEEDOL FORZOL.

The fact that we are publishing this information in the Service Bulletin should not of course be construed as an endorsement, as it is contrary to our policies to recommend any particular brand of oil.
An Attractive Parts Display

An effective method of displaying genuine Ford parts has recently been adopted by Ford dealers in our Buffalo Branch territory. The display has created so much interest in that section that we believe its general adoption will prove of value to all dealers.

The parts are attractively arranged on display boards as shown in Figures 15 and 16 and the exhibit is then placed in a prominent place in the showroom.

In addition to the interest and favorable impression that such a display creates, it also familiarizes owners and prospective purchasers with the various items that are used in the construction of Ford cars, and effectively illustrates the durability and strength that is built into every genuine Ford part.

The display boards can be constructed locally, or within reasonable distances can be purchased from the Niagara Metal Stamping Corp., Niagara Falls, N. Y., who are in position to quote attractive prices. The stand shown in Figure 16 is approximately 69" in height and 43" in width, while the one shown in Figure 15 is approximately 60" long by 22" wide. The boards are painted a dark green, with catalogue numbers and names of the items clearly displayed. The parts are fastened in place by wiring them to the display board. Before installing the parts on the board they should be thoroughly cleaned and coated with banana oil. This preserves their appearance and prevents any formation of rust.

Stimulating interest in merchandise through the medium of effectively displayed goods is a form of advertising that carries a strong appeal to the observer and yet involves little expense. Endeavor to so effectively display your merchandise that a favorable impression is created in the mind of the prospective purchaser—Arousing interest through the appeal of an attractive display of merchandise is an excellent sales adjunct, and one that is within easy reach of every dealer.
Correct Method of Assembling Gasoline Feed Pipe

Method of Assembling Gasoline Feed Pipe on Touring, Roadster, Coupe-1924, 4 Door Sedan & Model-TT

Fig. 17

Method of Assembling Gasoline Feed Pipe on Tudor Sedan

Fig. 18
Correct Method of Assembling Gasoline Feed Pipe

In assembling the gasoline feed pipe to the chassis it is extremely important that the exact alignment of the pipe be maintained.

Gasoline pipes are furnished shaped to proper form and under no circumstances should they be bent out of shape when being assembled to the chassis.

Figs. 17 and 18 show the correct method of assembling the gasoline feed pipe on the different models.

There are several points in connection with the installation of the feed pipe that should be checked by dealers before delivering either a new or repaired car to customers:

(a) Check for correct alignment of pipe at points where it enters carburetor and sediment bulb, see "A" and "B" in Fig. 17.

(b) Examine pipe to make sure it has not been bent out of shape and that it is securely held in place by the T-2118 clamps as illustrated in Figs. 17 and 18.

When a feed pipe has been forced out of alignment at either the carburetor or sediment bulb, or is not securely held in place by the T-2118 clamps, there is a possibility of a gasoline leakage occurring in the line at either the carburetor or sediment bulb, which is not only expensive to the owner but creates fire hazard.

Check these points carefully on all cars that are brought into your place as well as on the cars you have on hand. The examination requires but a few moments and is an excellent precautionary measure.

Light Design Piston

A new design piston has been adopted for use in both production and service which is known as the Light Design Piston. The new piston differs from the old type by having thinner side walls and smaller bosses and holes for piston pin bushings, and can readily be distinguished from the old type by the small flange that extends around the inside edge of the piston, at the bottom of the skirt. See "A", Fig. 19. The change in design reduces the weight of the new type piston to approximately 1 lb. 12 oz.

The use of the light design piston in production makes it necessary to carry the following pistons for service, in addition to the old design:

3021 L 418 H Light Design Piston — Standard
3021 M 418 JR " " .0025" oversize
3021 N 418 JR " " .0035" oversize
3021 P 418 KR " " .031" oversize
3021 Q 418 LR " " .033" oversize
3021 R 4473 H Light Design Piston with pin — Standard
3021 S 4473 IR " " .0025" oversize
3021 T 4473 JR " " .005" oversize
3020 U 4473 KR " " .031" oversize
3021 V 4473 LR " " .033" oversize

When replacing pistons it is very important that the correct type piston be used. Persons performing their own overhaul work should be advised to bring in the old piston so that the dealer’s stock man may see that they get the proper type piston to replace the one removed. If however, four new pistons are required for the same job the new design piston should be supplied.

The outside dimensions of T-668 Piston Pin Bushing, have been changed. It is therefore, necessary to carry two bushings, to be listed as 3022½ 668 AR and 3022C 668 B. Both the heavy and light design pistons now being produced are being equipped with 3022C 668 B Bushing. The 3022½ 668 AR will, therefore, only be carried for rebushing old heavy design pistons.

Prior to being adopted as standard equipment the new design pistons were subjected to exhaustive tests, and thoroughly proved their efficiency. The principal advantages gained from their use are faster acceleration and a smoother running motor.

The new type pistons are of exceptionally high quality and long life and possess none of the objectionable features that characterize many of the so-called light weight pistons that are advertised for Ford cars.
New Design Camshaft and Bearing

An engineering change was recently made in the model T cam-shaft 3041-410 by lengthening No. 1 exhaust cam \( \frac{3}{6} \)" and shortening the cam-shaft front bearing T 411 the same amount. Fig. 20 and 21 illustrates the changes that have been made in these parts. It will be noted that the notch "B" and the 30 degree chamfer "A" on the rear end of the old style bearing has been eliminated on the new type.

The length of No. 1 cam on the new design cam-shaft has been increased from \( \frac{7}{8} \) to \( \frac{11}{16} \)". This change of course decreased the distance between the cam and flange, the distance between these points being \( \frac{177}{32} \)" on the new shaft and \( \frac{133}{32} \)" on the old type.

The old type cam-shaft bearing will be listed as 3042-411AR while the new type will be listed as 3042B-411B, both bearings being carried in service stock. The new type cam-shaft will be carried under catalog No. 3041, Factory No. 410 the same as the old type, as the old design will no longer be available after present stocks are exhausted.

Due to decreasing the distance between No. 1 cam and flange on the new type shaft, when selling a cam-shaft front bearing it will be necessary to ascertain whether the car in which it is to be installed is equipped with the old or new type cam-shaft.

After your stock of old style cam-shafts is exhausted you will furnish the new type shaft and new type front end bearing in filling any orders you receive for the old style shafts. Having to purchase a new front bearing under such circumstances should not prove objectionable to customers, as the additional cost of the bearing is slight and furthermore it would not be good practice to install a new cam-shaft without replacing the front bearing.

Adjusting the Brake Pull Rods

The Brake Pull Rods are adjusted so they will pull evenly on both wheels, and the brake will be set tightly when the hand brake lever is in a vertical position. The adjustment is made by turning the threaded clevises on the ends of the pull rods. Ordinarily the pins will slip into the clevises readily. However, if trouble is experienced, place the hand brake lever forward and draw the pull rod so that the hub brake lever enters the clevis. Insert a drift through the clevis and lever holes to draw them into line. The drift may be made from a piece of \( \frac{1}{8} \)" round steel bent at right angles and tapered at the ends. When the clevis and lever holes have been lined up properly withdraw the drift and insert the pin. Then try the brakes to see that they are set evenly, proceeding as follows: With the rear axle jacked up pull the hand brake lever back as far as it will go. Next examine wheels to see whether they are both tightly locked, if not, readjust until both wheels are locked, then release hand brake and examine wheels to make sure the brakes are not dragging.
Adverse Conditions Do Not Affect Ford Service

Last winter when ordinary methods of transportation were rendered ineffective for long trips owing to exceptionally heavy snow falls, Mr. M. A. Small, Ford Service Dealer at Belcourt, N. D., obtained a dog team and sled and transported genuine Ford parts for a distance of fifteen miles to owners in Belcourt who were in need of such material.

Maintaining Ford service in spite of such decidedly unfavorable conditions is both a tribute to Mr. Small's zeal and a credit to the service which he represents.

Figure 22 shows the outfit used by Mr. Small in transporting Ford parts.

Revision of Fordex Ford Facts

A revised edition of Fordex Ford Facts has just been released by its publishers, the Sales Equipment Company, Kerr Building, Detroit, Michigan.

The new book Fig. 23 contains 112 pages of instructive data. It is of the same convenient vest pocket size as the former edition and in addition includes a large amount of new and valuable information pertaining to Ford products.

We believe the information contained in the latest edition of Fordex Ford Facts will prove beneficial as well as interesting to everyone in the dealer's establishment. This applies particularly to service men and parts salesmen, whose value today is largely determined by their sales ability, as well as mechanical knowledge, consequently the greater degree of knowledge they possess concerning Ford products the more valuable they become to their employer and the greater their earning capacity.

Fordex Ford Facts retails at $1.50 per copy or $3.50 for a carton of three.
STARTER NOTES

When assembling the Bendix Drive to the starting motor shaft, care must be used to see that the stop nut or bearing which enters the mounting bracket on the starting motor is not too tight; also that the bearing is in proper alignment with the bracket. The bearing should be oiled and then fitted so that it can be turned readily with the fingers. If the bearing is too tight, it should be dressed down with an oil stone. Too tight a fit will cause the bearing to freeze to the bracket, resulting in serious damage to the starter.

When installing the generator, the drive pinion must be properly meshed with the large time gear. The generator bracket, that is, the section to which the generator is bolted is separate from the cylinder block and the meshing of the generator driving pinion with the large time gear can be regulated by the use of one or more paper gaskets between the bracket and the cylinder block. The bracket should rest tightly on the crankcase gasket and line up with the face of the time gear case. If these gears are meshed too tightly, a humming noise will result, also the generator shaft will be thrown out of alignment.

THE STARTING MOTOR

The starting motor is of the series wound type, that is, when the switch is in, the current passes from the battery through the field to the positive brushes into the commutator, then through the armature to the ground brushes. To decrease the resistance there are two positive brushes and two ground brushes, half of the current passes through two of the field coils, and one of the positive brushes, the other half of the current flows in a similar path on the opposite side of the motor.

The wiring of the motor is much heavier than that of the generator, because it carries a greater flow of current. The motor has a stall torque of between 14 and 16 ft. pounds and draws between 175 and 225 amperes when turning over an engine, depending on temperature and the amount the engine has been run in.

The brush end bearing is self-lubricating. The mounting bracket arm has a babbitt bearing for the bendix drive and a bronze bushing for the armature shaft. The last two bearings are lubricated by the oil in the transmission.

Because of the short duration of its operation the motor requires very little attention. However, after a car has been in service for a long period it is good practice to inspect the motor to insure efficient operation. A back-fire may spring the armature shaft or disarrange the bendix drive, making repairs necessary.

If the motor fails to turn the engine over, test the battery, inspect the wiring and try turning the engine over by hand before removing the motor.

GENERATOR BRUSH HOLDERS

When overhauling a generator the brush holders should be carefully inspected to see that they are not cracked and that they are securely riveted to the support. The brushes should be free in the holder so that there is no danger of their being held off of the commutator. It sometimes happens that a deposit forms on the holder, thus causing the brush to bind. If this occurs, withdraw the brush and file the hole in the holder. Do not file away the brush, simply remove any high deposits which may appear on it. Due to excessive heating caused by dirty commutator, high mica or improperly set brushes, there is a possibility of the solder which holds the pig-tails on the brush flowing, causing the brush to stick to the holder. The solder on such a brush should be filed off flush with the surface. A new brush should be inspected to see that the solder at this point is flush with the face before placing it in the holder.

If the holder is loose on the support it may be tightened by peening the rivets. When tightening the positive (insulated brush holder), take care not to crack the insulation. The third brush holder is not secured by rivets but by means of a stud, nut and lock washer. Sometimes the nut may be drawn down too tightly, causing the head of the bolt to cut through the insulation; this causes a ground between the insulated holder and the support. Such a ground may be proved by holding one of the terminals of a test lamp (110 volt circuit) on the holder and the other terminal on the support. If a light shows, the holder is grounded.

Test the springs to see that they are not riding on the edge of the holder but are exerting their full strength on the brush. To do this raise the brush by means of the pigtail about ½". It should, when released, drop back onto the commutator with a sharp click. If the spring is riding against the side of the holder it may be bent back to fit properly. If the spring has become weakened it should be replaced. This is done by removing the support and inserting a knife in the slot to spread the post, after which the spring may be withdrawn. The new spring is then positioned and the slot in the post closed.
An Attractive Sales and Service Building

A sales and service building every part of which reflects neatness and cleanliness and whose pleasing appearance is further enhanced by well kept lawns in which flower beds are attractively arranged, is the appealing combination that has been developed by the Owens Motor Sales, Ford dealers at St. Paul, Minn.

For the exclusive purpose of displaying used cars and giving tractor demonstrations, these dealers have improved a section of ground at the side of their building around which they have built an ornamental fence with a trellis constructed over the entrance to the grounds, which is covered with vines—the whole arrangement presenting an exceptionally attractive appearance, which makes a direct appeal to the observer.

The pleasing manner in which the Owens Motor Sales display their merchandise and the attractive and cleanly appearance of their entire establishment, arouses the interest of prospective purchasers of both new and used cars and is indicative of the high type of service which they render.
Assembling Windshield Glass

Windshield glass is furnished in three thicknesses, namely ⅛", ⅝" and ⅝". The canvas-back cork retaining strips which are placed along the edge of the glass before assembling it into the frame are listed under part numbers T 17314AX, T 17314 BX, T 17315 AX and T 17315 BX.

The T 17314 AX and BX are ⅛" and ⅝" thick respectively, and are used on the lower half of the windshield. while the T 17315 AX and BX are also ⅝" and ⅝" thick respectively but are slightly longer in length and are used on the upper half of the windshield.

After placing windshield frame in position on either a table or bench the glass should be inspected for thickness. If it is ⅛" thick a piece of friction tape 59" long for upper glass and 55" long for lower glass should be placed along the edges of the glass, that fit into the frame, as shown in Fig. 25, after which one of the ⅛" and ⅝" cork retaining strips should be applied in the same manner. If the glass is ⅝" thick a piece of friction tape and one of the ⅝" cork strips is applied. If the glass is ⅝" thick a piece of friction tape and one of the ⅝" cork strips is used.

When installing glass in frame hold cork sheeting firmly against the glass and insert glass into channel, then force the glass down a few inches at a time as shown in Fig. 26.

After the glass has entered into the cross piece of channel frame, raise frame several inches.
from bench and jolt it down until glass sets firmly in frame, as illustrated in Fig. 27.

Trim cork strips flush with frame on both sides, using sharp knife of a good grade as shown in Fig. 28 then trim ends of cork sheeting flush with end of frame. Trim tape leaving a sufficient amount to fold under glass clip.

Assemble glass clip, as shown in Fig. 29.

The upper half of the windshield is assembled in exactly the same manner as the lower half with the exception of course that the finger clips must be assembled after glass clip has been installed.

Displaying Merchandise

While seeing may be believing—from a merchandising point of view “seeing is buying.”

Display your stock of Emergency Kits, as well as the new Ford windshield wiper, dash light and rear view mirror in such a manner that everyone passing by or entering your place of business can observe this material.

The sales possibilities of these items are such that no dealer can afford to overlook the profit making opportunities they present.

Adjustment of Fan Belts

The fan on the Model T motor is designed to draw a certain amount of air through the radiator; the amount of air varying with the speed of the engine. The proper working of the fan at any engine speed, and hence, the suction of the required amount of air, is solely dependent on the fan belt. It is accordingly important that the fan belt be kept in proper working order.

When installing a fan belt the pulleys should be carefully checked for correct alignment, this can be done by placing a straight edge across the sides of both pulleys. Then loosen the fan bracket allowing the fan to drop to its lowest position. Place the belt over the fan working the belt around the crankshaft pulley with the hands. Never use sharp tools for this purpose. Next raise the fan until the tension on the belt is fairly tight.

The correct adjustment of the rubber fabric fan belt may be obtained by attaching a spring balance on a blade of the fan as shown in Fig. 30, and adjusting the belt so that a pull of five pounds on the spring balance will just be sufficient to cause the belt to slip on the pulley.

When a fan belt is adjusted too tightly it will have a tendency to force the pulleys out of alignment and cause the belt to become frayed. In fact, a belt with a frayed edge indicates that one of the pulleys over which the fan belt runs, is out of line. If care is taken to prevent this condition, the life of the belt will be prolonged.

When a fan belt slips, it is usually due to being adjusted too loosely and should be tightened as outlined above. A slipping belt will wear much more rapidly than a belt which is correctly adjusted. Owners should bear in mind, however, that more trouble is caused by belts being adjusted too tightly than too loosely.

Belt dressings or oils should not be used on the fan belt adopted as standard equipment on Ford cars.
A Service Plan That is Proving Profitable

ANNOUNCING
A NEW ECONOMY
FOR FORD OWNERS

"Economy Maintenance Service"
by the
Don Prentiss Motor Co.
AUTHORIZED FORD DEALERS
Broadway and Jackson

Ford
PRODUCTS

NEVER CLOSED

PHONES
City 5926
South 1053

BECAUSE Fords will continue to run in almost any condition, owners sometimes fail to give them the attention they would be compelled to give cars of other design. With more timely care, we believe the majority of Ford Owners could double the life of their cars and cut maintenance costs fully one-half.

Our “Economy Maintenance Service” will save you at least 50 per cent on labor prices in the actual operations described, and is designed to hold the need for other shop repairs to an absolute minimum.

This Service is the "ounce of prevention" that saves the "pound of care."

Allow us to place your name on our list for this highly specialized service. After your car leaves our shop, our Service Men will periodically call to inspect your car and make recommendations to enable you to get the utmost in longer life, lower expense, higher value and even greater satisfaction from Ford products.

Should work or material be needed other than that listed herein, a report will be made to you and with your permission, will be cared for on a regular shop repair order.

Patrons of our “Economy Maintenance Service” are saving while we are serving. And, as we never close, they are able to leave their cars and trucks at times most advantageous to them.

We can work while you sleep.

The first impression gained after examining the list, is that it would be difficult to realize a profit in performing all of these operations at a labor charge of $12.50. When it is taken into consideration, however, that comparatively few cars will require all of the work included in the list, and furthermore that many of these operations are so correlated that several of them can be performed in only slightly more time than is required to perform one, it can readily be seen how such a plan has proved profitable.

Mr. Prentiss advises that this plan has not only greatly increased his volume of service work on the particular operations which it covers, but that he is now receiving many

The Don Prentiss Motor Co., of Louisville, Ky., recently inaugurated a plan that has proved very effective in increasing their service profits.

The plan consists in combining a number of the most frequently called for service operations and performing such work at a fixed labor charge of $12.50 which is approximately half as much as it would cost to have all of such service operations performed separately.

The list of operations which Mr. Prentiss performs at this single labor charge, is shown in the pamphlet illustrated in Figs. 31 and 32, a copy of which is mailed to all Ford owners in his community.
orders for complete motor overhauls and all branches of service work as a direct result of this service.

The value of a service plan which attracts new customers to your place of business should not of course be determined solely by the labor profit which it yields, but rather it should be considered from the standpoint of the opportunities it presents to every department of the dealer’s business.

The principal opportunities presented by Mr. Prentiss’ plan are:

(a) Greater volume of service work, which not only reduces the dealer’s overhead expense, but results in additional parts sales and more frequent stock turnover.

(b) Maximum profits on your parts sales, as under this service plan all parts are sold at retail prices.

(c) Enabling the dealer to obtain a line on the age and condition of the cars owned by these prospective Service Customers from which an excellent list of new car sales prospects can be secured.
In addition to the profit that can be derived from a plan that attracts more car owners into your service station, it also affords the dealer an opportunity of converting this class of trade into permanent service customers through the medium of efficient and courteous service.

**Use Correct Type Drive Shaft to Worm Couplings**

Under no circumstances should the 1041-TT85AR Drive shaft to worm coupling be used on trucks manufactured subsequent to July 1st, 1919. At that time in order to increase the strength of this part the depth of the splines were increased approximately \( \frac{3}{16} \) in. on both the coupling and drive shaft, the new coupling being listed as 1041B-TT85B. See Figs. 33 and 34.

While the old design coupling with shallow splines can be assembled to the present type 1034-TT87 Drive shaft, it makes a very inefficient job, and due to the fact that the splines do not engage to their full depth will result in shearing the splines.

When replacing a drive shaft to worm coupling on trucks manufactured since July 1st, 1919 it is necessary that extreme care be taken to use the correct type coupling, namely 1041B-TT85B

**Correctly Fitted Piston Pins**

To insure piston pins being correctly fitted, all model T pistons are now being shipped from the factory with the pins assembled, and should be sold in this manner by dealers.

The list price of the piston with pin assembled is $1.20, which is but 25 cents more than the price of the piston only.

This change has been necessitated by the fact that dealers frequently made a practice of selling pistons and pins separately without reaming the bushings and fitting the pins. As a result of this practice garages and car owners often performed such an unsatisfactory job in installing the pin that a piston pin knock developed.

When the importance of having the piston pin correctly installed is explained to an owner, you should experience no trouble in selling him a piston with pin assembled, as the knowledge that this work has been properly performed and that satisfactory service is assured will more than compensate him for the slight additional cost.

**Incorrect Use of Battery Current Weakens Magneto**

Some owners make a practice of using a battery on the tractor for starting purposes. When this is done care should be taken to see that the battery is not connected to the coil box terminal until the magneto wire has been disconnected at either the coil box or magneto terminal.

If the battery is connected to the magneto wire terminal on the coil box without first disconnecting the magneto wire, the magnets are liable to be weakened by the battery current.
Tractor Brake Adjustment

From inquiries received at this office it is evident that dealers are failing to instruct owners how to correctly adjust the transmission brake on the Fordson tractor.

In order that there may be no misunderstanding as to how this adjustment is made, we are outlining below the correct procedure to follow.

Remove the foot plate which is located on the right side of the transmission, and expose the adjusting screw "A", Fig. 35, located at the lower end of the clutch lever. It is extremely important that this screw be adjusted so that a gap of not less than $\frac{1}{6}$" or more than $\frac{3}{8}$" is obtained between the head of the screw and the upturned lug "B" on the brake shaft.

It is absolutely essential that this clearance be maintained in order to allow some movement of the clutch pedal to throw out the clutch before bringing the brake into operation.

Failure to do this will cause the brake to drag, resulting in excessive wear of the plates.

The Ammeter

At an engine speed of 15 miles per hour or over and with the third brush correctly adjusted, the ammeter should show a reading of from 10 to 12 amperes with lights turned off.

If the engine is running at 15 miles or more per hour and the ammeter does not show the above reading, first inspect the terminal posts on the ammeter, making sure that the connections are tight, then disconnect the wire from the terminal on generator cut out and with the engine running at a moderate speed, take a pair of pliers or a screw-driver and short circuit the terminal on the generator to the generator housing. If the generator is O. K., a good live spark will be noted. (Do not run the engine any longer than is necessary with the wire disconnected.) Next inspect the wiring from the generator through the ammeter, to the battery for a break in the insulation that would result in a short-circuit. Remove the dust cap from the end of generator and thoroughly clean the generator commutator, using for this work a fine grade of sand-paper which has been slightly oiled. With the motor running, hold the sandpaper against the commutator with the fingers until all dirt has been removed and a bright surface attained.

When adjusting the third brush, under no circumstances should force be used in tightening the clamping nut. The clamping nut should, of course, be run down sufficiently far to prevent the third brush holder from moving. When force is used in tightening the third brush clamping nut, there is a possibility of damaging the insulation which will cause a ground and failure of the generator to deliver a charge.
Types of Door Panels Used on Ford Closed Bodies

Two types of door panels are used on Ford closed bodies.

After a Fordor panel is assembled to the door frame the assembly is completed by the installation of a "T" trim moulding as shown at ("B") Fig. 37. This type of construction permits replacement of damaged door panels.

On the Tudor and Coupe panels a bead as shown at ("A") Fig. 36, is stamped around the edge of the door panel and this does away with the "T" trim moulding. The door jams are covered with a steel panel that interlocks with the outer panel and this together with the wooden frame constitutes a complete unit. Consequently when replacing a door panel on the Tudor or Coupe one of the following assemblies should be used rather than attempting to replace the panel only:

17450 X Door Panel and Frame Assembly, R—Coupe  
17451 X Door Panel and Frame Assembly, L—Coupe  
17559 X Door Assembly less Trimming, R—Tudor  
17560 X Door Assembly less Trimming, L—Tudor

While the price of the above assemblies is of course higher than that of the panel only, the time and labor saved by the dealer in installing the assembly practically offsets the additional cost to the customer.

Genuine Ford Parts Demonstrate Their Quality Under Severe Test

The following extract was taken from a letter we recently received from Noel E. Bullock, the well known Western racing driver.

"As a race driver and aviator, I have always used the best material available in building my cars and in rebuilding airplanes. Genuine Ford parts have always served me well; and of over 200 races in which I have started in the past five years, just once was I unable to finish due to the failure of a Genuine Ford part, and that was due to the extremely rough track which caused me to bend a front spindle.

On Sept. 6, 1922, just after winning the Pikes Peak National Championship, the Penrose Trophy and first in my class, I obtained a set of spindle arms from a Denver concern. I called for Genuine Ford parts, but they gave me bogus parts.

On Sept. 16th at Brighton, Colorado, both of these bogus parts broke; one of them breaking in three pieces. The result was the hospital for me and 28 stitches in my arms, besides a badly damaged racing car and a lost race. I have always been able to depend on Genuine Ford parts and my motor is all Ford except head, carburetor, ignition, oil pipe, exhaust pipe and cam shaft.

Surely no more severe tests can be put on an automobile than those which my Ford race car has sustained.

I congratulate you as dealers of cars built from a quality material throughout."

(Signed) NOEL E. BULLOCK.
An Attractive Parts Department

Figure 38

THAT attractive displays of merchandise are not confined solely to concerns located in the larger cities is evidenced by the pleasing display of genuine Ford parts illustrated in Fig. 38 which shows the parts department of Mr. C. J. Nelson, Ford dealer at Clifton Heights, Penn., a town of less than 3500 inhabitants.

In addition to effectively displaying merchandise, the glass show case is used as a counter over which all service bills are paid. This arrangement insures the customer noticing the items displayed and frequently results in sales.

An analysis of the methods employed by successful merchants proves that too much importance cannot be attached to keeping a place of business clean and inviting in appearance. This is not simply a duty that you morally owe yourself and community—it is a valuable and serviceable business asset.

There is an indefinable feeling in most of us that quickly responds to pleasant surroundings and courteous treatment, and this feeling so largely determines our selection of a place at which to trade that no concern can afford to overlook the important bearing it has on their business.
Instructions for Cleaning Car

Fig. 85

1. Any dust on top of a closed car should first be removed. A whisk broom can be used to good advantage for this purpose. Mud spots should be washed off with a slow stream of water flowing from a hose without nozzle, using a sponge to facilitate the operation. The excess water should then be taken up with a sponge and the top dried with a chamois. After a top has been in service approximately six months it is a good plan to apply a brush coat of high grade spar varnish containing 5% of black color.

2. The interior of the car is brushed with a whisk broom. If the upholstery is soiled it should be cleaned with gasoline, or cleaning fluid. The floor mat should be brushed and if necessary cleaned with gasoline. (Caution: When using gasoline keep fires away.)

3. The motor may be cleaned with kerosene applied with a water tool brush (an oval shaped brush) preferably about 1" diameter, after which it should be washed with water in which linseed oil soap has been dissolved, then rinsed off with clean water flowing at low pressure from a hose without nozzle, using a sponge to facilitate the operation. Any excess water should be taken up with a sponge, and the motor then allowed to dry. If any parts are rusty, sand, dust off and touch up with M-165 Black Enamel.

4. Plenty of water should be used when washing the body in order to remove all dust and mud. A slow stream of water flowing from a hose without nozzle should be used for this purpose, using a sponge to facilitate the operation. The excess water is then taken up with a clean sponge and the body dried with a chamois. Avoid the use of soap whenever possible. If a polishing fluid is used only one that is neutral and contains but a small amount of finely ground abrasive should be used. If any part of the body is noticeably marred, touch up with M-111 Ford touch-up black.

5. The fenders, running boards, hood, radiator, and lamps are washed and polished as outlined in paragraph No. 4. If any part is rusty, sand, dust off, and touch up with M-111 Ford touch-up black.

6. The running gear is washed with water flowing from a hose without nozzle attached, using a sponge to facilitate the operation. After the mud has been removed, sponge with water in which linseed oil soap has been dissolved. This should remove all grease. Next rinse with clean running water. If the greasy spots are such that soap and water will not remove them, wash with kerosene and then apply soapy water as directed above. For drying, use chamois only. If a polishing fluid is necessary, use nothing but a neutral polish which contains a small amount of finely ground abrasive. If any part is rusty, sand, dust off, and touch up with M-165 Black Enamel. Tires can be cleaned with a rag moistened with gasoline after any mud or dust have been washed off.

7. All nickel plated parts are polished with any metal polishing compound designed for the purpose.

8. The windshield and windows should be cleaned last. For this purpose use a sponge which has been well soaked and ring out in water containing a small amount of ammonia. Dry and polish with soft, clean rags. Best results will be obtained by using dry, clean rags which have been washed free of linters.

(See next page for Instructions for Polishing.)
An Effective Method of Advertising Fordson Tractor Paint

Demonstrating the quality of Fordson tractor paint by using it to paint the walls of their own sales and service building (see Fig. 40) is the convincing method used by the Parkway Motor Company, Ford dealers at Washington D. C. to advertise this product and incidentally illustrate another of the purposes for which this quality paint can be satisfactorily used.

The cleanly appearance and brightening effect in a sales and service building whose floors and walls have been made attractive by a coat of paint of the quality of M-210 not only creates an inviting appearance but proves an excellent medium in advertising this product.

While the list price of M-210 is trifle higher than the price of ordinary paints, which are sometimes used for painting walls or floors, the quality of M-210 tractor paint is taken into consideration, together with the fact that the dealer obtains it at net price it will readily be seen that its cost to him in improving the appearance of his place of business is exceptionally reasonable.

Proving the confidence you have in an article by using it yourself is a convincing method of advertising, as it not only affords an opportunity to the prospective purchaser to examine the product in actual use, but the conclusion he forms after comparing your statements concerning its advantages with the fact that you are using it in your own business, usually results in the sale of the article.

Instructions for Polishing
Polishing cloths must be of clean, soft material, free from linters. When polishing a car, first moisten one cloth with water, and then pour just enough of the polishing fluid on the cloth to spread over one panel at a time. Next take a dry cloth and wipe off the polishing fluid. Then use another dry cloth for polishing. It is imperative that in drying and polishing the operation must be carried out in one way strokes only, i.e. the strokes must be horizontal or vertical but never crosswise or circular. In drying with a chamois, use only the flesh side which is soft and fluffy.

Display Your Own Products
Various concerns have adopted the practice of distributing free samples of their product to Ford dealers for display purposes. This is unquestionably the most direct method of advertising any device applicable to Ford cars and the dealer who permits his counter or show window to serve this purpose, inadvertently assumes the appearance of an agent for the outside manufacturer.

The space you have for display purposes is too valuable to be taken up by accessories and appliances of a non-essential character. Furthermore, a collection of these appliances gives your service station the appearance of a bazaar, which distracts the attention of customers from the products in which you are most vitally interested.

Make the most of the business you are in—SELLING FORD PRODUCTS.

Pumping Oil
The typical indications of pumping oil are: a blue smoke at the exhaust, a moist deposit of carbon in the spark plug and the head of the cylinder.

Check the oil level in the crankcase to see that it is at the correct height. If the oil level is found to be O.K., the trouble is no doubt due to weak or undersize rings, rings set improperly, or scored cylinders.
A New Unit for Garages and Stores Handling Genuine Ford Parts

There is a considerable demand among service stations, garages and stores for an adequate stock bin system for handling a small stock of fast moving Ford parts. To meet this demand we are furnishing a new steel parts unit (See Fig. 41) which can be obtained at an exceptionally low price.

It has frequently been proved that an attractive arrangement of merchandise promotes a larger volume of sales, and in order that small garages and merchants selling Ford parts can take advantage of this fact, this attractive new parts unit has been designed.

The unit consists of a specially designed stock bin which is so constructed as to hold a small quantity of the majority of those parts for which there is the greatest demand, each section of the bin being plainly numbered, so that parts may be located at a glance.

The new unit is not only neat and attractive in appearance, but it creates a favorable impression of system and orderliness.

Inasmuch as parts are always visible, it is a simple matter to note when additional quantities of any item are required, thus insuring adequate stocks and satisfied customers at all times.

The booklet entitled “Profits in Ford Parts for the Garage,” copies of which will be forwarded to all dealers, who in turn will forward a copy to all concerns in their community selling Ford parts, is illustrated in Fig. 42, and describes this unit in detail.

Marketing a line of merchandise for which there is a large demand is a valuable asset to a merchant, because it is instrumental in causing people to enter his establishment who bring their buying power with them. It is by attractive display and the power of suggestion that the progressive merchant appeals to customers who enter his place of business.

The satisfaction derived by customers in being able to promptly obtain the genuine article over the counter can never be attained by “just as good” substitutes or by information to the effect that “we will get it for you.”

This attractive proposition will make a direct appeal to all aggressive service stations, garages, and concerns selling Ford parts. Information and delivery can be obtained from any Authorized Ford Dealer or the nearest Ford Branch.

The price of this bin is $45.00 f.o.b. Ford Branch city. The parts required to fill this bin cost $232.69 and when sold at retail bring in $335.99, thus making a gross profit of $103.30.

Fig. 41

Fig. 42
Types of Window Regulators Used on Ford Cars

In order to eliminate the difficulty that is sometimes experienced in ordering the correct type window regulator for replacement purposes, we illustrate in Fig. 43 the various type regulators used to date in Ford closed bodies.

17200A - 17201A shows two designs of the A type regulator. Either can be used in place of the other.

There are rights and lefts of 17200-17201A, B and C, but 17200D is used interchangeably for either right or left side.

We can supply types A, B and D for repairs, but when it is necessary to replace one of the C type regulators, the D type, together with corresponding lock board, should be furnished, as the C type is no longer available.

Locating Trouble When Engine Fails to Start

Failure of the engine to start usually results from troubles in the ignition or carburetor. Weak compression in the cylinders will, however, occasionally cause trouble in starting. This is also true when there is excessive end play in the crankshaft and the car is started on magneto.

If the trouble lies in the ignition, it is due to either a weak or dead magneto or battery; ground in the primary circuit, (usually the wires between the coil box and the commutator); dirty commutator case; broken or weak spring on the commutator brush; water in the coil box; or if the car has been standing for some time, all the coils or spark plugs may require attention.

If when the starting switch is closed the engine does not turn over but the lights go out, the battery is run down. If, however, the battery is O. K., turn the switch key to point marked "Bat," and slowly crank engine, listening for the buzz of each coil unit. Stop cranking at each buzzing point and place a screw driver on the cylinder, leaning it close to the terminal of each spark plug to see if there is a spark. If there is no spark at the plug which is connected with the buzzing coil, shut off switch and remove wire from spark plug. Then turn on the switch and hold terminal of this wire close to cylinder head. If there is a spark, the spark plug is shorted. Take the plug apart and clean the porcelain, or if necessary install a new plug. If there is no spark when spark plug wire terminal is held near the cylinder head, while the coil is buzzing, the coil is either defective or the spark is being grounded in the coil box. Put one of the other coils in the place of the buzzing coil. If a spark occurs at the wire terminal, the first coil is defective. If a spark does not appear, and the coil buzzes, the coil box is grounded or the second coil is defective.

If the coils do not buzz when the engine is cranked slowly, ground the lowest terminal on the coil box. If a spark appears, there is a break in the circuit between this terminal and the commutator roller. Ground the four top terminals on the coil box and if none of the coils buzz, the coils may be out of adjustment, are in the box wrong side forward, or there is a break in the circuit between the bronze strip in the bottom of the coil box and the lowest terminal on the coil box.
If the coils all buzz when the four top terminals are grounded, either the spring on the commutator roller is broken, the commutator case is out of position, or the commutator wires are broken or disconnected. If, when the engine is cranked slowly, all but one of the coils buzz, the coil failing to buzz is out of adjustment or the wire connecting it with the commutator is broken. If one, or more of the coils buzz continuously, the wire connecting it with the commutator is grounded through a break in its insulation or its segment in the commutator is grounded. Clean the commutator or tape the bare spot on the wire.

On a car whose only source of ignition is the magneto, turn on the switch and crank engine rapidly while someone checks the action of the vibrators on the spark coils, to make sure they are operating O. K. If they fail to buzz, remove the wire from the magneto terminal and while the engine is being cranked rapidly, ground this terminal to see if it sparks. If it does not spark, remove the magneto contact post. Examine the post to see if the spring is in good condition, also its point of contact, to make sure there is no foreign substance between it and the contact post spring, or no wire, or cotter pin grounding it. If the contact is dirty, clean out the slight indentation made by the contact spring and replace the contact post. If necessary, stretch the spring a little. Try the spark by shorting the terminal to cover with a screw driver. If there is no spark now, the trouble lies in the magneto.

The easiest way to prove a weak magneto on a car not equipped with battery is to run one wire from a six volt storage battery or 3 or 4 dry cells, to the right hand terminal post on the terminal block, and the other wire to some metal part of the motor. Turn the switch key to the other position and try starting the engine. On cars equipped with starters turn switch key to point marked “Bat.” If the engine starts, the magneto is either weak or dead.

While running the engine, take a volt meter reading. Remove the wire from the magneto terminal. One wire from the volt meter is pressed against the magneto terminal while the other is pressed against some clean part of the cylinder or transmission cover. Throttle the engine down to about 400 revolutions per minute, which is equivalent to a speed of 10 miles per hour. The magneto should generate at least 7 volts at this speed.

If the car is hard to start but can be made to run on the magneto, a voltage reading may be made while the engine is running. To insure a correct reading, the light and horn wires should be removed from the terminal block on the dash.

On old cars, a weak magneto may be caused by excessive end play in the crank shaft which increases the air gap between the field coils and the magnets to such an extent that it will not generate its normal output. Excessive end play can be noted by inserting a large screw driver or piece of flat stock between the fan pulley and the time gear cover. If there is any noticeable movement at this point, there is end play in crank shaft.

If the magneto is O. K., disconnect the wire which is on the lowest terminal on the coil box. Then using a temporary wire, connect this terminal with the magneto terminal which should have no other wire on it. If the engine does not start, the trouble lies in the coil box coils, spark plugs or commutator. If the engine starts, the ground is in the horn or lighting system. Replace the horn system wire and if the engine runs, the trouble is in the lighting system.

If the trouble lies in the carburetor, it is no doubt due to: incorrect adjustment of needle valve; no gasoline getting to the carburetor; water in the gasoline; choke valve closed; dirt in jets; air leak in the inlet manifold; gasoline not vaporizing readily due to cold weather. If the trouble cannot be located by preliminary tests, the carburetor should be removed, cleaned and examined. The principal points to be checked in service are the spray needle, spray nozzle and proper setting of float. The distance from the top of the float to the machined flange on the mixing chamber on the Ford N H carburetor should measure $\frac{15}{44}$, while on the Kingston carburetor this dimension is $\frac{1}{16}$.

Weak compression caused by valves not seating properly, worn pistons and rings, etc., may also cause trouble in starting. This condition may be detected by cranking the car by hand.
Lubrication of Fordson Rear Axle Roller Bearings

Each of the Fordson rear axle shafts are supported at their inner ends by the differential assembly which is in turn carried on large size ball bearings. These bearings are lubricated by a constant flow of oil carried up by the worm wheel.

The outer ends of the axle shafts are supported by roller bearings (S5-F2035) which are not internally lubricated and require frequent lubrication by the operator.

A tractor operator does not expect the bearings in the engine to stand up if he neglects to replenish the oil in the crank-case or maintain it at the correct level, and yet there is a tendency among many Fordson owners to expect the rear axle roller bearings to stand up indefinitely without lubrication.

The rear axle roller bearings are lubricated by means of two grease plugs ("B," Fig. 44), which should be removed once a week and grease forced into the bearings. When fenders are used on the tractor, it is difficult to remove the grease plugs owing to the proximity of the fenders and in order to overcome this condition we recommend replacing the standard pipe plug which is now used, with a $\frac{1}{4} \times \frac{1}{2}$ pipe reducer bushing which can be obtained at any hardware or plumber's store. This will give the correct size hole for our standard grease cup 2579-T 195. One of these grease cups should be assembled in each side of the axle.

On tractors built during 1924, the grease cups can be assembled without interference from the fenders. On tractors built previous to 1924, however, the oil plugs were located at the rear of the axle housing and were pointed straight back, consequently with fenders installed, a grease cup cannot readily be used on account of fender interference. To remedy this condition, the rear axle housing S2-F-1674 should be shifted by removing the 12 cap screws which hold it to the main housing and turning it backward one hole as shown at A, so that the grease cup will be in the position shown at C. This will make an easily accessible location for the grease cup.
New Design Crankcase Oil Tube

An engineering change was recently made in the crankcase oil tube changing the length of the funnel from 1 1/2 to 3 3/8". Figs. 45 and 46 show the difference in the size of the old and new design oil tubes.

This improvement permits the new design funnel to collect and deliver to the front end of the motor approximately twice as much oil as was possible with the old style. This is especially advantageous when travelling in mountainous country where steep inclines are frequently encountered. Also, during cold weather when the oil has become congealed and the oil flow is necessarily slow when the engine is started, the larger amount of oil collected by the new type funnel insures the oil reaching the front end of the motor considerably more quickly than would be possible with the old design.

This change also decreases any possibility of clogging of the oil pipe as the additional amount of oil which is collected by the new funnel increases the oil pressure in the pipe sufficiently to carry away any foreign matter that might accumulate.

Magnets Sold Only in Complete Sets

When necessary to replace a magnet due to breakage or other causes, an entire set of new magnets should be installed rather than replacing only the damaged part.

The cost of a complete set of new magnets to the customer in exchange for his old ones, is but $1.75 and when the amount of time and labor necessary to install these parts is taken into consideration it would be extremely poor practice to install only one new magnet. Furthermore, when one magnet has been broken there is always a possibility that the other magnets have been damaged or weakened and under such circumstances the installation of but one new magnet would result in the strength of the new part being reduced to that of the weaker ones.

New magnets are furnished by us only in complete sets. The new magnets at time of shipment being placed on a board in identically the same relation to each other as when installed on the fly wheel. Extreme care should be taken when assembling new magnets and lining up the magneto to see that the faces of the magnets are exactly 3 1/2" from the faces of the magneto coil cores.
Tractor Fenders

At a slight increase in price, fenders have been provided as additional equipment on Fordson Tractors for some time past. This equipment adds greatly to the serviceability of the tractor, as well as to the satisfaction of the owner. Fender equipment is especially advantageous on tractors used in agricultural work, and dealers should make it a point to sell a tractor complete with fenders in every case, as well as solicit every tractor owner in their community who is operating a Fordson on which these fenders have not been installed.

By properly pointing out and demonstrating the value of fender equipment, the sale of these units will be increased and at the same time greater satisfaction will be derived by the owner in the general performance of the tractor. Fenders not only add to the appearance of the tractor and afford the owner a convenient...
carrying platform, but they also preclude injury which might occur to the operator in event of careless or negligent operation.

The following are the outstanding advantages of Fordson Tractor fenders:

1. Prevents throw of dust and mud from wheels upon driver and engine.
2. Eliminates any possibility of operator becoming injured through carelessness in getting feet or arms in wheels or on the cleats. Fenders protect the operator from the possibility of being thrown into the wheels as a result of accident in operating the tractor under extraordinary conditions.
3. Each fender provides a convenient box for carrying tools, lunches, repair parts, or other articles that may be required.
4. The Fordson Tractor fenders are designed with large sand pads which prevent the tractor digging itself into the sand, mud, or soft ground beyond a predetermined depth. When the sand pads strike the ground, the tractor is supported between the front wheels and the pads and the rear wheels are prevented from digging in deeper, thus preventing further miring of the tractor.
5. The sand pads protect the driver by absolutely preventing overturning of the tractor in event of careless or negligent operation.
6. Fender equipment affords a platform of considerable size which has three distinct advantages.
   (a) Convenience in getting on and off tractor which lessens the possibility of driver being injured by slipping.
   (b) The platform gives an opportunity for the operator to stand up and rest at intervals without dismounting from the tractor.
   (c) The platform provides carrying space for grain or chains, or for taking helpers into the fields.

Fordson Tractor fenders are heavier and stronger than other types on the market, consequently the price is correspondingly higher. Experience has proven that fenders of light gauge steel do not stand up satisfactorily under the severe service which the tractors are called upon to withstand. The bracing and structural strength of the Fordson fender is conceded to be superior to other fenders on the market which accounts for their durability. The price of fender equipment is insignificant in comparison with its value to the owner in the way of satisfaction and serviceability.

New Steel Tractor Valves Possess Many Advantages

Chromium silicon alloy steel valves are being used as standard equipment in the Fordson tractor (see Fig. 48). This type of valve is particularly desirable in a heavy duty type of engine such as the Fordson, since the conditions of service produce much higher temperatures in cylinders.

The principal advantages of the new type valve are:

Practically Eliminates Oxidation—The chromium silicon alloy steel prevents warping of the valves. It also reduces oxidation or scaling to a minimum, thereby preventing pitting or breaking off of valve heads.

Longer Life—Valves are heat treated, hardened and ground. This prevents any wear on the end of the stem by coming in contact with the tappet and also reduces wear to a minimum between valve stem and guide bushing, which makes for better carburetion as it reduces air leakage at this point.

Easily Removed and Installed—The valve spring being held in a compressed position by a steel seat which is locked in position by a split collar. (See "A" and "B", Fig. 48). Eliminates the use of a pin at this point which has to be lined up with a hole in the valve stem.

Less Frequent Valve Grinding—The new design valve being made of chromium silicon alloy steel is considerably harder than the old type valve and consequently does not require as frequent grinding. Owing to its hardness the new valve forms and maintains an ideal seat in the cast iron cylinder block, which is a considerable factor in maintaining good compression.
Advertising Service

Using a specially painted Ford car on which is plainly printed an invitation to owners to avail themselves of the home and road assistance offered, (see Fig. 49) is the effective method adopted by the Brandt Motor Corp., Ford dealers at Norfolk, Va., in attracting attention to the service which they render and incidentally creating favorable publicity which serves to keep their firm name constantly before the public.

Consistent and intelligent advertising is so closely related to increased business that no concern can afford to overlook its possibilities. There are many ways that the average dealer who is performing high grade service work can acquaint the public with this fact. Mr. Brandt has chosen the method outlined above which has proved exceptionally effective; other dealers have employed various plans, such as newspaper advertising, direct-by-mail advertising, distributing specially prepared pamphlets, etc., all of which have given excellent results.

The method selected to advertise service, however, of secondary importance when compared to the importance of rendering that type of skillful and courteous service which is in itself an excellent advertisement and which at the same time more than substantiates any advertised claims regarding the quality and satisfaction of the work performed. It is the blending of these factors, —intelligent advertising and competent service,—which largely determines the volume of service work secured.

Improved Battery to Switch Cable

Sometime ago an improvement was made in the construction of the battery to switch cable. This improvement consists of using finer strands of wire in the cable and increasing the number of strands from 37 to 61. A and B, Fig. 50, show the difference in construction in the old and new design cables.

Using 61 strands of wire in the new design cable, insures that degree of flexibility which is necessary to absorb road shocks or vibration that would otherwise be transmitted to the battery, causing a possibility of damage to the cells or resulting in breakage of the positive post.

Furthermore the new cable causes no interference when removing a battery from a car, as the flexibility of the cable readily permits it being bent to one side, which is difficult to do when a rigid type cable is used.
Use of Modern Service Equipment Important Factor in Advertising Service Work

HOW the G. B. Ehrman Company, Ford dealers at Cleveland, Ohio, capitalize their use of modern service equipment in advertising their service work is illustrated by a pamphlet which they publish and distribute among Ford owners in their community, a copy of which is shown in Fig. 51.

Mr. Ehrman advises that from a service standpoint, this method of advertising which shows the prospective service customer the actual difference

Every Man a Specialist

EHRMAN Repair Men are all "hand-picked" and Ford-educated. Each skilled worker has had years of experience in one particular type of repair work until he has become expert at his chosen task. And they all pull together, happily and contentedly. That's why every Ford car leaving the Ehrman Station gives its owner such splendid service—the work is done right under the most favorable conditions by men who specialize on Ford repairs. Every modern shop facility for the proper handling of repair work has been provided in the Ehrman Station and, of course, only Genuine Ford Parts are used, a complete stock of which is always kept on hand. This combination of expert workers and complete equipment enables you to secure Ford Repair Service without a peer.

Fig. 51
between the methods employed in the well equipped shop and those used in ill kept shops having no equipment, has proved exceptionally effective.

The use of up-to-date service equipment represents a decided advancement in the performance of service work. Modern service equipment not only insures a higher standard of workmanship, but it results in a considerable saving of time in performing the various repair operations.

When advertising their service facilities, dealers frequently overlook the importance of bringing this fact to the attention of car owners and explaining to them how by the use of specially designed equipment, service work can be performed not only more accurately, but the saving in time that is effected permits a lower labor charge to the customer.

Which Do You Prefer?
Ehrman's Authorized Ford Service Station—or the Little Shop Around the Corner

YOU'VE probably had experience with the little "alley" shops where, in cramped quarters and without the essential equipment, it is physically impossible to turn out satisfactory repair jobs. Like so many other Ford owners, you may have been misled by the time-worn talk of "lower overhead means reduced repair costs." Many of these shops are here today and gone tomorrow—you have no redress in case you decide that the job was not done right. That's one point in the Ehrman Service that we are always glad to hear about—if you feel, for any reason, that the repair work is not up to the Ehrman standard, we want to know about it—without delay. Then we'll immediately see that you are satisfied beyond the question of a doubt—that is the basis on which our business has been conducted for many years.

"Yours for Service"

THAT is not merely a "catchy phrase"—it means exactly what it says. From the beginning, the one thought in the minds of those responsible for the present complete Ehrman Service Station has been to give Ford owners the highest type of service within the power of human ability. We decided then that the good-will of our customers would become the biggest Ehrman asset—and so it has proved. Today we value the constantly increasing number of satisfied Ehrman customers far above everything else, and we have good reason to believe that a large number of our new customers come to the Ehrman Station solely upon the recommendation of their fellow-drivers for whom we have done repair work.

Ford owners are realizing, more and more, that the only logical method of doing repair work is the Ehrman Way—it brings satisfaction because the work is done by men who know their business. And back of these repair specialists, stands a reputable organization whose sole object is to give you the highest type of service—efficient workmanship, careful inspection, deliveries as promised, and reasonable cost. The only way to find out just how well we can serve you is to drive your Ford into the Ehrman Station the next time it needs attention of any nature. After that you will rely on Ehrman Repair Service regularly.

THE G. B. EHRMAN COMPANY

3212 West 25th Street

CLEVELAND, OHIO
An Automatic Wheel Aligner

An important service operation frequently overlooked by dealers is the checking and alignment of the front and rear wheels on customer's cars.

Correctly aligned wheels not only materially add to the life of the tires but they have considerable bearing on the steering of a car and the ease with which it is handled.

An automatic wheel aligner specially designed for service station use on Ford cars is shown at "A", Fig. 52. Tests conducted with this aligner have proven its efficiency, and its advantages warrant it being included in the equipment of every dealer's shop. It is not only a time saver but its use insures a more accurate check on the alignment of the wheels than is possible to secure with the ordinary devices generally used.

Complete particulars concerning this wheel aligner can be obtained from the nearest Ford Branch.

The correct method of using the aligner is given below:

Instructions

Connect the Aligner by inserting the bar through the spring and guide. First fasten guide to bar with flat head screw, then fasten spring with large round head screw. Now see that Aligner compresses back and forth freely. Care must be taken not to bend or spring the arrows out of shape. These arrows are lined up perfectly and when pointing to "C" on dial the instrument should represent a perfect square.

How To Operate

Straighten out the wheels and see that both tires are inflated evenly. Floor or ground should be fairly level.

Then compress the aligner and place it between the wheels so that the abutment bars rest firmly on the felloes and against the steel rim of the wheels. Be sure that they do not rest on any of the spokes or bolt heads.

Where the abutment bars cannot be placed on the felloes, they should be placed on the straight edge rim next to the tire, without resting on the tire.

Cuts above show both positions—one for Pitch and the other for the Toe-In. Letter "C" on the dial represents center. Each line on the dial represents one-quarter inch on the wheel.

FOR TOE-IN: Place the Aligner be-
between the wheels, as shown at "C", Fig. 52. Have ends of abutment bar same distance from floor or as nearly parallel with the floor as possible. Straighten out the wheels and see that one arrow points to center on ONE dial. Then, the OTHER dial will register the toe-in for BOTH wheels.

For instance, if you desire ¼" toe-in, this means that the two front wheels should be ¼" closer together in front than at the rear

(see Fig. 53). It is easier to get the reading all on one dial, as explained, instead of getting both dials to read ¼" each. Care should be taken to see that the abutment bars are not tilted up or down, as this will change the reading on the dial every time the position of the Aligner is changed.

THE ARROW FOR TOE-IN should point toward REAR OF CAR. If arrow points toward operator from the center line, this shows wheels are TOED OUT and must be corrected.

For Pitch

Place abutment bars between wheels, as shown at "B", Fig. 52. Have abutment bars vertical or at right angles with the floor. Or, in other words, abutment bars should be straight up and down, not tilted either backward or forward. EACH dial will register position of EACH wheel. Amount of Pitch is shown on the dial, as indicated by arrow ABOVE THE CENTER LINE. Fig. 54 shows how the pitch is obtained.

To Find "Wobbly" or Sprung Wheels

Place instrument in position for Pitch. Then take measurement. Then move car forward one-third turn of the wheel. Take measurements. Then move car forward another one-third turn of the wheel. Take measurements.

If Aligner has been correctly placed in each case and the wheel is perfectly straight and true, all three measurements should be the same. If they vary, that indicates a sprung wheel, or spindle.

Alignment of Rear Wheels

The rear wheel alignment is just as essential as front wheel alignment. The rear wheels should register on center or zero on both dials, in both positions—Pitch and Toe-in. It is very essential in wheel alignment to have rear wheels "tracking" with the front wheels and at the same time in line with the chassis.

In using the Aligner on either the front or rear wheels, if it is found that they are very much out of alignment, it is advisable to take readings in two other positions as described, to be sure that the wheels are straight and true before the adjustment or repair.

How to Find a Swung Rear End or Sprung Chassis

Place the Aligner in position for toe-in, then split the toe-in so that each dial shows the same; this gets both wheels lined up perfectly straight. Now measure the distance from center of front axle to center of rear axle. Distance should be exactly the same on both sides of the car.

Wire and Disc Wheels

Place abutment bars on extreme outside straight edge of wheel next to tire, but keep bars free from tire itself. This applies to both pitch and toe-in.

How to Find Worn Bushings in Steering Connecting Rods

Place the Aligner for toe-in. Move wheels so that one pointer points to center on one dial. The other dial will show the toe-in. Now move wheels so the other pointer points to center on the other dial. If the reading in each case is not the same, the difference is the play in the tie-rod bushings.
Rear View Mirror Assemblies now furnished for Open Cars

In addition to the rear view mirror assembly that we are supplying for closed cars, we are now furnishing a rear view mirror assembly equipped with a specially designed bracket to fit the windshield on open cars, thus making Ford rear view mirror assemblies available to owners of both open and closed cars.

Figs. 55 and 56 show the difference in the design of the brackets. Owing to this difference in design, care should be taken when selling a rear view mirror assembly to ascertain whether or not the assembly is to be used on an open or closed car, under no circumstances should attempts be made to install a closed car rear view mirror assembly on an open car.

The open car rear view mirror assembly possesses all the improved features of rigidity, adjustment, length, etc., that are incorporated in the closed car rear view mirror assembly, and retails at the same price, namely $1.50.

Checking Time Gears for backlash

Every repair shop should be equipped with two brass bars about 14" long for checking the time gears for backlash. (Space between teeth.) See Fig. 57. While it is possible to check them with a screw driver, there is always the danger of throwing a burr on the teeth of the gear. If this burr is not removed it will cause a noise which will not wear out immediately. The brass rod should be 1/4" in diameter, and drawn out on the end in much the same shape as a screw driver. Much time will be saved by the use of these bars and the possibility of marring the gears will be eliminated.

Reduction In Price Of Old Style Radiator

The retail price of 1916 type radiators 3925-T1100C, has been reduced to $15.00.

This price will continue in effect until our present stock of these old type radiators is exhausted. Thereafter it will be necessary to purchase the later type radiator together with hood and other parts which must necessarily be used when replacing a 3925-T1100C radiator with the later design.
A campaign that increased battery sales

As the result of a battery sales campaign conducted during the month of September by the Service Manager and dealers in Detroit Branch territory, the sale of Ford batteries in that section increased 119% over the previous month's sales.

No unusual methods were used by dealers in obtaining this new business, it was simply the result of creating interesting battery window displays, coupled with hard work in increasing retail sales as well as the soliciting of battery orders from every garage and concern retailing batteries in the dealer's vicinity.

The average cost for battery window decorations during the campaign was less than $5.00 per dealer, yet these displays, coupled with consistent effort on the part of dealers, resulted in the sale of more than $60,000.00 worth of Ford batteries in Detroit Branch territory during the month of September—an increase of approximately $33,000.00 over their August sales.
Keep Display Batteries Clean

To obtain best results from your parts window display, endeavor to exhibit every article to the best possible advantage—this of course is impossible if a coating of dust has been allowed to accumulate on the items displayed.

Frequently what would be an ordinary battery display has been transformed into an exceptionally pleasing exhibit by brightening up the appearance of the show window and cleaning the display batteries until they assume a spick-and-span appearance. If the battery box has been scratched or marred, it should by all means be refinished before being used for window display purposes.

The cleanliness and general appearance of your display window is an index to the passerby of the manner in which your business is conducted.

Oiling the Generator

The tendency of the average owner is to put too much oil in the generator oil cup. When this is done, the excess oil works down onto the commutator, setting up a resistance between the commutator and the brushes which will render the generator operative only at high speeds, and frequently causes it to cease generating entirely.

The generator ball bearing requires very little lubricant, 2 or 3 drops every two weeks being sufficient.

Winter Specifications of Engine Oil for Fordson Tractor

During cold weather, the oil in the crankcase upon becoming chilled, has a tendency to thicken or congeal; this creates a certain amount of resistance in the moving parts of the engine which is sometimes reflected in hard starting.

In order to prevent this condition, and also facilitate cranking the tractor, during winter months, we recommend that a lighter grade oil, of the following specifications be used in the engine only, when tractors are kept outside or in unheated quarters:

<table>
<thead>
<tr>
<th>Color</th>
<th>Flash</th>
<th>Fire</th>
<th>Viscosity</th>
<th>Cold set</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Open °F.)</td>
<td>°F.</td>
<td>Saybolt-Universal 100°F.</td>
<td>°F.</td>
<td></td>
</tr>
<tr>
<td>No. 4</td>
<td>(Min.)</td>
<td>370</td>
<td>300</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(Max.)</td>
<td>420</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Cold weather does not necessitate a change in the specifications of the oil used in the Fordson transmission—oil of the following specifications being used in the transmission both winter and summer. This heavier grade of oil should also be used in the Fordson engine during the warm months.

<table>
<thead>
<tr>
<th>Color</th>
<th>Flash</th>
<th>Fire</th>
<th>Viscosity</th>
<th>Cold set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Darker Than</td>
<td>Open Cup °F.</td>
<td>°F.</td>
<td>Saybolt-Universal 100°F.</td>
<td>°F.</td>
</tr>
<tr>
<td>No. 5</td>
<td>(Min.)</td>
<td>400</td>
<td>650</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>(Max.)</td>
<td>450</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

Examine Oil Grooves in Babbitt

When a cylinder block has been re-babbitted particular attention should be given to the fitting of the crankshaft. After the crankshaft has been burned-in, it should be removed to determine whether or not the oil grooves in the babbitt have been closed. It if is found that these grooves have been closed, they should of course be recut.

As a matter of fact it is a good plan regardless of whether the grooves are open or closed, to run a bearing scraper through them to remove any rough edges.
An Investment in Customer Satisfaction

Affording complete protection to the upholstery, from greasespots and stains, and preventing fenders from becoming scratched or marred while a car is undergoing repairs, is the function of the car covers shown in Figs. 60 and 61.

Possibly no equipment in a dealer's shop possesses greater possibilities of converting customer complaints into customer satisfaction, than the use of clean car covers.

An owner whose car is returned to him with the upholstery in as cleanly a condition as when the car was driven into the service station and who notes the care that it receives in the dealer's shop, instinctively feels that this attention is representative of the quality of service rendered. It convinces him that the dealer takes a personal interest in the service needs of his car, and this conviction is largely the foundation on which good will and permanent business relations are founded.

This attention to cleanliness appeals especially to women drivers, and as this feminine trade is constantly on the increase, it must be considered in conjunction with any plan tending to enlarge the volume of service work.

Full particulars concerning car covers for all types of Ford closed cars can be obtained from the nearest Ford Branch.

Cause of Spring Breakage

The breakage of springs can frequently be traced to failure to keep spring clips and clamps properly tightened. When these parts become loose, it permits the spring leaves to get out of alignment, also greater side play occurs at the tie bolt eventually causing the bolt to shear off and permitting the body and frame to shift as well as causing breakage of spring leaves. This is particularly true of front springs.

To prevent formation of rust and retain the spring action, the sides of the springs should occasionally be painted with engine oil. Oil drained from the crank case can be used to good advantage for this purpose.
Holley and Kingston Vaporizers can be used interchangeably

By substituting several parts the Holley and Kingston vaporizers can be used interchangeably on the Fordson tractor.

When installing a Kingston vaporizer in place of a Holley vaporizer the following parts are used in replacement of the Holley parts removed:
- S710C-F1881C Air washer tube
- S497C-F2037C Primer rod
- S191B-F1933B Fuel feed pipe—long
- S718-T5919 Air washer elbow plug

When installing a Holley vaporizer on a Fordson which was formerly equipped with a Kingston vaporizer the following parts are used in replacement of the Kingston parts removed:
- S710-F1881B Air washer tube
- S497B-F2037B Primer rod
- S191C-F1933C Feed tube—long
- S709C-F1882B Air washer tube—small

The S718-T5919 air washer elbow plug is used when replacing a Holley vaporizer with a Kingston vaporizer, for closing the hole in the air washer elbow where the primary air pipe for the Holley vaporizer was removed. Since no primary air pipe is used with the Kingston vaporizer, this hole is closed with an S718-T5919 expansion plug. The plug is installed by inserting it into the opening in the air washer elbow, and expanding it by means of a piece of steel approximately \(\frac{1}{4}\)" in diameter, and a small hammer as shown in Fig. 62.

Larger Amount of Oil Deflected on Transmission Band Linings

"A", Fig. 63 shows the rib or web which is now being cast into the transmission cover.

The addition of a rib at this point deflects a larger volume of the oil carried up by the flywheel and magnets, onto the transmission band linings, and transmission drum bushings, thereby insuring an exceptionally smooth braking effect as well as materially adding to the life of both the band linings and bushings.

Check Electrical Connections

In order to prevent head lamp bulbs burning out prematurely, dealers should make it a point to see that connections on all electrical circuits are clean and tight before delivering a car to an owner. This is especially true of the connections on the battery circuit, such as terminals on battery, ground connection of battery, and battery wire terminals on terminal block.

It is also extremely important that all connections on the back of the switch be checked to insure their being in correct position and that the rubber insulation on the different wires is sufficiently near the end of the terminals that it is impossible for the metal part of any of the terminals to come in contact with each other. Should the metal part of the terminals touch each other at any time, serious trouble will result, such as burning out lamps, demagnetizing magneto, or short circuiting the lighting system.
Change in Length of Tractor Steering Connecting Rod

Due to the general use of rubber tired wheels on the Fordson tractor for industrial purposes, we have recently reduced the amount of "toe-in" on the front wheels of the tractor in order to secure the maximum amount of wear from the rubber tires.

This change was accomplished by reducing the length of the steering connecting rod from $37\frac{7}{8}''$ to $37\frac{3}{32}''$ (see Fig. 64).

The front wheel rims were formerly $1\frac{3}{4}''$ closer together at the front of the rim than at the rear. The new design rod, however, has reduced this distance to $1\frac{1}{4}''$. Some "toe-in" is, of course, necessary as the spring of the parts, together with the wear at the bushings in the joints of the steering gear has a tendency to cause the wheels to try to "toe-out" consequently by providing an initial "toe-in" the wheels will always remain parallel providing the pins and bushings have not become badly worn after long service, in which event the parts can be easily replaced.

As stated above, this change was made solely to obtain the maximum amount of wear from rubber tired wheels used on the tractor and except for this purpose there is no occasion for substituting the new rod in place of the old design.

Symbol Numbers Stamped on Couplings

The July 1924 Service Bulletin contains an article instructing dealers to use the 1041-TT85AR drive shaft to worm coupling only on trucks manufactured prior to July 1st, 1919. On trucks manufactured after that date the 1041B-TT85B coupling should be used. This is absolutely necessary owing to the difference in the depth of the splines in these parts.

In order to eliminate any possibility of the TT85AR coupling being confused with the TT85B coupling, we are now marking the symbol numbers on the side of these couplings as shown in Fig. 65.
Removing and Installing Upholstery on Steel Closed Body Doors

For the purpose of installing upholstery on the improved all-steel doors now being used on Fordor and Coupe bodies, the doors are provided with holes equally spaced, (see "A", Fig. 66) into which glove fasteners (see Fig. 67) are assembled.

Special design nails (see Fig. 67) are placed in the upholstery. These nails are so spaced as to line up exactly with the holes in the doors, and are pressed in as far as possible into the glove fasteners.

In order to remove the upholstery a screw driver should be inserted between the glove fastener and the door (see Fig. 68), a slight pressure will remove both glove fasteners and upholstery.

The old glove fasteners can be removed from the nails by prying open one of the prongs of the fasteners with a screw driver or any sharp tool (see "C", Fig. 66).

When replacing the upholstery it is advisable to use new glove fasteners, placing them in the holes of the door preparatory to installing the upholstery as outlined above.
Tracing Trouble in Charging Circuit

The charging circuit (generator to battery) is one of the most important circuits on the car. It is in continuous operation whenever the engine is running at or above normal road speeds. Its proper function determines to a large extent the life of the generator and battery.

The functioning of the circuit is indicated by the ammeter located on the instrument board. The hand should remain on or near the zero mark when the engine is idling, with no lights burning and the ignition switch on the magneto side. It should read 10 to 12 amperes charge at 20 to 25 miles per hour when the lights are off and the ignition is on the magneto. It should read 3 to 4 amperes discharge when the engine is shut off and the lights are burning on bright.

Short Circuits

In tracing a short in the generator to battery circuit, it should be borne in mind that the current flows from each end, for example, from the generator when running at a charging speed, and from the battery to cut-out when the generator is not charging. A short in this circuit is usually indicated by the odor of burning insulation, and if this warning is not heeded, the wire is likely to melt, resulting in an open circuit, and the possibility of fire. If the short circuit is between the battery and the ammeter, no indication of trouble will be shown on the instrument. If it lies beyond the ammeter, it will be registered.

An ammeter is a delicate instrument, and if a heavy discharge from the battery is passed through it the hand will be bent so that it registers inaccurately. To determine whether or not the ammeter hand is bent or whether its failure to register accurately is due to a short in the ammeter or wires, proceed as follows:

Disconnect “terminal block to starting switch” wire at the terminal block. If the ammeter now registers zero, the hand is not bent but there is a short in the ammeter, wire from the ammeter to cut-out, wire from the ammeter to light and ignition switch, or in the light and ignition switch, or in the head or tail light wires.

Open Circuit

An “open” in the charging circuit is a condition to be guarded against, as running the car for any length of time with the charging circuit open will result in a burned out generator. An "open" is indicated by the ammeter showing no charge with the engine running at a fair rate of speed. The trouble should be located and corrected immediately. If it is necessary to run with the charging circuit open, ground the generator which may be done by running a piece of wire from the generator terminal to one of the brush end screws as shown in Fig. 70. To locate the open circuit try the lights with the engine stopped. If the lights burn, the battery to ammeter wire is OK and the trouble lies between the ammeter and the grounded brush in the generator. If the lights do not burn, ground points A and B as shown at Fig. 69. If a spark occurs, the open does not lie in the ammeter. If no spark occurs the trouble lies between points A and G. Next ground point C. If no spark occurs, the trouble lies between C and G. Point D should then be tested in the same manner. If, when point E is grounded, no spark occurs, the indications are that either the battery is dead, or points G and F or the ground wire are open. A visual inspection at points F and G will detect at which of these points the open is located as no spark will occur of course when points F and G are grounded, as this is the grounded side of the battery.
Assembling Oil Plug in Drive Plate Assembly

![Fig. 71](image1.png)  ![Fig. 72](image2.png)  ![Fig. 73](image3.png)

It has been the practice of dealers to install a 3324B-T775 oil plug in the 3321-T749 drive plate assembly whenever this part is used for repairs or sold through service. Instances, however, have recently been reported where dealers have failed to install this oil plug in the assembly, and as a result there is a possibility of oil working down the drive shaft tubing into the axle housing causing oil leaks and unnecessary loss of oil.

To prevent any misunderstanding regarding the correct method of installing this plug, we are illustrating in Figs. 71, 72 and 73 the proper procedure to follow:

Fig. 71 shows how the plug is installed by inserting it into the square end of the drive plate assembly. If when the plug is inserted in the sleeve it is too tight a fit to permit it being readily forced into place, the edges of the plug can be dressed off with a file. The plug is then tapped down into the opening as shown in Fig. 72 until it can be turned in the sleeve so that the convex side is toward the drive plate, after which the assembly is then turned upside down and the plug is expanded by means of a hammer and a round piece of steel as shown in Fig. 73.

In the future in order to prevent any possibility of dealers failing to install this oil plug, we will assemble the plug in the drive plate assembly before shipping it out. Until all outstanding stocks are exhausted however, these oil plugs must be installed by dealers, when drive plate assemblies are used for repairs or sold through service.

Specific Gravity Determines Freezing Point of Electrolyte

The freezing point of the battery solution depends upon its strength. For example, a solution with a strength or specific gravity of 1.250 will not freeze until the extremely cold temperature of 62 degrees Fahrenheit below zero is reached. A strength of 1.150 will freeze at 5 degrees above zero, so it will be seen there is little danger of freezing except with a completely discharged battery. Moreover at these freezing points, the solution is slushy and does not become hard until the temperature goes still lower.

If water is added to a battery in freezing weather and then not stirred in with the solution by charging the battery, it will remain on top of the solution and may freeze. It is to avoid this possibility that warning is given not to add water in cold weather until just before running the car.

Clean Commutator with Fine Sandpaper

Coarse sandpaper should not be used when cleaning the commutator on the generator. If sandpaper coarser than grade No. 00 is used, the brush track will be scored, destroying the contact and causing excessive wear of the brushes.
The effective display of Ford products shown in Fig. 74 was originated by J. A. Deignan, Ford dealer at Oklahoma City, Okla.

Within four days after this exhibit was displayed, 25 batteries as well as a quantity of emergency kits and Ford specialties were sold over the counter.

In addition to window displays, Mr. Deignan has forwarded a letter to every Ford owner in his vicinity emphasizing the superiority of the Ford battery, at the same time calling attention to his own facilities for promptly and efficiently servicing batteries. A Ford battery folder is attached to the letter which is concluded with an invitation to all owners to avail themselves of his service.

An analysis of Mr. Deignan's sales methods shows that his results are attained largely through salesmanship, advertising and attractively displayed goods - factors that are within reach of every dealer.
Methods That Have Increased Service and Parts Sales Profits

Different seasons of the year create a larger demand for certain items. Winter weather actually proves of valuable assistance to Ford dealers in the sale of numerous articles such as radiators, batteries, curtains, windshield and body glass, pedal shields, cylinder heads, etc., as well as emergency kits and the new Ford specialties.

The average car owner, however, does not know what you have to sell unless you inform him and the most effective method of conveying this information is to advertise your merchandise and prominently display it. Goods effectively displayed sell readily.

Keep your display window attractively trimmed. A window that attracts favorable attention not only proves an excellent advertising medium, but creates the impression that your shop is an exceptionally good place at which to trade.

Treat the arrangement of stock in your store in the same manner that you do in your window. Arrange your merchandise so as to display it to the best advantage, and maintain it in an orderly and systematic manner. Make full use of the counter display cards, posters, etc., which can be secured from the nearest Ford branch.

Remember, the faster you turn over your stock, the faster you turn over your investment and the greater your profits.

Salesmanship

Salesmanship plays such an important part in the success of any concern that it is difficult to overestimate its value. Its influence is so far reaching that it will repay everyone in the dealer’s organization to make a special study of this subject.

Cleanliness, good manners and courtesy coupled with a thorough knowledge of the merchandise sold are important factors in successful salesmanship. Cultivate the habit of diplomatically suggesting the purchase of items that a customer may require or could use advantageously. Note how lights burn on cars entering your service station—suggest a Ford emergency kit, or possibly a new lamp complete is required. An emergency kit and an extra fan belt are as necessary as an extra tire. A glance is sufficient to note if a radiator is leaking. This may result in the sale of a new radiator or at least a service job should be secured.

Examine the cars in your repair shop; note what equipment is damaged or missing and suggest the replacement of such material. The mental attitude and interest behind a salesman’s efforts determines to a large extent the success he attains in suggesting and inducing a prospect to buy.

Selling Service

A plan that is proving profitable to a number of dealers is the employment of service salesmen who devote their entire time to the solicitation of service work. In addition to keeping the service department busy at all times and increasing the sales of parts and Ford specialties, the additional service customers obtained form an excellent source from which new car sales prospects can be secured.

A point frequently overlooked by dealers is the solicitation of service work from car and truck fleet owners as well as from municipal authorities not maintaining their own repair shops. Not only is this service work profitable, but the acquaintanceship which the dealer forms with such concerns in performing their service work, can be successfully utilized in providing an entree for the dealer’s car salesmen.

Continually strive to improve your service—find out why certain owners who reside in your vicinity have their service work performed by repair shops located considerably further away from them than you are, your investigation may disclose weaknesses in your organization that are affecting your profits.

Cleanliness In The Shop

A neat, clean appearance shop attracts trade. An unclean shop actually drives it away. Floors are the most difficult part of a building to keep clean, and should receive special attention. Under no circumstances should pools of oil be allowed to accumulate and remain on the floor of your repair shop, or your floors permitted to become coated with grease and dirt. Floors should be scraped and scrubbed regularly. It is a good plan to assign someone in your establishment to devote whatever part of his time is necessary to keep floors clean. Attention should also be given to the cleanliness of your windows and a regular schedule should be maintained for washing them. Compare the appearance of your establishment with that of some of the most successful merchants in your town.
A Comparison in Prices

Combining an exhibit of corn, wheat and genuine Ford parts, together with display cards which show the increase in the present prices of grain over 1912 prices, as compared with the decrease in price of genuine Ford parts during the same period (See Fig. 75) is the effective method adopted by dealers in Kansas City Branch territory, in showing how Ford products have constantly been reduced in price in spite of the upward trend of practically every other commodity.

It will be noted, from the display cards, that the present price of corn and wheat is approximately 40% higher to-day than it was 12 years ago, while the price of genuine Ford parts during this same period has decreased approximately 139%.

**Price vs. Quality**

Material used in the manufacture of Ford cars which is purchased from outside sources must conform to our manufacturing standards. This inspection policy, of course, necessitates the rejection of a considerable amount of goods.

A manufacturer who supplies some of the carbon brushes used in our generator and starting motors recently received the following letter in connection with these rejections:

Gentleman:

"We understand that you are the manufacturers under contract in the making of Ford generator and starter brushes.

"We are wondering whether in the manufacture of the starter brush, you do not find that Ford rejects a certain percentage, or possibly your own inspection precludes the possibility of you shipping them to the Ford Motor Company.

"If this situation should be so, we are wondering whether you would object to quoting us on your rejections.

"Quantity by no means frightens us. The object principally is price.

"Very truly yours,"

This letter is significant of the practices of certain concerns, and also indicates the quality of the goods which they are offering the trade at special prices.
While the battery requires comparatively little attention it is absolutely essential that it receive some attention. The care it requires may be summed up as follows:

(1) Keep connections tight and coated with vaseline. (See "A", Fig. 76)

(2) Keep filling plugs tight, (see "B") and battery dry and clean—if the plugs are not screwed down tightly the electrolyte will spray out.

(3) Add water frequently, enough to keep the plates covered at all times. Distilled water or clean rain water that has not come in contact with any metal should be used for this purpose.

(4) Take hydrometer readings every month at any time except just after adding water and be guided by their indications as follows: Readings between 1.250 and 1.300 indicate a fully charged battery. Readings less than 1.225 but more than 1.150 indicate a battery less than half charged; at such time the lights and starter should be used sparingly until the readings become more than 1.250. Readings less than 1.150 indicate complete discharge, in which case the battery should be given a bench charge. This discharged condition may be due to trouble other than in the battery in which case all connections should be examined; a loose or dirty connection is often the cause of trouble.

If the connections between battery and cable terminals are not kept well coated with vaseline they will corrode, causing a poor connection or else opening the circuit altogether. This corrosion will also consume the battery cable insulation, (see "C") causing a short circuit when the exposed part of the cable comes in contact with the metal battery container, resulting in the battery becoming discharged.

If corrosion is not removed from the positive post of the battery it will continue to form until a sufficient amount has accumulated to reach the metal battery cover, forming a ground and resulting in the battery becoming discharged.

If the battery wire terminal becomes corroded and is causing trouble, remove it and clean the parts thoroughly with weak ammonia. Remove all foreign matter; give all connections a coating of vaseline and securely tighten.

There may be a leak or ground in the wiring. Test for this by turning on the lights, then remove bulbs from sockets. Disconnect one of the cables at the battery. Then rub the cable terminal against the battery terminal post from which it was removed. If sparks are noticed, there is a ground in the wiring, which must be looked for and removed.

(5) If starter will not crank engine, turn on lights and attempt to start in the usual manner. If lights go out or become quite dim, battery is in poor condition and should be given a bench charge and the cause of the trouble located and removed. If lights continue to burn brightly, the trouble is elsewhere than in the battery.
Improved Magneto Coil Support Shims

Recently several improvements have been made in the design of the magneto coil support shim which is used for regulating the gap between the coils and magnets.

Magneto coil support shim, part 3272-T584A has been obsoleted and we are now using four types of shims, part numbers 3274-T589, 3273-T590, 3272-T584B, and 3275-T4487 (See B, C, D and E, Fig. 77.)

3274-T589 is a paper shim .007 to .008” thick. Two of these shims are specified per car. Sometimes it is only necessary to use one, while again it may be necessary to use more than two, in order that the gap between the coils and magnets can be set at exactly 1/32”.

Occasionally there is a slight variation in the width of the gap between the magneto coils and the magnets, that is, the gap will be greater at one side of the coil support than it is at the other; it is to regulate this variation and make the gap uniform at all points that 3272B-T584B and 3273-T590 shims are used. These shims are made of steel and are .025 and .015” thick respectively.

3275-T4487 is a small thin “U”-shaped paper shim (see “E”, Fig. 77) which is used for the same purpose as the T584B and T590 shims when it is necessary to obtain extremely close adjustments in setting the gap at exactly 1/32”.

Use Correct Type Transmission Triple Gear Shafts

When necessary to remove transmission triple gear shafts, the original shafts (see “A”, Fig. 78) should not be replaced in the flywheel, but new shafts, part 3315-T715AR, should be used, these shafts being .003” larger on the part that fits into the flywheel, (see “B”) than the original shafts.

If the shafts which were removed are again installed in the flywheel it will result in a loose fit, as the holes in the cast iron flywheel become slightly enlarged when the steel shafts are withdrawn, and it is for this reason that 3315-T715AR shafts, which as stated above are .003” oversize on the part that fits into the flywheel, must be used for replacement purposes.

Replacing the original shafts and attempting to make them fit tightly by peening the flywheel around the edge of the shaft is very poor practice as this alters the distances between the shafts and as a result the gears are thrown off center, resulting in poor fitting gears and a noisy transmission.
Fitting Pistons and Rings

The piston and rings in an automobile engine act as a seal when compressing the gases and transmitting their energy to the crankshaft. It is, therefore, necessary that pistons fit the cylinders within comparatively close limits.

Because of the difference in expansion between the piston and the cylinder, it is necessary to fit the piston with a clearance between it and the cylinder walls, and further, since the head of the piston is subjected to greater heat than the lower walls or "skirt," it is necessary to allow more clearance at the top of the piston than at the bottom. This is taken care of in manufacturing, the piston being .010 smaller at the head, than at the skirt.

The three following conditions, viz.: Scored, undersize and leaky pistons make replacement of pistons necessary.

A piston if not too badly scored may be dressed off with a mill file. However, this practice is not recommended unless a mechanic is skilled in the use of a file. As a general rule, it is better to replace a scored piston. A scored piston sometimes means a scored cylinder and this necessitates reboring the cylinders and fitting oversize pistons.

Leaky pistons are found by placing the piston bottom side up in a pan of gasoline, or by pouring about 1 inch of gasoline into the interior of the piston. The gasoline will seep through, if there is a leak.

Undersize pistons cause excessive wear on the walls of the cylinder. A cylinder may be made to hold compression by fitting new rings on a badly undersize piston, but because of the wear on the block, such practice is false economy. Pistons should be fitted to the cylinder bore so they are tight on .004 and loose on .002. Commercial repair jobs may be fitted tight on .006.

Due to jars and frequent handling in shipping, and the various methods used in storing pistons, they occasionally become out of round. In fitting a piston it is, therefore, necessary to watch this condition closely.

Feelers (Fig. 79) should be tried at several points between the piston and cylinder bore. (See Fig. 80.) The piston should then be turned a quarter turn and checked again. If the piston shows out of round, tap it with a rawhide mallet on the greatest diameter of the skirt to true it up.

For repair purposes, pistons may be obtained in five different sizes, .03125, .033 oversize.

The Piston Ring

The piston ring is used to fill the gap between the piston and the cylinder walls, preventing the gases escaping into the crankcase and excess oil working into the combustion chamber.
Ford rings are machined .002 taper on the face of the rings. This insures the ring wearing to conform to the cylinder wall in the shortest possible time and when assembled with the script word "Ford" up, as shown in Fig. 81, the ring presents a sharp edge to the cylinder wall on the down stroke, and an incline on the up stroke. The incline rides over the oil while the sharp edge pushes the oil before it, thus preventing the oil working into the combustion chamber.

Since the rings are softer than the cylinder walls against which they are tightly pressed, and also present small wearing surfaces, they become undersize in time. To insure maximum power, together with minimum oil and gas consumption, the rings should be renewed every 10,000 miles.

It sometimes happens that a ring does not seat all the way round. Such a ring allows the oil and gas to pass and should be replaced. The ring may be removed with a pair of piston pliers as shown in Fig. 82. Before replacing a ring, the groove should be cleaned of carbon.

The new ring should first be fitted into the cylinder in which it is to operate, with the script word "Ford" up, that is toward the top of the piston and tried for gap with feelers. (See Fig. 83.) The ring gap clearance is .008 to .015 for the top and middle rings and .004 to .008 for the lower ring.

If the gap is too small it should be filed as shown in Fig. 84, until it has the proper opening. In badly worn cylinders, it is sometimes necessary to file an oversize ring to fit
the cylinder. Care should be taken in gauging the ring that it is not forced out of shape, as it is possible in this way to get a larger gap measurement than the ring actually has. To insure the ring setting squarely in the cylinder, put the piston in the bore. Next slip the rings in and draw the piston up until the ring is resting squarely on the skirt of the piston. Note also that the gap is larger on the inside diameter than the outside.

Before setting the ring on the piston, it is advisable to run it around the groove, as shown in Fig. 85, to insure a correct fit. The ring should fit in the groove with a clearance of from .001 to .0025. The fit of the piston ring in the ring groove and on the cylinder wall are of vital importance in controlling oil pumping and leakage. If the ring has considerable up and down motion in the ring groove, it will act as a miniature oil pump. As the piston moves downward, the ring moves to the top of the groove. The oil in the cylinder wall is collected in the space under and back of the ring. When the piston starts upward, the ring shifts to the bottom of the groove and the oil below and in back of the ring is forced around to the upper side. As the piston reaches the top of the stroke and starts downward, the ring again shifts to the top of the groove and the oil is deposited on the cylinder wall at a point above the top ring and, therefore, cannot be carried back with the piston on its down stroke. It will be seen that a large amount of oil will be pumped into the combustion chamber in this manner.

**Generator Drive Pinion Must Be Properly Meshed With Large Time Gear**

When installing the generator, the drive pinion must be properly meshed with the large time gear. The generator bracket, which is the section to which the generator is bolted, is separate from the cylinder block. Consequently, the distances between points A and B (Fig. 86) can be varied by the use of one or more paper gaskets (3017C-T1775) between the bracket and the cylinder block. (See "C".) The bracket should line up with the face of the time gear case. If the drive pinion is meshed too tightly with the large time gear, a humming noise will result, also the generator shaft will be thrown out of alignment.

When these gears are meshed too tightly, it is necessary to install an additional gasket at point "C." If, however, the distance between points A and B were too great to permit the proper meshing of the generator drive pinion with the large time gear it would be necessary to install a thinner paper gasket at point "C." If this does not remedy the condition, some of the metal should be removed from the generator bracket at point "C." This can be done by rubbing the joint surface of the bracket on a surface plate to which sandpaper or emery cloth has been attached.
The beginning of the new year is an opportune time to carefully analyze every angle of your service business to determine whether you are obtaining the maximum profits that this branch of your organization will yield.

The value of your service department should be considered from the relationship it bears to your parts sales; obtaining new car sales prospects, and building up good will, in addition to the profits it yields from repair work. (See page 82 of the November issue for service profit making suggestions.)

One of the greatest aids to dealers in developing a larger business, is the adoption of an efficient service follow-up system. Largely thru the use of such a system, Fred Jones of Oklahoma City who was appointed a Ford dealer but two years ago, has increased his car and parts sales to such an extent that he has built up one of the largest dealerships in that section of the country—his parts sales alone amounting to more than $100,000. On page 92 of this issue, we are publishing a letter written by Mr. Jones, in which he explains how the consistent use of a close follow-up system has assisted in building up his business.

Beginning with the new year, make it a point to systematically follow-up every repair job as well as every car, truck, and tractor sale—a larger volume of business with larger profits will repay your efforts.
A Letter that Increased Battery Sales

Karl Kaltenbach, Ford dealer at Buffalo, N. Y., does not believe in waiting for business to come to him, his plan is to go out after the business.

Recently he forwarded the following Battery letter to all Ford owners in his vicinity and it created so much interest that we are publishing it for the information of all dealers:

Dear Madam:

“A Ford car with a dead battery is always very annoying. When you step on the starter you like to have the battery respond as though it meant business.

Cold weather naturally causes a severe strain on your battery—especially if it is weak or of the old 11 plate type. Any motor turns over harder in cold weather.

“If you are having any of these ‘seasonal’ battery troubles, we can help you. We have a complete electrical department equipped to recharge or repair your battery. If the trouble is in the generator or starting motor we can take care of that, too.

“Mr. ------ who has spent years on automotive electricity, is in charge of this department.

“If your battery or generator isn’t working right bring your car in. Just ask for the battery man. He will gladly give you the benefit of his expert advice without any obligation to you.

“Should you require a new battery we recommend the NEW 13 PLATE GENUINE FORD BATTERY. It’s ‘a horse for work’ and is especially adapted to the Ford car. And don’t forget, it has two more plates than other batteries selling at near its price.

“The enclosed folder describes the new Ford battery fully.

Yours for BETTER BATTERY SERVICE”

Advertise Your Merchandise

After noting the decided increase in their sales of Ford batteries and specialties since advertising these products the Droeg Motor Sales Co., Ford dealers at Ada, Ohio, are convinced of the value of attracting attention to their merchandise.

Fig. 87 is a reproduction of the advertisement they are now running in local newspapers.

Battery advertisements are particularly effective at this season of the year, and when coupled with courteous and efficient service prove excellent business-getters.

Conditions that Affect Service Profits

Do you use a checking system for determining exactly what parts are used on repair jobs performed in your shop?

Recently this question was asked a newly appointed service dealer whose profits were not in proportion to the amount of parts used in his repair work. His reply was that he did not believe the volume of his service business warranted him installing such a system and furthermore he could trust his mechanics. While the integrity of his mechanics was not questioned; with the dealer’s permission an investigation was made. A repair job on the floor was examined—it was an overhaul job. The new parts used were counted and priced, they amounted to $30.52. The repair bill was next examined—it showed $28.76. How did this happen; simply that this difference of $1.76 represented miscellaneous bolts, nuts and washers that the mechanic forgot to count.

Investigate this condition in your shop—it may be affecting your profits.
An Investment in Battery Service Satisfaction

Ford battery sealing compound is sold in 10-pound cartons (see Fig. 88) and retails at a price of 13 cents per pound. It is prepared primarily for the purpose of furnishing dealers with a high grade battery sealing compound which will insure efficient service work and assist in building up a larger battery business. It is your protection—it's use carries with it the assurance of quality and satisfaction.

Figs. 89 and 90 illustrates the difference in the quality of battery sealing compound. The battery shown in Fig. 89 was sealed with Ford sealing compound while the one shown in Fig. 90 was sealed with ordinary sealing compound. The batteries were then subjected to a cold test for one week—the pictures show the results.

In addition to its value in the service department, Ford battery sealing compound with the proper amount of sales effort, can be made the source of considerable revenue. Prominently display this material in your window and on your counters and shelves—make a real sales drive among all concerns in your vicinity performing battery service work. Once Ford battery sealing compound has been established in your community, very little sales effort will be required to secure a steady volume of repeat orders.

Were we to base our conclusions solely on the inquiries we receive from battery service stations with reference to the advisability of using a high grade battery sealing compound, it would seem that comparatively few concerns realize the important part that this material plays in connection with the servicing of batteries. As a matter of fact the quality of the sealing compound used has a direct bearing on the efficiency of battery service work. In fact it does more than simply affect service work, it affects every branch of a service station's battery business, as battery sales are so largely dependent on the performance of satisfactory service work and satisfied customers, that whatever affects one necessarily affects the other.

Figs. 89 and 90 illustrates the difference in the quality of battery sealing compound. The battery shown in Fig. 89 was sealed with Ford sealing compound while the one shown in Fig. 90 was sealed with ordinary sealing compound. The batteries were then subjected to a cold test for one week—the pictures show the results.
Fred Jones, our dealer at Oklahoma City, who has made an excellent sales and service record since his appointment as a Ford dealer two years ago, states that the consistent use of a close follow-up system is largely responsible for the success he has attained. In his letter which we are publishing below, Mr. Jones explains just how this system functions and the part it has played in building up his business.

Gentlemen:

"We desire to call your attention to the success that we have had with our service follow-up system, and are enclosing sample sheets which are carried in four large binders. (See Fig. 91.) Each binder will hold fifteen hundred sheets, the sheets being arranged in alphabetical order. At the present time, we have listed on our books 4,620 regular service customer's cars.

"As you know we started in as Ford dealers two years ago the first of this month and this volume of business has been built, first: by a complete and thorough follow-up system, and second: by "all day and all night service," which of course, must necessarily be prompt, efficient and courteous.

"Our follow-up system also reflects favorably on our parts sales, as we have sold more than $100,000.00 worth of genuine Ford parts to September 20th this year.

"The cars which we sell are recorded on the pink sheets. The cars which are sold by other dealers and serviced by us are listed on buff colored sheets. (Fig. 91 is a reproduction of these sheets.) These service records are divided into twenty-four periods each year. The follow-up check on each customer is made by placing the figure one under the period when the customer should again be called upon. Our method is to set up the date four periods from the time the customer was last in our Service Department. In case he does not return prior to this date we either make a personal call, phone call, or send him one of our service follow-up cards. (See Figs. 92, 93, 94, 95, and 96.) These cards are numbered, one, two, three, four and 1A, and are sent out in that order, in case it takes that many cards or calls to get the customer back to our service station. The cards are used mostly in outlying districts, as we can get better results by personal calls. However, the results obtained from these cards have been very gratifying.

"Commercial firms and fleet owners are followed by personal calls. We have listed them in a separate binder, which enables us to go over the record frequently and very carefully, as this is a nice volume of business which is always cash or a requisition accompanies the order.

"Our service record also assists us in car and truck sales, as we have a thorough canvass of more than forty-six hundred prospects for Ford products, and we find it much easier to make a sale to a commercial firm or an individual when we can go to him and tell him the type of car he has, the motor number, the license number, the date purchased, and the exact amount he has spent on his car since the date of its purchase—as we call it 'being on the inside.'
"This service record has been exceptionally valuable to us and we are sure that a service record properly followed up will be of great value to any dealer. The writer remembers about two years ago when you told him that even a cleaning and pressing establishment could build up a tremendous volume of business by giving service and using a proper follow-up system. I wish to tell you that your statement impressed me and I have endeavored to follow your suggestion and now have proven that it has been very successful to us.

Very truly yours,
Fred Jones.

"We've missed you: Wonder where you've been!"

We sold it to you and are especially interested in its performance. Our records show that your car was in our shop last on. Regular oiling and greasing lengthens your car's life and reduces repairs. Our No. 1 and No. 2 Oiling service will save you money. Try it.

Fred Jones
FORD DEALER
210 SOUTH HARVEY
MAPLE 717

"We're interested in your car!"

Beginning at once, why not incorporate an efficient follow-up system in your business—the sales and service problems daily encountered by Mr. Jones are identical with your own and what he has accomplished by the consistent use of a close follow-up system can be duplicated by you if you will but conscientiously make the effort.
Taking Up Connecting Rod Bearings

In taking up a slightly worn connecting rod bearing, the first thing to do is to check the crankshaft with a micrometer to see that it is not out of round. Take the measurements across several different points and if the crank pin shows more than .0025 out of round, the shaft should be changed. If the shaft is all right and the babbitt in the rod and cap has not been damaged, the cap may be filed with a large mill file as shown in Fig. 97.

The repair man must exercise great care to hold the file squarely on the cap. When the cap has been dressed down sufficiently, try the surface for high spots by holding a scale across it at several points and angles. (See Fig. 98), or try it on a surface plate by tapping the cap lightly with the fingers at several points to note any slight variation in the surface.

If the cap is rubbed lightly over the surface plate and dark spots appear on the surface, these are the high spots, and should be rubbed off with a file until they are distributed evenly over the surface of the cap. The rod may now be assembled to the shaft. It should be tight enough to require a hammer blow to move it along the shaft (see Fig. 99).

If the babbitt has been burned out, a new rod should be substituted. When installing a new rod in place of one that has been burnt out, make sure that the pin bearing is free from any babbitt left by the burnt out rod, such babbitt can be dressed off with an oil stone. Before installing a rod, it should be carefully checked for correct alignment, as a rod which is out of line will cause excessive wear and knocking.

In fitting a new rod on an old shaft, the crank pin is usually undersize and it is not only necessary to remove the shims, but to also file off the cheek (face) of the cap. If the crank pin bearing is badly undersize, it is necessary to file both the cap and the rod, and scrape the bearing in until a 50% bearing shows.

To scrape a bearing in, file the cap and rod until it will tighten down on the shaft.
so the rod cannot be moved by hand, then loosen the bolts just enough to allow the rod to be turned by hand. Turn it back and forth a few times and remove it. The spots which are bearing will show and should be removed with the bearing scraper (see Fig. 100). Scrape very lightly, as deep holes are hard to smooth out. A very thin coating of Prussian blue wiped on the shaft before trying out the bearing will more plainly show the spots. When the rod shows a good bearing of about $50\%$, tighten it to the shaft so that it is hard to turn by hand. Assemble the motor, with the exception of the bottom door and start it up. Run it for about 30 seconds, then remove and examine the bearing. Scrape off any loose babbitt and if it shows a good bearing, replace the cap. If it does not show a good bearing, remove the cap and repeat the operation until it does. If the shaft is badly undersize and all the rods need changing, it is usually less expensive to put in a new crankshaft.

**Valve Timing**

The method of accurate valve timing on a Ford Model T engine is to time the valves by piston travel. The measurements are given below.

**Previous to 1913 Model:**
- Exhaust opens $3\frac{3}{4}$" before bottom center.
- Exhaust closes $1\frac{1}{4}$" past top center.
- Intake opens $1\frac{1}{4}$" past top center.
- Intake closes $3\frac{3}{8}$" past bottom center.

**Later than 1913 Model:**
- Exhaust opens $7\frac{3}{8}$" before bottom center.
- Exhaust closes top center.
- Intake opens $1\frac{1}{4}$" past top center.
- Intake closes $3\frac{1}{4}$" past bottom center.

The piston of the cylinder being timed is first brought to top center. (The highest point to which piston rises.) A scale is then laid across the piston and the distance from this scale to the top of the cylinder is measured. The engine is then turned to bottom center and the distance from the piston to the top of the cylinder block is measured again. This is the "bottom center." For example, the top center is $\frac{3}{8}$" above the face of the cylinder block and the bottom center is $3\frac{3}{4}$" below the face of the cylinder block. On a 1913 engine, the exhaust opens at a point $3\frac{3}{4}$" below the face of the cylinder block on the down stroke of the piston, the crankshaft turning in the direction of rotation of the engine, and closes on top center. The inlet opens $1\frac{1}{4}$" above the face of the cylinder block on the down stroke, and closes $3\frac{1}{8}$" below the face of the cylinder block on the upstroke.

Should a valve open early and close late, a small amount of stock should be ground from the end of the valve stem. If the valve opens late and closes early, the stem is too short, and a new valve should be substituted. Some repair men draw out the stem by peening the lower end, but this is poor practice as the average man merely turns a burr on the edge and this is soon worn off by the incessant tapping on the stem. The intake valve should be timed accurately on the opening and the exhaust should be timed on the closing as in a motor whose camshaft may be worn it is not always possible to have both the opening and closing check accurately with the figures given.

The method of determining when the valves open and close is as follows: With the spring assembled, close the valve. When it is closed, hold it with the fingers as shown in Fig. 101. Twist back and forth on the head while someone cranks the engine slowly. The instant the valve will turn, it has started to open. In the same way the valve may be checked for closing, the valve turning until it has seated. Another way to check the opening and closing is to insert a .001, feeler, or a thin piece of paper, between the stem and push rod. The instant the feeler will not move, the valve has opened. The instant it will move after being held tight, the valve has closed.
Millions of people all over the country regularly attend motion picture theatres. The popularity of this form of amusement has never waned—it is here to stay.

While motion picture theaters were designed primarily for amusement and educational purposes, they also present exceptional advertising possibilities inasmuch as they afford the live merchant an opportunity to present his card before a new audience each night when they are in the best mood to be approached. These people buy automobiles and thousands of them own cars which will sooner or later require service. Whether or not you obtain their trade depends to a large extent on whether you advertise your business.

Fig. 102 shows a set of eleven attractive service slides made up to suit the needs of your service department. They are attractively designed and carry a series of service messages, which will prove valuable advertising, each slide bearing the name of the dealers in neat black type.

The slides may be obtained direct from the Globe Slide and Film Co., Albion, Mich., at a price of $2.20 per set of eleven slides, or single slides at 25 cents each.