Location of Repair Department Affects Volume of Battery Business

WHILE practically every dealer recognizes the value of display in promoting the sale of merchandise, the importance of applying this principle to the sale of service work is frequently overlooked.

Display meets a two-fold sales requirement—it acquaints the public with the goods carried by a merchant, and through the medium of appeal and serviceability suggests their purchase.

The location of battery repair departments in dealers' shops furnishes an illustration of the value of display as applied to the sale of service work.

Recently, while investigating the cause of the wide variance in the volume of battery business obtained by dealers, it was observed that the dealer whose battery repair department was maintained in a cleanly manner and located in an easily accessible part of the shop, where it could be seen by everyone, obtained a much larger volume of battery business than the dealer whose repair department was located in some obscure corner in the rear of the shop.

Study your shop layout; endeavor to arrange each department so that it is displayed to the best advantage.

The sales value of display is of particular importance to the automobile dealer, as it affects every department of his business.
Counterfeit Parts

There is a Ford owner at Royal Oak, Michigan, who when purchasing parts, or having repair work performed on his Ford car, will make certain hereafter that he deals only with an authorized Ford dealer. "A" and "B", Fig. 2 explains his reason.

While the owner was operating his car under ordinary conditions, both of these counterfeit offset spindles collapsed at the same time.

Eckstine-Lakie, Ford dealers at Royal Oak, who replaced the broken parts with genuine Ford spindles, sent in the counterfeit material for our inspection. An analysis of the parts showed them to have less than \( \frac{3}{2} \) the strength of genuine Ford spindles.

When a customer experiences trouble as the result of having been sold an inferior grade article, he seldom blames the manufacturer of such material, he blames the concern who sold him the goods. As a result, their business, which is dependent solely upon local trade, sustains a permanent loss, while the manufacturer of the counterfeit material simply transfers his selling efforts to some other locality where his goods are unknown.

Genuine Ford parts are your protection—their use is an assurance of quality and customer satisfaction.

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 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.

Designate Series When Ordering Door Locks and Keys

Two series of Briggs & Stratton closed body door locks and keys have been used on Ford cars.

The first series of keys and locks carries the serial number only, for example 22312 while the second series carries the letter "A" after the serial number, (see Fig. 3.)

As the same serial numbers were used on the keys of both series, it is essential that the suffix letter "A" be specified on the order when ordering keys of the second series.
A Display That Increases Sales

A display board made in our own plant for the purpose of assisting dealers in increasing their sales of genuine Ford gaskets, is shown in Fig. 4.

The dimensions of the board, which is so designed that it can be fastened to either the end of a stock bin or counter, are 2 x 4 ft. It is made of 3/8" fibre board finished in dark green, and mounted in a frame having a golden oak finish. The specially designed hooks which are equipped with a shoulder that holds them in a rigid position, are nickel plated and polished—the whole arrangement presenting an exceptionally attractive appearance.

The principal advantages of the board are:

1. Displays gaskets in an effective manner where they can be observed by everyone entering the parts department.
2. Is a constant reminder to the parts salesman to suggest the purchase of genuine Ford gaskets.
3. The convenient grouping of gaskets on one board is both a time and space saver, insuring prompt service to the customer.
4. As a silent salesman it assists in promoting the sale of genuine Ford gaskets.
5. The display board being in plain view insures the maintenance of an adequate supply of gaskets and eliminates the possibility of sales being lost as the result of stocks becoming exhausted.

The price of the board is $3.40 each, net, this figure representing our actual manufacturing cost in wholesale quantities—The board is listed under symbol No. 56Z-168.

Fig. 4

At the price quoted, this equipment affords dealers an unusual opportunity to develop their gasket business at a minimum cost.
Tightening Rear Wheels

Tightening rear wheels on axleshafts, is an operation requiring special attention.

If the axle shaft nut is not drawn down tightly, the wheel hub will clash against the key on the shaft, ultimately resulting in breakage of the shaft either from crystallization or because of the chipping off of small pieces which work around the shaft, eventually cutting both shaft and hub.

Owing to the importance of this operation and the necessity of using the correct type wrench, we are making up a quantity of specially designed hexagon head box shaped wrenches, having handles 20" and 25" long, for use in tightening axle shaft nuts on both car and truck, (see A, Fig. 6).

The net prices of these wrenches are $1.35 and $1.65 respectively. One each of car and truck axle shaft nut wrenches will be shipped all dealers. The wrench used on the car is listed under symbol No. 52-248, while the one used on the truck is listed under symbol No. 52-591.

When wheels are installed while car is on assembly line, a bar, details of which are shown in Fig. 5, can be used to prevent the wheels from turning. The bar is placed between the spokes of the wheel and rests on the radius rod, it is then hooked into the channel of frame as shown at B, Fig. 6.

Change in Design of Fordson Commutator Control Rod

Fig. 7 shows an improvement recently made in the Fordson commutator control rod. Note that the new style rod is curved at the end which is attached to the commutator. This insures ample clearance between commutator case and control rod when the spark is fully retarded, thus preventing any possibility of the rod short circuiting the commutator terminals.
Checking the Camshaft

The usual practice of correcting noisy time gears is to change the large gear; selecting one which meshes properly with the small gear. Usually one change of gears is sufficient, occasionally, however, it is necessary to change two or three gears before the proper one is found. Occasionally noisy time gears are caused by a sprung camshaft, the camshaft having been sprung due to a loose camshaft bearing or some foreign substance getting between the gears.

When a camshaft is sprung it is necessary to remove and straighten it or replace it with a new shaft. To remove the camshaft, it is first necessary to remove the radiator, fan, commutator, cylinder front cover, large time gear, cylinder valve cover, gasket, generator and generator bracket. In order to facilitate lifting the push rods it is also necessary to remove carburetor pull and adjusting rods, and hot air pipe.

The two camshaft bearing set screws are withdrawn. The push rods are then lifted out of the way of camshaft. This is done by inserting a valve lifter under valve seat pin (see Fig. 8). While the valve is held up, the push rod may be raised with the fingers until the hole in the rod is exposed, a pin is then inserted into the hole in each push rod.

(An 8d nail with the point filed off can be used for this purpose) and the valve stems are allowed to rest on the rods as shown in Fig. 10.

The camshaft may now be withdrawn from the cylinder block by means of a camshaft puller.

The front and center bearings are of the split bearing type. They are held on the shaft
by means of circular springs. These springs are removed by inserting a screw-driver under them, forcing them off, as shown in Fig. 11.

The camshaft may then be tried on centers as shown in Fig. 9.

Before setting the shaft on centers, inspect the center holes in the shaft to see that there is no burr. Scrape out any burr or dirt which may be in the holes and clean them out with a rag, as very little foreign matter in the center holes will cause the shaft to run out.

The amount the shaft runs out is measured by a dial indicator, reading in one-thousandths of an inch. A ball point plunger rests on the bearings to be indicated and the shaft is turned slowly, the operator watching the dial. A slight variation in the surface is noted by the movement of the hand on the dial. The camshaft should not run out any more than the limits given in Fig. 9. The high sides of the shaft should be noted and the shaft should be straightened on a press, as shown in Fig. 12.

When straightening a shaft it is always advisable to first bend it far enough in the opposite direction so it will be distorted the other way. The shaft is then brought to normal from this side. This overcomes any tendency to spring out of line again.

After the camshaft has been straightened, or when a new shaft is to be installed, the bearings are put back into position. A new center bearing may be assembled in either direction, but a bearing which has been in service for sometime should be replaced in its original position. The old style front bearing with the notch and 30 degree chamfer “B” and “A”, Fig. 13, is always assembled with the cut-away part towards the rear. This is to allow clearance for the push rod of the first valve.

The present design front camshaft bearing is assembled with the radius on the end of the bearing (see “C”, Fig. 14), set toward the front of the shaft.
Before putting the spring ring into position, try the play by holding the bearing on the edge of the table and moving the shaft up and down. Any play in the bearings may thus be easily noticed. A slight amount of play is permissible in fitting the center bearing, but the front bearings, which act as a thrust, should move very little, new jobs being fitted to about .004 of an inch end play.

To assemble the bearings, place them in position on the shaft, making sure that the two halves are fitted properly, according to the break in the cast iron shell. Bring the ring over the center of the bearing and press it on as shown in Fig. 16. The bearings should be carefully oiled before being assembled to the shaft. Position the two bearings on the shaft so that the set screw holes line up with the two cam bearing set screw holes in cylinder block. Insert the shaft into the hole and drive it into position, with a wooden mallet or rawhide hammer, taking care not to turn the shaft until the center bearing has started to enter its hole. Otherwise its position will be lost and it will be impossible to bring the set screw hole in the bearing to line up with the hole in the cylinder block. It is advisable to screw the commutator brush nut part way onto the shaft, in order to protect the threads when driving the shaft into position. Drive the shaft in until the front bearing set screw hole lines up with the set screw hole in the cylinder. The set screw hole in the center bearing will then be at the edge of the set screw hole in the cylinder. As there is end play in this bearing, it will be impossible to drive it all the way into position. Insert a drift through the set screw hole in the cylinder and draw the bearing into position, as shown in Fig. 17. When the holes have been lined up, tighten the set screws in both the front and center bearings.

The generator bracket, time gear and generator are now replaced, when installing the time gear make sure that the tooth marked Ford on the small time gear comes between the two teeth on the large gear at the point marked zero (o).

The pins may now be withdrawn from push rods, and cylinder valve gasket and valve cover replaced. Examine gasket before replacing to make sure it is in satisfactory condition.

Carburetor pull and adjusting rods are connected to carburetor, cylinder front cover, commutator, fan, and radiator are then installed and the assembly is completed.
Complying with requests from dealers for a tool that will speed up the operation of blanking out grommet holes in side curtains, a specially designed grommet punch has been produced, see Fig. 18. This new tool will be included in the list of tools comprising the curtain fastener and carpet catch riveting set illustrated in the May 1924 issue of the Service Bulletin.

The net price of this set of tools including the new grommet punch, is now $12.00.

Orders for these tools can be placed with nearest Ford Branch. Shipment being made direct from manufacturer on a C. O. D. basis.

### Adjusting 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 \( \frac{1}{4} \)" 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.

### Installing Demountable Rims

When installing a demountable rim on a wheel, be sure that the bead on the rim is just flush with the edge of the felloe all the way around. If the bead and felloe are not even, the wheel will have the appearance of wabbling. The lugs should always be drawn up evenly by giving each nut a few turns at a time. Do not tighten one lug before drawing up on the others.
WHO PAYS EMPLOYEES?

The sign illustrated above hangs in a prominent place in the service station of Morgan-Woodward Auto Co., Ford Dealers at San Antonio, Texas. It serves as a constant reminder that it is the public that must be pleased, for it is the public that finally provides the employee with his pay check.

Service is judged largely by little things—a courteous word spoken at the right time—a helpful suggestion offered in a friendly manner—the sympathetic consideration of a complaint—the acknowledgment of a fault when one is at fault. These things all make up the great service ideal.

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 fails off, if the public takes its business elsewhere, the result is a reduction of employees 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.
A Timely Window Display

Recently there has been much agitation in Masontown, Penn, regarding the erection of a new bridge over the Monongahela River at this point.

The Wright Motor Company, our dealer at Masontown, was quick to take advantage of this trend of local interest, by exhibiting the clever display of Ford parts illustrated above. Naturally the window attracted much attention and favorable comment, the subject being one so much discussed locally.

An attractive and interesting window display is an inexpensive method of advertising, and one that should not be overlooked by the dealer.

Battery Separators

Of late we have been receiving complaints relating to damaged separators, particularly drawing attention to the cracked condition. Investigation discloses that this condition results from the method of handling, rather than to defective stock being shipped from the factory.

There are no better separators to be had on the market today than the genuine Ford battery separator. To begin with, nothing but the highest quality of raw material is used—No. 1 grade Port Orford cedar. The equipment used in manufacturing cannot be excelled.

After the cutting and grooving operations are completed, the separators are given a 28½ hour treatment for the purpose of eliminating acetic acid. This treatment is considerably longer than that given cheap separators. They are then trimmed to width and held within a variation of ½ in order to insure the separator extending beyond the plate. This prevents any possibility of a short at the end of plate. Following the trimming operation, the separators are given an individual piece inspection and then placed into a humidor in which the humidity is maintained at the correct point in order to insure the retention of proper amount of moisture until placed in use.

When the separators are removed from the humidors, for repair purposes, they are again given a rigid inspection and submerged in water, after which they are wrapped in a double container of waxed paper, which is tightly sealed to prevent any moisture from escaping.

Dealers should not allow separators to remain in the open waxed container, but on the contrary, after using whatever quantity may be required, the balance, in their original form, should be submerged in a crock of water. They should not be indiscriminately thrown into the crock. Remember that separators which have once become dried out, are rendered useless. Submerging such parts does no good. Do not allow them to get in this condition.
Determination is a Reason for Success

Our Fargo Branch have shown a remarkable parts business for the first quarter of this year. Parts sales for the first three months of 1925 shows almost a 50% increase over the same period in 1924. This proves that the dealers under the Fargo Branch are enjoying a profitable parts business. The parts salesmen back of the counter are working and serving Ford Owners and Garage men with an earnest desire to please.

Back of this success is a determination to work for it and this purpose is well illustrated by the following excerpts from letters received from Fargo Dealers.

“We are continually working on plans to increase our parts sales and the outlook for 1925 is very good. We will do our best to hit the mark set for us.”

B. C. GAMBLE COMPANY
Fergus Falls, Minn.

“We expect to increase our parts for the coming year at least 50% and possibly more than that, at least we are going to try and get all the parts business that is here to get.”

KARNOP & BELEY
Harlowton, Mont.

“We expect to make a very substantial increase in our parts business during the year 1925.

“We have placed an order for a full carload of parts and have a good stock on hand. We are carrying two ads in the Great Falls Tribune per week, and have made additional display space in our stockroom. We have also put in a good live wire salesman to assist in our parts department and pay our salesmen five percent commission on all parts they sell. We believe all these will help to increase the parts business in our territory during the coming year.”

MCKINNEY MOTOR COMPANY
Great Falls, Mont.

“Our parts business has a better outlook this year than ever before. We believe that we will not only reach our quota, but will more than exceed it.

“More cars coming into our territory all the time, and they will, naturally, increase our sales of Parts.

“The suggestions you offered in the above mentioned letter will be used to the fullest extent, and we cannot help but believe that 1925 will be the biggest year for us in the sale of Ford Parts.”

BROADWAY GARAGE OF WINNETT, INC.
Winnett, Mont.

“Regarding parts sales possibilities for the year 1925, we intend to push this end of our business, for two big reasons eliminate the sale of gyp parts by selling more Genuine, which in turn will give our customers more satisfactory service and help sell cars, and the sale of parts is a very profitable part of our business.”

E. C. CLAPPER
Cut Bank, Mont.

“We are glad you are pleased with our parts sales for 1924, and will say we sure worked hard to reach this target. We believe with our new parts system we will be able to increase our parts sales 50% in 1925.”

PULLOCK AUTO COMPANY
Pullock, South Dakota

“In reply to your letter of Jan. 30th we thank you for your compliment. We are going out after the business on all the Ford Products harder than we ever have before and don’t see why we can’t increase our parts business 50%, as well as cars, trucks and tractors. We are working on tractor sales every day even if we cannot get around on account of the snow and cold weather. Again thanking you for your compliment on the parts business we remain,

WAGNESS AUTO COMPANY
Lakota, N. D.”

9 Leaf Front Springs for Trucks

All trucks are now being provided with 9 leaf front springs in place of the 7 leaf design which is standard production on all model T cars. This heavier front spring will carry the excessive loads that are often placed on the trucks, with less danger of breakage.

These heavier front springs are now available at all branches, and dealers should arrange to carry stocks adequate to their needs. When installing the new 9 leaf spring on a truck formerly equipped with the old 7 leaf spring, it would be necessary to substitute the following parts:

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Fac. No.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1165</td>
<td>TT-342</td>
<td>Front spring clip bar</td>
<td>$0.25</td>
</tr>
<tr>
<td>1164-B</td>
<td>TT-2921</td>
<td>Crankcase bearing and spring clip assembly</td>
<td>.90</td>
</tr>
<tr>
<td>3664-B</td>
<td>TT-493</td>
<td>Front license bracket assembly</td>
<td>.10</td>
</tr>
<tr>
<td>1151</td>
<td>TT-332</td>
<td>Front spring—9 leaf</td>
<td>3.00</td>
</tr>
<tr>
<td>1166</td>
<td>T-242</td>
<td>Front spring clip nut</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>T-82</td>
<td>Front spring clip cotter, Doz.</td>
<td>.03</td>
</tr>
</tbody>
</table>

The 9 leaf spring will list at $3.00. The prices covering extra leaves and other parts mentioned above will be contained in a new parts catalog issued May 1st.
Carburetor Overhaul

To Remove Carburetor from Car:
1. Lift off hood.
2. Shut off gasoline at sediment bulb underneath gasoline tank.
3. Disconnect carburetor pull rod at throttle by withdrawing cotter pin.
4. Disconnect the two priming wires at carburetor butterfly and the adjusting rod at needle valve.
5. Disconnect feed pipe at carburetor by running off pack nut.
6. Loosen manifold stud nut which holds carburetor hot air pipe to manifold and withdraw hot air pipe from carburetor.
7. Run off the two carburetor flange bolt nuts and withdraw bolts.
8. Lift out carburetor and place it in a vise, holding carburetor at throttle flange and intake flange. In order to hold carburetor in this manner, it is necessary to pull intake lever back (see "A", Fig. 22). This prevents shearing pin in intake plate.
9. Remove spray needle by loosening spray needle clamp nut "B". Needle can then be run out.
10. Remove drain valve plug assembly and mixer chamber nut. Float chamber and gasket can now be lifted off of mixing chamber flange.
11. Remove float by withdrawing float lever pin (see "A", Fig. 24).
12. Withdraw gasoline inlet needle from inlet seat. (see "A", Fig. 25).
13. Run out spray nozzle and lift out gasket from mixing chamber. (See "B", Fig. 25.)
14. Run out inlet seat (see "A", Fig. 26) from mixing chamber. Carburetor is now completely disassembled.
15. Before reassembling carburetor, examine all parts carefully. To avoid leaks, it is advisable to use new gaskets when reassembling. See that inlet needle and seat have no burrs or ridges and that seat is not worn oversize or threads cracked. Make sure that spray needle
point is not loose or scored, and that spray nozzle, is not oversize or scored. Check metal float for leaks by placing it in boiling water, if bubbles rise to surface there is a leak. Examine intake lever spring for tension, also make sure that throttle and intake levers have not become loosened.

17 To assemble carburetor, place spray nozzle gasket in mixing chamber and run down spray nozzle with a spray nozzle wrench.

18 Position inlet seat gasket and inlet seat into mixing chamber and run down inlet seat (see "A", Fig. 26).

19 Place inlet needle into inlet seat. Needle is seated by tapping it very lightly, using a small hammer and a seating tool and turning the tool while tapping. (see "A", Fig. 27) It is important that the needle be tapped very lightly to avoid damaging needle or enlarging seat.

20 Position inlet seat gasket and inlet seat into mixing chamber and run down inlet seat (see "A", Fig. 26).

17 To assemble carburetor, place spray nozzle gasket in mixing chamber and run down spray nozzle with a spray nozzle wrench.

21 Position mixer chamber gasket on flange of mixer chamber. Install float chamber over
mixture chamber. Place mixture chamber nut gasket on float chamber and run in and tighten drain valve assembly.

22 Install spray needle assembly (see “A”, Fig. 31) by running spray needle assembly down until it seats in spray nozzle. Do not use any force in screwing the needle down against the nozzle. If force is used, it will enlarge the nozzle hole or deeply score the needle point, causing imperfect operation. After needle has been seated in spray nozzle, turn needle back 7/8 to 1 turn. This will give the correct opening. Spray needle clamp nut “B” is then run down sufficiently tight to clamp the needle.

23 Run down the adjusting screw “C” in throttle lever until end of screw is 1/8” from throttle lever stop. Test tightness of gasoline inlet needle by turning carburetor upside down, and sucking lightly on fuel inlet elbow. If needle is properly seated, the tongue or lips will stick to the elbow in the same manner as a small bottle. (See Fig. 32).

24 Connect carburetor to intake manifold:
   (a) Insert the two carburetor flange bolts through inlet pipe placing carburetor flange gasket over ends of bolts.
   (b) Position carburetor so that bolts can be entered. Run down the carburetor flange bolt nuts on the ends of the bolts. It is absolutely essential that these nuts be drawn down tightly in order to prevent any interference with the mixture of gas and air which is drawn into the cylinders.
   (c) Insert end of carburetor hot air pipe into carburetor, and tighten nuts which hold hot air pipe to manifold.
   (d) Connect adjusting rod at carburetor needle valve by inserting cotter pin.
   (e) Connect the two priming wires at carburetor butterfly.
   (f) Connect carburetor pull rod to carburetor throttle by inserting cotter pin.
   (g) Run down feed line pack nut, making sure that feed pipe gasket inside of pack nut is in place.
   (h) Turn on gasoline by opening stop cock in sediment bulb underneath gas tank.
   (i) Install hood.
Fig. 33 shows the voltage curve of the Ford Battery at 200 amperes discharge, which is the average amperage required to start the Ford engine, in comparison with the voltage curve of three other well-known makes of batteries selling at corresponding prices. The Ford Battery is designated as No. 1 on the chart.

It will be readily seen that the Ford Battery delivers a greater amount of current for a longer period than the other batteries. This means that the Ford Battery will crank the engine faster and longer.

**Electrolyte**

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.

Ford Dealers should use only the Electrolyte which is supplied through branches. This acid is sold at a very reasonable price, with an additional charge to cover the carboy in which shipment is made. Credit covering this charge is issued upon return of the carboy to the Branch. This electrolyte is already mixed and of the proper strength to give satisfactory results.

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.
## Chart of Cylinder, Piston, and Ring Sizes

<table>
<thead>
<tr>
<th>Nominal</th>
<th>Cylinder</th>
<th>Piston</th>
<th>Piston &amp; Ring Ass'y</th>
</tr>
</thead>
</table>

### Fig. 35

**It Is Economy to Change Spark Plugs Every 10,000 Miles**

When spark plugs have been in use over a period of 10,000 miles, the spark loses its intensity and consequently the weakened spark fails to give complete combustion in the cylinders. Power is lost, the engine becomes sluggish and gasoline and oil are wasted. That is why it is real economy to change the plugs at least every 10,000 miles.

The spark plug core is made of a highly glazed porcelain material. After a time, due to the terrific heat of the explosions in the cylinder, the glazed surface on the core is gradually broken down and it becomes roughened enough to retain particles of carbon, road dust, etc. These foreign particles form a partial short circuit across the plug, and part of the current which should give a hot efficient spark, leaks across the “short” and reduces the effectiveness of the plug in proportion. Thus it will be seen that installing a new set of spark plugs is not an expense, but an actual economy because of the more satisfactory engine performance obtained and the gasoline and oil that is saved.

**Tractor Air Washer Plug**

Occasionally, the threads in the filler hole in the Fordson Air Washer become stripped thru carelessness, etc., so that the metal cap with which this hole is covered, will not hold. In cases of this nature, owners usually resort to the use of wooden plugs, etc., to close the opening. The rubber plug S719—F-1884BR shown in Fig. 35 will be found very useful for this purpose, as it is easily inserted and removed and makes a tight joint. These plugs will be available shortly and will retail at 15 cents each.

*Fig. 35*
New Type Transmission Bands

The new type transmission band with detachable ear, shown in Fig. 36, simplifies the job of changing bands considerably, and reduces the cost of this operation to a great extent. It is unnecessary to remove the transmission cover to change this type band, as all of the operation may be accomplished through the transmission cover door.

The only special tool actually required is the one shown in Fig. 37. It is made by bending over the end of a screw driver approximately one-quarter of an inch and can easily be made up in the dealer's shop.

To change bands, remove the door in the transmission cover. Run off the nuts and lock washers from the ends of the pedal shafts and remove the springs.

"EXTREME CARE SHOULD BE EXERCISED TO PREVENT DROPPING ANY PARTS INTO THE TRANSMISSION."

The reverse pedal and brake pedal should then be pulled out as far as they will conveniently go, see Fig. 39, and remove the ears as explained above. The bands may then be withdrawn from the right side, see Fig. 40, permitting them to follow close to the cover to prevent their being distorted.

To remove the ear, simply insert a tool through the end of the ear into the square hole in end of brake band, lift up on the tool forcing the brake band down and the ear back.

Fig. 36

Fig. 37

Fig. 38

Fig. 39
To replace the bands insert the earless end in the right side of the transmission, see Fig. 41, forcing the band around until it is possible to reach the square hole with a hooked tool shown in Fig. 37. When the end of the band has been pulled around as explained above, the ear may be slipped over the stud and forced back into the locked position, if necessary forcing it back with the hooked tool as shown in Fig. 42.

The first band replaced should be positioned over the first or reverse drum; the second over the brake drum and the third over the slow speed drum.

The springs are then slipped over the shafts, the ears drawn up into place holding them against the compression of the spring with the hooked tool as shown in Fig. 43.

The lock washers and nuts may then be replaced and the bands adjusted in the regular way.

To install this new type band in a car which is equipped with the old type, it is necessary to remove the transmission cover.

The slow speed shaft must be cut off about \( \frac{7}{8} \)" from the shoulder and unless the cover is removed, there is a possibility of the steel shavings falling into the transmission case and shorting the magneto.

A new type slow speed adjusting screw, Fig. 44, must be installed with the new type bands and outside of cutting off the slow speed shaft, the first installation of these bands should be done in the same manner as the old type.
Using Low Grade Fuel in the Fordson

Two special units designed to give high efficiency with the use of kerosene or other low grade fuels, have been adopted as standard equipment on the Fordson tractor. These are the Holley Plate Vaporizer and the Kingston Regenerator. Each of these units give very satisfactory results and an equal number of each is used in production. A brief outline of the construction and operation of this equipment is given on the following pages.

The Holley Plate Vaporizer

Gasoline and kerosene are used generally as though they were different kinds of fuel. This is not so for they are derived from the same crude oil and differ only in grade—gasoline being lighter, vaporizing at a lower temperature—and kerosene being heavier, requiring high temperatures before it becomes a vapor.

The Holley Hot Plate Vaporizer uses temperatures corresponding to grade of fuel used. The liquid with a very small quantity of air is exposed to a hot plate, which covers a large opening in the exhaust manifold. The exhaust heat not only has free access to the back of this plate, but the plate itself is so thin that it responds immediately to any change in temperature in the exhaust of the engine, such as when starting, warming up, and any changes of throttle position effecting the load.

The fuel is brought into perfect contact with the hot surface by means of a cover which has ribs to match those of the heated plate, see Fig. 46. These ribs form paths for the fuel and air, or after it is vaporized, the vapor. The direction and path of the fuel or vapor is shown by arrows in the front view. It will be noticed that the path is not straight, but the fuel or vapor must travel backwards and forwards. This also gives more time for the vaporization to take place, making it impossible for any liquid fuel to reach the inside of the cylinder.

The vapor leaves the plates by a vertical tube entering the mixing chamber at the throat of the venturi and mixes with the cold air drawn from the air washer. To take fullest advantage of this perfect vaporization a new type of air valve is used which, having no adjustment, will accurately maintain high economy and efficiency. This valve is located at the horizontal intake between the choke valve and the primer.

Starting is greatly accelerated by using an emulsion of fuel and air. This is more easily drawn from the lower end of the plate, through the mixing chamber, and into the cylinders than if solid fuel were used. To accomplish this, air is allowed to enter with the fuel, thus atomizing it. This is accomplished by having two chokes which operate at the same time by means of the same lever. The shaft which operates the main choke valve is extended into a pocket of the mixing chamber connected with the primary air. The end of the shaft is milled off so that when the main air choke is closed the passage for the primary air is also closed, but around this shaft there is a fixed leakage or by-pass, which reduces the primary air, increases the suction on the nozzle for making the mixture rich, and at the same time furnishes a small amount of air with which to atomize the fuel. If the choke lever is pushed open, the main air valve is wide open and the primary air is also in the wide open position.

To Start Cold Engine:

Drain kerosene from float chamber and fill it with gasoline or benzol.

See that adjusting needle (on top of float chamber) is open from 1 to 2 turns.

Choke and crank.

NOTE: The small cup at the top of the mixing chamber can be used for priming with a squirt can in extremely cold weather.

To Clean Hot Plate:

Unscrew vapor tube nut and four cover plate nuts. Also disconnect fuel line.

The "hot plate cover" will come off with the iron cover plate. Do not detach plate from cover.

Clean carbon deposit off "hot plate" and cover with steel brush.

Some fuels deposit more carbon than others. Carbon deposits slow up heating of "hot plate" and make a smoky exhaust. The "hot plate" is very easy to clean and to insure perfect operation should be inspected every 100 hours of actual use. The operation of inspecting and cleaning can be done in five minutes, see Fig. 45.
Kingston Regenerator

The regenerator is designed to give satisfactory service using kerosene or low grade fuel and equal service without change, using gasoline or any of the higher grade fuels.

It is so constructed the intake and exhaust manifolds are combined into a common unit, the intake portion of which extends into the exhaust portion of the manifold in the form of a generating pocket or trap. At the lowest point of this generating pocket is located the "heat-booster" which is one of the main features in the automatic heat control.

The vacuum in the intake manifold is highest at small throttle opening and lowest at wide open throttle. It is also known that, for complete vaporization, a fuel mixture must be heated to a higher temperature at low idling speeds than is necessary at high speeds. The design of the regenerator is based on these two principles.

With the Kingston type regenerator, the control of heat is accomplished by means of the heat control valve, the intake manifold floater and the heat booster. When starting the motor on gasoline or operating it on kerosene, the heat control valve should be turned to "Ker." If the motor is operated on gasoline, the heat control valve should be turned to "Gas" after the motor becomes warmed up. The intake manifold floater and heat booster operate automatically in connection with the opening and closing of the throttle. At low engine speeds, the throttle being only slightly open, a high vacuum is created and but a small amount of mixture passes through the carburetor. At low speeds the intake manifold floater is in the idling position forcing the mixture down into the generating pocket which is heated by the exhaust gases. At the same time the high vacuum draws heat through the small holes in the heat booster and the mixture is completely vaporized.

At higher engine speeds less heat is required to vaporize the mixture and as the speed of the engine is increased by opening the throttle, the intake manifold floater is gradually raised to the high speed position forcing the mixture down into the generating pocket which is heated by the exhaust gases. At the same time the high vacuum draws heat through the small holes in the heat booster and the mixture is completely vaporized.

The automatic action of the intake manifold floater and the heat booster gives the correct heat for complete vaporization of the fuel at all engine speeds.

Adjustment

The only adjustment provided and necessary is the high and low speed needle control valves of the carburetor.
The carburetor is automatic and controls the flow of fuel and air in the proper proportion at all speeds.

To adjust vaporizer, turn two-way valve to "Gas" and if carburetor bowl is filled with kerosene, drain the kerosene off by means of the carburetor drain plug, as adjustment should be made while using gasoline. Loosen high speed lock nut and turn high speed adjusting needle down until it seats (do not force it against the seat,) then turn it back one and one-quarter turns. Adjust the low speed adjusting needle in the same way. Start the engine (using the choke) and let it run until warmed up. Turn the kerosene on and with the throttle open (do not race the engine) turn the high speed adjusting needle down until the motor begins to misfire, then turn the needle back until the engine operates smoothly. Tighten the high speed lock nut. Close the throttle and adjust the low speed adjusting needle in the same way as the high speed needle was adjusted. With high and low speed adjusting needles correctly adjusted, the carburetor will function properly at all engine speeds.

**Do not Choke Carburetor to Stop**

SHUT OFF FUEL at fuel switch lever and allow motor to use all fuel in carburetor bowl. Always switch to gasoline to start; especially if tractor is allowed to stand a sufficient length of time to permit motor to get cold.

**Generator Brushes**

Some dealers are evidently unaware of the fact that in order to secure best results from generator brushes, it is essential that all three brushes be of the same kind. We have several sources of supply for these brushes and while they all conform to the same general specifications, some makes are softer than others. Equally satisfactory results will be secured from the soft brushes as from the hard brushes, but it is very important that precautions be taken against using a soft brush with two hard brushes or vice versa. This results in the commutator becoming dirty very quickly which of course, prevents the generator functioning properly.

All genuine Ford brushes are marked on the terminal end with the manufacturer's name and to insure all brushes being of the same hardness, it is merely necessary to see that all three brushes bear the same name.
Crankcase Arm Bolt on Trucks

We have discontinued using the side bolt and block for the crankcase arms on the TT Truck. This allows the mounting of the engine to be somewhat more flexible and reduces the possibility of cracking crankcase arms on trucks used on rough roads, etc.

The change discontinues the following parts for use on trucks:
- T-3073-B Crankcase arm bolt-side
- T-3083 Crankcase arm block

Change in Steering Gear Ratio

Steering gears of 5 to 1 ratio, which were originally installed only in cars equipped with balloon tires, are now being used in all cars regardless of their tire equipment.

A new steering wheel, 17 inches in diameter, is used with the new steering gears and the change in the ratio of the steering gear together with the increased diameter of the wheel add materially to the well-known ease of control inherent to the Ford car.

The gears used in the new "5 to 1" steering gear are not interchangeable with the old type "4 to 1" and it is very important that all mechanics be apprized of the difference. The installation of a "5 to 1" driving pinion in a set of "4 to 1" driving gears would very likely result in a serious accident due to locked gears. The new style driving pinions are considerably smaller than the old style and the effects of installing a "5 to 1" pinion in a set of "4 to 1" gears is clearly illustrated in Fig. 49.

The stockman should be instructed to take precautions against mixing old and new style steering gear pinions. T-3517, the "4 to 1" ratio pinion has 12 teeth and T-3517-B the "5 to 1" ratio pinion has 13 teeth. The "5 to 1" ratio driving pinion has 9 teeth and the "4 to 1" ratio driving pinion has 12 teeth.

Fig. 48 shows both the new and old style gears correctly assembled and too much emphasis cannot be placed upon the necessity for installing the proper gears.
Tractor Parts for the Small Dealer

The illustration shows a two-unit metal bin system designed to carry an assortment of tractor parts most generally in demand. This unit will meet the requirements of that class of dealers who service a limited number of tractors, while others who do repair work more extensively will naturally require a more complete assortment.

The selection of parts totals approximately $500 at list price, and represents the minimum investment that any dealer should make, even though his tractor service demands are comparatively small.

By confining the purchase of tractor parts to a definite list of articles, the dealer saves time and money, in addition to providing better service to the tractor owner in his locality.

Dealers desiring information regarding these bins should communicate with their respective branches.
Ford Body Polish and Top Dressing

We are now supplying Ford Body Polish and Top Dressing. The symbol numbers and prices of these commodities are as follows:

M-230-F  Body Polish  65c Qt.
M-255-F  Top Dressing  65c Pkt.

The Ford Polish was selected after very exhaustive tests of a large number of different polishes had been conducted in our Laboratory. The same can be said for the Top Dressing. The quality of both assures our dealers of handling products that they can conscientiously recommend to the prospective purchaser.

We are able to offer both the polish and the top dressing at exceptionally low prices, which should assist our dealers materially in building up a very good business on these products.

All dealers are expected to carry Ford Polish and Top Dressing in stock for sale to Ford owners.

Tire Inflation

Our Engineering Department, working in conjunction with the various tire companies, has found that in order to secure the maximum service and comfort from balloon tires on Ford cars, they should be inflated in accordance with the following table. The correct pressures for standard 30 x 3 1/2 tires are also given below.

The table shown below of pressures supersedes all other information on this subject and we cannot emphasize too strongly the importance of adhering closely to this table. Dealers should make it a point to see that the tires on new cars are inflated in accordance with the table below before delivery, and also endeavor to impress upon owners the importance of giving careful attention to keeping the tires properly inflated.

An under inflated tire will not give the service and life of which it is capable and likewise the benefits of balloon tires are lost if the tires are over inflated.

<table>
<thead>
<tr>
<th>Balloon Tires</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadster</td>
<td>24 lbs.</td>
<td>24 lbs.</td>
</tr>
<tr>
<td>Roadster with pick-up body</td>
<td>24 lbs.</td>
<td>30 lbs.</td>
</tr>
<tr>
<td>Coupe</td>
<td>24 lbs.</td>
<td>24 lbs.</td>
</tr>
<tr>
<td>Touring car</td>
<td>24 lbs.</td>
<td>27 lbs.</td>
</tr>
<tr>
<td>Tudor Sedan</td>
<td>24 lbs.</td>
<td>30 lbs.</td>
</tr>
<tr>
<td>Fordor Sedan</td>
<td>24 lbs.</td>
<td>30 lbs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Pressure Tires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard tires (cars)</td>
</tr>
<tr>
<td>Truck tires (front)</td>
</tr>
<tr>
<td>Truck tires (rear)</td>
</tr>
</tbody>
</table>
Service Follow-Up System

That the advantages derived from the proper use of service follow-up systems are being recognized, is evidenced by the increasing number of Dealers who have installed systems of this kind, with profitable results.

There are several satisfactory systems that may be employed, from the simple card record in a box to the elaborate visible record housed in metal cabinets.

While the highly developed costly system can be profitably used by the Dealer who has a sufficient volume of business, good judgment must always be exercised to prevent an over investment in system by smaller dealers.

None of these systems are self-actuating, however, and each requires a certain definite amount of work to become effectual.

The purpose of the service follow-up system is to enroll the names of the Dealer's customers, as well as all Ford owners living within a reasonable distance, or within the dealer's natural trade area, so that contact can be maintained with them through personal calls, telephone and frequent letters of solicitation. The service follow-up then is the key to the dealer's service market as it constitutes a record of prospects for the future sale of Ford parts, repair labor, accessories, gas, oil and other commodities, and eventually another Ford car, truck or Fordson tractor.

All repair orders after having been completed should be computed showing the total amount of the bill of labor and parts. These orders before filing should be routed to some definite person in the office designated to make entries on the service card record. This is particularly important, for unless some employee is held to strict accountability for the maintenance of the follow-up system, it is likely to be slighted, with the result that it will eventually become useless.

All entries on the service card should show date, repair order number and amount of the repair work performed in dollars and cents.

There are some small service jobs done on cars where no repair order is issued due to the small amount involved; in such cases a job ticket should be issued and postings made to the service card from them.

Dealers' service superintendents and shop foremen will find a service record of great value in keeping the shop working to capacity during dull periods. Service follow-up cards assist the service floor man to sell a repair job to the customer on the basis of past experience.

A Service follow-up properly used keeps you in contact with your customers. It will show you how many service customers you are losing and by it the reasons for each case of customer dissatisfaction, can be determined. It will show whether your service is satisfactory or not, and enable you to make any changes necessary for the betterment of your service.
Operation of Service Follow-up System

When a new car is sold, the following should be noted on "Service Customer" side of the car Prospect card, Ford form No. 3593.

Name and address of customer
Type of car
Motor number
Delivery date
Name of salesman who sold car.

Within three days after delivery it is a good plan to send out a letter similar to the one which follows:

"My dear Mr. (Mrs. or Miss):

With the delivery of your new Ford car, we extend to you our best wishes for many years of motoring satisfaction. Ford cars are built to give years of economical service. We aim to help you get the most out of your investment. You, of course, realize that every piece of high grade machinery requires a certain amount of attention, if it is to continue to operate satisfactorily for an indefinite period. Accordingly, it will be to your interest to carefully study the Ford Manual containing instructions on the care and operation of Ford cars, in order that you may be generally familiar with the mechanism of the car.

In driving a new car the following points of care are of particular importance: Do not drive over 20 miles per hour for the first 500 miles. Change the oil in the crankcase at the end of the first 400 miles and every 750 miles thereafter, except during cold weather, when it is advisable to change oil every 500 miles. Keep car well oiled and greased throughout. Have adjustments made as soon as possible after need for them is noticed. Drain and refill radiator frequently, especially while your car is new. Have the battery inspected every two weeks and fresh distilled water added. Keep all bolts and nuts properly tightened.

We invite you to take advantage of our thirty-day free inspection and adjustment service, and suggest that you drive your car into our Service Station every ten days during this period. This will give us an opportunity to check up any mechanical defects, which if neglected might eventually result in a repair bill.

"The knowledge and skill of our mechanics is at your service at all times, and we want you to always consider our Service Department the proper home for your Ford car.

"May we have a chance to show our appreciation of your patronage?"

READY MOTOR COMPANY
By .................................."

A signal is placed on service card on date seven days later, or ten days following date of sale.

When Service Card comes up for attention 10 days after delivery, the salesman who sold car is advised on his daily report sheet to make a personal call on purchaser to see how he or she is getting along, and incidentally to pick up any possible prospects. Result of call as reported by salesman is checked off on Service Card, in space "Service calls." Signal is placed on date interview was made for follow-up 30 days later.

Thirty days after salesman's call, Service Card will turn up. If purchaser has not previously called, a letter carrying signature of the Service Manager should be sent out. This letter should be written along the following lines:

"My dear Mr. (Miss or Mrs.):

You have been using your car for about a month and we are interested in knowing if it is up to your expectations. If there is any way in which we can be of service to you, we want you to know that we are always ready and willing to assist you.

"We would suggest that you bring your car into our service station and allow our battery man to examine the water level in your battery. There will be no charge for this service.

READY MOTOR COMPANY
By ................................."

Signal is placed on service card on date purchaser calls for follow-up 30 days later.

Thirty days later, in case customer has not called, service card will again turn up and a letter or post card, signed by the Service Manager, should be mailed to the following effect:

"If there is anything we can do to make your car a source of more pleasure or more comfort to you, please remember we are always ready to cheerfully serve you.

"Have you had the water level in your battery examined recently? If not, come around to our service station and let us attend to it for you.

"Yours for Better Service."
Signal is placed on service card on date seven days before the expiration of three months from date of purchase of car. On this day service card will turn up. Provided the purchaser has not been in recently, a letter, signed by the Service Manager, should be written about as follows:

“My dear Mr. (Miss or Mrs.):”

“As you have had your car in operation about three months we would suggest that you bring it to our service station and allow our mechanics to inspect it and make any necessary adjustments.

“There will be no charge to you for this work, which is a part of our service to customers.

“Assuring you that we desire to accord real Ford service at all times, we remain Very truly yours,

READY MOTOR COMPANY
By . . . . . . . . . . . . . .

We will now consider the owner a prospect for service work, and will carry service card under a separate index, which will be operated by months and days—12 dividers being used to designate months. The file is now used as a mailing list, record of service work and to see which customers it is necessary to follow by reason of their not coming in for service—the most important function of the file.

All repair orders are entered on service cards each day by clerk who notes R. O. number, date and dollars and cents amount in space provided. After entry is made, a signal is placed on service card on day of repair order entry, and filed under the future month designated for follow-up, (either 60 or 90 days hence, as desired).

As stated in the foregoing, it is essential that the service follow-up be conducted in a regular and systematic manner. Good results cannot be obtained from a system that is handled haphazardly. It is generally the practice in larger dealerships to have the service file clerk examine and pull all service cards from file and place them on service manager’s desk who will dictate type of follow-up to be employed. Smaller dealers usually make a practice of dividing the alphabet into four sections, and pulling each section once a week. A letter should be written by the Service Manager to the customer, along the following lines:

“My dear Mr. (Miss or Mrs.):”

“It has been two months since your car was in our shop. No doubt the reason we have not seen you is because your car is giving good service.

“Possibly you would like to have one of our mechanics check it over for you to insure satisfactory future operation. A call on (Glendale 1000) will put us into immediate action for you.”

If no response is received, the owner should be called on the phone or a personal call made. The latter is preferable.

Service card is held on Service Manager’s desk and follow-ups made until the owner comes in for service, when card is placed back in file.

Patching Inner Tubes

Complaints are occasionally received to the effect that the standard Ford canvas back tire patch does not stick when applied to the tube. Investigation of such cases indicates that it is the method of application, rather than the patch which is at fault.

It is of the utmost importance to thoroughly roughen the tube in order to give the cement a foothold. This should be accomplished by holding portion of tube to be patched firmly on a flat surface and scraping it briskly with the top of the can. Considerable pressure must be applied to the can.

The surface of the tube should look rough and pitted when properly prepared. Dust this portion off thoroughly and clean by applying a generous coating of cement, working it well into the roughened surface with the edge of a knife. This must be accomplished quickly before cement dries. Then scrape surplus cement off with one firm stroke of the knife.

Next allow tube to dry and then spread a thin film of cement over portion to be patched, allowing it to dry for 5 minutes. Do not blow on or wet cement as the moisture affects the adhesive qualities.

While waiting for cement to dry, cut a piece of patching material large enough to cover the puncture and extend about one-half inch all around it.

Remove linen fabric from face of patch, exercising care not to touch the exposed surface after the linen is removed.

Place patch on tube and press down firmly with edge of can, rolling in a circular motion, so as to remove air bubbles and form perfect adhesion.

Allow patch to dry for 5 minutes before inflating tube.

If patches are applied as directed above, and this is necessary with any type of patch, no difficulty will be encountered because of the patch coming loose.
Replacement of Fordson Tractor Parts to Dealers

In the matter of handling credit on tractor parts, it is necessary to modify previous instructions to some extent.

The Fordson tractor, because of its serviceability, efficiency of operation and economy of upkeep, has become well established in the industrial field where it is being used for heavy hauling; a class of work formerly undertaken only by motor trucks. This, together with the fact that considerable progress has been made in educating the owners of both agricultural and industrial tractors in the proper care of their tractors, permits us to continue using thirty days actual service as a basis for adjusting claims presented for alleged defective material removed from such tractors. Hereafter such parts should be adjusted on a three months basis, which is the same basis as is applied to Model T cars and trucks. In applying this policy to parts removed from tractors used for agricultural purposes, it is assumed that such parts will have seen thirty days actual service.

The fact that we specify a certain time limit of three months within which period parts may be replaced, is intended as a workable basis between dealers and owners, and to prevent incurring needless expense on the part of dealers in returning alleged defective parts to our branches. The tractor, like our other products, is warranted to be free from defects for an indefinite period. It should be borne in mind, however, that defective workmanship or material will ordinarily show up within the period specified above.

It is understood, of course, that parts which give way because of excessive strain put upon them by improperly designed equipment should not be considered defective, and credit on such parts is not in order.

It is imperative that the dealer call on the buyers of new tractors frequently during the first thirty days, to see that the tractor is kept in perfect working order. The matter of lubrication is of the utmost importance, and it is one of the duties of every dealer to supply a suitable tractor oil, and also impress upon the owner the importance of frequently draining the crankcase and substituting fresh oil. This will do more than anything else to eliminate undue wear of cylinders, pistons, crankshafts, valves, etc.

Our attention has been directed to the fact that, in some cases, dealers inform tractor owners that our warranty is void unless some particular brand of oil which they recommend is used. Promoting the sale of an oil at the expense of our warranty will not be tolerated, and immediate steps should be taken to stop this practice.

The dealer must not expect us to replace, free of charge, parts worn or damaged through lack of lubrication, or failure to keep the air washer clean and filled with water.

Until further notice the following exchanges and allowances will be in effect:

CONNECTING RODS: Connecting rods with caps, if not damaged other than the babbit being worn or burned out, will be exchanged with dealers at $1.50 net each. Dealers may exchange with customers at $2.00 net each. If the rod is sent in without the cap an additional charge of 50 cents will be made when furnishing a complete rod in exchange.

MAIN BEARING CAPS: Main bearing caps will be exchanged with dealers at $3.50 net each if not damaged other than the babbitt being worn or burned out. Dealers will exchange with customers at $.50 net each.

MAGNETS: Within three months magnets will be replaced gratis if not damaged other than being demagnetized. Beyond this time magnets will be exchanged with dealers at $1.25 net per set. Dealers will exchange with customers at $.50 net per set.

MAGNETO COIL ASSEMBLIES: Within three months magneto coil assemblies will be replaced gratis. After this period, and within one year, they will be exchanged with dealers for $2.50 net each, and with garages and owners at $3.00 net each.

CRANKSHAFTS: Within three months crankshafts developing defect will be replaced gratis. For crankshaft becoming worn out of round due to failure to keep bearings tightened, poor lubrication or improper care of air washer, an allowance of $5.00 will be made when such crankshafts are returned in exchange for a new or reground crankshaft, provided inspection shows that they can be satisfactorily reground to 1.967—1.968″. No allowance is in order for crankshaft which measure less than 1.985″.

Adjustments on all other tractor parts will be handled in accordance with our general policy as outlined above. When passing on such parts as cylinders, valves, transmission housings, and draw bar caps, it shall be borne in mind that improper care and operation are very often responsible for their replacement. A careful inspection will usually reveal such conditions and in these cases no allowance is in order.
All tractor parts on which an adjustment is claimed must be returned to the Branch for inspection. This manner of disposing of such parts is more satisfactory than holding them for a roadman’s inspection, and we do not believe there is sufficient volume of replacements to inconvenience the Dealer. Complete information must be given with each part as to Serial Number of Tractor from which removed, name and address of owner, together with advice as to nature of work for which tractor is used.

**Repairing Flat Tube Radiator**

A considerable portion of new car production is now being equipped with the flat tube type radiator. The construction of this radiator is such that it not only provides greater cooling efficiency, but is also very easily repaired. The same general practice is followed in repairing the new type radiator as the old type, the bottom tank being removed to accomplish most repairs. In cases where a tube is broken in the center of the radiator, the tube should be cut off directly above the break. The lower part of the tube should then be heated with a torch just enough to melt the solder, which holds the tube to the fins. The proper way to do this is, to keep the heat of the torch passing up and down the length of the tube until the solder has been melted. It is then only necessary to withdraw the tube through the bottom of the radiator, by grasping the end with a pair of pliers.

Before attempting to replace the tube with a new one, the fins should be straightened up by running through a tapered bar of iron, which should be the same size as a tube. After the fins have been straightened, the end of the tube which you intend to use in replacement of the old one, should be slightly closed together in order that it will telescope into the portion of the old tube which was left in the radiator. The tube should then be worked into place until it has been forced into the old tube far enough to insure a good connection. After running a bar of iron through the tube, in order to make sure that the tube is open throughout its entire length, it should be soldered into place and the bottom tank reinstalled.

In some cases where a radiator had been subjected to very hard usage or extreme vibration from very rough roads, it was found that the end tubes pulled away from the tank at top or bottom. Radiators now coming through have a reinforcement inside the tube, which eliminates this possibility, but in order to take care of radiators which are damaged in this manner, a reinforcement has been designed.

This part is designated as T-8869-A and a supply can be secured from the local branch.

To install the reinforcement, place it around the tube as shown in Fig. 52 and solder it to the tank as well as the tube. The tube and tank should of course, be first cleaned with acid.

In case there is a small hole in a tube, it can be repaired by pushing a small piece of a tube inside the tube to be repaired and soldering it into place over the hole. To do this, a small piece of tube should be cut in half, lengthwise, and pushed into place under the hole. A tapered bar of iron the same size as the inside of the tube should then be run through the tube to hold the small piece in place while it is being soldered. This is done by holding a piece of wire solder over the hole allowing the solder to run in until the small piece is securely fastened to the tube. When repairing a tube in this manner, care should be taken to see that the tube is open throughout its length after the job is finished.

Stopping of a leak which is due to the seam in a tube having opened is a comparatively simple matter. Place the radiator on the bench so that the tubes are in a horizontal position. The tube in which the seam has opened should then be cleaned with acid and the opened seam resoldered. In view of the fact that the seam is always at the front of the radiator, no difficulty should be encountered in making such repairs.

When repairing this type radiator, it is essential that the torch be carefully used. If held too far away from the radiator the heat is greater and there is a possibility of melting the fins. This possibility is eliminated however, if the torch is held close enough so that only a small flame strikes the fins.
Fordson Ignition Switch

All Fordson tractors now being shipped from the factory are equipped with a switch as shown in Fig. 53. This feature makes it unnecessary to shut off the fuel or choke the engine to stop the tractor. It consists of an insulated brass contact point placed so the spark lever can be moved over to touch it and so ground the magneto through the wire which connects to the magneto contact plug. A handle at the front end of the spark rod enables the operator to operate the switch from the front or side of the tractor.

The spark lever must not be left in contact with the switch button when cranking as no spark will occur with the spark lever in this position.

A switch can be installed on old tractor dashes by drilling a 49/64 diameter hole in the location indicated in Fig. 54 and installing the following parts:

1. S-746 Ignition switch terminal F-1657
2. S-747 Ignition switch terminal nut T-1818
3. S-748 Ignition switch terminal block F-1658
4. S-749 Ignition switch insulating spacer F-1659
5. S-755 Magneto to switch wire assy. F-1216

Assemble the terminal block into the hole in the dash, insert the terminal nut. The terminal should be turned so that the spark lever rests on the terminal and the projecting lug is at the bottom acting as a stop for the lever. See Fig. 53. The wire should then be attached to the terminal using the other nut and the other end of the wire connected to the magneto contact screw over the flywheel.

Neither the terminal on the wire nor any metal part of the switch should be in contact with the dash or the magneto will be continually grounded.
Good Location and Appearance Bring Returns

Fig. 55

The success of an enterprise depends greatly upon its location. In fact location is considered one of the prime factors in the profitable conduct of a business.

Not alone do large department and syndicate stores give a great deal of consideration to the location of a store, but also the location of each particular department in that store.

O'Meara-Young Motor Co., Ford Dealers at Denver, Colorado, have applied the same principle to the location of their battery and electrical department, with very profitable results, as will be noted from the following excerpts from a recent letter received from these dealers.

"About the first of April, we began studying the possibilities of getting more battery and electrical business. We reached the conclusion that it was a mistake to have these departments back in a corner of the shop and decided to combine the battery and electrical departments and move them into the very front of the Service room, making a department that would be a model of cleanliness and efficiency.

"A room 18½ x 16 feet was made, facing the street through wide plate glass windows, the interior being painted a cream color. The electrical department was placed on one side, the battery recharging line in the center, and the testing and repairing bench on the other side of the room. The arrangement is compact, which means no wasted steps for the workmen, and a very noticeable increase in efficiency has been the result.

"But it is in the increased battery business the new department is doing, that the move has most fully justified itself. This increase, in three months, has amounted to just 48%. This is due, in large measure, to the advertising value of having so attractive and clean a department placed in such a conspicuous position. It is not unusual for passerbys to walk around back into the Service Room and ask questions about this Department. Its value, as an advertisement, is incalculable. It is giving the public a visible demonstration of the fact that we are equipped to handle all kinds of battery and electrical service—and this naturally is attracting a substantially larger volume of this business."

Lamp Bulbs

Dealers will note by referring to the May 1st issue of the Wholesale Parts Price List, that we are now supplying L-5040 headlamp bulb which is a single contact 6-8 volt bulb such as formerly used on Lincoln cars. We believe there should be considerable demand for this bulb, as it is also used on practically all other cars except Fords.

We are in a position to supply this bulb in attractive cartons containing 10 bulbs and have established a very low price especially in quantity.

All dealers, particularly those in the larger centers, should carry at least one carton of these bulbs in stock.
A Well Kept Parts Department

The illustration above shows the parts department of Chas. E. Neal's Auto Company, Cotulla, Texas.

We consider this to be a very neat and attractive display of merchandise and it is evidence that clean, orderly arrangements which carry a strong appeal to the customer, are not confined to the dealers located in the large cities.

Customers unconsciously respond to pleasant surroundings and courteous service and this feeling exerts such an influence on their selection of the place with which to do business that no concern whether large or small can well afford to neglect these all important items.

Nickel Plated Radiator Shells

The following parts in nickel finish are now available, for sale through service:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T 8737-C</td>
<td>Radiator shell—nickel plated</td>
<td>$5.00</td>
</tr>
<tr>
<td>T 8016</td>
<td>Radiator apron—nickel plated</td>
<td>.75</td>
</tr>
<tr>
<td>T6575-X</td>
<td>Headlamp door only—nickel plated</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

The above prices are subject to the usual parts discount, f.o.b. branch.

Fordson Transmission Lubrication

The idea is prevalent among many Fordson owners and dealers that the heaviest possible oil should be used in the rear end of the Fordson tractor.

This is a mistake and only heavy engine oil should be used for several reasons. The ball bearings used in the transmission are designed for engine oil lubrication and if the rolling balls are required to squeeze heavy grease out of the groove in the ball bearings, the friction is increased to such an extent that the bearings are liable to turn as a unit. This of course, wears out the housing in which the bearing is seated as this is not intended as a bearing surface. The tractor brake also operates much better if heavy engine oil is used instead of gear oil as the gear oil will not allow the brake plates to come together, but are held apart by the film of this thick oil.

Lubricating oil conforming to the specifications given below will give the best results for both winter and summer use:

- **Flash**: 400°F. Min.
- **Fire**: 450°F. Min.
- **Viscosity**: 650°F. Max. at 100°F.
  - 66°F. Min. at 210°F.
- **Cold**: 45°F. Max.
A CLEAN well arranged stock room gives a lasting impression of good service. In fact the old adage "Goods well displayed are half sold," is particularly applicable to parts and accessories. The Parts Department can be made a splendid advertisement of the dealer's ability to render prompt service, consequently it should be located in the front of the building adjacent to the showroom, where parts can be effectively displayed. This arrangement is illustrated in the photograph above of the New Jersey Motor Co., Ford dealers at Newark, N. J.

If possible the stock room should be located to provide convenient service to the Dealer's repair shop, as the despatch with which material can be furnished the Dealer's mechanics has a relative bearing on the profits earned in this department.

With a well kept stock room, it is important that the parts man in charge present a neat appearance. The dealer's customers come in contact with the Parts and Service Department more frequently than with any other branch of the business. Consequently the dealer should be represented by cleanly attired men, capable of meeting and serving the trade in a manner that will inspire confidence. The courtesy and promptness shown by the parts man indicate that the entire organization is interested in the customer's welfare.

The average quantity of parts sold per car in the dealer's locality should determine the amount of stock to be carried. As all parts do not move with the same regularity each month, it is usually necessary for the dealer to maintain an inventory representing approximately a 90-day turnover. Care must be taken not to allow the parts stock to become low. This condition means not only a loss of revenue from parts sales, but also a loss of goodwill on the part of customers who are obliged to wait until replacement parts are obtained from the factory. It means the additional and unnecessary expense of a rush shipment from the factory.

A thorough check should be made monthly of every part regularly sold for service and replenishment made accordingly, consideration being given to seasonal demands.

Steel storage bins can be used advantageously, particularly where space is limited. In addition to presenting a more attractive appearance, the stock can be more readily checked and maintained than is ordinarily possible with wooden box systems.

The Parts bins should be placed back to back in double rows and arranged at a right angle to the customers' counter. The height of the bins should not be over 7 feet. All aisles should be at least 3 feet in width if space will permit.
Care and Adjustment of Steering Mechanism

During a recent canvass of larger fleet owners, it was found that a lack of knowledge on the part of mechanics as to the proper adjustment of various assemblies of the car was responsible for many service troubles. This was illustrated by inquiries on the proper setting of front wheels and requests for information concerning remedies for wheels shimmying.

Ordinarily, this can be traced to loose or worn parts in the front axle assembly, such as spindle bolts, spindle connecting rod or steering ball socket. If the replacement of worn parts and tightening those that are loose does not eliminate the wabble, a check should be made to ascertain whether the camber and toe-in is correct. Full particulars as to the proper alignment of front wheels were given in the September issue of the Service Bulletin, and it is essential that repairmen rigidly adhere to these instructions.

Our investigation has shown that many repairmen fail to appreciate the importance of the planetary reduction gears at the upper end of the steering column. Excessive play in this part of the assembly, resulting from worn gears or gear case, is very often the cause of wheels shimmying, particularly if parts of the front axle assembly are loose. The correct procedure in such cases is, of course, to replace the gears and gear case in addition to tightening any loose bolts.

In rare cases, the shifting of the front spring, due to insecurely fastened spring clips or broken center bolt, will cause the front wheels to wobble. This is due to the front axle being out of line.

It has been called to our attention that in several cases dealers have bent the front axle on account of complaint received that cars equipped with balloon tires have not enough camber in front wheel. This is unnecessary and should be discontinued immediately.

The front wheels of a car equipped with balloon tires should be set in so there will be difference of 3" between the top of wheel and lower edge of wheel on a straight line across top and bottom of wheel.

An Ounce of Prevention

Patronage to the repair shop should be invited on the basis of preventing trouble.

Any dealer or service station operator can render a greater service to his customers by inspecting their cars periodically and making the necessary adjustments to prevent development of trouble than by waiting for trouble to develop and then making repairs.

Most automobile troubles can be traced back to neglect of some form or other, either to lack of proper lubrication or nuts which have been allowed to become loose, thus permitting excessive jolts and strains to work havoc on the mechanism.

All troubles are minor in the beginning and if caught in time can be prevented from developing into major repair jobs.

Furthermore, the satisfaction to the owner is much greater in operating a car that functions smoothly rather than being forced to ride in one which is shivering for service.

A systematic owner follow-up must be employed to successfully operate this periodical adjustment system. A complete history or record should be kept of the calls made, follow-up systems applied, etc., so that semi-annually it can be drawn to the owner's attention that he has spent so much money on the maintenance of his car and prevented troubles, delays and big repair bills. This is a fact that appeals to the owner and therefore must be constantly placed before him in an attractive manner to keep him enthusiastic on the plan.

The human tendency is to put off doing anything to a car to-day unless it is absolutely necessary. For this reason, the most difficult task in performing this periodical inspection is to get the owner to bringing his car in.

Wheel Pullers

In their desire to reduce the time on labor operations, dealers sometimes lose sight of the fact that the quickest way is not always the best way of repairing a car. This is evidenced by the type of wheel pullers which we have noticed a few dealers using.

The type we have in mind is one which screws onto the axle shaft and when struck a sharp blow with a hammer, springs the wheel off. Anyone who is familiar with the construction of a rear axle can readily see the damage which can be done by pounding on the end of the axle shaft. A greater portion of the shock is borne by the gear on the end of the axle shaft and the pinions in the differential, all of which are likely to be damaged if subjected to blows such as are required by the use of a puller of the type mentioned above.

Considering the number of very satisfactory wheel pullers on the market, there is no excuse for resorting to sledge hammer work and we do not consider it advisable to use pullers such as those described above.
To eliminate the difficulty that is often experienced in ordering the correct type of window regulator for replacement purposes, we have illustrated in Figs. 58 and 59 the various types of regulators which have been used to date in Ford closed bodies.

T 17200A—T 17201A show two designs of the A type regulator. Either can be used in place of the other.

There are rights and lefts of all types except T 17200D which is used interchangeably for either right or left side.

We can supply all types except the C type for repairs and when it is necessary to replace one of the C type regulators, the D type together with the corresponding lock board should be furnished. Types E and G, also F and H are practically the same. The principle difference between the E and G is in the spring. The type E has a considerably heavier spring than the type G. The type E is used on the Tudor Sedan and the G on the Coupe and Fordor Sedan.

The most noticeable difference between the F and H type is in the number and pitch of the teeth in the large gear and the shape of the housing, the F housing being pointed at the end and the H type rounded.
An Instructive Window Display

Dealers should never lose sight of the many advantages to be gained through modern merchandising methods, particularly window display. A window that commands the attention of the passerby serves as a splendid advertising medium and eventually enhances profits as a result of increased parts sales.

Above is illustrated an original window arrangement by A. J. Kerth, our dealer at Clayton, Mo. This window aroused considerable local interest and favorable comment in connection with the Ford battery.

What is inside of the storage battery box is more or less of a mystery to the great majority of car owners and the window illustrates the construction of the battery very clearly. At the same time, attention is drawn to the high quality of the various raw materials entering into the construction of the Ford battery.

Setting Generator Charging Rate

In a great majority of cases it will be found that generators which do not give satisfactory service have been set so as to charge at too high a rate. When the charging rate is set higher than 12 amperes, excessive heat is generated in the windings in the generator, both field and armature, due to internal resistance. This excessive heat, if allowed to continue, will evaporate the oil from the bearings, causing them to wear out very quickly. Also it often causes the insulation to become so badly burned on the fields and armature that the generator will cease to function.

All mechanics should be carefully instructed therefore, to observe this precaution and set the generator charging rate at between 10 and 12 amperes.
Replacement of “T” and “TT” Parts to Dealers and Garages

The following information is for your guidance in the handling of adjustments of Model “T” and “TT” parts:

While no time limit is specified in the Ford Warranty as embodied in the buyer’s order and agreement, adjustments on defective parts, will be confined as in the past to material in service not more than three months, since it is generally recognized that actual defects in parts will ordinarily develop within the first few weeks of service. The object of this time limit is to give the dealer a workable basis for adjusting claims with his customers, and to prevent incurring needless expense involved in the return of material that cannot be considered defective. Exceptions to this policy will only be permitted when forgings or castings show absolute defects.

T-3413-B transmission band assembly with detachable ear is now being used in production. Effective at once the exchange on old style transmission bands of the non-detachable type is withdrawn. Dealers, service dealers and garages may exchange new style detachable bands with bands of the same type with customers, at the cost of relining.

The following are the only exchanges remaining in force:

Connecting Rods:

Connecting rods of the heavy type will no longer be accepted on an exchange basis. Replacement rods of this type may, however, be purchased outright at the price of $.30 net each, which is identical with the dealer’s cost of rebabbitting.

Rods of the present light type will be exchanged by branches, as formerly, at $.30 net each to dealers and garages and $.60 net each to customers. In some cases, garages may prefer to make the exchanges with a dealer and in such cases the latter will exchange the rods at $.40 net each, thus allowing the dealer a margin of $.10 to cover the cost of handling.

Any connecting rods less caps returned to branches by garages or dealers, may be replaced with complete rods at $.45 net each. The exchange price to a customer when a rod less cap is returned will remain, as in the past, $.75 net each. The above exchanges also apply to T-3024-B Connecting Rod .025” undersize.

Magneto Connectors:

Within three months the present type 3/4” magnets that have become demagnetized will be replaced gratis; beyond three months magnets may be exchanged with dealers at $1.25 net per set, with garages and owners $1.75 per set.

Magneto coil assemblies of the present type, which have been in service three months or less, will be replaced gratis. Beyond three months and up to one year, coil assemblies will be exchanged at $2.50 net to dealers and $3.00 net to garages and owners. After one year no allowance is in order.

Carburetors:

Only in very rare cases should it be necessary to replace a carburetor, as the replacement or readjustment of some part will usually overcome any defect in this assembly. In the event that the dealer is unable to repair the carburetor, it will be replaced gratis within three months; beyond this period no allowance is in order.

Radiators:

The replacement of defective radiators will continue to be handled on the same basis as in the past, viz: gratis replacement within three months; no adjustment beyond this period.

Before replacing a radiator, dealers should make every effort to repair the part, as in most cases, a radiator can be placed in A-1 condition with the expenditure of very little time or material. The crating and transportation charges, which the dealer must stand when returning a radiator, are usually in excess of the cost of repairs, and it is, therefore, to the dealer’s advantage to make repairs in his own shop.

Coil Units:

Coil units which develop internal defects will be replaced gratis within three months; beyond that period no allowance may be made. No units should be returned for credit if the trouble is merely due to vibrators or bridges. These parts can be very easily replaced by dealers, and credit will be allowed only for the units which fail to function due to some internal defect.

Generators and Starting Motors:

Complete generators and starting motors are not to be returned by dealers to branches for credit or repairs. Any parts of these assemblies which prove defective may be replaced gratis within three months, but the installation of the new part must be done by the dealer, who should by this time be properly equipped to test and repair such units.
Armatures:
The policy in connection with handling defective generator and starting motor armatures, remains unchanged; these parts being replaced gratis within three months; after three months' dealers are expected to exchange armatures with customers at $4.00 net each, as outlined in the Model T parts price list.

Starter Drive Assemblies:
Starter Drive Assemblies, which prove defective within three months, will be replaced gratis; beyond that time, no allowance is in order.

Cut-outs, etc.:
No allowance is in order on ammeters, cut-outs and ignition and lighting switches after three months' service. Any of these parts which prove defective within this period, however, will be replaced gratis. Dealers should exercise extreme care in packing cut-outs so as to avoid damage while in transit, and to insure the parts reaching us in good condition.

Batteries:
Experience has proven that defects in batteries will ordinarily develop within three months after delivery to the owner. In view of the fact that such parts as the plates, cells, and separators, used in the construction of Ford batteries are made from the highest grade of materials obtainable, we have such confidence in this battery that we are willing to guarantee the battery against defects for one year from date of delivery. It is, of course, understood that batteries will not be considered defective that have been damaged by lack of charge, failure to keep the plates covered with solution by filling the cells with distilled water at specific times, or driving with battery hold-downs not properly tightened. Neither is it expected that the guarantee will cover the charging of batteries in the car as well as on the bench, since it is obvious that we cannot be expected to assume the responsibility for damage to a battery which has been overheated by an excessively high charging rate.

The event that defective plates are the cause of the trouble, the entire group in that cell should be returned for inspection.

Magneto and Battery Horns:
The replacement of a horn should seldom be necessary, as in most cases the dealer can eliminate any trouble with this part by making a few minor adjustments. The only occasion which a dealer might have for returning a horn would be where inspection shows internal parts broken because of defects. Such cases should be handled on the usual three months basis.

General:
All parts on which an allowance is asked must be returned to the branch transportation charges prepaid. With the exception of items accepted on an exchange basis, all parts must be accompanied by information as to serial number of car from which they were removed, name and address of owner and whether or not credit has already been allowed.

New Parts Removed from Cars or Trucks:
New parts returned from cars or trucks as a result of substituting special equipment may be accepted at 30% of the list price, F. O. B. Ford Branch. This basis of allowance will apply to all new car or truck parts with the following exceptions:

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-995-A2 Steering wheels</td>
<td>No allowance</td>
</tr>
<tr>
<td>T-6561-X Side oil lamp</td>
<td>No allowance</td>
</tr>
<tr>
<td>T-6568-BX Tail oil lamp</td>
<td>No allowance</td>
</tr>
<tr>
<td>T-5039 Steering gear cover</td>
<td>No allowance</td>
</tr>
<tr>
<td>Tires</td>
<td>No allowance</td>
</tr>
<tr>
<td>Wheels</td>
<td>No allowance</td>
</tr>
<tr>
<td>Less hubs</td>
<td>No allowance</td>
</tr>
</tbody>
</table>

It is understood that the above applies only to parts removed from new cars which are in condition for resale through service stock or use on the assembly line.

Stamping Motor Numbers
Numerals used in stamping motor numbers are 1\(\frac{1}{4}\)" high and located 3\(\frac{1}{2}\)" below upper edge of boss. This provides space for stamping the old number below the new number in numerals 1\(\frac{1}{8}\)" high when motors are installed in old cars, etc. This arrangement makes it unnecessary for any dealer or individual to file or grind off the motor number from any motor. The motor number which is on the block when received will be considered the car number. It will no doubt be necessary in several states for owner to have his title changed so as to show both numbers on title of ownership when a motor is purchased for replacement. This should be checked into very thoroughly and all concerned instructed to this effect.
Tractor Horsepower Rating

WHEN speaking of the horsepower of a tractor, one of three things may be meant.
1. Horsepower available at the engine crankshaft.
2. Horsepower available for belt work.
3. Horsepower available for drawbar work.

A tractor rating may be determined either by horsepower tests, or by means of a formula. As a matter of information both methods are here described.

Engine Horsepower

Figure 61 shows the horsepower of the Fordson engine at various speeds.

The most common formula used for engine horsepower rating is that given by the National Automobile Chamber of Commerce (formerly A. L. A. M.):

\[ \text{Engine Horsepower} = \frac{DN}{2.5} \]

Where \( D \) = Diameter of Cylinder.
\( N \) = Number of Cylinders.

This is the formula used extensively as a basis for computing state license fees for motor vehicles. It is supposed to give the horsepower output of engines running on gasoline at 1000 feet per minute piston speed. The formula is not suited for kerosene tractors as these usually have a lower compression than automobile engines. The Fordson engine is rated 25.6 horsepower by this formula at 1000 R. P. M. By referring to Figure 61 it is seen that the actual horsepower is 23.6 at this speed.

A more suitable formula, perhaps, is that recommended by the Society of Automotive Engineers:

\[ \text{Nominal Engine Horsepower} = \frac{0.7854D^2LRN}{13,000} \]

Where \( D \) = Diameter of Cylinder in inches.
\( L \) = Stroke in inches.
\( R \) = Revolution per minute of crankshaft.
\( N \) = Number of Cylinders.

This formula merely expresses in figures the statement, "A kerosene tractor engine should develop one horsepower for every 6,500 cubic inches of gas mixture entering it per minute."

It is intended by the S. A. E. that this formula shall give a lower horsepower than the actual tested horsepower of an engine. This is to insure a reserve of power for emergencies.

The formula rates the Fordson engine 19.33 H. P. at 1000 R. P. M., while the actual tested horsepower is 20.4 at this speed, as shown in Figure 61.

Belt Horsepower

The Fordson is rated 18 belt horsepower at 1000 R. P. M. by the Ford Motor Co., this being based on actual tests.

The power available at the belt is always less than the engine power. This is due to belt slippage. There is also of course a slight loss in transmitting the power through the bevel pulley gears, but this is very small. The actual belt horsepower output of the Fordson as tested by the University of Nebraska is 18.16 H. P. at 1000 R. P. M. and similar results have been obtained at the factory with an electric dynamometer.

Drawbar Horsepower

The Society of Automotive Engineers recommends, that, if a drawbar rating is desired, one-half the engine horsepower obtained by the S. A. E. engine rating formula should be taken.

According to this the Fordson would be rated 9.66 drawbar horsepower. The S. A. E. points out, however, that this formula gives
only a rough estimate, as the mechanical design has much to do in determining how great a percentage of the engine power can be delivered to the implement in actual drawbar horsepower.

Since no formula has been invented that considers these mechanical design factors, formula rating of drawbar horsepower is at present impractical.

But supposing the drawbar horsepower, as obtained by tests, was given. This would be of no practical use to the average user as he has no way of knowing just how much power (and reserve for emergencies) is needed for the particular plow or implement he has, and for the soil conditions of his farm and at the speed it is to be pulled by the tractor. The soil conditions alone may cause the pull for a single 14-inch plow to vary anywhere from 100 to over 2000 pounds.

We, therefore, do not recommend the use of a drawbar rating with the Fordson.

If it were possible to rate tractors accurately by means of formula, it would be a simple matter to compare various tractors and tests and demonstrations for the purpose would be unnecessary. The formula method is not accurate and for this reason the user does not want a formula rating. He wants to know:

First: The actual belt horsepower output so he may buy the proper size of belt-driven machine. This information has been given under the heading of Belt Horsepower.

Second: He wants to know the size and the number of implements that can be pulled by the tractor.

The Fordson will pull two 14-inch plows through stiff soil at 8 inches depth. (Other implements usually require less power so it is unnecessary to mention them.)

This is a sufficient rating for a tractor.

Service Labor Charges

Various changes recently made in parts of the Ford engine necessitate some revisions in our suggested Schedule of Labor Operations. The following revisions will appear in the next issue of the Suggested Schedule of Ford Repair Charges, form 3554:

Transmission Bands—Operation No. 9 C

In cases where new type bands are installed for the first time in cars equipped with the old type bands, operations No. 9 A and No. 9 B should be used. This recommendation is made because of the fact that we do not consider it advisable to make the first installation of the new type bands without removing the transmission cover. When installing the new type bands, it is necessary to cut off the slow speed shaft and if this is done without removing the cover, there is a possibility of the steel shavings falling into the crankcase and shorting the magneto. The suggested labor charge for changing the new type bands thereafter is $1.00.

Main and Connecting Rod Bearings

Tightening connecting rod bearings can be accomplished more quickly with the new type crankcase and it is accordingly necessary to revise the operation covering this work. A labor charge of $3.00 is suggested for tightening all connecting rod bearings, which operation will be designated No. 7 A. When it is necessary to replace two or more connecting rods, a charge of $4.50 is suggested; this operation being known as No. 8 A. The new type crankcase also makes it possible to take up the main bearings without removing the motor. A new operation has accordingly been made to cover this work. This will be operation No. 8 B and the suggested charge is $6.00. It is understood, of course, that these charges are to apply only to cars having the new type crankcase, and operations 5, 6, 7 and 8 covering work of this nature in cars with old type crankcases, still remain in effect.

Coil Units—Operation No. 572

Testing, adjusting and replacing points on coil units has been reduced to $.15 per unit. In cases where a dealer merely takes the units out of a car, tests them and finds that they are O. K. or merely adjusts them and then replaces them in a car, he can well afford to handle this on a gratis basis since the time involved is hardly worthy of consideration. It is, therefore, suggested that the above operation be used only when it is found necessary to take off the points either to remove pits or to replace the points.

Generator Brushes—Operation No. 564 A

A new operation has been added to the suggested schedule of Repair Charges, which will cover replacing generator brushes and cleaning generator commutator. The suggested charge for this operation is $1.50. This operation will be known as No. 564 A.
PROMPT, courteous and intelligent attention to customers service needs has assisted Ed. Rudolph, Ford dealer at Phoenix, Arizona, in building up one of the most successful dealerships in that section of the country.

An example of the type of service which Mr. Rudolph renders Fordson owners, is illustrated by the two Fordson tractor service cars shown above. These cars carry a complete supply of parts and are operated by expert service mechanics—a call speeds one of the cars to any Fordson in the locality which requires attention. This unusual convenience places the farmers' tractor service no further away than his telephone.

Mr. Rudolph advises that in addition to creating good will and increasing his parts sales, the plan has proved of considerable sales value in soliciting tractor orders.
Dealer Advises How Service Follow-Up System Increased His Sales

That many dealers have proved the sales value of an efficient and properly maintained service follow-up system, is evidenced daily by the number of favorable letters received from dealers maintaining service record cards.

The following letter just received from one of our dealers in the Philadelphia Branch territory, interestingly describes his experience in installing a follow-up system, and the results he has since obtained.

"I desire to give you my frank and honest opinion of the use of service record cards. Like the majority of dealers, up until April 1st of this year, I had always felt that the service record cards were a bugaboo and just some extra system to create additional work.

However, I took a dare from Mr. Hoover that if I would install the system and would honestly admit at the end of sixty days that it was not beneficial, he would allow us to throw it in the waste-basket. On this proposition I proceeded to have service record cards made up for all jobs from January 1st of this year; white cards for the pleasure type and pink cards for trucks.

Much to my surprise it was almost impossible for us to make up cards from a great many of the repair orders, as we found that a great deal of valuable information was being omitted carelessly by our shop foreman. We immediately got after the situation and from that day on the repair orders have been properly and neatly made up. This has more than paid us for the work of keeping up the system.

The service record cards act as a positive check on the Service Department. We fill in the cards in their entirety and go a step further by denoting before the amounts a 'D' or an 'N,' showing if the customer is a day or night patron. After the amount, if it is a guaranteed job we show a star.

On numerous occasions, since installing this system, questions have arisen with our patrons which have been easily settled in a satisfactory manner by having all information possible at our finger-tips.

Furthermore, even in the face of a profitable repair business in our shops, we are concentrating a great deal more and using these cards as an up-to-date mailing list, sending out at given periods letters to the various groups such as truck owners, pleasure car owners, day and night patrons and patrons who have only had one job performed since January 1st, and therefore should be followed up.

I might further add that from a sales standpoint we have increased our truck business a great deal since using these cards in the following manner: Our salesmen will often come to the sales manager stating that they know where they could place a good used Ford truck if we had one in stock. We immediately turn to the service records of our regular truck service patrons and hand the salesman a list. It is a ten to one shot that after calling on a few of these concerns, our salesman will secure a good used truck and at the same time obtain an order for a new truck from the concern from whom he had obtained the used one.

I believe the above will give you the gist of some of the uses which this system can be put to, and I am frank to say if it was a question of throwing out every record in our office and retaining one, the service records would be the one that I would retain."

The proper use of a service follow-up system has proved a valuable aid to dealers in developing a larger business and keeping a steady volume of work coming into the shop.

The success of this plan has not been confined to any one section, it has been demonstrated by dealers in practically every part of the country.

The sales and service problems daily encountered by these dealers are identical with those which confront all of us, and what they have accomplished by the consistent use of an efficient follow-up system can easily be duplicated if a conscientious effort is made.
Service Record Cards

In Fig. 63 is shown a service record card which is proving popular with dealers in providing a simple yet effective follow-up record.

To illustrate how it is used, both sides of the card have been properly filled out.

The explanations at the top and bottom of the card show in which spaces the various data should be entered and how this information can be utilized by the dealer in following up customers.

The cards are furnished in white and buff color; white cards being used for classifying service customers who bought their cars from you—buff for service customers who bought their cars elsewhere.

A glance at the record then shows, by color, whether or not you are holding your own car customers and gaining service customers who bought cars elsewhere.

Further details regarding size of cards, prices in different size lots, etc., can be obtained from the nearest Ford branch.
Fig. 64—Wiring diagram of improved Ford car not equipped with starter

- Headlamp Wire (Dimmer to Switch) Dim—Black
- Headlamp Wire (Dimmer to Switch) Bright—Black
- Ignition Switch T-7676
- Switch to Terminal Block (Magneto—Red)
- Switch to Terminal Block (Battery—Yellow)
- Switch to Terminal Block (Headlamp) (Black with Green Tracer)
- Headlamp Wire (Dimmer to Switch) Black
- Horn Switch T-8028
- Black Wire—Horn Switch to Terminal Block T-8894-C
- Black Wire—Horn Switch to Horn T-7917-C
- Batteries Wire to this Terminal (Yellow)
- Magneto Wire to this Terminal (Red)
- Horn Switch to Terminal Block Wire (Black)
- Headlamp Wire to this Terminal (Black with Green Tracer)
- Terminal Block T-1051-B
- 2-Way Cable—Terminal Block to Lights and Magneto T-7661-B

No. 4 Green
No. 3 Blue with Yellow Tracer
No. 2 Red
No. 1 Black with Red Tracer
4-Way Commutator Wire T-7502-D

- 4-Way Cable—Switch to Terminal Block T-7660-B
- Magneto to Terminal Block Wire (Red)
- No.4 Spark Plug Wire T-1360
- No. 3 Spark Plug Wire T-1360
- No. 2 Spark Plug Wire T-1360
- No. 1 Spark Plug Wire T-1360

- Horn to Horn Switch Wire (Black)
- Coil Box to Switch Wire Blue with Yellow Tracer
- Magneto to Terminal Block Wire (Red)
- T-7868

- Headlamp Connecting Wire Black with Green Tracer
- Headlamp to Ground Wire Black with Green Tracer
- Wires Must Be Over Priming Rod

Sketch Showing Method of Assembling Wires to Commutator Case
This Insulator to be Used on Touring and Tudor only to take up slack in wire. On Forord Use T-7941 Staples in Place of These Two T-6409 Assemblies.

View Showing Method of Assembling Tail Lamp Wire to Tail Lamp Wire Clip

Battery Bracket
T-1943 Ignition Switch T-7675-F
T-517 Ammeter T-7680-B
Ammeter to Switch Wire T-7681-B
View Showing Method of Assembling Battery Ground Connector to Frame—Connector to be Bent to Shape When Assembling.
Starting Switch T-8722—Wire to Tail Light—Black

Battery Box Cover T-5491
T-8819 Battery to Frame Ground
Connector T-1890-B
Battery T-7670
Battery Box T-7571—(Pos) (+) Positive Terminal of Battery.
Battery to Switch Cable Sleeve T-2120
Battery to Switch Cable Sleeve Retainer T-2121
Bend Cable in Horizontal Plane as Shown When Assembling to Chassis
Battery to Switch Cable Support T-2114
Battery to Switch Cable T-1899-B
Starting Switch to Motor Wire T-1891
Yellow Wire to Terminal Block
Switch to Motor Cable Sleeve T-2119

Bolt—T-1905 (Short)
Bolt—T-8760 (Long)
Nut—T-316
Cotter—T-544

This Insulator to be Used on Touring and Tudor only to take up slack in wire. On Forord Use T-7941 Staples in Place of These Two T-6409 Assemblies.

Frame Rear Cross Member T-2913-B
T-2108
T-2107
Running Board Bracket
T-336-C
T-4082
T-6409 Ass'y

Sketch Showing Method of Attaching Tail Lamp Wire Bushing to Running Board Bracket
Horn Switch—T-8628
Black Wire—Horn Switch to Terminal Block—T-8894-C
Black Wire—Switch to Horn—T-7917-C
Wire to Ammeter—Yellow
Wire to Tail Light Terminal—Black
Wire to Dim Terminal—Black with Red Tracer
Wire to Magneto Terminal—Red
2-Way Cable—Switch to Terminal Block
Wire to Battery Terminal—Yellow with Black Tracer
Wire to Coil Terminal—Blue with Yellow Tracer
Wire to Head Light Terminal—Black with Green Tracer
No. 6 Wires to this Terminal—Black with Green Tracer
No. 1 wires to this Terminal—Black with Red Tracer
No. 4 Wires to this Terminal—Black
No. 3 Wires to this Terminal—Yellow
No. 2 Wires to this Terminal—Red
No. 2 Wires to this Terminal—Black with Green Tracer
No. 4 Spark Plug Wire T-1350
No. 3 Spark Plug Wire T-1350
No. 2 Spark Plug Wire T-1350
No. 1 Spark Plug Wire T-1350

Sketch Showing Method of Attaching Battery to Switch Cable Support to Frame
Also Method of Attaching Tail Lamp Wire
With T-6409 Assembly to Frame by Inserting T-6410 in Place of Cotter Key

Starting Switch T-8722—Wire to Tail Light—Black

No. 1 Black with Red Tracer
No. 3 Red
No. 2 Blue with Yellow Tracer
No. 4 Green

Red Wire to Magneto—Red

Wires Must Be Over Priming Rod

Healights Grounded Through Lamps

Sketch Showing Method of Attaching Battery to Switch Cable Support to Frame
Also Method of Attaching Tail Lamp Wire
With T-6409 Assembly to Frame by Inserting T-6410 in Place of Cotter Key

Starting Motor T-1877 Grounded to Transmission Cover

Fig. 65—Wiring diagram of improved Ford car equipped with starter
The increased convenience provided by the new style carburetor priming and adjusting rod has resulted in a considerable demand on the part of Ford owners for the installation of this device on cars which were manufactured before this was made standard equipment. To install this assembly on cars equipped with the old style dash, it is necessary to cut a hole in the dash for the rod. The proper place to bore the hole can easily be figured by taking the measurements from a new car.

When ordering parts for this assembly the following numbers are to be used:

- **4129-B**: Carb. Adj. rod—Tour., rdstr and open cab
- **4129-C**: Carb. Adj. rod—Coupe, tudor, fordo
- **4129-D**: Carb. Adj. rod—T & TT chassis
- **4129-E**: Carb. Adj. rod—Closed cab
- **4590**: Priming rod bumper
- **4591**: Priming rod lift
- **4592-B**: Choke lever rod T & TT Chassis
- **4589-D**: Choke lever rod open & closed cars
- **4131**: Carb. Adj. rod sleeve
- **4132**: Carb.Univ. joint spider
- **6213-B**: Spray needle assembly
- **6161-B**: Spray needle assembly
- **6208-B**: Spray needle adjusting nut
- **6165**: Spray needle sleeve

If car is equipped with a Ford Model NH carburetor, it is necessary when installing dash adjustment, to purchase T-6213-B and 6208-B. However, if car is equipped with Kingston Model L-4, it is not necessary to purchase part T-6165, as the spray needle will fit the sleeve now in the carburetor.
Parts Displays Which Attract Attention

Fig. 67

Parts Department of the New Jersey Motor Co., Ford Dealers at Newark, N. J.

Note the direct appeal of this clean and orderly arrangement of genuine Ford products.

While a comparatively small variety of material has been used in making this display, the arrangement is so effective that it attracts immediate attention.

Too often the effect of a display is marred by poor arrangement, or crowding too great a variety of material into a limited space.

Compare the appearance of your window and parts department displays with that of some of the most successful merchants in your town—the comparison may prove valuable.

Adapting Present Design Motors to Older Type Cars and Trucks

As all model T motors supplied in future will embody certain changes in design, it will be necessary for dealers to purchase the following additional parts in order to make these new motors adaptable to the older cars and trucks.

- T-4201 BRX Floor Boards No. 2. 1915-23.
- T-9496 BX Floor Boards No. 2. Due to the wider spacing of the pedals, the width of the opening in the floor mats must be enlarged. This can be done by cutting 1 ½ inches from the mat at the left hand side of the opening.

When dealers' stocks of new style parts are finally complete, this material will naturally be drawn from this source, making it unnecessary for the dealer to order the extra parts shipped with each new motor.
The Fordson

Oil Retainer for Drive Pulley

To eliminate the possibility of oil leaks at the outer end of the drive pulley assembly, a new design retainer and drive pulley packing, part No. F-3125 is now being used at this point. See Fig. 68. This retainer and packing replaces the felt and retainer formerly used.

Sand, and Failure to Change Oil Affect Transmission Gears

Occasionally a report is received that the gears and bearings in a Fordson transmission have worn prematurely.

When instances of this kind are brought to our attention, we obtain the parts and have them returned to our laboratory for inspection and analysis.

In practically every instance, the bearings and gears which were returned, were found to have the proper physical qualities, although plainly showing the effects of wear. The cause of this condition was found in deposits which were scraped from the parts—these deposits being composed principally of sand.

In interviewing the owners of the tractors with reference to how often they changed the oil in the transmission, it was found that very little attention had been given to this important detail. The only definite report we received was in one case in which the owner stated that he replaced the transmission oil every 300 hours. This might be satisfactory for industrial work, but for agricultural purposes the oil should be replaced every 100 hours. There is no doubt but that the sand which entered these tractors and which was allowed to remain there by the owners failing to change the oil in the transmission with any degree of frequency, was the cause of the trouble they experienced.

Page 28 of the Manual states that the oil should be replaced every two weeks and the housing flushed with kerosene. (This applies to the transmission only, as the engine should not be flushed with kerosene on account of the numerous pockets in the crankcase which prevents all of the kerosene draining out.)

The filler cap should be wiped clean before taking it off to prevent any possibility of sand falling into the opening, also all oil receptacles should be kept tightly covered and oil measures thoroughly cleaned before using.

By emphasizing the importance of following these suggestions, dealers can render tractor owners a real service.
A NEW BOOK entitled "Ford Service" has recently been compiled by the Ford Motor Company for the purpose of simplifying and standardizing Ford repair methods.

The new book describes in an interesting and practical manner every phase of Ford repair work. It contains specific step-by-step instructions for performing each repair operation and explains in detail how to systematically locate and correct car troubles promptly.

In addition to mechanical information, it contains articles on the essentials of good service; suggestions for improving the parts department; an ideal shop layout; and complete details of an efficient follow-up system.

Ford Service will prove invaluable to mechanics, and give dealers a clearer insight into one of the most important branches of their business.

Orders for the new book may be placed direct with nearest Ford branch.
Servicing the Improved Car

The numerous improvements made in the new car have to some extent altered former methods of removing and installing certain parts.

So that dealers will experience no difficulty when replacing a new part, we will, wherever an improvement has altered former replacement methods, describe in detail how the new part is removed and installed.

Copies of these Bulletins should be placed where they will be readily available to mechanics.

Removing and Installing the New Type Fenders

In addition to being of a wider and heavier construction, the new crown type fenders extend lower and are hung closer to the wheels, thus affording maximum protection against road splash.

In place of mounting the fenders on fender irons, the new type fenders are bolted direct to the body and frame. This method of assembly affords exceptional rigidity and eliminates fender vibration.
Removing the Front Fender

To remove the new type front fender it is first necessary to remove the radiator; the radiator is removed as follows:

1. Open pet cock underneath radiator and while water is draining, lift off hood and disconnect priming rod (see “A”, Fig. 69) by unhooking it from carburetor butterfly “B”.
2. Loosen cylinder head outlet hose clip screw (see “A”, Fig. 70) also cylinder water inlet hose clip screw “B”.
3. Withdraw cotter pins and run off radiator stud nuts (see “A”, Fig. 71) and lift off upper thimbles “B”.
4. Pry up the three loom clips on radiator bottom tank (see “A”, Fig. 72) and lift out lighting wire loom from underneath clips.
5. Loosen radiator stay rod lock nut (see “A”, Fig. 73) and lift rod out of radiator stay rod bracket “B”.
6. Lift radiator off of studs—radiator inlet connection together with outlet pipe can then be withdrawn from hose connections (see “A” and “B”, Fig. 74); radiator can then be lifted from car.
7. Remove starting crank ratchet pin (see “A”, Fig. 75) by withdrawing cotter key “D” and driving the pin out of the ratchet with a hammer and drift. Ratchet can then be withdrawn over end of starting crank.
8. Withdraw starting crank together with radiator apron spacer (see “A”, Fig. 76). Radiator lower thimbles “B” stud springs “C”, and radiator apron can now be lifted off over ends of radiator studs.
9—Run off the nuts on the ends of the two engine pan bolts (see “C”, Fig. 69) also the nuts on the ends of the two hood block bolts “D”, Fig. 69. Hood block can then be lifted from frame as shown in Fig. 77.

10—Disconnect headlamp plug (see “A”, Fig. 78) at headlamp by pressing in on plug and turning it counter clockwise.

11—Run off the nuts on the ends of the two headlamp bracket bolts (see “B”, Fig. 78). Headlamp can then be withdrawn from fender apron.

12—Run off the nuts on the ends of the two front fender to running board bolts (see “A”, Fig. 79) and withdraw the bolts.

13—Run off the nuts on the ends of the four front fender to dust shield bolts (see “B”, Fig. 79) and withdraw the bolts.

14—Run off nuts on the ends of the three front fender to bracket bolts (see “A”, Fig. 80) and withdraw bolts. Fenders can now be lifted off as shown in Fig. 81.

Installing Front Fender

15—To install the new type front fender, position it against frame and fender bracket, lining up the bolt holes in fender with holes in frame. The three front fender to bracket bolts are then inserted through bracket and fender. Castle nuts are run down on the ends of two of the bolts, but are not locked with cotter keys until all bolts and nuts are entered. The third bolt is locked in position with a lockwasher and hexagon nut. See Fig. 80. Do not draw nuts down tightly until all fender bolts have been entered.
16—Place flat washers over the ends of the four front fender to dust shield bolts and insert the bolts through fender and dust shield (see "B", Fig. 79). The bolts are locked in position by means of a flat washer and a lock washer which are placed over the ends of each bolt and nuts run down but not tightened until all bolts are entered.

17—Insert the two fender to running board bolts through running board and fender (see "A", Fig. 79). Place lockwashers and nuts over the ends of the bolts and run down nuts but do not tighten until all bolts are entered.

18—Insert headlamp wire into notch in hood block and position hood block on frame lining up bolt holes in hood block with holes in frame. The two engine pan bolts (see "C", Fig. 69) are then inserted through hood block, frame and engine pan; lockwashers being placed over the ends of each bolt and nuts run down but not tightened until all fender bolts are entered.

19—Place flat washer over the end of one of the two hood block bolts (see "D", Fig. 69) and insert the bolts through the hood block. Place a lockwasher and nut over the ends of each of the two bolts and draw the nuts down tightly.
20—Draw all fender bolts and nuts down tightly, locking the two fender to bracket bolt nuts with cotter keys (see Fig. 80).

*Installing the Radiator*

21—Position radiator apron (see “E”, Fig. 75) over ends of radiator studs “B”. Place radiator apron spacer over end of starting crank (see “A”, Fig 76). Insert starting crank through radiator apron and starting crank sleeve. (It is very important that the radiator apron spacer is installed, as the spacer holds the crank firmly in the sleeve and prevents any possibility of a rattle). Position starting crank ratchet over end of crank. Line up hole in ratchet with hole in crank and insert starting crank ratchet pin (see “A”, Fig. 75) through ratchet and crank. The pin is locked in position by means of a cotter key which is inserted through end of pin as shown at “D”, Fig. 75.

22—Position springs (see “C”, Fig. 76) and lower thimbles “B” over ends of radiator studs.

23—Insert inlet connection into cylinder head outlet hose (see “A”, Fig. 74). Insert radiator outlet pipe into outlet hose connection “B” making sure that the lower hose connection is underneath lighting wire loom. Position radiator over ends of studs, seating radiator firmly on lower thimbles. Place upper thimbles (see “B”, Fig. 71) over ends of studs. Run down radiator stud nuts “A” sufficiently far to permit locking them with cotter keys. Tighten hose clip screws on top and side hose connections.

24—Insert radiator stay rod into bracket on dash and run down and tighten lockwasher and nut (see Fig. 73). Position headlamp on fender, lining up bolt holes in headlamp with bolt holes in fender. Insert the two headlamp bolts through headlamp and fender, (see “B”, Fig. 78) running down lockwashers and nuts on ends of bolts.

26—Connect headlamp plug to headlamp by pressing in on plug and turning it clockwise.

27—Insert lighting wire loom under the three clips on radiator bottom tank, bending the clips down until loom is held firmly in position. (See Fig. 72)

28—Connect carburetor priming rod to carburetor butterfly by inserting priming rod through radiator apron and hooking it into carburetor butterfly. (See “B”, Fig. 69)

29—Replace hood; close drain cock underneath radiator and fill radiator with clean water.

30—The headlamps should now be checked for alignment. If a new headlamp was installed the lamps should also be checked for correct focus.

*Focusing and Aligning the Headlamps*

31—On the improved car, the headlamps are set higher and further apart, this has been accomplished by mounting the headlamps on the fenders. The new method of assembly necessitates dealers making a few changes in the dimensions of their shop layouts used for focusing and aligning headlamps. Fig. 82 show the new layout.

32—Headlamps are aligned and focused with the empty car standing on a level surface in front of a white wall or screen 25 feet from the front of the headlamps. This wall must be in semi-

![Fig. 82]
darkness or sufficiently shielded from direct light so that the light spots upon it from the headlamps can be clearly seen. The wall or screen must be marked off with black lines as shown in Figs. 83 and 84.

33—To focus the headlamps:
(a) Turn on bright lights.
(b) Focus, by means of focusing screw (see "C", Fig. 78) at back of lamps, first one lamp and then the other, adjusting the bulb filament at the focal center of the reflector to obtain an elongated elliptical spot of light on the wall, with its long axis horizontal (see Fig. 84).

With lamps thus focused for the "bright" filament, the "dim" will be in correct position.

34—The headlamps are aligned after they are assembled to the car by bending the headlamp brackets as follows: (A new type bending iron is used, details of which are shown in Fig. 85).
(a) The tops of the bright spots on the 25-foot wall are to be set at a line 28 inches above level of surface on which car stands. (See Fig. 82). With top lines thus set for empty car, the headlamps will also have the proper tilt under full loads as required by the various states.
(b) The beam of light from each headlamp is to extend straight forward, that is, the centers of the elliptical spots of light must be 28 inches apart.

35—Proper alignment is readily checked by means of a horizontal line on the wall in front of the car 28 inches above the level surface of car, and two vertical lines 28 inches apart, each one 14 inches from center line of car. Proper alignment of car relative to marks on the wall may be readily provided by use of wheel guide blocks for one side of the car, as shown in Fig. 82. If it is impractical to tie up the floor space required by these blocks, marks painted on the floor can be used to show where one set of wheels should track and where the car should be stopped.

**Removing and Installing Rear Fenders**

To remove the new design rear fender, run off nuts on the ends of the two rear fender to running board bolts (see "A", Fig. 86).
37—Run off nuts and withdraw the two fender to dust shield bolts "B".

38—Run out the four fender to body bolts (see “A”, Fig. 88). (The nuts on the ends of these bolts are fastened in the body and remain there when the bolts are withdrawn).

39—Fender can now be lifted from body.

40—The new tail lamp and license bracket assembly is installed on the left rear fender (see "A", Fig. 87). When changing a left rear fender, it is therefore necessary to remove the bracket. This is done by disconnecting the tail lamp wire at tail lamp and running off the nuts from the ends of the three bracket to fender bolts "B". Bracket can then be lifted off of fender. To install the new tail lamp and license bracket, the procedure is reversed.

**Installing Rear Fender**

41—To install the new type fender, place lockwashers over the ends of the four fender to body bolts. Position fender against body and line up the bolt holes. Insert the four fender to body bolts through fender and run them down into the fender bolt nuts which are held stationary in body (see Fig. 88). Do not tighten until all bolts have been entered.

42—Insert the two fender to running board bolts through running board and fender. Place lockwashers over the ends of the bolts and run down the nuts (see "A", Fig. 86). Do not tighten the nuts until all fender bolts and nuts are entered.

43—Place flat washers over the ends of the two fender to dust shield bolts and insert bolts through fender and dust shield (see "B", Fig. 86). Place a flat washer, also a lockwasher over the ends of each of the two bolts. Start nuts on ends of bolts and draw them down tightly.

44—Draw down all fender bolts and nuts tightly.
New Design Transmission Brake Band

Fig. 89

The new transmission brake band has been increased from \(1\frac{1}{8}\)" to \(1\frac{3}{4}\)" wide, an improvement which affords an exceptionally smooth and positive braking effect as well as contributing to the ease of braking. In addition, the increased width of the band makes adjustments infrequent and materially increases the life of the lining.

To facilitate replacement, all transmission bands are equipped with detachable ears. This improvement permits new linings being installed without removing the transmission cover, thereby effecting a saving in time and labor, as well as lowering replacement cost to the customer.

Installation instructions contained in the May, 1925, issue of the Service Bulletin apply to the present design bands.
45—The new design running boards are 1 1/2" wider than the old style running board and in addition they are set closer to the ground, thus affording maximum convenience when entering or leaving the car.

46—The new running boards can be easily removed by running out eight bolts and nuts as follows:

47—Run off the nuts on the ends of the two front fender to running board bolts (see "A," Fig. 90) and withdraw the bolts.

48—Run off the nuts on the ends of the two rear fender to running board bolts (see "A," Fig. 91) and withdraw the bolts.

49—Run off the nuts on the ends of the four running board bolts (see "A," Fig. 92) and withdraw the bolts. Running board can now be lifted from brackets.

50—Installing—Place the two running board blocks on running board brackets. Position running board on top of blocks, lining up bolt holes in running board with holes in blocks and brackets.
51—Insert the four running board bolts (see "A," Fig. 92) through running board blocks and brackets, placing lock washers over the ends of the bolts and running down the nuts. (Do not draw nuts down tightly until all bolts have been entered.)

52—Insert the two rear fender to running board bolts through running board and fender. Place lock washers over the ends of the bolts and run down the nuts (see "A," Fig. 91). (Do not tighten the nuts until all bolts have been entered.)

53—Insert the two front fender to running board bolts through running board and fender. Place lock washers over the ends of the bolts and run down and tighten nuts (see "A," Fig. 90).

54—Draw down nuts tightly on the ends of the four running board bolts, also the two rear fender to running board bolts.

Removing and Installing the New Dust Shield

55—To remove the new design dust shield, it is first necessary to remove the running board as described in paragraphs 46 to 49.

56—After removing the running board, run out the two wood screws which hold dust shield to body (see "B," Fig. 92).

57—Withdraw cotter pin from end of rear hood clip; hood clip washer and spring can then be lifted off and hood clip (see "A," Fig. 93) withdrawn.

58—Run off nut on end of hood block bolt "B," and withdraw bolt.

59—Run off the nuts on the ends of the four front fender to dust shield bolts (see "B," Fig. 90) and withdraw the bolts.

60—Run off the nuts on the ends of the two rear fender to dust shield bolts (see "B," Fig. 91) and withdraw the bolts.

61—By sliding the dust shield back until it clears the front fender, the shield can be withdrawn as shown in Fig. 94.

62—Installing—Insert end of shield between rear fender and frame (see Fig. 94).

63—Position hood block support in channel of hood block, lining up bolt and hood clip holes in support with bolt and clip holes in hood block.

64—Draw dust shield forward until shield rests on hood block bracket, lining up the hood block bolt hole in the shield with the bolt hole in bracket.

65—Insert hood block bolt (see "B," Fig. 93) through hood block, support and bracket. Place a lock washer over end of bolt and run down nut but do not tighten until all dust shield bolts have been entered.
66—Insert hood clip (see "A," Fig. 93) through hood block and support. Position hood clip spring and washer over end of clip, locking them in position by inserting a cotter key through end of clip.

67—Place a flat washer over the ends of the two rear fender to dust shield bolts and insert the bolts through fender and dust shield. A flat washer and a lock washer are then placed over the ends of the bolts and the nuts run down but not tightened until all dust shield bolts are entered.

68—Place flat washers over the ends of the four front fender to dust shield bolts and insert the bolts through fender and dust shield. Place a flat washer and lock washer over the end of each of the bolts and run down nuts tightly.

69—Tighten nuts on the ends of the hood block bolt and the two rear fender to dust shield bolts.

70—Run down the two dust shield to body screws through dust shield into body (see "B," Fig. 92).

71—The running boards are now installed as described in paragraphs 50 to 54.

The New Design Fan Bracket

72—To obtain maximum cooling efficiency, the fan on the improved car has been placed at a higher elevation. This improvement has been accomplished by means of a new type fan bracket which is designed as an integral part of the cylinder head outlet connection (see "A," Fig. 95).

Adjusting the Belt

73—To adjust the new fan belt, loosen the lock nut on the end of the adjusting screw (see "B," Fig. 95) and turn the eccentric "C" by turning adjusting screw "B" to the right, this will tighten the belt. To loosen the belt, turn the adjusting screw to the left. When correct adjustment is obtained, tighten lock nut on end of adjusting screw, making sure that cotter key in end of screw is in good condition.

Replacing Fan Belt

74—To remove the new design belt, loosen lock nut on end of adjusting screw (see "B," Fig. 95) and turn the screw to the left until the fan shaft in the eccentric reaches the lowest point of the bracket (see "C," Fig. 95); fan belt can then be slipped from fan and drive pulleys and lifted off over fan. To install the belt, position it over fan and drive pulleys. The belt is then adjusted as described in paragraph 73.
Replacing Fan

75—To remove the fan, loosen the fan belt as described in paragraph 74 and run off fan shaft nut (see "D," Fig. 95). Fan shaft can then be withdrawn from the eccentric as shown in Fig. 96. To install the fan simply reverse the procedure.

The New Type Coil Box

76—In place of being bolted to the back of the dash, the new design coil box (see Fig. 97) is mounted on the left hand side of the cylinder head.

77—The new location provides easy access to the coil units and affords quieter operation as the action of the vibrators cannot be heard by the occupants of the car.

78—The hold down springs which are riveted to the inside of the cover (see "A," Fig. 97) hold the coils tightly against the box contacts, insuring perfect contact at all times.

79—By means of a special composition gasket (see "B," Fig. 97) and two heavy type spring latches "C" which are hinged to the coil box cover, a dust and waterproof joint is formed between cover and box. A trough (see "A," Fig. 98) which has been made an integral part of the cover prevents any water reaching the terminals on the back of the coil box.

80—To remove the new type coil box: run off the nuts on the ends of the eight coil box terminal posts (see "B," Fig. 98) and lift off commutator loom and spark plug wires.

81—Run off ignition wire terminal nut on bottom of coil box and lift off ignition wire.

82—Run out the three cylinder head bolts which hold coil box brackets to cylinder head (see "C," Fig. 98), coil box can then be removed.

83—To install the new type coil box, simply reverse this procedure.

Removing and Installing the Gasoline Tank

84—The new design gasoline tank is placed underneath the cowl between the instrument board and dash. The new location places the tank at a higher elevation, bringing it almost directly over the carburetor, thus insuring a steady flow of fuel to the carburetor even when ascending the steepest hills.

85—The sediment bulb is conveniently located underneath the hood. This has been accomplished by means of a flanged pipe connection extending from the gasoline tank through the dash. The new location affords easy access to the sediment bulb and simplifies the operation of removing water and foreign matter which the sediment bulb collects.
86—The tank is filled from the outside of the car, the filler cap being located in the center of the cowl underneath a rain proof cover. A large trough or wall built around the filler and connected to an overflow pipe, carries any spillage direct to the ground.

**Removing the New Design Gasoline Tank**

87—To remove the new tank:

88—Close shutoff cock on sediment bulb. See “A,” Fig. 99.

89—Run off feed pipe pack nut “B” at sediment bulb outlet elbow and withdraw feed pipe from elbow.

90—Drain gasoline from fuel tank. A quick method of draining the fuel is as follows: (a) Place a 10 gallon or larger gasoline container near car. (b) Insert a large funnel into the end of a 5 or 6 foot length of hose. (c) Place end of hose in container. (d) Remove filler cap on tank. (e) Loosen the sediment bulb, then while holding the funnel underneath end of sediment bulb connection, run out the sediment bulb. The gasoline will then flow freely into the funnel and through the hose into the container. (f) (Caution: when draining gasoline, keep fires away.)
91—After draining gasoline from tank, loosen nut on end of overflow pipe clamp (see "A," Fig. 100.)

92—Run out overflow pipe set screw "B". Pipe can then be withdrawn from gasoline tank connection "C".

93—Remove cotter key (see "C," Fig. 99) and withdraw carburetor adjusting rod "D" through dash.

94—Run off the two gasoline tank strap nuts (see "E," Fig. 99) and lift off washers.

95—Hold the nuts stationary on the ends of the two ignition switch screws and run out the screws.

96—Withdraw ignition switch from instrument board. (See Fig. 102.)

97—To prevent any possibility of a spark occurring should the gasoline tank touch the terminals of the wires on the back of the switch when withdrawing the tank, it is a good plan to disconnect the battery wire and insert a small piece of rubber tubing over the end of the battery wire terminal (see Fig. 101).

98—Lift out floor boards and mat.

99—Run out the six transmission cover door screws (see "A," Fig. 102). Back up the two adjusting nuts to the end of the reverse and brake pedal shafts.

100—After loosening the reverse and brake pedals, the transmission cover door should be temporarily replaced, this will prevent dropping any parts into the transmission; one screw is sufficient to hold the door in position.

101—Withdraw gasoline tank straps through dash into body, bending the straps straight down as shown in Fig. 102. The straps are hooked into brackets which are located at the top of the cowl (see "D," Fig. 100). By unhooking the straps from these brackets, the straps can then be withdrawn.

102—Force the brake and reverse pedals forward as far as they will go so there will be plenty of clearance to withdraw the tank.

103—Move tank back and forth until sediment bulb connection on tank clears opening in dash. To facilitate this operation have someone stand at front of dash and guide the sediment bulb connection through the opening while the tank is being withdrawn. When connection clears opening in dash the tank can then be lifted out as shown in Fig. 103.
Installing

104—Position tank in car, inserting sediment bulb connection through opening in dash. (Have someone stand in front of dash to guide connection through opening).

105—Hook the two tank straps into brackets at top of cowl (see “D,” Fig. 100) slightly bend the straps to conform to the contour of the tank and insert the threaded ends through holes in dash. Place a spacer washer and lock washer over ends of straps. Start nuts on ends of straps and run them down tightly (see “E,” Fig. 99).

106—Insert overflow pipe into sediment bulb connection (see “C,” Fig. 100) lining up screw hole in pipe with set screw “B” in connection. The set screw is then run down until it enters pipe.

107—Position overflow pipe clamp over pipe (see “A,” Fig. 100) running down nut tightly on end of clamp.

108—Screw sediment bulb into sediment bulb connection.

109—Insert feed pipe into sediment bulb elbow and run down feed pipe pack nut (see “B,” Fig. 99).

110—Open shutoff cock on sediment bulb.

111—Insert carburetor adjusting rod (see “D,” Fig. 99) through instrument board and dash. Place priming rod lift over end of adjusting rod and insert rod into carburetor adjusting rod sleeve. Lock priming rod lift in position by inserting cotter pin “C” through adjusting rod.

112—Position ignition switch on instrument board. Insert the two ignition switch screws through switch and instrument board. Start nuts on ends of screws. Hold the nuts stationary and draw the screws down tightly.

113—Remove transmission cover door and adjust brake and reverse pedals. Replace transmission cover door by running down the six screws which hold door to transmission cover.

114—Replace floor boards and mat.

115—Withdraw rubber tubing which was inserted over end of battery wire to prevent a spark (see paragraph 97) and insert terminal of wire under head of battery wire screw on terminal block.

116—Install hood and fill gasoline tank with fuel.
TASTEFULLY decorated display windows, featuring articles having a Christmas gift appeal, attract unusual attention at this season of the year and in addition offer acceptable gift suggestions to the Christmas shopper.

How to decorate the display window for Christmas is a question frequently asked by dealers; this of course depends largely on available space and how elaborate a display is desired.

Fig. 104 shows a display suggestion for the parts department window which is attractive yet inexpensive. The material is grouped around a Christmas tree on which cards are placed which call attention to the various items in the display. The floor of the window is covered with cotton and mica to get the snow effect, while the various lengths of gold and silver fringe which extend from the top of the window, reflect the light and give a cold sparkle to the entire display.

A dark blue or black cloth drape makes an effective background and tends to emphasize the display.
117—To provide ample braking surface for the improved brake band, the new design transmission brake drum has been increased from \(1\frac{1}{8}\) to \(1\frac{3}{4}\)" wide (see "A," Fig. 105). Hardened steel shoes are fitted over each of the six lugs inside of the new drum as shown at "A," Fig. 106. The steel shoes prolong the life of the drum by absorbing any clutch disc wear which would otherwise be directed on the lugs.

118—The shoes can be easily replaced by withdrawing them from the brake drum lugs with a pair of pliers; new shoes being installed by placing them over the lugs and tapping them down into position with a small hammer.

119—When rebushing the brake drum, only one driven gear sleeve bushing is now used in the brake drum sleeve (see "B," Fig. 106) instead of the two bushings formerly used. This bushing (3320C-T712) is pressed in from the driven gear end of the sleeve.

120—The new hub brake shoe has been increased from \(7\frac{13}{16}\)" in diameter to \(10\frac{3}{8}\)" in diameter, the width of the shoe being increased from \(1\frac{1}{8}\)" to \(1\frac{3}{4}\)" (see Fig. 108).
121—The hub brake shoes are now made of pressed steel in place of cast iron, and are covered with a heavy asbestos lining which renders braking smooth and positive and eliminates all metal to metal contact between brake shoe and drum.

122—To provide ample braking surface for the new shoe, the hub brake drum has been increased from 8” in diameter to 11” in diameter, the width of the drum being increased from 1 1/2” to 1 3/4” (see “A,” Fig. 109).

123—The shoe is assembled to the axle housing plate by means of four steel clips which are riveted to the brake shoe plate (see “A,” Fig. 110). A heavy coil spring shown at “B” holds the shoe firmly against the hub brake cam.
124—After removing the rear wheel the new brake shoe is removed as follows:

125—**Removing**—Disconnect brake shoe spring by withdrawing it from lug on brake shoe. As the new spring is larger and has a much stronger tension than the old type spring, a special tool has been designed (see Fig. 107) to facilitate its removal and installation. Fig. 112 shows how the new tool is used to remove the spring. After disconnecting the spring, the brake shoe can be lifted off of the axle brake housing plate as shown in Fig. 111.

126—**Installing**—To install the new brake shoe, position it on axle housing plate, inserting the flange on the edge of the shoe behind the four steel clips on housing plate (see “A,” Fig. 110). Line up brake shoe so that hub brake cam (see “A,” Fig. 111) can be entered between ends of brake shoe.

127—Install brake shoe spring by placing it over lug on upper side of brake shoe and hooking it over the lower lug with the special tool as shown in Fig. 112.

128—The rear wheel is then replaced.
The Transmission Cover

129—The new transmission cover is designed with an extension at the top of the cover behind which are placed steel shims as shown at “A,” Fig. 113. This extension acts as an added support to the crankcase while the shims which are inserted between extension and cylinder block insure accurate alignment of the universal ball cap.

130—When overhauling an engine or transmission, or in fact performing any repair operation which requires the removal of the crankcase, it is extremely important when reassembling to see that the universal ball cap bearing lines up accurately on the drive plate shaft.

131—To insure these parts being in exact alignment, position crankcase on cylinder block and run down the two crankcase cap screws through cylinder front cover and into crankcase. Place gasket on universal ball cap; oil end of drive plate shaft and insert ball cap over end of shaft with oil hole towards the top. The two ball cap cap screws are then entered into ball cap and run down about half way into crankcase. The remaining crankcase bolts are then inserted through crankcase and cylinder block and lockwashers and nuts run down tightly on ends of bolts.

132—The transmission cover is then replaced and the two transmission cover to cylinder bolts and lockwashers run down about half way into cylinder block (see “A,” Fig. 114).

133—The fit of the ball cap on the drive plate shaft is then checked by loosening the two ball cap screws “B,” and moving the ball cap back and forth on the shaft. If the cap moves freely on the shaft, the alignment of the crankcase and cylinder block is O. K. If ball cap does not move freely on drive plate shaft, insert a flat bar between cylinder block and transmission cover (see “C,” Fig. 114) and slightly pry the transmission cover back until ball cap moves freely on shaft. This will leave a small gap between extensions on transmission cover and cylinder block. With the flat bar still in position, insert sufficient shims between cylinder block and transmission cover (see Fig. 115) to completely fill the gap between these parts. When sufficient shims have been installed, withdraw the flat bar and run down the two transmission cover to cylinder block bolts tightly (see “A,” Fig. 114).

134—A second check should now be made to insure that the ball cap moves freely on drive plate shaft. If ball cap binds on shaft, remove or install additional shims between cylinder block and transmission cover until correct alignment is obtained, after which the two ball cap cap screws are tightened.

135—When performing repair operations requiring the removal of the transmission cover only, care must be exercised when installing the cover to replace the exact number of shims which were removed from between transmission cover and cylinder block.
Misfiring
(Misfiring Caused by Trouble in Ignition System or Valves)

136—Misfiring (missing) may result from trouble in either the fuel system, ignition system or in the valves. If the miss is irregular and cannot be located by shorting the plugs, the trouble is probably in the fuel system.

137—If the trouble indicates itself as lying in the ignition system or valves, start the engine and place a screw driver on the cylinder near one of the spark plugs, then lean it against terminal of spark plug. This shorts the current past the spark plug. A screw driver with a wooden handle should be used when making this test to prevent receiving a shock. Check each plug in this manner until one is found which makes no change in the sound of the exhaust from the engine. When this plug is found, the trouble lies in the ignition or valves of that cylinder. (As the miss is more likely to be due to ignition than valve trouble, it is advisable to check the ignition first.)

138—Next, stop the engine and disconnect the spark plug wire from the plug in the missing cylinder, then start the engine and hold the end of the spark plug wire approximately "s" away from any part of the engine. If a spark occurs the trouble lies in the plug and can be overcome by cleaning, or if necessary, replacing the plug. Before replacing the plug, check the spark plug points for gap, the gap between the points should measure approximately 1/32". Also examine the porcelain to make sure that it has not been cracked.

139—If no spark occurs when the above test is made, again hold the end of the spark plug wire approximately 1/8" away from the engine, at the same time shorting the commutator terminal of the missing cylinder at the coil box by placing a screw driver on the terminal and resting it against the radiator stay rod. (The commutator terminals on the coil box are the four upper terminals on the back of the coil box and for convenience are numbered 1, 2, 3 and 4 to correspond with the cylinders.) If a spark occurs between spark plug wire and cylinder, the trouble lies in the commutator or commutator loom and can be corrected by inspecting the loom for breaks in the wire and insulation and noting whether commutator loom terminals are properly soldered and that the points where they are connected to commutator case and coil box are clean and all connections are tight. (If no spark occurs, see Par. 140.) If the trouble is not in the loom or connections, remove the commutator and clean it thoroughly by washing it with kerosene. Inspect interior surface of commutator where the roller travels; this surface should be clean and smooth. If the surface is uneven and as a result, the roller fails to make a good contact with any one of the four contact points, its corresponding cylinder will not fire. This usually occurs when driving at high speed. Examine roller for wear. Inspect brush spring to see that spring is not weak or broken. If commutator case or roller is badly worn or the spring is weak or broken, new parts should be installed.

140—If no spark occurs between spark plug wire and cylinder head when commutator terminal is shorted to radiator stay rod, as described in Par. 139, the trouble lies either in the coil unit of the cylinder which is missing or in the coil box and can be remedied by inspecting the tungsten points on both vibrator and bridge and checking the coil units on a coil testing machine. (When a coil unit is correctly adjusted, it will show a good spark at each of the 16 points around the ring with the ammeter on the stand registering 1.3 amperes and the volt meter registering 6 volts). When checking the coil box, examine the contact points inside of coil box to make sure they are not bent or broken. See that the two soldered wire connections in coil box are tight and that there is no foreign substance in the coil box which prevents the coil units seating squarely in box. If the soldered wire connections in coil box are loose, it will be necessary to remove the coil box and solder them.
TIRE MILEAGE CHART for 4.40 BALLOON TIRES

The following chart indicates loss of tire life in miles in comparison with a pressure of 27# as recommended for the roadster and coupe.

27# AVERAGE MILEAGE

24# loses 2100 MILES in Comparative Service

21# loses 4200 MILES in Comparative Service

The same ratio of mileage loss will apply to the other recommended pressures specified in the following table:

<table>
<thead>
<tr>
<th>CAR</th>
<th>FRONT</th>
<th>REAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROADSTER</td>
<td>27#</td>
<td>27#</td>
</tr>
<tr>
<td>COUPE</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>SEDAN</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>TOURING</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>ROADSTER WITH PICK-UP BODY</td>
<td>27</td>
<td>30</td>
</tr>
</tbody>
</table>

Fig. 116

Fig. 116 shows the loss in tire mileage when balloon tires are not inflated to the pressures recommended above.

Dealers should point out to owners the advantage of keeping their tires inflated to recommended pressures as well as checking the tires at regular intervals to guard against under inflation.
National Fleet Owners Operating 100 or More Ford Cars or Trucks.

For the information of Dealers generally, the following concerns have qualified as National Fleet Owners to date. The travelling representatives of these concerns should be encouraged to make use of the Dealers' service facilities, as their continued satisfaction with Ford products depends largely upon the co-operation given along service lines.

Advance Rumley Thresher Company, Inc.  
American Agricultural Chemical Co.  
American Can Co.  
American Railway Express Co.  
American Telegraph & Telephone Co.  
American Tobacco Co.  
Armour & Co.  
Atlantic & Pacific Tea Co.  
Atlantic Oil Co.  
Austin Western Machinery Co.  
Bell Telephone Co.  
Booth Fisheries Co.  
Borden Co.  
Byllesby, H. M., & Co.  

Carnation Milk Products  
Case Threshing Machine Co.  
Certain-teed Products Corp.  
Cities Service Co.  
Coca-Cola Bottling Co.  
Colgate & Co.  
Continental Oil Co.  
Corn Products Refining Co.  
Crane & Co.  
Cudahy Packing Co.  

Devoe & Reynolds  
Fairmount Creamery Co.  
Ferry Seed Co.  
Firestone Tire & Rubber Co.  
Fleschmann Co.  

General Petroleum Co.  
Goodyear Tire & Rubber Co.  
Grand Union Tea Co.  
Gulf Refining Co.  

Hartford Steam Boiler Insurance Co.  
Heinz, H. J., Co.  
Humble Oil Co.  

Iten Biscuit Co.  
Jewel Tea Co.  
Jones Bros. Tea Co., Inc.  
Kellogg Co.  
Kelly Springfield Tire Co.  
Kirk, James S., & Co.  

Liberty Yeast Co.  
Liggett Meyers Co.  

Loose Wiles Biscuit Co.  
Lorillard P., & Co.  

Magnolia Petroleum Co.  
Miller Rubber Co.  
Morrell, John & Co.  
Morris & Co.  
Morton Salt Co.  

National Cash Register Co.  
National Refining Co.  

Ohio Oil Co.  
Oliver Chilled Plow Works  

Pacific Telephone & Telegraph Co.  
Peet Brothers Co.  
Pierce Oil Co.  
Pillsbury Flour Mills  
Pittsburgh Plate Glass Co.  
Proctor & Gamble  
Pure Oil Co.  

Quaker Oats Co.  

Red Star Yeast & Products Co.  
Reynolds, R. J., Tobacco Co.  
Royal Distributing Co.  

Salvation Army Organization  
Saunders System  
Shell Oil Co.  
Sinclair Refining Co.  
Standard Oil Co.  
Swift & Co.  

Texas Co.  

Union Oil Co.  
U. S. Bureau of Public Roads  
U. S. Dept. Agriculture  
U. S. Forest Service  
U. S. Post Office Dept.  
U. S. Reclamation Service  
U. S. Tire Co.  
U. S. Veterans Co.  

Val Blatz Brewing Co.  
Washburn Crosby Co.  
White Eagle Oil & Refining Co.
More Room for the Driver

Seats in the Improved Coupe and Tudor Can be Easily Adjusted to Provide Additional Space

While the standard seating arrangement in the improved Coupe and Tudor is designed to furnish maximum riding comfort for the average size driver, provision has also been made for the accommodation of owners of larger than average size. This has been accomplished by designing the seats so they can be easily adjusted to provide additional space between driver's seat and steering wheel, as well as increased leg room.

Detailed instructions, covering these adjustments, are contained in this issue of the Service Bulletin.

As this information possesses considerable sales value, it should be brought to the attention of all car salesmen, as well as prospective car purchasers.
Adjusting the Coupe Seat

141—In addition to the increased space obtained by inserting the two dowels in seat riser into the two forward holes in bottom of seat cushion (see Fig. 125), the seat back in the improved Coupe can be moved back to provide additional space between steering wheel and seat back, as well as increased leg room, by proceeding as follows:
142 — Lift out seat cushion.

143 — Run off the nuts on the ends of the three seat back strainer bolts (see "A," Fig. 117), and withdraw the bolts.

144 — Raise the seat back approximately 2", this will release the clip which holds seat back to spacer board. Seat back can then be lifted out of car as shown in Fig. 118.

145 — Run off the nuts on the ends of the five spacer board to body bolts (see "A," Fig. 119) and withdraw the bolts.

146 — By tipping up the back of the spacer board, it can be lifted out as shown in Fig. 120.
147—The seat can now be moved back 2" by running off the nuts on the ends of the four seat bar to bracket bolts (see "A," Fig. 121) and withdrawing the bolts. Next slide the seat bar back approximately 2" on brackets or until rear bolt hole in seat bar lines up with rear hole in brackets. The four bolts are then inserted through seat bar and brackets (see "A," Fig. 122) and lock washers and nuts run down tightly on ends of bolts.

148 This change necessitates two additional bolts, lock washers and nuts being used to hold each end of the body supports to the brackets as shown at "B."

149—The width of the spacer board is next cut down 2" to correspond to the distance which the seat was moved back. This will preserve the comfortable angle at which the seat back is set and in addition provide greater space between steering wheel and seat back.
150 — To cut down the spacer board proceed as follows:

151 — Place spacer board on a flat surface with the bottom side up and run out the five wood screws (see “A,” Fig. 123) which hold spacer block to board. Spacer block “B” can then be removed.

152 — Withdraw tacks from edge of fabric on spacer board where spacer block was withdrawn and fold the fabric back as shown at “A,” Fig. 124. Mark off a section 2” in width extending the full length of the spacer board as shown at “B” and saw it off. If an owner is unusually stout and requires a larger amount of clearance between steering wheel and seat back, an additional 2” can be cut from the spacer board.

153 — In instances where the owner does not desire the seat moved back, but simply requires more clearance between steering wheel and seat back, the maximum width of the strip sawed from the spacer board should not exceed 3”.

154 — To eliminate any possibility of cutting off too wide or too narrow a strip, it is a good plan to keep several spacer boards on hand from which strips varying in width from 1 to 3” have been cut. By trying out these different width spacer boards in an owner’s car, the owner himself can determine which is the most suitable for his needs.

155 — After cutting down the width of the spacer board, drill five new holes in spacer board for the five wood screws which hold block to board. Smooth out the fabric on the board (see “A,” Fig. 124) and tack it securely to spacer board. Any excess fabric can be cut off with a pair of scissors or a sharp knife.

156 — Assemble spacer board block to spacer board by running in the five wood screws (see “A,” Fig. 123) which hold block to board.

157 — Install spacer board in body, running down the five bolts and nuts (see “A,” Fig. 119) which hold spacer board to body.
158—Position seat back in car, hooking the clip on the back of the seat back into the spacer board block. Line up the three bolt holes in seat back strainers with bolt holes in seat bar and run down the three seat back strainer bolts and nuts. (See "A," Fig. 117).

159—Replace seat cushion, making sure to insert the two dowels on seat riser (see "A," Fig. 125) into the two forward holes "B" on bottom of seat cushion board.

![Diagram of seat back with dimensions and annotations](image)
Different Adjustment Methods Used on Coupes Equipped with Former Type Seat Bar Brackets

160—In the first run of the improved Coupes, the seat bar brackets were of a slightly different type than the present design. This necessitates a little different method being used in moving back the seat.

161—A simple method of moving back the seat in Coupes equipped with the former style bracket is to first remove the seat bar by running out the four seat bar to bracket bolts (see "A," Fig. 121). Then bolt a small steel plate to each of the two brackets (see "A," Fig. 127). This plate serves as an extension to the bracket and permits moving back the seat 2" in the same manner as is done with the present design bracket. Details of the plate which can be easily made locally, are shown in Fig. 126.

162—The width of the spacer board is then cut down in the same manner as described in paragraphs 150 to 152.

Moving Back the Seats in the Improved Tudor

163—The driver's seat in the improved Tudor can be set back 1 1/2" by simply moving back the seat and inserting the seat legs into the two forward holes at bottom of seat assembly. This is done as follows:

164—Lift out seat cushion.

165—Run off the two seat leg nuts and washers (see "A," Fig. 128). Seat legs can then be withdrawn from bottom of seat assembly by tipping the seat backwards.

166—Insert seat legs into the two forward holes in bottom of seat assembly shown at "B". If the finishing material extends over the bottom of the holes it can easily be cut out with a knife.

167—Place a flat washer and a lockwasher over the end of each seat leg and run down the two seat leg nuts. (See "A," Fig. 128.)

168—Replace seat cushion.

169—The rear seat can be moved back by sliding back the cushion into the seat back and positioning dowels on seat riser into the two forward holes in cushion frame, in the same manner as shown in Fig. 125.
Winter Care of the Storage Battery

170—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 longer than during the summer months.

171—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 which might have a tendency to discharge the battery.

172—When starting in extremely cold weather it is good practice to give the engine several quarter or half turns with the hand crank before using the starter. This relieves the battery of the initial load by breaking the seal formed by the congealed oil around the pistons, bearings, etc.

173—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 Fahr.</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>

174—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, and result in considerable damage to the battery.

175—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 remain on top and freeze at a much higher temperature than the electrolyte.