

# Ford Service Bulletin

No. 1

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## Selling Points of the Ford Control

ONE of the outstanding features of the Ford car and a contributing cause of its deserved popularity is the ease and facility with which the average driver can control and successfully operate it under the most trying conditions. This is due to the proportioning and design of several features as follows:

1. Wheel Base.
2. Short Turning Radius.
3. Direct acting steering mechanism.
4. Gear change by means of foot pedal action instead of with foot operated clutch and hand operated gear shift lever.
5. Possibility of quick shift from low speed ahead to reverse and back again without shifting of gears.
6. Impossibility of failure to accomplish gear shifts.
7. Ample and positive brakes.

The combination of these features gives the driver of the Ford car unequaled control in traffic, in sand and mud, and in all places where matter of control of an automobile is most critical and all important.

The short wheel base and small turning radius is a source of convenience many times daily in going in and out of the garage and in maneuvering into a parking position at the curb. In turning corners they permit the driver to keep to his right-of-way and to avoid possible inconvenience in traffic or even accidents.

The design of the Ford steering mechanism is such that turning is accomplished without excessive motion of the steering wheel.

Further, being direct acting less effort is required to steer the car in and out of parking places. This is a matter of great convenience and results in a material saving of time.

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

The operation and control is particularly advantageous under heavy road conditions, such as those of sand or mud. This is because of the light weight of the car coupled with the fact that the low speed ratio is high in proportion to the weight and the added fact that the relative effect of the engine torque in driving thru the rear wheels is correspondingly high. The possibility of quick shift from low speed ahead to reverse and back again permits "rocking the car" forward and back as can be done with no other automobile. This is usually sufficient to extricate the Ford from the heaviest sand and mud.

Another outstanding feature is the impossibility of failure to accomplish gear shift

as with the Ford transmission there is no chance to clash gears and the driver need not worry about not getting into gear and, thereby, being caught in traffic with his engine disengaged.

The Ford Service Brake operated by pedal and acting direct on the driving shaft thru which the power is transmitted from motor to rear wheels give the Ford Owner a powerful positive brake which permits immediate stopping of the car. In addition there is the emergency brake operated by hand lever and acting on the drums of the rear wheels. This simple effective dual system of brakes requires little or no adjusting as compared with many other designs yet gives the Ford car a high factor of safety that is universally recognized.

### Defective Wheels on the Market

A recent investigation shows that the extremely low prices quoted by certain manufacturers and jobbers on wheels with and without hubs, are due to the poor quality of material furnished.

These wheels are manufactured largely out of material rejected by the various wheel manufacturers as unfit for their production of standard wheels used by the motor car manufacturers. In one instance a reliable wheel manufacturer rejected 1,000,000 spokes on account of the wood being cross grained, brash and knotted and unsafe for the various strains to which a wheel is subjected in every day use. Instead of being destroyed, this faulty stock went into the manufacture of wheels for sale to the jobbing trade. The defects in the wood are, of course, covered by paint and are not observed by the unfortunate purchaser who risks life and limb as a result.

We are acquainting all dealers with these facts so they may warn their customers of the dangers resulting from the purchase of such material.

In order to protect buyers against imposition by unscrupulous manufacturers and jobbers, we will, in the near future, identify all Ford wheels with the script word "Ford."

### The Storage Battery in Action

When charging a storage battery the electricity is not being stored as the name would imply. The action of the battery is purely chemical, and the current given off is generated by chemical action. In other words, it can be said that the storage battery is an apparatus that converts chemical energy into

electrical energy for the purpose of starting, lighting and ignition.

In order to explain the chemical action which takes place in a battery, it is necessary to briefly cover the plates in the cells of the battery. There are two kinds of plates used in a cell, one called the positive and the other the negative. These plates have a filigree or screen appearance before they are pasted with the active material. The frame work of the plates is composed of lead. The active material of the positive plate is called Peroxide of Lead in a charged condition and Oxide of Lead in a discharged condition and is brown in color. The negative plate is made up in the same form as the positive plate only the active material is called Spongy Porous Metallic Lead in a charged condition and is changed into Lead Sulphate in a discharged condition, and presents a grayish appearance.

It is also necessary to consider that the electrolyte of the cell consists of a mixture of Sulphuric Acid and water.

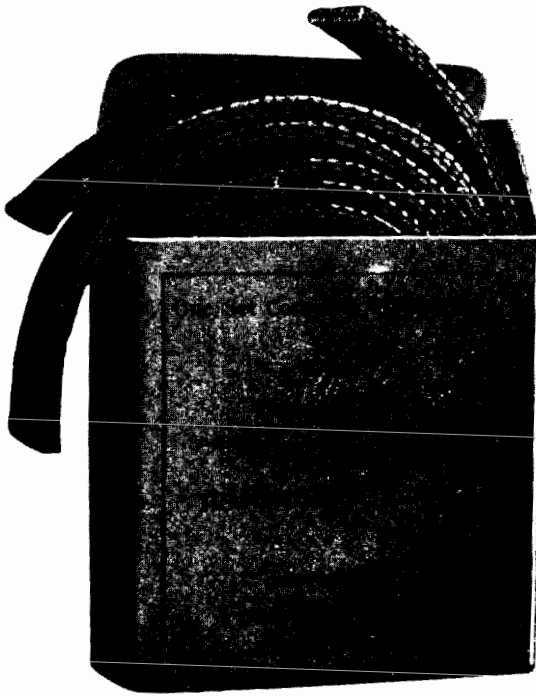
When the Battery is fully charged and placed upon a car, and properly connected with the starting and lighting systems, if the operator steps on the starting switch, a direct flow of electricity from the battery to the starter takes place. The battery is accordingly being discharged and a certain chemical action is taking place within. This action is that the acid in the electrolyte combines with the lead of the porous part of the negative plate called the active material, with the result that a compound known as Lead Sulphate is formed. As the discharge progresses the electrolyte becomes weaker due to the absorption of the acid by the plates. Then the Lead Sulphate continues to increase in quantity until the pores of the plate are entirely filled. This retards the free circulation of acid into the plate. As a result the acid does not get into the plates fast enough to maintain a normal action, and the battery will become less active as the voltage becomes lower.

To charge a battery direct current is passed thru the cells in a direction opposite to that of discharge. This current passing thru the cells in the reverse direction will reverse the action which took place in the cells during discharge. In other words, reversing the current thru this Sulphate in the plates restores the active material to its original condition and returns the acid to the electrolyte, thus during the charge the electrolyte gradually becomes stronger as the Sulphate in the plates decreases until no more Sulphate remains, and all the acid has been returned to the electrolyte. It will then be of the same strength

as before the discharge and the same acid will be ready to be used over again during the next discharge.

### Transmission Band Linings in Cartons

Our Branches are now carrying in stock transmission band linings packed in cartons at 85c per set including rivets, subject to the customary discount.



*Fig. 1*

It has been the experience of our Dealers that linings are more salable when packed in cartons. Furthermore, they can be displayed to better advantage on the parts counter or shelves. These linings are of heavy woven fabric material and have been found by engineering tests to be equally as serviceable as anything on the market.

It must be borne in mind that one of the greatest causes of rapid wearing of transmission band linings is the use of inferior motor oils. Poor oil with a low viscosity results in increased heat which not only glazes the band linings and causes chattering, but is harmful to the motor as well.

The serviceability of transmission band linings is also greatly reduced by failure of many owners to drain and replenish the crankcase lubricating oil at regular intervals. This is particularly true in winter, since gasoline is less volatile when cold, consequently a large

percentage of raw gasoline works past the pistons and into the crankcase, diluting and breaking down the lubricating oil. It is advisable to drain the oil from the crankcase after the first five hundred miles of service in a new car and replenish with fresh oil. Thereafter, it is advisable to repeat the operation every one thousand miles.

We will also supply band linings in bulk for Dealers who prefer that type at prices quoted in parts catalog so long as the demand continues.

### Service Must Be Prompt to Satisfy

There is nothing more exasperating to the automobile owner when trouble develops with his car than to be put off with the statement "drive it awhile and the trouble will correct itself."

This attitude on the part of the Dealer usually results in the Owner taking his car to some other Dealer or Garage for relief. Then if the trouble is not immediately corrected he disposes of the car and purchases one of another make, thereby not only injuring the Dealer, but this Company as well.

When any necessity for adjustments develops in a new car it is good business to satisfy the Owner without any hesitancy. There is nothing gained by delaying adjustments that must eventually be made. On the other hand the customer gives no credit for service grudgingly or reluctantly performed.

### Parts Purchased by Post Office Department

All branches of the Post Office Department in the United States are entitled to a discount of 25% applying on parts sold over the Dealers' counter. When parts are installed in Dealers' place of business the full retail price applies to any Governmental Department or in fact any firm operating as a wholesale buyer.

### Supply Manuals

Requests are frequently received at the Factory for Ford Manuals indicating that the Owner has been unable to obtain a copy from the Dealer. This is regrettable as it is of vital importance that every Ford owner should thoroughly understand the operation of his car in order to obtain the maximum efficiency and satisfaction from its use.

It is particularly important that all new car buyers be supplied with the Manual and the dealer is expected to carry a sufficient quantity to meet this demand.



Fig. 2

### Tire Repair Outfits

Practically every Ford owner has need for an outfit similar to the above with which to make repairs on the road or in his garage. The article which we are supplying enables Dealers to meet this demand at a reasonable price.

This outfit which ordinarily retails at 50c is being furnished Dealers and Garages at a figure that will allow a substantial profit on the investment.

### Selling by Deception

It appears that accessory stores and supply houses in some localities are advertising parts for Ford cars at discounts ranging from 10 to 25% and to offset this charge a higher list price. The owners through ignorance of the reduction in prices that have been made in Ford parts during the past few months are induced to purchase from these sources.

Any situation of this kind should be promptly investigated by the dealer and if neces-

sary a copy of our latest parts price list should be mailed to every Ford owner in the territory in order to prevent further deception of this kind.

### Transmission Band Lining

Certain concerns manufacturing transmission band linings have issued circular letters to our dealers containing the statement that the material they are using is identical with Ford lining.

This is absolutely untrue, as the sources supplying us with this material do not distribute through other channels.

### February 1st Price List

A Revised Model T Retail Parts Price List effective February 1st is now ready for distribution.

Service Dealers, Garages and Accessory stores should call on the Dealer for a copy in case they do not receive one.

### Relieving the Battery in Cold Weather

In cold weather, there is a heavy drain on the storage battery, due to its drop in efficiency, the slower charging rate because of slower driving, congealed oil in the motor, and the reluctance of the fuel to vaporize at the lower temperatures.

The driver may assist the battery by exercising the following expedients:

When the car is to be left standing for some time, cover the hood and radiator with a pad or blanket and set the control lever in high speed. The former retains the heat in the system while the latter forces the oil from between the clutch discs lessening the drag on the motor when starting.

To start the car, pull back the control lever, open the throttle four or five notches and pull out the choke rod. Close the starting switch, turning the motor over half a dozen times. Retard the spark, position the throttle about half way down, put the switch on the magneto side and push in the choke valve rod. Hold the left hand on the spark lever and close the starter switch. The instant the engine fires, advance the spark and keep it running at a fair speed until the system is thoroughly warm. If the engine coughs, due to a lean mixture, hold out the choke rod a little until it picks up speed again.

## Valve Timing Model T

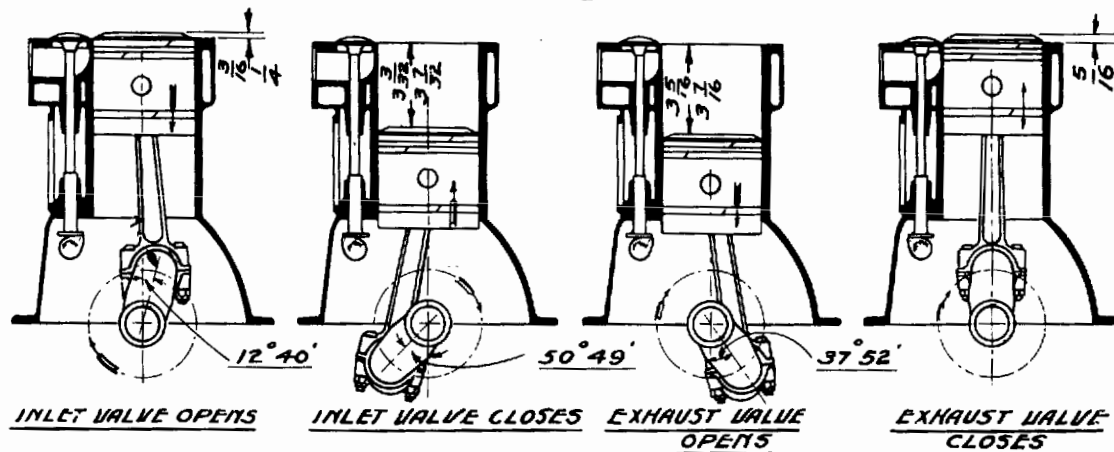


Fig. 3

We show above the position of the piston and crank shaft at the opening and closing of the valves. It is recommended that the valves be timed by the piston travel.

In Fig. 4 is shown correct adjustment of the slow-speed connection and clevis.

### .005" Pistons

We are now prepared to supply Dealers with pistons .005" oversize in addition to the various other sizes furnished heretofore.

Please request your Branch to forward the quantity you desire.

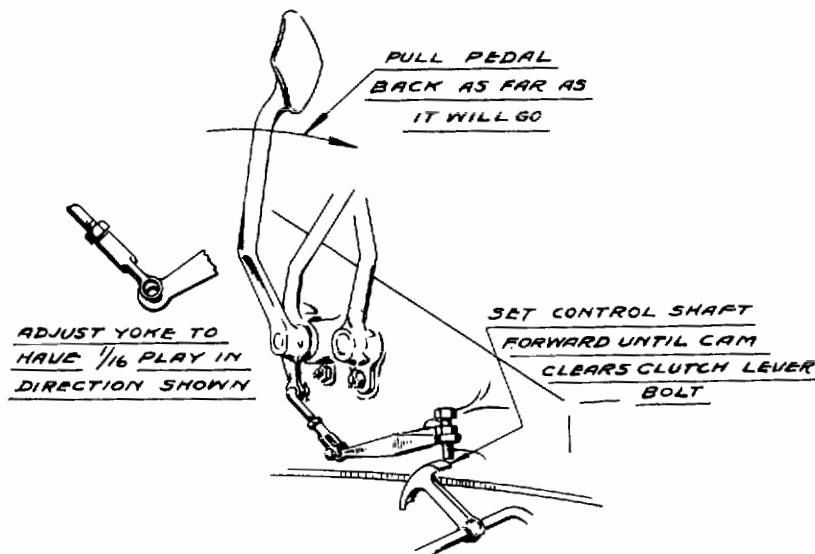


Fig. 4

## Follow-up Repair Work

Some of our most successful dealers have established the practice of communicating with their Service customers after a repair job has been completed and the car delivered to the owner.

The Brandt Motor Corp., Ford dealers at Norfolk, Va., send out a postal to their Service customers which reads as follows:

"The trouble with your car was corrected (date) by the use of genuine Ford parts in-

stalled in accordance with factory methods. We trust our work proves satisfactory and thank you for your patronage."

We believe that this is very good business, as it shows that the Dealer is interested in seeing that the owner obtains satisfactory service from the car.

The Brandt Motor Corp. have been able to build up a very large Service business, and they attribute their success in that line to their ability to retain their customers by following up repair jobs and making sure that the work performed by them is satisfactory.

## Parts Delivery Appreciated by Garages

Fig. 5 is a photograph of the Parts Wagon operated by Roy E. Warner Co., authorized Ford Dealers at Louisville, Ky., in handling the parts business of Garages and Accessory Stores in that city.

The interior of the body of this truck contains bins in which a stock of the Ford parts for which there is the greatest call is carried. This enables the Warner Company to make immediate delivery of parts, which service is greatly appreciated by their customers.

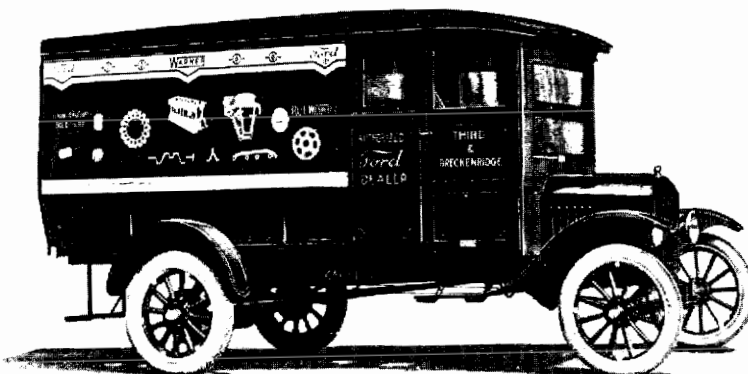


Fig. 5

This Parts Wagon is a splendid advertisement for the Dealer, and has created very favorable comment among the trade.

## Low Price Because of High Quality

The Ford Motor Company has taught the world a new principle in automobile manufacture, namely: that low price may be maintained because of high quality.

Years ago the public appraised the Ford automobile as the most value per dollar on the market, and this appraisal has never been disputed. Large quantity sales resulted, enabling large quantity production. Quantity production in which the Ford Motor Company produced as many automobiles each day as many companies produce in a year, enabled quality production otherwise impossible.

Few people realize, without a trip through the great Ford factory:

1. That the machinery and methods used for insuring quality production are the most advanced and costly known in the industry;
2. That the materials used are the world's best for combining light weight with strength and durability;

3. That accuracy in machining and assembly surpassing that in any other factory has been the cause back of the reputation of Ford parts for reliability and service.

Expensive precision machinery, improved designs, special shop methods, and high class operating and inspection personnel have been possible because the costs can be spread over the production of hundreds of thousands of automobiles, amounting to very little per automobile.

Quantity production, therefore, enabled quality production unheard of previously. Quality production put greater and greater value in the car and produced increased sales. Increased sales again enabled reduction in price. So it can truthfully be said that because the quality of a Ford car is maintained high, the price can be maintained low.

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**Cars bearing motor numbers 5,602,302 to 5,638,071  
were shipped during December**

## Several Mechanical Reasons for Fordson Superiority

### Design and Construction:

In designing the Fordson Tractor our engineers have worked with the idea of obtaining maximum efficiency with the minimum number of parts. This simplicity of design and construction, together with accurate workmanship in the making of the various parts, gives the Fordson Tractor the following superior features:

- A—More rigid construction.
- B—Light weight.
- C—Elimination of frame, radiator hose, hose clamps and connections, adjusting collars for ball bearings and valve tappet adjustments.
- D—Fewer parts to get out of order.
- E—Less parts to assemble and adjust.
- F—Less time required to make repairs.

### Motor:

- 4 Cylinder, Bore 4", Stroke 5".
- Heavy duty type motor designed to work at its full capacity for long continued periods with a minimum amount of wear.
- Large bearings.
- High safety factor of all parts to insure against wear and breakage.
- Starts on gasoline, operates on kerosene.

### Clutch:

- Multiple disc operating in oil. No facings to wear out and does not require adjustments.

### Transmission:

- Constant mesh selective type transmission possessing these advantages:
  - A—Very compact design considering the number of gear ratios obtained. This combines strength with light weight.
  - B—Practically eliminates possibility of stripping teeth of the gears, as instead of meshing a couple of teeth as is common in some sliding gear transmissions, engagement is provided for all teeth

by means of internal gears constructed solely for that purpose.

- C—Three forward speeds, one reverse. Three forward speeds instead of two as in the case of many tractors give the Fordson greater flexibility to working conditions.
- D—Power transmitted through but one pair of gears in high and plowing speeds. This with the worm driven axle makes but two reductions between engine and wheels which means a comparatively low power loss and insures higher operating efficiency.

### Worm Drive:

Gives compactness, simplicity, and strength in construction. Reduces wear.

### Water Type Air Washer:

One of the most important features of the Fordson is the air washer which removes all dust and solid matter from the air before it enters the cylinders, thus preventing excessive wear to the pistons and cylinder walls. Also, it moistens the air in its passage through the water, reducing carbonization and pre-ignition. This is a decided improvement over the dry type air washer.

### Advanced Design of Radiator:

The radiator lines up with and is bolted to the engine, thus greatly increasing its structural strength. This, also, reduces possibility of water leakage and eliminates the trouble connected with replacing hose which clog up and deteriorate. Large water openings insure better cooling.

### Three Point Suspension:

Reduces strain on the separate units and adds to the flexibility of the tractor.

### Easily Maneuvered in Field:

Because of light weight, short wheel base, small turning radius, and direct acting steering mechanism.

## Put Tractors in Shape for Spring

This is an opportune time for Dealers to suggest to Fordson owners the advisability of putting their tractors in shape for Spring work. When the owner's attention is called to the advantages of having all necessary repairs made at this time rather than waiting

until the season actually opens, he will no doubt appreciate that you are rendering him a real service.

The fact that the tractor works constantly under a heavy load makes it necessary to keep the machine in good mechanical order

if satisfactory results are to be secured. Every tractor may not require a complete overhauling. However, in all probability after a season's use the valves will need grinding and carbon removed. Possibly the bearings should be taken up; the manifold may require cleaning or the vapor tube replaced. Perhaps the air washer float or radiator leaks and should be soldered. The coils may require testing and replacement of vibrators. The oil in the crank case, transmission and differential should be drained off, those parts thoroughly washed out and new oil put in.

In soliciting owners for work, the Dealers should suggest that his tractor mechanic be given the opportunity of calling and inspecting the machine before another season's work is begun. The Service man can then advise the Owner a good idea as to what repairs are required and, also, whether or not the work is of such a nature that the tractor should be brought to the Dealer's shop. If the latter he can give an estimate of the labor cost of the job.

Anything the Dealer can accomplish to insure the tractor giving satisfactory service will pave the way for easier sales during the coming season.

### Rebored Tractor Cylinders

The comparatively few rebored Tractor cylinders sold indicates that Dealers are not taking advantage of an opportunity to save their customers money.

Our Branches can supply rebored Tractor cylinders to Dealers at \$20.00 list less 25% discount. If this price is called to the attention of Owners requiring new engine blocks for their tractors, no doubt many will prefer to install the rebored cylinders rather than new standard cylinders at \$60.00.

Possibly Dealers by advising Tractor Owners of the saving resulting from the use of rebored cylinders in overhaul jobs can obtain repair business that would not otherwise come into their shops because of the expense involved.

### Oil Holes in Tractor Pulleys

Some instances have been reported to us of the old type tractor pulleys throwing oil.

Fig. 6 shows the four oil drain holes in the wall of the pulley housing. A few of the first housings did not have these holes. Consequently the pulleys when running are apt to fill up with oil which then works outside onto the Rim and is thrown off. Such pulleys should be inspected and oil holes drilled if necessary.

Four  $\frac{1}{4}$  inch holes should be spaced equally around the housing so that one of them will always be at the bottom no matter which way the housing is assembled.

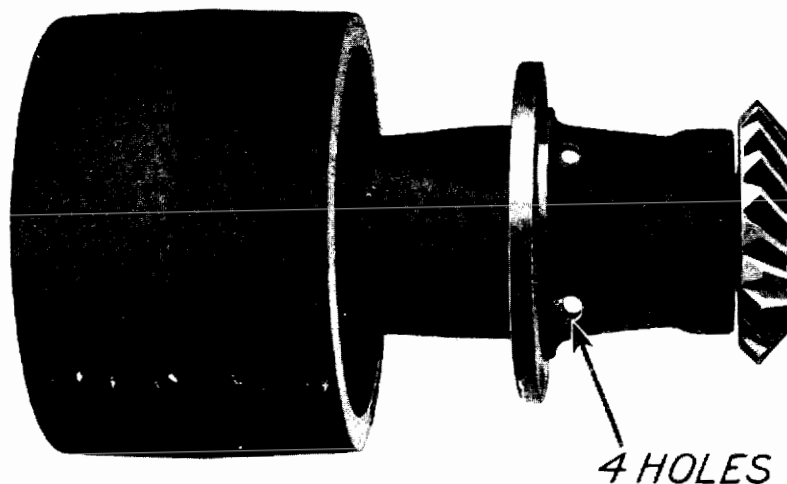


Fig. 6

Remember that these holes are drilled on the housing which goes inside of the tractor.

### Serial Numbers of Tractors Shipped During December 1921

Motors Assembled at  
Branches

170,891 to 170,957

Motors Assembled at  
Cork, Ireland

109,576 to 109,672

Motors Assembled at  
Home Plant

# Ford Service Bulletin

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## Better Cars at Lower Prices

**Ford Cars have never been as low in Price  
Ford Cars have never been as high in Quality**

**T**HE above statements are absolute facts, and this principle of giving the Ford buyer the greatest value per dollar invested, is responsible for the remarkable growth of our business.

The present selling prices of Ford cars have been made possible through :

- 1—Sales of a million cars yearly, which permits quantity production on the most economical basis.
- 2—Standardizing on one model over a period of years has made it possible to develop automatic machinery for producing parts in quantities at a great saving in labor costs.
- 3—The consumption of raw and finished products at a cost of approximately one million dollars per day, makes our purchase contracts most attractive to manufacturing concerns, and insures our obtaining the best quality in materials at the lowest possible cost.
- 4—The financial strength of the Ford Motor Company not only greatly increases our buying power, but also permits taking full advantage of market conditions. The Company has no bonded indebtedness to meet and its resources are always available for use in the development of the business.

That reductions in prices of Ford cars have been made without sacrifice in quality, is evidenced by the following mechanical improvements recently made:

### Wiring System

The wiring system has been completely redesigned, making it practically proof against short circuits and fire. Moreover, the new design has been approved by the Fire Insurance Underwriters and all Ford cars equipped with the new wiring system obtain the remarkably low fire insurance rate of 55c per \$100.00 valuation. Insurance on Ford cars equipped with any wiring except the approved Ford design is double this amount. Some of the features of the new wiring are:

- 1 All wires of No. 16 gauge or heavier insuring freedom from breakage and ample mechanical strength.

- 2 All rubber or braid insulation of standard National Electrical Code specifications approved by the Underwriters.

- 3 Improved dash and frame clips for carrying wires. Redesigned for rigidity and strength, yet without danger of shorts.

- 4 Special insulator looms and frame brackets for heavy duty starting cables.

- 5 Special tail light wire suspension with tension spring and frame insulators.

- 6 New design dash terminal block of Fordite insulator.

- 7 All wires in black glazed cotton looms, giving strength and good appearance.

- 8 Special brackets for supporting gasoline tank to prevent contact with wiring system or abrasion on frame.

- 9 Special loom extension on commutator wires and fibre insulators on commutator case.

The new wiring at once insures the Ford owner against breakage, short circuits or other trouble in his electrical system and affords him a fire insurance rate as low as the highest priced cars on the market.

### Pressed Steel Muffler

The present muffler is of full pressed steel design. Its muffling action is the equal of, and its freedom from breakage and extra weight far superior to that of the conventional type with cast ends and brackets. Mounted directly upon the exhaust pipe, a very compact, light and rigid construction is obtained.

The new muffler has been approved by the Engineers of the Fire Insurance Underwriters, which means that it is free from possibility of breakage, leaks or other fire hazards.

### Pistons and Connecting Rods

Pistons and connecting rods have been redesigned providing lighter structures without decrease in strength or wearing qualities. This reduction in reciprocating weight has produced a smoother running motor with reduced vibration and with quicker, snappier pick-up. Moreover, careful weight selection of these parts in the shop before assembling into any given motor further insures absence from vibration and increased efficiency, under all conditions of operation.

### One-piece Running Board Brackets

The new design running board brackets are of channel section and in one piece extending completely across the chassis.

This design insures the owner exceptional rigidity with light weight and freedom from vibration.

### Fan Assembly

The new fan assembly provides the following features:

- 1 Large diameter pulleys preventing slippage, and increasing life of belt.

- 2 Bronze bushings running in self-contained bath of oil.

- 3 Dustproof enclosure.

### Starting Switch

The new Ford design starting switch combines all the best features of manufacture and operation of the previous types. It is simple, direct acting, of few parts and exceptionally easy of assembling and repair. Although there is practically nothing to get out of order in this simple switch, still disassembling is easily accomplished by the removal of two screws, when the top lifts off and the entire inner switch is exposed.

The new switch is water, dust and rust proof, and in addition it is located in a protected position under the floor boards.

### Dash Weather Trough

Prevention of rainy weather trouble due to water on the dash and coil terminals has been effected by application of the new design dash weather trough. This trough catches any water which in severe rains may work under the hood at the dash and carries it to either side eliminating danger of shorts, hard starting or irregular firing due to possible water shorts on the coil terminals or dash wiring.

Additional mechanical improvements will be given in March issue of Service Bulletin.

## Ford "H" Headlight Lens

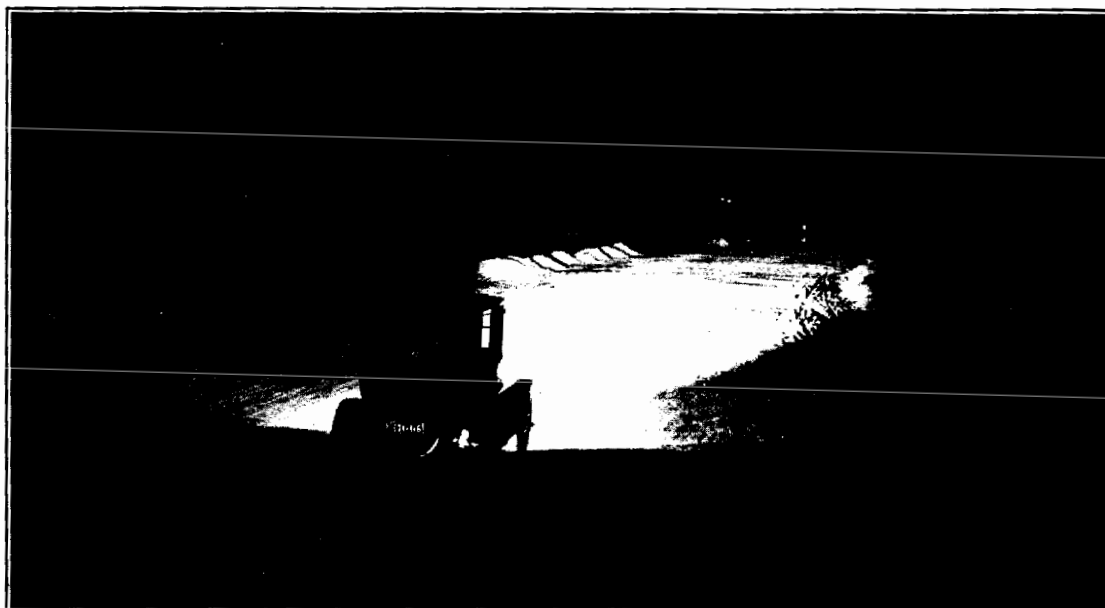


Fig. 7

The above is an exact reproduction of a photograph of a Ford car equipped with standard Ford "H" Lenses. Note the exceptional light distribution.

**T**O give the Ford owner the best possible value, and to make night driving a pleasure and free from danger, the Ford Motor Company, after much research and experiment, have developed and brought out the "H" Headlight Lens that combines all the best qualities a headlight lens should possess, such as,

- 1—*Excellent road light without glare.*
- 2—*Passes the requirements of all existing state laws.*
- 3—*Adds to the general appearance of the car.*
- 4—*Simple to install and adjust.*

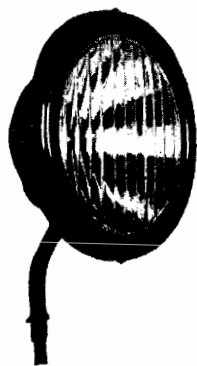


Fig. 8

These lenses, which are now standard equipment on all Ford cars, and are being supplied by Branches to Dealers for service, give not only exceptionally bright lights without glare and a light distribution that is unequalled, but also the lighting results obtained are far in excess of the requirements called for by existing state laws.

### State Tests

In order to make perfectly clear the matter of required road light and absence of glare, various states have passed automobile headlight laws requiring tests of candle power on a screen 100 feet ahead of the car as shown in Fig. 9.

The points "D" and "C" are respectively at a level of the eyes of an approaching driver, or pedestrian, in front of the car and at these points a candle power of only 800 and 2400 is allowed as indicated in Fig. 10.

The points "M," "PL," "PR," "QL" and "QR" are located above the road, or on the road, as indicated in Fig. 9, and at these points a certain minimum candle power is required as is shown in Fig. 10. The intensity and distribution of this light has been determined by the States in an effort to insure for the owners ample road driving lights, and, at the same time, freedom from glare.

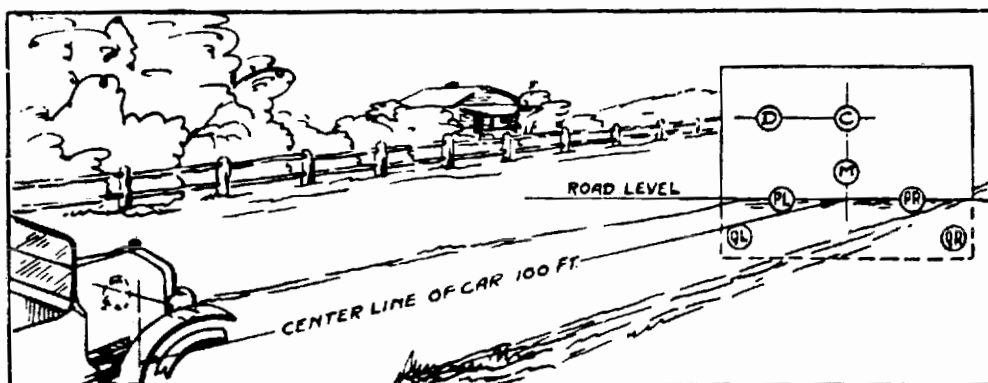


Fig. 9

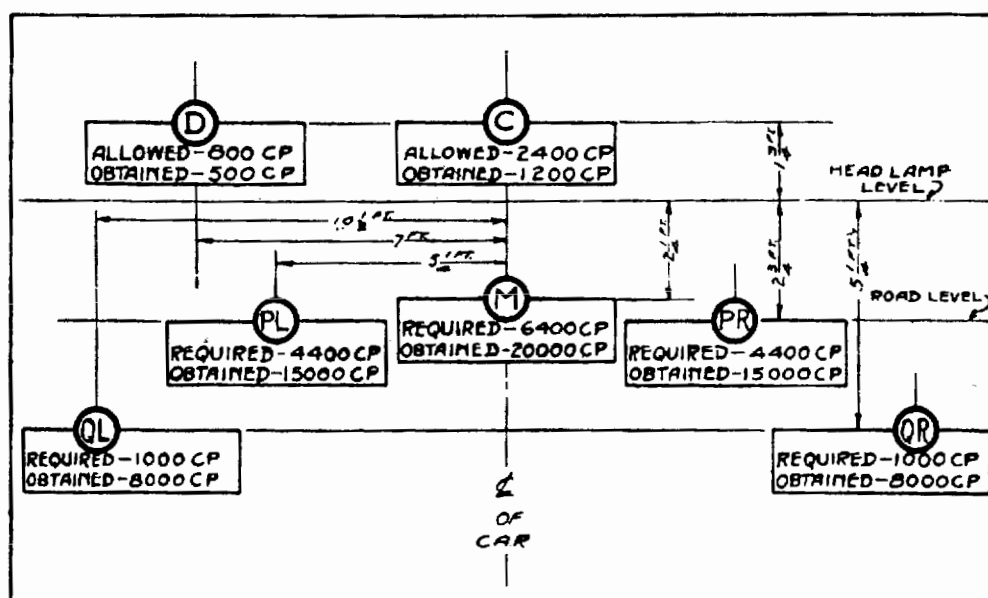


Fig. 10

The new Ford "H" Lens not only meets these requirements, but goes far beyond in the matter of excellent results, both as regards road light and lack of glare. At each point in Fig. 10 is shown the candle power obtained for standard Ford "H" headlamps in official tests. These results speak for themselves.

#### State Approvals

In the following states where provision is made for official tests, the Ford "H" Lens has received formal approval: Connecticut, Massachusetts, New Jersey, Pennsylvania, Maryland, Maine, Ohio, Indiana, Missouri, Iowa, Delaware, New York, California, Nebraska, Utah, Wisconsin District of Columbia.

#### New Design Bulbs

When the latest type T-6576 H Lenses are installed in headlights in replacement of the old clear lenses or the green visor lenses, it is also necessary to replace the frosted or plain bulbs used therewith with the latest type T-6572 H bulbs. These are clear glass, double filament, 21 candle power, gas filled bulbs, which are built entirely in accordance with Ford specifications. After extended study, a design and specifications have been developed which afford a high efficiency light and at the same time give a 20% longer life on both major and minor filaments than any bulb now on the market.

On non-starter jobs use T-6572K single filament 21 C. P. gas filled bulbs with new lenses.

### To Focus and Align

After replacement of old style lenses and bulbs with the latest type lenses and 21 candle power bulbs, it will be necessary to focus and align the headlamps with the empty car standing on a level surface in front of a white wall or screen 25 feet in front of the headlamps. This wall must be in semi darkness or shielded from direct light, sufficient that the light spots upon it from the headlamps can be clearly seen, and must be marked off with black lines as shown in Figs. 11 and 12.

First turn on bright lights. Then focus, by means of screw at back of lamps, first one lamp and then the other, adjusting the bulb filaments 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. 11.) In focusing, adjust the bulb to obtain as good contrast and as well defined cut-off across the top of the spot of light as possible. With lamps thus focused for the "bright" filament, the "dim" will be in satisfactory position.

### Alignment

Headlamps may be aligned by bending the headlamp brackets as follows: 1—The tops of the bright spot on the 25 foot wall are to be set at a line 32 inches above level of surface on which car stands. (See Fig. 13.) With top lines thus set for empty car, the headlights will also have the proper tilt under full loads as required by the various states. 2—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.

Proper alignment may be readily checked by means of a horizontal line on the wall in front of the car 32 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. 13. If it is impractical to tie up the floor space required by these

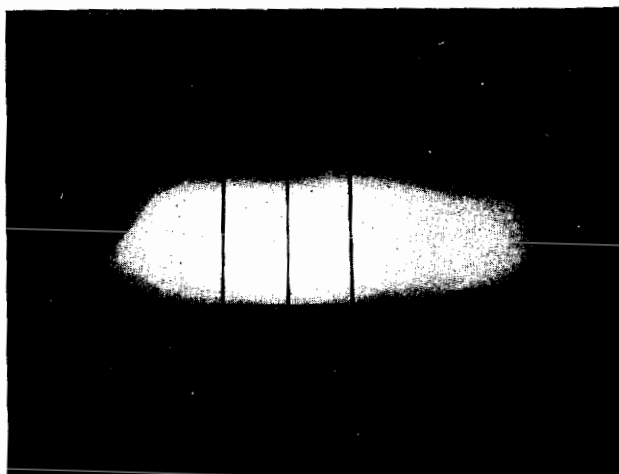


Fig. 11  
Left Headlamp Properly Focused and Aligned.

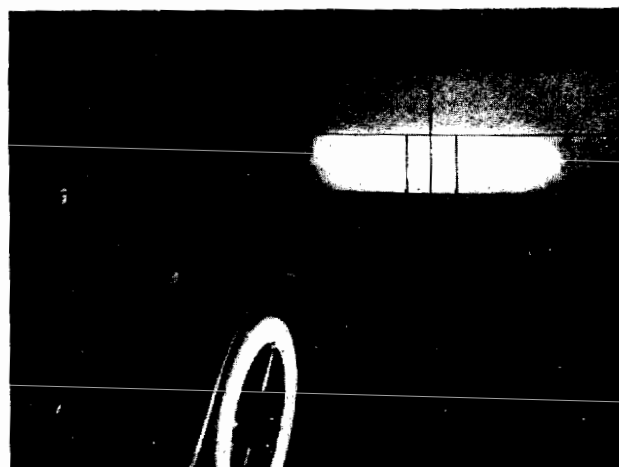


Fig. 12  
Both Headlamps Properly Focused and Aligned.

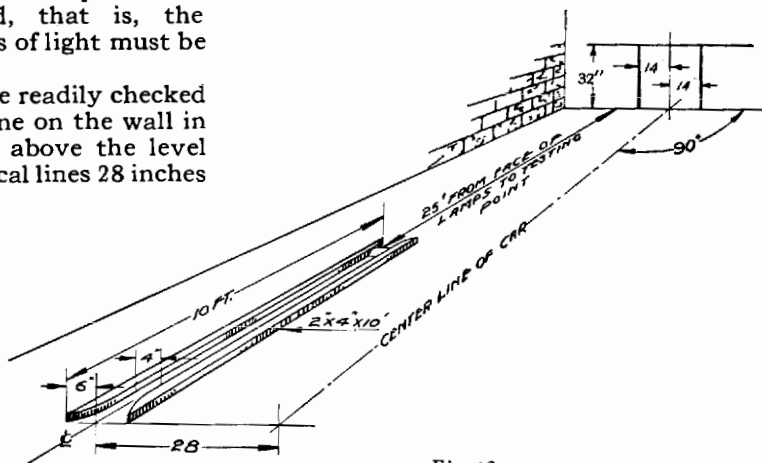


Fig. 13

blocks, marks painted on the floor may be used to show where one set of wheels should track and where the car should be stopped.

### Battery Sales

The rapidly increasing sale of Ford storage batteries is an indication that Dealers everywhere are becoming more and more convinced of the possibilities of revenue from the battery business.

There is no battery on the market today of equal starting ability, capacity, and life selling at as low a price as the Ford. Various makes of batteries are being offered to the public, but they are generally so poorly constructed that beyond price there is little to commend them to the prospective buyer. A battery that will wear out within three or four months, or that is incapable of turning the motor over in cold weather when starting conditions are unfavorable is not a good investment at any price.

The superiority of the Ford battery is apparent when the following points are taken into consideration.

1. Starting ability: The Ford battery is a 6 V. 80 Amp. Hour Battery constructed with 13 plates, whereas the majority of the cheaper batteries on the market have only 11 plates. As a consequence, the Ford battery, when charged, will turn the engine over faster and for a much longer time than batteries having fewer or smaller plates. Dealers can readily appreciate the merits of the Ford battery by disassembling and comparing its construction, part by part, with batteries selling at corresponding or even higher prices.

2. Life: Our object in entering the battery field was solely for the purpose of securing for our customers a thoroughly dependable battery at a reasonable price. As the efficiency of a battery is a vital factor in the serviceability of any motor car, a high standard of quality in material and workmanship is of the utmost importance. All parts used in the Ford battery are made from the highest grade material obtainable. Our Dealers can, therefore, sell Ford batteries to their customers with the confidence that comes from handling a first class product, and the assurance that the buyer will be satisfied. The sale of cheap batteries will eventually prove a boomerang to the Dealer and the purchaser will find the saving in first cost is more than offset by the expense and annoyance involved in keeping the battery in working condition.

A great deal of interest can be created and sales stimulated by displaying battery parts in the show window or by having a cross section of the battery on the parts counter where its superior features may be demonstrated.

### Handling Service Stock

Safeguarding the quality and condition of repair parts is a matter of vital importance, yet every day dealers' men can be observed driving cars or trucks away from branches with a supply of parts so carelessly loaded that they are bound to become damaged in transit.

In some instances, fenders or other enameled stock are thrown in with heavy parts, such as gears, pistons, or springs—no care being taken to prevent mars or injury to the enameled surfaces. It is still more serious to improperly handle such parts as crankshafts, camshafts, and connecting rods, as these parts are easily thrown out of alignment. Crankshafts are tested for alignment on expensive precision machines in our factory, and then carefully packed in ten lot crates, specially designed to prevent the shaft springing out of true. Crankshafts should always be carried from the branch in the original crate containing ten shafts, and should not be removed by the dealer except as required, unless they are stored in some manner that will prevent distortion. It is considered good practice to either hang crankshafts by the starting pin hole or to stand them on their flanges.

In other cases delicate electrical parts are handled as tho they were rough castings.

Material damaged in this manner means an actual loss to the dealer, as time and money must be spent in restoring the parts to their normal condition. Customers are entitled to receive perfect material either over the counter, or when installed in repair jobs. Mechanics are apt to spend considerable time in attempting to line up bent crankshafts, or in polishing main bearings when the babbitt has been scratched thru rough handling. Dealers should therefore instruct their men to use proper care in handling, packing and storing parts. This is one excellent way to reduce expense and waste.

### Battery Repair Equipment

The fact that complete equipment for repairing Ford Batteries can be procured at a

comparatively small outlay makes the handling of Ford Batteries an even more attractive proposition to Dealers.

For the benefit of those dealers who are equipping their shops in order to render intelligent and dependable battery service, we are listing below the equipment required to properly repair batteries:

Lead Burning Outfit Complete.  
Electric Drill and  $\frac{5}{8}$ " Drill to bore Connectors.  
Gas Plate  
Compound Pot  
Lead Pot  
Two Small Ladles  
Burning Strip Mould  
Vise  
Putty Knife  
 $\frac{1}{2}$ " Wood Chisel  
10" Base File  
Pair Goggles  
Negative and Positive Post Builder  
Group Assembly Frame  
Hammer  
Model 45 Weston Volt Meter  
Battery Syringe  
Battery Thermometer  
Battery Hydrometer  
Screw Driver  
Pair Rubber Gloves  
Wire Brush  
Pair 8" Pipe Pliers  
Pair 8" End Cutters

With the exception of the lead burning outfit and the burning strip mould, all of the equipment listed above can be purchased locally.

The burning strip mould can be made easily from a piece of angle iron.

### Lead Burning

Whenever a battery becomes discharged, and is removed from a car and taken into the service department, it is first given a preliminary test and inspection. Then it is placed on the charging rack and connected into the low voltage circuit. Electric current measuring instruments soon show whether or not the battery is properly absorbing the electric current. Very frequently a battery does not take the charge, and it becomes necessary to disassemble it, in order to determine the causes of the trouble.

The lead burning outfit, illustrated in Figs. 14 and 15, is then used to soften the sealing compound so that the battery jars, plates, and separators can be removed. Inspection of these parts shows immediately the reason

for the failure to take the charge. Possibly new separators or even new battery plates are required. If new plates are assembled into the battery, the lead burning outfit immediately comes into use, for the reason that these new plates must be burned or welded to the so-called group strap, which like the frame of the plates, is made of lead. Lead sticks made by recasting melted lead scraps, or new lead sticks purchased from us are used as filler rod. The battery posts are built up, and the cell connectors are next burned on or welded, and again in both instances the lead stick is used as filler rod. The sealing compound is "chased" into place, and the battery is ready once again to go to the charging rack.

The lead burning outfit is really the heart of the Battery Repairing Department. This outfit is supplied for use with two combinations of gases—oxygen and acetylene, or oxygen and city gas, either of which is satisfactory for lead burning work. Many Ford dealers have in their possession at this time small automobile type, Prest-O-Lite cylinders, which can be used as the acetylene supply. Where city or natural gas is piped into your building for lighting, and Prest-O-Lite cylinders are not available, this also serves the purpose. Oxygen which is used in mixture with either gas is supplied in loaned cylinders at many

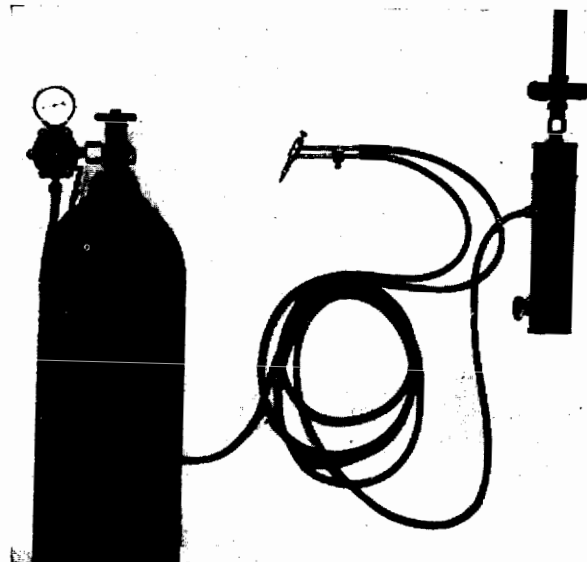


Fig. 14

distributing stations throughout the country by suppliers such as the Linde Air Products Co.

A small handy blow pipe shown in the illustrations is used to mix the gases and produce the proper flame for lead burning. This

blow pipe with unique injector type mixer permits the lead burner or operator to use very low pressure on his gases, and thru its automatic action after being regulated or adjusted, permits him to continue his work uninterrupted by any attention to the blow pipe or other parts of the lead burning outfit.

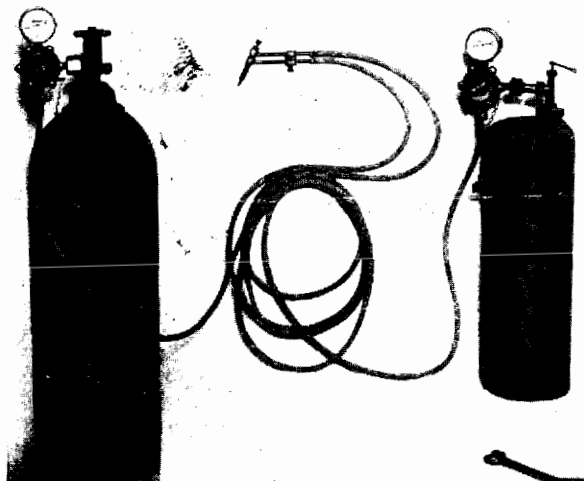


Fig. 15

The gas consumption of the lead burning outfit is extremely low, ranging from two to three cu. ft. of each gas per hour on every storage battery welded. Outfit No. 1 illustrated in Fig. 14 is for use with oxygen and city gas, and consists of one lead burning blow pipe with three tips, one oxygen regulator with 50 lb. gauge only, one city or natural gas back-pressure valve, 20 ft. of  $\frac{3}{16}$ " rubber hose, and one instruction book.

Outfit No. 2 illustrated in Fig. 15 is for use with oxygen and acetylene, and consists of one lead burning blow pipe with three tips, one oxygen regulator with 50 lb. gauge only, one acetylene regulator with 50 lb. gauge only and cylinder adaptor, 20 ft. of  $\frac{3}{16}$ " rubber hose, and one instruction book.

In both illustrations the lead burning outfits are shown connected to a Linde oxygen cylinder and a gas supply. Lead burning outfits can now be obtained at a price within the reach of every dealer. Dealers desiring additional information regarding these outfits should communicate with the nearest Ford Branch.

### Proven Efficiency of Burnishing-in Bearings

Several years ago Ford Engineers, after a great deal of research and experiment, adopted

the practice of burnishing-in crankshaft bearings using a specially designed burnishing-in stand for the purpose.

The outstanding advantages of this method are as follows:

- 1—Exact conformity of babbitt bearings to the corresponding bearings of the crankshaft, thus making as nearly as possible a 100% bearing.
- 2—Highly polished and more perfect bearing surfaces.
- 3—Better fitting bearings than is possible to obtain by the old hand scraping process.
- 4—Burnishing-in method increases the hardness of the bearing surfaces—insuring greater ability to withstand wear.
- 5—Time saved in comparison with scraping bearings by hand.

Over 5,000,000 Ford owners operating their cars under every conceivable condition, with practically no bearing trouble, save that caused through natural wear or abuse, have proven that burnished-in bearings add to the efficiency of our product.

Some manufacturers of equipment are attempting to discredit the Ford method of burnishing-in bearings and have even gone so far as to try to influence dealers to substitute other equipment for their burnishing-in machines. Dealers who may be contemplating such changes should bear in mind that our experience has proven that burnishing-in bearings is the most practicable method developed to date, and in our opinion there is nothing to be gained through the substitution of other methods and equipment.

### Clean Tractor Vapor Tube

Before starting the tractor into Spring work, every owner should be cautioned to examine the vapor tube to see that it is free and clear. Carbon is liable to collect in the coils of the tube, and either block it entirely or choke it to such an extent that the operator in order to keep the machine running is obliged to partly close the choker or butterfly in the air passage in order to increase the suction sufficiently to draw the fuel through the partly closed tube. This increases the likelihood of the surplus kerosene getting into the crank case and thinning the oil to the extent that it does not lubricate properly.

**Cars bearing motor numbers 5,638,072 to 5,683,808 were shipped during January**

# Ford Service Bulletin

No. 3

Vol. 3

March, 1922

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## Recent Mechanical Improvements in Ford Cars

### Ford "H" Headlamps

The new Ford "H" Headlamps give to Ford owners a lighting equipment second to none on the road. Equipped with our special design refracting type lens, and a new 21 candle-power, gas-filled, double-filament bulb, these headlamps afford at once ample and well distributed road light and no glare.

The Ford Motor Company has co-operated to the fullest extent with state officials and owners in obtaining the best possible road driving light without objectionable glare and the new Ford "H" equipment has been universally commended.

The new headlamps, when properly adjusted, are legal in all States. Not only does the Ford car pass the most exacting State requirements, but affords the owner several times the road light required by law, and at the same time maintains the glare far below that permitted by any State.

### Radiator Mounting

The radiator is now mounted upon springs whereby it is afforded a limited flexibility. This increases the life of the radiator, prevents possible breakage due to weaving of the frame, and relieves the radiator from sudden shocks and vibration.

### Front Radius Rods

Fastening of the front radius rods has been improved by the use of tapered nuts in tapered seats. This construction insures an absolutely tight initial fit and the wedging effect obtained prevents loosening under even the most severe service conditions of load and vibration.

### Front License Bracket

A new design front license tag bracket has been made standard on all cars. These brackets, together with the standard rear brackets, are in locations convenient for attaching license tags for any State and reasonably protected from splash and mud in service.

### New Jack—Ford Design

The new Ford design jack gives to the owner at once a simple, powerful jack at a reasonable cost. This jack is of an improved screw type, combining those features which have in service proved themselves to be entirely satisfactory. The action is simple, the design is rugged, and there are few parts to get out of order.

### Crankcase Front Bearing

Crankcase front end bearing has been redesigned, making it simpler and at the same time providing greater flexibility for the front spring, with improved riding qualities.

### Spring Hangers

The new one-piece spring hangers are a decided improvement.

Being in one piece they cannot loosen up or rattle in service and their permanent alignment means better spring action and better riding qualities.

### Ford Design Cut-out

The new Ford cut-out has been designed with special reference to

1. Reliability
2. Simplicity

It is very compact, of comparatively few parts, and with ample insulators. It

operates upon the oldest, simplest and most reliable cut-out principle and is located directly upon the generator.

The new cut-out is furnished sealed in the confidence that the owner should have no trouble with this unit, and no occasion for manipulation or adjustment.

### New Pump—Ford Design

Experience with various types of pumps has led to a standardized Ford design, which is the equal of any pump on the market.

Note some of the specifications:

- Barrel of seamless brass tubing.

- Special cast iron base combining ruggedness and light weight.

- Large diameter pump rod with one-half inch steady bearing at its upper end.

- Tapered cone leather bucket fitting tight against the barrel insuring airtight closure.

- Special tapered threads on pump barrel and in base and head to insure tight fit and prevent possible breakage at ends of thread.

- Special collar support for barrel in base casting.

- Three-ply rubber tubing.

A simple, positive acting pump, with every detail of proven design; the Ford pump is a demonstrated success.

### Steering Wheel Stop

The steering wheel stop limits the travel of the steering wheel between those positions in which the front wheel spindles strike the front axle yokes. This means that the full steering wheel motion is always effective in turning the front wheels and the stop prevents straining or buckling of the steering mechanism after the front wheels have reached the limit of their travel.

### Steering Mechanism

Improvement has been made in the Ford steering mechanism by the use of a taper construction on the steering ball bolt. The tapered bolt fitting into a special tapered seat in the steering connecting rod yoke provides a construction initially tight and prevents loosening and rattle in service.

### Steering Wheel

The steering wheel has been increased to sixteen inch diameter, making steering and driving in general easier, more positive, and more comfortable.

### Spare Tire Carrier

An improved design which combines light weight with increased strength and rigidity. The new design reduces vibration.

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## Headlamps Must Be Adjusted and Focused

In order to obtain proper light distribution, without glare, from the new Ford "H" headlight lens, it is absolutely necessary that headlamps be aligned and focused in accordance with instructions contained in the February Service Bulletin.

Every dealer should make certain that headlamps are correctly aligned and focused when setting up new cars, or when "H" lenses are installed in replacement of the earlier type plain or green visor lens. Failure to do this will not only destroy the value and efficiency of a high grade lens, but will ultimately bring discredit to our product.

When installed in headlamps that have

been properly aligned and focused, these lenses far exceed all requirements of existing State laws in the excellence of lighting results obtained, both from a standpoint of exceptionally bright lights without glare, and also in the way of unequaled light distribution.

To obtain satisfactory results from the new "H" lenses, dealers should instruct their parts salesmen to furnish T-6572H double filament 21 C. P. gas filled bulbs for starter equipped cars, and T-6572K single filament 21 C. P. gas filled bulbs for non-starter cars when supplying the new "H" lenses in replacement of clear or green visor lenses.

## Wholesale Parts Business on the Increase

OUR parts business has shown a splendid increase in volume during the past 60 days which reflects the activity of our dealers in wholesaling Ford parts. There is no question but that the pirate parts evil can soon be eliminated in every locality by means of the service and co-operation which our organization is giving the garage trade generally.

Manufacturers and jobbers of bogus parts fully realize the situation and are making desperate attempts to liquidate their stocks

even to the extent of quoting prices considerably below actual costs.

We know that dealers and garages who are interested in building up a repair business based upon fair and honest treatment of Ford owners, will not be misled by any propaganda put out by pirate parts makers in their attempts to sell inferior goods.

It is the duty of every dealer to impress upon all Ford drivers, the danger to life and property which may result from the use of bogus parts.

CHART SHOWING LENSES & BULBS USED IN HEAD-LAMPS

LAMPS	LENS	BULB	CONTACT	VOLTS	AMPERES	C. P.
T-6511-A USE WITHOUT DIMMER ON CARS WITHOUT STARTER CURRENT FROM MAGNETO	T-6576-BX GREEN VISOR	T-6572-A	DOUBLE	9	2	18
T-6511-B USE WITH HEAD LAMP DIMMER ASSEMBLY (T-8892) ON CARS WITHOUT STARTER CURRENT FROM MAGNETO OR FOR REPAIRS WITH HEAD LAMP DIMMER ASSEMBLY (T-7320) ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-BX GREEN VISOR	T-6572-B	DOUBLE	6-8	2.5	15-17
T-6511-C (TWO BULBS) USE WITHOUT DIMMER ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-BX GREEN VISOR	T-6572-C BRIGHT T-6520 DIM	SINGLE  SINGLE	6-8  6-8	2.5  .42	15-17  2
T-6511-D USE WITHOUT DIMMER ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-A CLEAR	T-6572-D FROSTED DOUBLE FILAMENT	DOUBLE	MAJOR 7 MINOR 7	3.75 1.25	21-25 3-4
T-6511-E USE WITHOUT DIMMER ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-BX GREEN VISOR	T-6572-E DOUBLE FILAMENT	DOUBLE	MAJOR 6-8 MINOR 6-8	3 1	18-20 2½-3½
T-6511-H USE WITHOUT DIMMER ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-H REFRACTING	T-6572-H1 OR T-6572-H2 DOUBLE FILAMENT GAS FILLED	DOUBLE	MAJOR 6-8 MINOR 6-8	2.80 .80	19-23 2½-3½
T-6511-K USE WITH HEAD LAMP DIMMER ASSEMBLY (T-8892) ON CARS WITHOUT STARTER CURRENT FROM MAGNETO OR FOR REPAIRS WITH HEAD LAMP DIMMER ASSEMBLY (T-7320) ON CARS WITH STARTER CURRENT FROM BATTERY	T-6576-H REFRACTING	T-6572-K SINGLE FILAMENT GAS FILLED	DOUBLE	6-8	2.80	19-23

Fig. 16

Fig. 16 is a chart showing lenses and bulbs used in the Ford headlamps. With the exception of the two bulb headlamps, the difference in the lamps is in the lens and bulb.

It is, therefore, unnecessary to carry these different type headlamps in stock, as the demand may be taken care of by changing lenses or bulbs.

## Advertise Your Service Department

In soliciting repair work, Ford dealers should emphasize the following important features of their Service Department:

1. Employment of mechanics who are specialists in Ford repair work.
2. Use of specially designed Ford equipment and tools.
3. Flat rate labor charges.
4. Use of genuine Ford parts.
5. Quality work—backed by a real guarantee.

Below is a reproduction of a pamphlet distributed by our dealers, Horst & Strieter, showing these features presented in a most convincing manner.

It has frequently been proven that advertising of this nature is productive of excellent results.



THE UNIVERSAL CAR

SERVICE

VI

A short treatise on  
"Motor and Transmission  
Overhaul"

Now done for a labor charge of  
only \$18.00

Prepared by

**Horst & Strieter Co.**

Davenport and Muscatine, Iowa

Rock Island and Moline, Illinois

Retain this for future reference.

Fig. 17

### Motor and Transmission Overhaul

#### Operation No. 1

Many things enter into the causes which finally make necessary a complete motor and transmission overhaul. We might go on indefinitely and state causes, many of which could have been avoided. The predominating causes are lack of cylinder oil, lack of

water, abuse of car, reckless driving, and no care or attention to speak of.

Ordinary wear and tear will, of course, necessitate an overhaul, but it can be put off for a long time if the car will only receive the care and attention it should have.

A motor and transmission overhaul requires skill of the highest order, and only mechanics who can pass muster as first class are allowed to do this work in our shops.

To give the layman an idea of what a motor and transmission overhaul means, we give here a general outline of the work as it is done in our shops.

When a job is received, the motor and transmission is taken out of chassis, put on a truck and sent to the wash rack, where all grease and dirt is removed. It is then sent to a disassembly bench, where it is taken down. From this point on expert workmanship is required. First, each part is thoroughly inspected. The crank shaft is then tested in a crank shaft straightening press, main bearings and caps are trued, and crank shaft fitted to cylinder block. Pistons, piston pins and piston rings are then fitted, connecting rods lined up in connecting rod alignment jig, and pistons assembled to connecting rods. After the crank shaft is burned in in our burning-in machine, the pistons and connecting rods are fitted in cylinder block. Cam shaft bearings, cam shaft and gears are then assembled in cylinder block, valves and valve seats are reground and resealed, and valves fitted in cylinder block and timed up to piston travel. The transmission parts and bushings that are worn are then rebushed and replaced by means of special reamers and jigs. Magnets are tested and magneto coil is tested for short circuits and other defects by means of an electrical testing device. The crank case is rebrazed if necessary and tested to make sure it is not bent or twisted. The motor is then assembled to crank case and transmission cover and run in on our modern test block until thoroughly freed up. It is then tested under its own power until pronounced O. K. by foreman.

All this work is absolutely guaranteed and done for a labor charge of only \$18.00.

All worn or defective parts are replaced with new ones, for which the regular Ford catalog price is charged.

We use *Genuine Ford Parts* exclusively.

In order to put off the day when a motor and transmission overhaul is necessary, owners should make it a point to study their cars. Learn all you can about its operation and care. A man having a knowledge of the car's construction, functions, requirements and limitations will maintain its usefulness and derive more pleasure from it. With proper care you will receive many thousand miles of service from your car and when after a prolonged period of usefulness, the car is ready for an overhaul, remember that we are here to serve you. We guarantee to give it the "pep" and stamina it had when new.

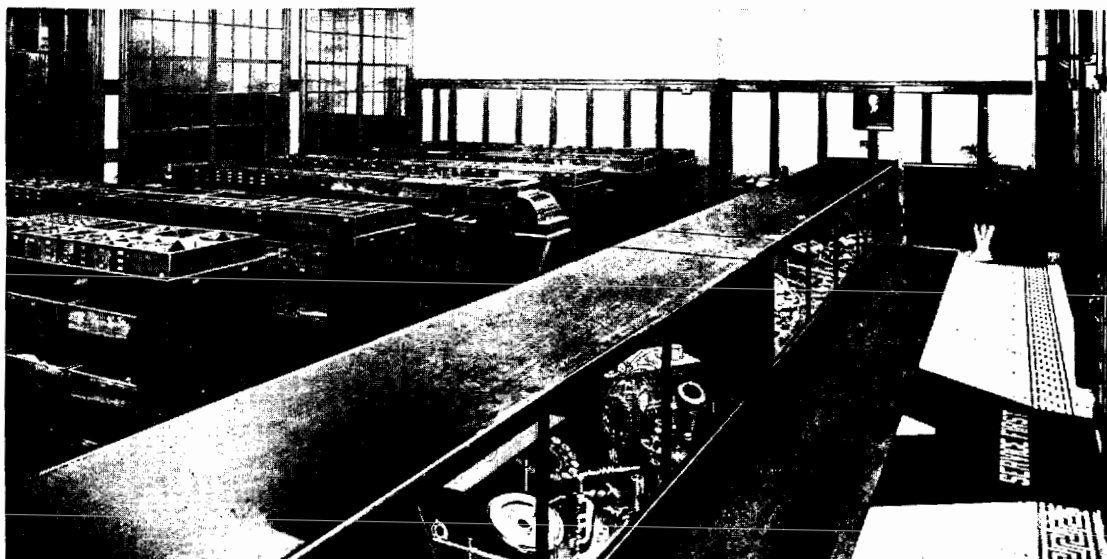


Fig. 18

**T**HE splendid parts store of the Mendenhall Motor Company, Ford dealers at St. Louis, Missouri, indicates how strongly they appreciate the merchandising value of properly displayed parts.

The stock box arrangement shown above may be easily adapted to changes in quantity or variety of parts carried.

Prompt and courteous service over the counter, by employees who are salesmen as well as stock clerks, is an outstanding feature of the Mendenhall business.

### Ford Design Cut-out

The latest type Ford design cut-out is sent out sealed as it is not expected that there will be any occasion for adjustment.

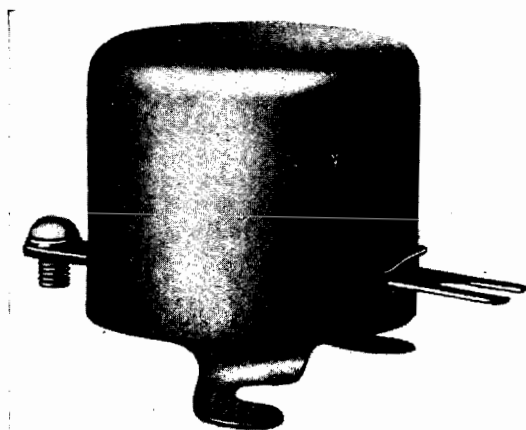


Fig. 19

The fact that the cut-out is sealed does not in any way interfere with the method of

testing for cut-out trouble as described on page 167 of the September 1921 Service Bulletin.

Within ninety days after delivery any Ford design cut-out that is tested and found to be giving trouble may be returned with seals unbroken to the branch for replacement.

Dealers and Garages must see that all such cut-outs returned are carefully packed so as to prevent any possibility of damage while in transit. Cut-outs damaged on account of failure to properly pack will not be considered for adjustment.

### Tractor Valve Seating Tools

The following list prices are now effective on tractor valve seating tools.

35 R-27	Valve Seating Holder	\$1.00
35 R-31	" " Cutter	1.25

Every Ford Dealer will find these properly designed high grade tools necessary in tractor repair work.

Orders should be placed with the nearest Branch.

## Combine Merchandising and Service

**B**Y using a Fordson tractor and trailer for selling and delivering Ford Parts to the wholesale trade, the McCarty - Sherman Motor Company, Ford dealers at Denver, Colorado, have increased their parts sales.

A part of a Ford chassis has been converted into a trailer and a specially designed body, fitted with bins, for carrying more than 300 different parts, has been installed.

This trailer is drawn by a Fordson tractor operated by a competent parts salesman, who calls upon more than 60 garages daily.

The McCarty-Sherman Company advise that their tractor and trailer has been productive of excellent results, both from a standpoint of service to the wholesale trade and the splendid publicity obtained by demonstrating the commercial uses of the Fordson. Since this plan was adopted they have obtained many new accounts thereby materially increasing the volume of their parts business.

They also state that many new prospects for the Fordson for industrial purposes, have been obtained, and cite several instances where interested parties have stopped the driver of the tractor and requested information regarding the use of the tractor in their particular line of work.

The idea of combining merchandising and service by the use of the tractor and trailer has proven so successful that it has been adopted as a permanent feature of the McCarty-Sherman business.

### New Rubber Fan Belts

We will hereafter furnish Goodyear rubber Fan Belts as well as Gilmer Fan Belts, both for equipment and service. The rubber belt will be packed in suitable cartons for shelf or counter display.

In handling fan belts of different materials the dealer will be able to satisfy the preference his customers may have along this line.

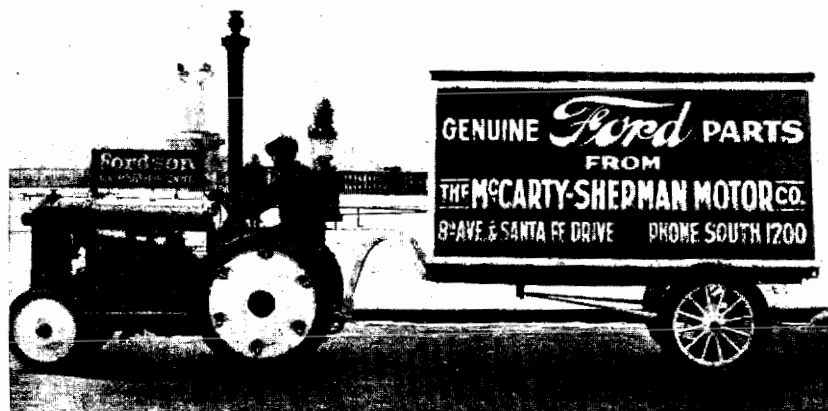


Fig. 20

### What Is Your Business?

If you were in the tire business you would display above everything else **TIRES**; if you were in the accessory business you would display **ACCESSORIES**, etc. The butcher does not display notions and dry goods, yet it would be a good paying addition, because 90% of his customers are women. Automobile dealers do not sell cigars, tobacco, etc., yet 90% of their customers are men, and at least 80% of them use these things daily.

What does any merchant display when he wants to increase his revenue? Articles upon which he makes the greatest margin, of course. It would not be good judgment to make an elaborate display of articles upon which he cannot and does not depend for a livelihood.

There is only one answer to the whole proposition, genuine parts—**FORD PARTS**—deserve the most prominent display because they are the most salable and profitable.

### Orders For Lincoln Parts

For the present, dealers located in territories where there are no Lincoln distributors carrying stocks of repair parts, should place their orders for Lincoln parts with the Ford Branches, who will arrange to have the material forwarded promptly.

Lincoln Parts Price Lists and Instruction Manuals are being prepared, and will be distributed within a few weeks.

## Dealers' Service Pleases Owners

Below is a reproduction of a card which the Universal Car Company, Ford Dealers, Houston, Texas, are using with very good results.

### I HOPE YOU WILL LIKE MY WORK

#### I HAVE DONE MY BEST---

To give you a full dollar's worth  
in service for each dollar you  
pay.

To keep your car clean.

To hold down the cost of parts  
--by replacing only those pieces  
that were too worn to use. *The  
old pieces are in your car...so you  
can see for yourself*

#### YOU MUST BE SATISFIED

YOURS TRULY

Mechanic

**Universal Car Company**

OVER

Fig. 21

After a repair job is completed this card is signed by the mechanic doing the work and placed upon the windshield of the car. At the same time any parts replaced during the repair operation are wrapped up and placed in the car so that the owner can inspect them and see for himself that replacement was necessary. Unfortunately, many car owners are inclined to the belief that repair men replace more parts than are necessary in order to increase the profit on a repair job. Under this plan they appreciate being allowed to pass upon the material as they feel that the repair man will not replace parts without cause

when he knows that they are going to see the old pieces.

Another feature of this card that should not be overlooked is the moral effect on the mechanic who signs a declaration of an honest desire to do good work, to keep the car clean, and a willingness to stand a thorough investigation of what he has done.

Fig. 22 is the opposite side of the card on which the mechanic makes suggestions as to repairs that should be performed in the future.

In order to keep this card from losing its effect upon either car owner or mechanic the dealers change both its wording and color from time to time.

The Universal Car Company have found that through this card they have been able to create a much better feeling on the part of their Service Customers which has aided them materially in increasing their sales of labor and parts.

### April 1st Wholesale and Retail Price Lists

Revised Model T Wholesale and Retail Parts Price Lists, effective April 1st, are now ready for distribution.

Service Dealers, Garages, and Accessory Stores should call on the Dealer for copies of each list in case they do not receive them.

### WE DO ONLY WHAT YOU SPECIFY

I would suggest you have these items attended to as soon as convenient:

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You are under NO obligation to let us do this work

Fig. 22

### Gauge for Setting Cylinder Front Cover

In Fig. 23 is shown a gauge for aligning the "T" cylinder front cover with the cam shaft. By the use of this gauge the commutator case is set concentric with the cam shaft, providing more even firing, and reducing wear on the commutator parts.

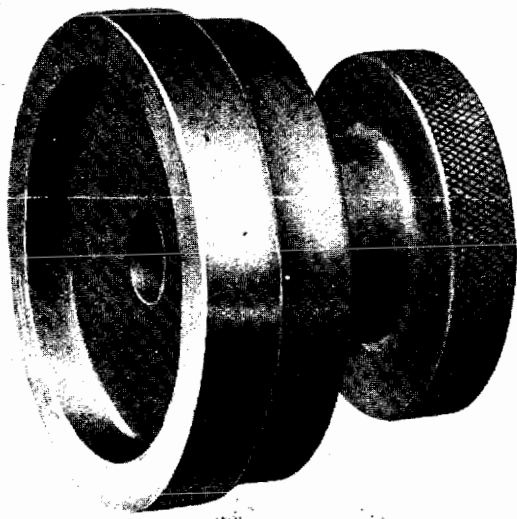


Fig. 23

When replacing a cylinder cover, first position the cover, then set the gauge over the cam shaft and into the recess in the cover provided for the commutator case. With the gauge in position, insert and draw down the ~~three~~ small cap screws which secure the cover to the cylinder. After these cap screws are tightened the gauge may be removed.

Every dealer should have a gauge for this work. Orders may be placed with nearest branch.

### Ford Service Bulletin Binders

Ford Branches can now furnish Service

Bulletin Binders at fifty cents net each. Dealers and Garages will find these Binders useful in preserving their copies of the Bulletin.

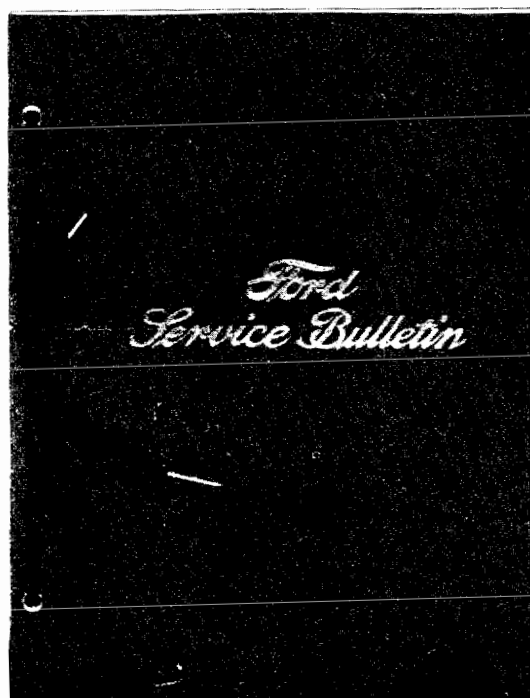


Fig. 24

### Price Corrections

Your attention is called to an error in the prices of the new Battery Box and Parts as printed in the April 1st issue of the Wholesale and Retail Price Lists:

The correct prices are as follows:

5155-TT8818 Battery clamp support-R.	\$0.15
5156-TT8819 Battery clamp support-L.	.15
5158-7671 Battery box—less cover	.75
5159-5491 Battery box cover assy.	.50
5160-5493 Battery box cover door	.15

## Cars bearing motor numbers 5,683,809 to 5,736,278 were shipped during February

### Serial numbers of tractors shipped

	Motors Assembled at Branches	Motors Assembled at Cork, Ireland	Motors Assembled at Home Plant
January		109,673 to 109,784	
February		109,785 to 109,891	201,026 to 202,521

# Ford Service Bulletin

No. 4

Vol. 3

April, 1922

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## Improvements in Ford Sedan and Coupe Bodies

**S**EVERAL changes in design, as well as interior refinements, have recently been made in Sedan and Coupe bodies, which add greatly to their comfort, convenience and appearance. The more important changes follow:

1. Upholstery for both Sedan and Coupe bodies is now furnished in a rich dark brown striped wool fabric.
2. Floor carpets in deep brown shades to match the upholstery are furnished with the new bodies. All the lower body trimming covering for such parts as heel board, gas tank box, bottom of Sedan folding seat, door covers, etc., is now furnished in material to match the floor carpets.
3. Design of door and quarter upholstery panels has been much improved in appearance and to provide ready replacement.
4. The door check straps have been redesigned to provide finish in keeping with new upholstery scheme and also increased strength and security.
5. Window lifters are provided which facilitate opening and closing of windows and provide for holding the windows open at any desired position. Special felt channels and spring retainers for the operating levers insure against looseness and rattle. Finished in black enamel and nickel plate, the new window lifters add materially to the general appearance of the interior of the body.
6. Driver's seat back in the Sedan has been increased in comfort by slightly increasing size and adding back springs.
7. Improved design of inside door pull handle in nickel plate finish is furnished on all closed body doors, improving the interior appearance and adding much to the convenience of the operation of the door.
8. Inside window finishing strips are now furnished in steel, black enameled, insuring excellent finish and permanency.
9. Outside pillar covers and in fact covers for all exposed wood parts are now furnished in pressed steel design, guaranteeing first-class paint finish on these parts and freedom from checks, blisters and other defects common to even selected wood designs.
10. The new design of instrument board panel is improved in general appearance and facilitates assembly.
11. Outside door handles as now furnished with all enclosed bodies are noticeable for the attractive appearance and convenient leverage in operation.
12. A roof drip moulding of an entirely new two-piece design, providing a much improved appearance and finish, has been adopted.
13. Door bumpers on all closed jobs are of special Ford double-roller design adapted to eliminate all rattles and squeaks in doors.

### Ford Headlight Bulbs

An investigation recently made indicates that comparatively few dealers and repair men realize that differences exist in the quality of the various headlight bulbs now on the market.

Many bulbs that are quoted at extremely low prices represent stock that because of imperfections would not pass the close inspection of the automobile factories, and being thrown back on the manufacturers' hands, are resold through jobbers with the idea of recovering whatever is possible.

Quality in headlamp bulbs cannot be determined by the average user by visual inspection any more than the quality of steels can be so determined. Bulbs which look the same will vary greatly in service due to variations in alloy compositions of the filaments, variations in exhaust pressure, variations in gas used for filling, and variations in mechanical alignment and sealing.

Ford inspection tests, both as to accuracy and alignment of the filaments, and more particularly as to the life and candle power limits of both major and minor filaments are more exacting than those for any bulbs being manufactured for any cars at the present time. Ford bulb quality is therefore superior to any other bulb on the market.

Every bulb stamped "Ford" has passed a rigid inspection at this plant, and can be guaranteed in every respect. Ford owners who pay the retail price for headlamp bulbs are certainly entitled to receive bulbs stamped with our trade mark as a guarantee. Our branches have been instructed to arrange for every Ford dealer to handle a standard bulb stamped with the name "Ford" to insure our customers receiving proper value for their money.

### Use April 1st Price List

Reports have reached us from various sections of the country calling attention to the fact that many garages, and even dealers, are not using our April 1st catalogue when retailing parts. In some cases catalogues three or four months old are still in use, which means that owners of Ford cars are not being charged the correct prices for repairs.

When new lists are mailed out, it is expected that every dealer and garage selling Ford parts, will immediately discard the old list and substitute the new one.

There is nothing that destroys confidence and creates ill feeling among customers as quickly as overcharging, and this is a prac-

tice that no reliable concern can afford to follow.

### T-1052 Truck Worm Thrust Bearing Plate Now Obsolete

After present stocks are exhausted we will discontinue supplying T-1052-TT22 Truck worm thrust bearing plate.

T-1004-TT33 Axle housing cap has been enlarged so as to accommodate the nut on the end of the drive shaft so that the thrust bearing plate is no longer required between the housing and cap.

Fig. 25 shows the new construction.

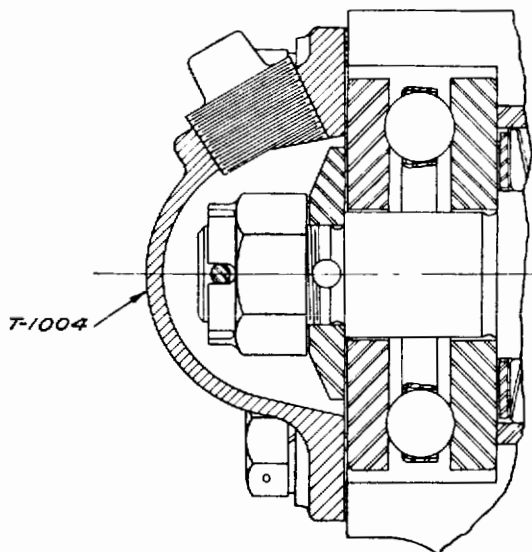


Fig. 25

### Increase in Price of Rebored Tractor Cylinders

Effective at once the price of S-200C Tractor Cylinders (rebored) is advanced to \$35.00. This price is subject to 25% discount to authorized Ford Dealers and 10% discount to the Wholesale Trade.

### Tractor Crank Case Pet Cocks

The Fordson Parts Price List is in error on page 10 in stating that S-161 which is the same as T-3079 Crank case oil cock is to be used in the Tractor crank case.

The Fordson crank case pet cock differs from the Ford crank case pet cock in that the wings of the valve are cut off. The Fordson pet cock will hereafter be carried in the Parts Catalog under S-253 factory number 1768. These pet cocks sell at \$.15 each list.

## Ford Battery Superior

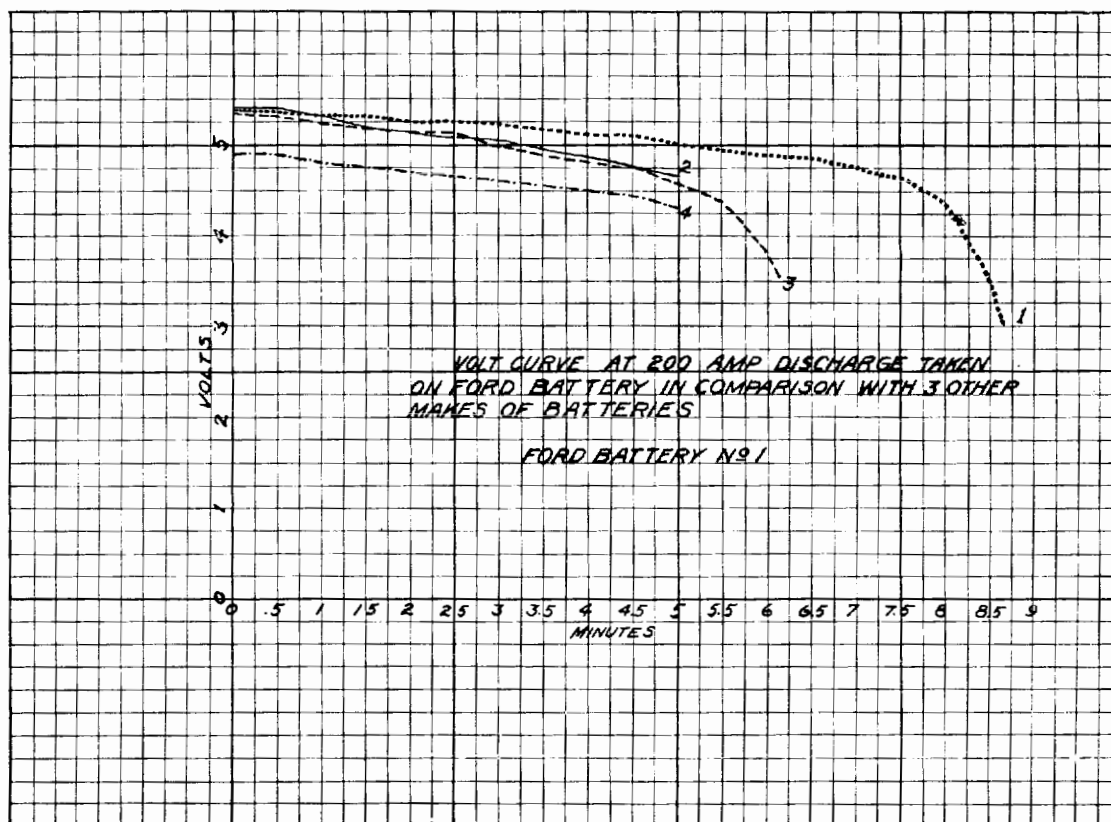


Fig. 26

**T**HE superiority of the Ford Battery is illustrated by the above chart.

This chart 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.

The Ford Battery is in every sense a quality battery and Dealers should make it a point to demonstrate its advantages to prospective purchasers.

### Differential Case Bolt and Nut

In assembling the present type differential cases right and left 3 T 2514C-52C bolts and 3 T 2515-8 nuts are used instead of studs and nuts as used with the old type cases.

### Buy Electrolyte From Ford Branches

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

Ford Dealers should use only the Electrolyte which is supplied through branches. This acid is sold at \$3.50 per Cwt., with an additional charge of \$5.00 to cover the carboy in which shipment is made. Credit for this is issued upon the 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.

### Use Fixture for Installing Roller Bearing Cups

It appears upon investigation that many Ford Dealers are still using the hammer and punch method of installing Timken roller bearing cups.

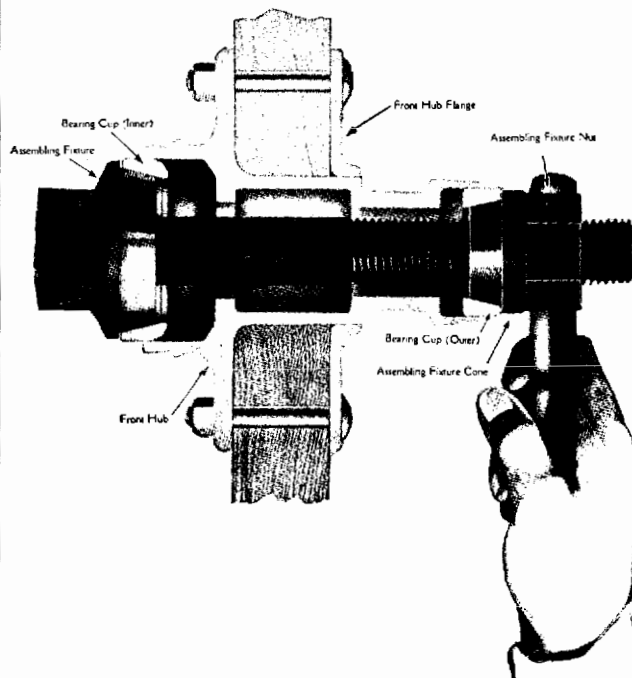


Fig. 27

A fixture (5Z-313) for properly fitting roller bearing cups is shown in Fig. 27. As our Branches are in position to furnish this tool to Dealers at \$2.50 net each subject to prior sale, there is no longer any reason for any Dealer using a hammer and punch to install these cups, particularly since accuracy of installation is absolutely essential to the life of the bearings.

### Tire Repair Kits

The increasing demand for Tire Repair Kits shows that Ford dealers are taking advantage of the opportunity offered them to handle a high grade tire repair outfit.

The fabric reinforcing of "Locktite" patches makes a very satisfactory patching material for casings as well as tubes, and this is a highly desirable feature because very often when punctures occur it is necessary to repair both the casing and the tube. This patching material can be used both inside and outside of the casing, preventing the tube from blowing out and keeping sand and water out of cuts in the outside of the casing.

Another important feature is that the fabric reinforcing produces a non-heating surface between the tube and the casing and this adds to the permanency of the patch, and eliminates the tendency of "all rubber" patches to loosen up when travelling on hot roads. This also eliminates the tendency that is always present with patches which are not reinforced to wrinkle and ultimately come off or blow out because of the cut becoming stretched thru the flattening out of the tire at each revolution of the wheel.

In addition, a facing of high grade unbleached linen covers the uncured rubber side of Locktite patches. This protects the rubber from the air and prevents deterioration.

### Tractor Clutch Assembly

There should be no occasion for dealers returning complete tractor clutch assemblies for credit, as repairs can readily be made by replacement of the springs or plates.

In many instances, slipping of the tractor clutch when pulling under a heavy load, is due to the operator continuously keeping his foot on the clutch pedal; this weight being sufficient to relieve the tension on the springs, causes unnecessary friction, resulting in premature wear of the clutch release plate.

Failure to change the oil in the crank case every 50 working hours, results in broken down or dirty lubricating oil, which is another cause of rapid wear of clutch plates.

Notwithstanding that these points have been covered in the Manual, it is suggested that dealers make certain that tractor owners' attention is directed to their importance. By so doing, a great deal of needless trouble and expense can be avoided.

# Method of Assembling Gasoline Feed Pipe on Sedan, Coupe, Touring, Torpedo and Truck

The sketches below clearly illustrate the new method of attaching the gasoline feed pipe on different models. Clamps T-2916 are also used in the new wiring system for holding wires in place.

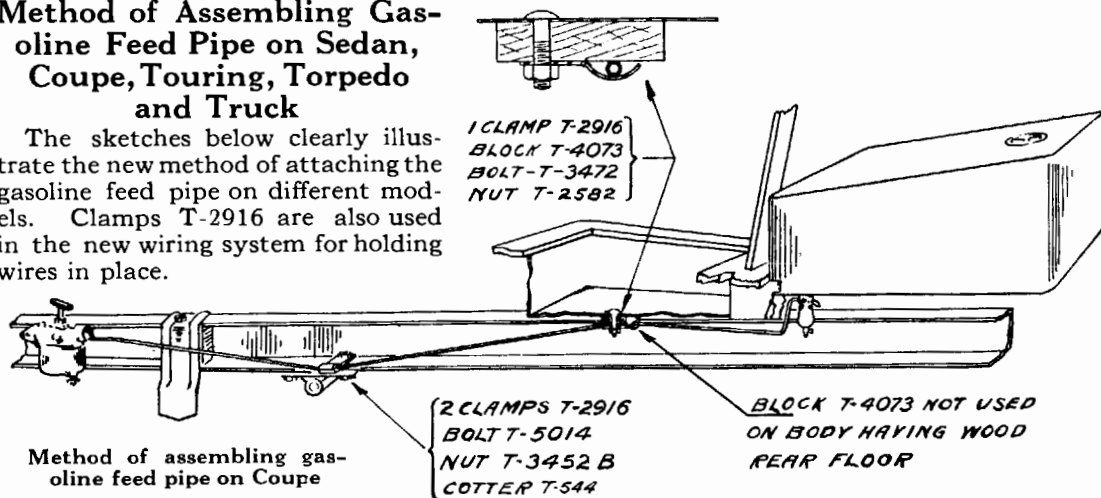


Fig. 28

NOTE  
GASOLINE FEED PIPE  
TO CROSS UNDER EXHAUST  
PIPE AT THIS POINT

Method of assembling gasoline feed pipe on Sedan

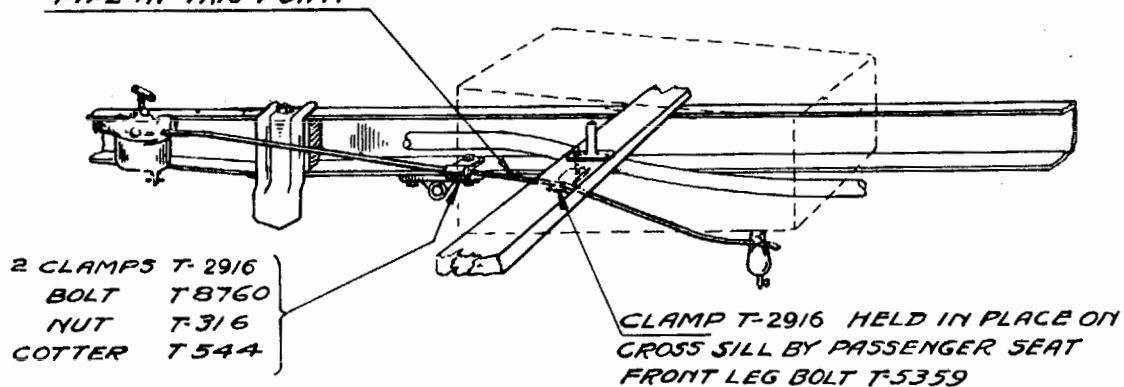


Fig. 29

NOTE  
GASOLINE FEED PIPE  
TO CROSS UNDER EXHAUST  
PIPE AT THIS POINT

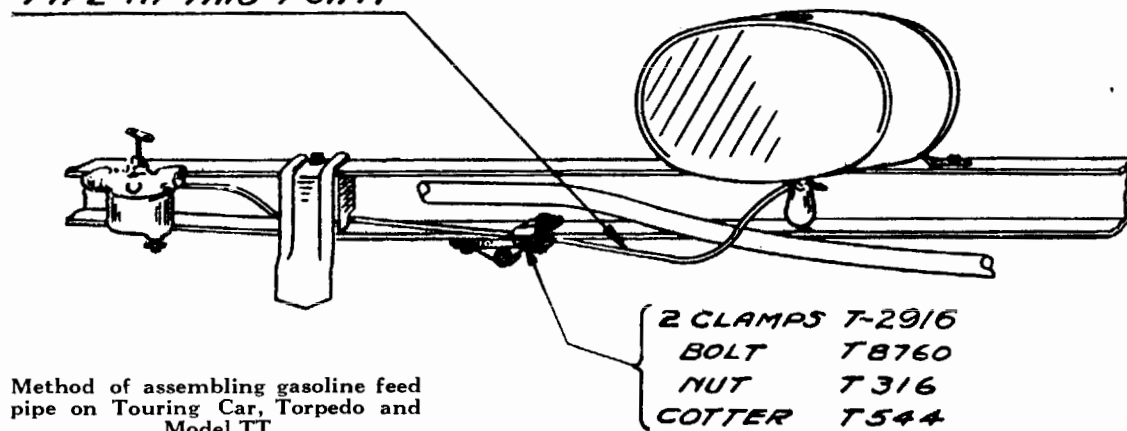


Fig. 30

### Fitting of Ford Pistons and Rings

Ford pistons are fitted in the cylinder bore tight on .004" and free on .002". To determine the proper clearance between piston and cylinder wall it is necessary to use feelers. Because of the possibility of piston being out of round the feelers should be tried at several points around the bore of the cylinder.

Ford piston rings are cut .002" taper and are stamped "Ford" on the small diameter. Piston rings should be fitted to pistons with this marking up or toward the top of the piston. When fitting a new ring first try it around the piston by placing its outside edge in the groove to which it is to be fitted thus making certain that it is a good fit but not tight in any position. Rings should fit in groove with .002" to .004" end play.

Ford piston rings should be fitted with the following gaps between the ends: 1st and 2nd rings .008" to .015", 3rd or lower ring .004" to .008".

Feelers or gauge same size as cylinder bore should be used to determine the gap between ends of rings.

### Champion Ford Spark Plug

In Fig. 32 is shown a cross section of the Champion Ford Spark Plug furnished as regular equipment in Ford cars and Fordson Tractors, and sold by all Ford dealers for service.

The insulator of this plug is so designed that at the firing end it has a comparatively sharp edge which burns clean at all times and at the same time, its construction is such that the heat can readily travel down the insulator.

When this plug is taken apart for cleaning, care should be used in re-assembling it to see that the gaskets are in place and that the bushing is not screwed down too tight. It should be screwed down reasonably tight, but not dead tight. The gap between the electrodes should be set at about 30/1000 of an inch or 1/32 inch.

It is not necessary to use pliers on the knurl nut to make a tight connection; the nut can be screwed down with the fingers and then the cable moved with the nut slightly and it will be sufficiently tight to carry the current.

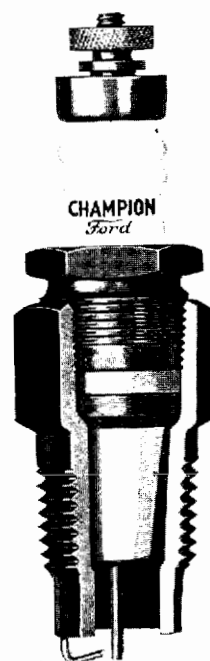


Fig. 32

## Important!!!

### NOTICE TO USER

To obtain best results this car should not be driven faster than 20 miles per hour for the first 500 miles.

Oil should be changed after first 400 miles and every 750 miles thereafter.

#### IMPORTANT

Always insist on genuine Ford Parts

Fig. 31

Above is a reproduction of the "Notice to User" sticker which will be pasted on the

windshield and gasoline tank of all new Ford cars shipped from Assembly Plants.

Care in "breaking in" new cars is of more vital importance now than ever before because the present fitting of piston rings does not permit as free a flow of oil past the piston for lubricating the cylinder walls as formerly.

Fast driving will naturally overheat the new motor and the expansion of the closely fitted piston is apt to result in scoring the parts.

Driving the new car at not to exceed twenty miles per hour for the first five hundred miles and with particular attention to lubrication insures more efficient and economical after operation.

It is impossible to lay enough stress on the importance of changing the oil in the crank case after the first four hundred miles and every seven hundred fifty miles thereafter.

Dealers should see to it that these stickers are on every car delivered by them as it is essential that users understand and observe these points of maintenance.

### Change in Piston Design



Oil pocket by bevel  $3/64$ " deep cut on  $20^\circ$  angle. Fig. 33

The above illustration shows the change made in the design of the Ford piston to prevent any possibility of excess oil working past the pistons into the combustion chamber. An oil pocket is formed below the lower ring groove by cutting a bevel on the skirt of the piston. This pocket which is  $3/64$ " deep and cut on a  $20^\circ$  angle collects any excess oil from the cylinder walls and carries it back into the crank case on the down stroke of the piston.

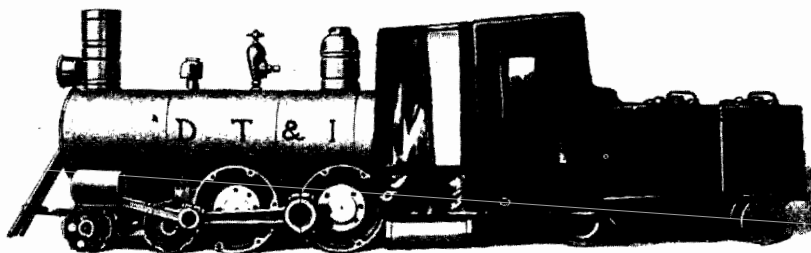


Fig. 35

### Narrow Valve Seats Best

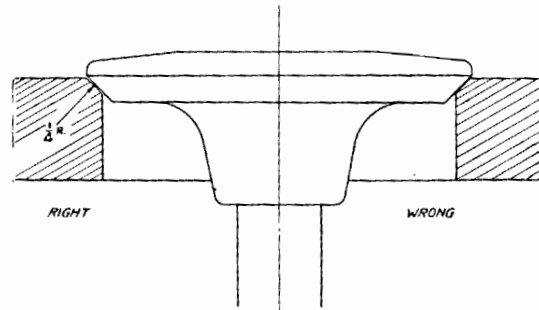


Fig. 34

The ideal seat for valves in an internal combustion engine is a hair-line bearing. The nearest practical approach to such a bearing is probably the straight face of the valve making contact with a radial seat, as shown to the left of Figure 34. The advantages of a narrow valve seat are that a complete bearing is obtained all around together with the fact that the continual operation of the valve has a tendency to form a better bearing. Furthermore, there is less likelihood of carbon getting between the valve and its seat in the cylinder.

### Right and Left Rear Radius Rods

Due to the present construction it is necessary to install rear radius rods with the seam down. This necessitates manufacture of right and left rods, which will hereafter be carried in the Price List under T-2547-152 and T-2547B-158.

### Novel Window Display

A. G. Powers, authorized Ford dealer at Belle Fourche, S. D., recently constructed a miniature Detroit, Toledo & Ironton locomotive from Ford and Fordson parts, and exhibited it in his display window.

This novel exhibit created an unusual amount of interest, and many people were attracted to Mr. Powers' place of business by the display.

## The Fordson Transmission

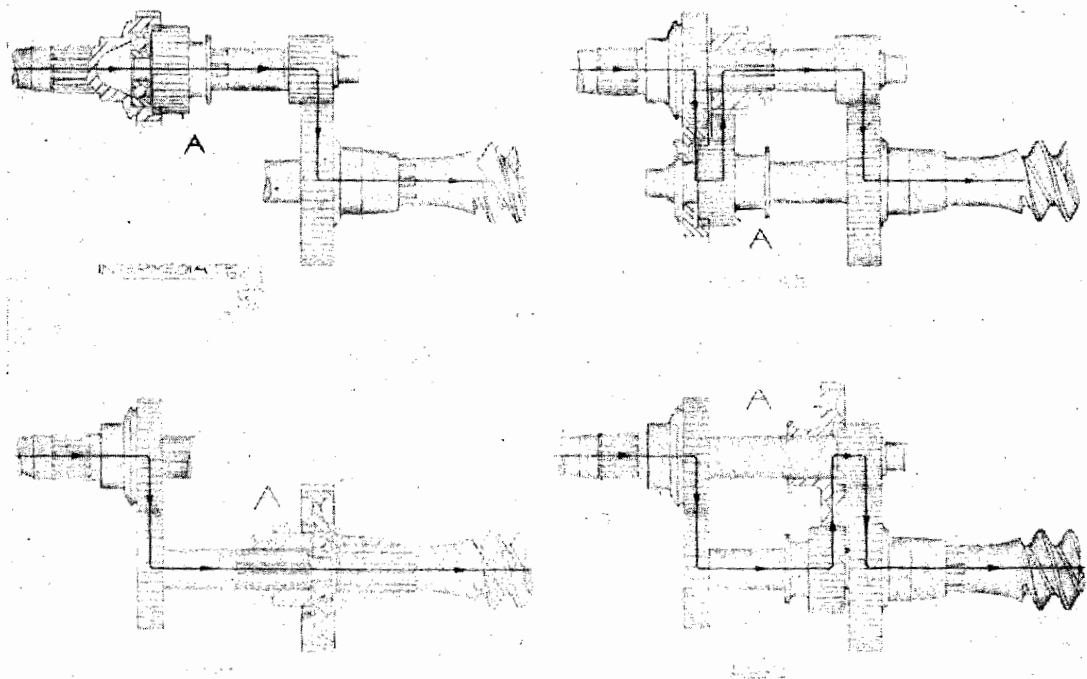


Fig. 36

The constant mesh selective type transmission of the Fordson possesses many advantages over the ordinary automobile type sliding gear transmission used in practically all other tractors.

Constant mesh does not mean that the gears of the transmission do not slide on their shafts for we know that is the purpose of the hand shifter lever. It does mean, however, that the gears on each shaft never shift far enough to come out of mesh with those on the other shaft.

This is accomplished by providing four special internal gears which act as separate clutches for each speed as shown in Fig. 36. Only the gears actually used for the speed indicated are illustrated and these are shown shifted into position for driving the wheels. In each case gear "A" has been shifted into mesh with a concentric gear of the same number of teeth. This means that when shifting all the teeth of "A" engage with the teeth of the other gear simultaneously thus

dividing the shock equally between all the teeth instead of its being absorbed by one or two teeth as in sliding gear transmissions.

The weight or size of the transmission is not increased by the special internal gears as they are cut inside of the other gears.

The illustration also shows that four of the external gears are provided with extra wide faces so as to give them sufficient length to enable them to mesh with the internal gears while transmitting power to the other shaft. This, of course, adds to the strength of the transmission and reduces wear on the parts.

In high and intermediate speeds there is only one gear reduction in the Fordson transmission. In low and reverse three pairs of gears are working. The power loss in high speed and in intermediate, which is used most of all, is a practically negligible quantity. Likewise the efficiency is exceptionally high in operating in both low speed and reverse.

**Cars bearing motor numbers 5,736,279 to 5,812,608  
were shipped during March**

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## Results of Efficient Service and Sales Methods



Fig. 37

IN 1914, Jonas Hedlund, Ford dealer at Elk City, Oklahoma, started in business in the rear of a real estate office with a stock of Ford parts valued at less than \$150.00.

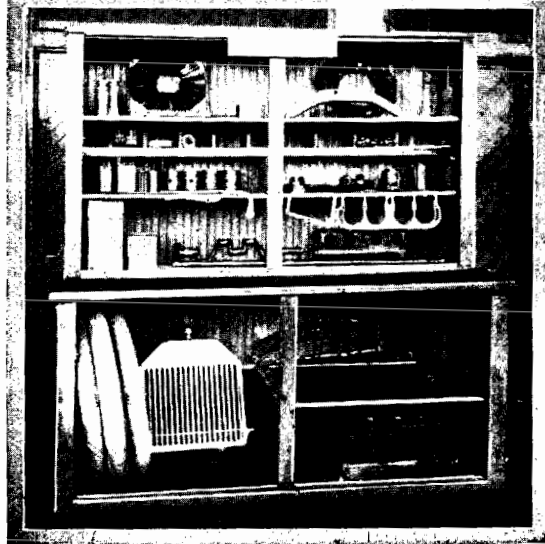


Fig. 38

The remarkable growth of Mr. Hedlund's business necessitated the erection of the large building shown above. In his new quarters, Mr. Hedlund carries approximately \$10,000 worth of Ford and Fordson parts, also equipment valued at \$4000, for properly servicing Ford cars and tractors.

This is only one of the many examples of rapid business growth on the part of Ford dealers, but it serves to show what can be accomplished by the adoption of up-to-date sales methods coupled with efficient and business-like service.

### Body Painting

Because of the large number of requests for information on body painting we are publishing detailed instructions for painting Ford Touring and Runabout Bodies—operation by operation.

As with anything else it is expected that better final results will follow when paint is applied by an experienced body finisher.

No recommendations are made as to brands of paints to be used beyond materials put out by paint concerns of established reputation.

The following general points must be borne in mind in order to make a successful body painting job.

1. Body must be properly cleaned-up.
2. Paint room must be clean, and every precaution taken to prevent dust getting in by keeping doors and windows closed and floor sprinkled.
3. Paint room must be kept at proper temperature which is about 80° Fahrenheit.
4. Use of proper grades of sandpaper, paints, and varnishes.
5. Brushes must be used properly, kept clean and hung up when not in use.
6. Paint cups must be properly cleaned.
7. All paint and varnish should be strained as directed in the following.
8. Sufficient time must be allowed for each coat to dry and for clean-up, tack-rag and shellac operations.

While these operations can be used for refinishing fenders, hoods, hood boards, running boards, shields and radiator shells, it is generally considered better to remove those parts and have them enameled by some concern equipped to do that work.

**1st Operation:**—All paint and varnish must be removed from car body before repainting. It is therefore advisable to procure a good grade of paint and varnish remover and apply over the surface of the old paint on the body. A 3" bristle brush should be used in applying paint and varnish remover. Varnish remover must be applied freely and should stand approximately 15 to 20 minutes before trying to remove old varnish. The old varnish can be removed from surface of body by scraping with a 3" knife. In a great many cases it is necessary to give the surface two or three applications before all old paint and varnish are removed. When the old varnish and paint have been removed it is then necessary, and very important, to have the body washed very carefully, with a mixture

of 50% high test gasoline and 50% denatured alcohol. By using this mixture you can obtain a good clean surface to work upon and all extra paint and varnish remover which may have accumulated on surface is destroyed.

**2nd Operation:**—Sand body down with a good 4/0 garnet sandpaper. After a good surface has been obtained on the metal, the body should be dusted off and tack rag'd. A tack rag can be made from a piece of cheesecloth about a yard long. This is dipped in quick drying varnish and wrung out as dry as possible. Then when opened up a semi-tack or sticky surface is obtained. The cheesecloth should then be folded to form an oblong approximately 3" x 6" so tack rag can be handled readily with the hand. The secret of obtaining a good paint job is to see that the body is perfectly clean and by using the tack rag very carefully and getting into every corner and wiping the panels off thoroughly all surplus lint is removed from surface of body.

**3rd Operation:**—Use a good grade of Oxide Primer, which can be red, maroon or black in color. The primer should be applied over the surface of the bare metal, using a 3" camel hair triple thick brush. A 1½" camel hair brush may be used for getting into and around corners of body. The primer should be thinned down to brushing strength and strained into a cup or paint container through 2 to 3 thicknesses of nainsook or a fine mesh cheesecloth that has been dipped in varnish and allowed to become dried thoroughly. Every precaution must be taken to have primer thoroughly strained and brushes properly cleansed. On applying primer it is proper to brush in a horizontal position and lay off material in a vertical position. By using this method, job will be free from sags. This coat if air dried should stand for 24 to 48 hours before the following coat is applied.

**4th Operation:**—After the primer is thoroughly dry, surface of body should be sanded down with 4/0 or 5/0 garnet sandpaper. When a good surface has been obtained, it should be dusted down with a painter's duster and entire surface tack rag'd in the same manner as directed in a previous operation. After this has been done, the body is ready for the second coat of paint, which is called the lead coat. This must be applied in the same manner as the first primer. The same brushes can be used for applying this coat as were used for the oxide primer described in operation number three. Extra precaution must be taken, however, to see that brushes are thoroughly cleansed

in high test gasoline before dipping or breaking brush into lead coat. 24 to 48 hours should be allowed for this coat to dry.

5th Operation:—After lead coat is thoroughly dry the body should be sanded with 5/0 garnet paper, dusted off, and tack rag'd again very carefully. It is then ready to be glazed in solid with a good lead glazing putty. This material must be applied with a 3" elastic putty knife. In using this putty and applying it over the surface of body, it is necessary to thin it to a semi-paste, so that when the operator dips the end of a wide knife into the putty the knife will carry a small percentage of putty on edge of blade. The putty which is used to take care of all defects in the metal must be applied or laid off so as to leave a very thin film on the entire metal surface of the body with the exception of the joints or mouldings. The putty must stand 24 hours before sanding.

6th Operation:—In this operation the body must be sanded down very carefully with 4/0 or 5/0 garnet sandpaper. It is essential that a good surface be obtained for the succeeding coat, therefore the glazing putty must be sanded down to a surface as smooth as glass. Then rub the hand lightly over the finished surface to make sure that there are no high putty spots. After the body has been dusted off and tack rag'd it is ready for the first coat color or ground coat which dries to a semi-gloss. This material must be thoroughly strained as in previous coats and brushes again thoroughly cleansed. First coat color must be applied rapidly at brushing strength because it has a tendency to set up and dry faster than any previous coat. The operator should brush first coat color on freely in a horizontal position and lay off in a vertical position. This coat must be given 24 hours to dry before the next operation is started.

7th Operation:—When the body is thoroughly dried it is ready for sanding with a fine grade of sandpaper such as 6/0 or 7/0 garnet finishing paper. In sanding the color coat it is only necessary to go over the surface lightly so as to remove any surface dirt, which may have accumulated on body while color coat was drying. After sanding, the body should be dusted off, tack rag'd, and all crevices, joints and mouldings sealed in with thin white shellac, using a 1/2" camel hair brush for the purpose. The shellac must be as thin as possible and applied only in crevices, joints and around mouldings to seal in dirt or grit which it is impossible to get out. This operation should be performed with care in order to get a good clean follow-

ing coat. It requires approximately 20 to 30 minutes for the shellac to dry, after which, body should be tack rag'd again and made ready for the first coat color varnish.

8th Operation:—The first coat color varnish should be applied with 3" and 1 1/2" brushes. Either Badger or Split Bristle Brushes can be used. Color varnish should be applied at brushing strength in a vertical position and laid off horizontally. The surplus varnish should be wiped off with the brush. The proper procedure is to apply color varnish to two or three panels before picking up and laying off, varnishing in a horizontal position so as to avoid brush marks or sags. This coat must be given 48 hours to dry before next operation.

9th Operation:—The body is now ready to be sanded down with an oiled sand paper. 7/0 sandpaper dipped into a mixture of two parts raw linseed oil and one part gasoline is used for this purpose. Be sure that these ingredients are thoroughly mixed before sandpaper is immersed. In oil sanding this coat down to a good smooth surface, the operator must sand one panel at a time. Then wipe up the surface with a good clean rag or towel making sure that the surface is free from all grit or dirt. After body has been oil sanded thoroughly, it is ready for washing. A mixture consisting of 2 1/2 gallons of water and one quart of gasoline is used for washing. The entire surface of body should be gone over using a sponge and getting into all crevices and corners of the finished surface. Then the body should be thoroughly wiped up with good clean rags entirely free from lint. Frayed or dirty rags cause a great amount of trouble and should not be used.

10th Operation:—During the oil sanding operation it often happens that the operator rubs through the metal particularly on the corners. To cover up any bare spots it is then necessary to touch up the body with a flat color of the same nature as the color coat. Then the job is tacked off and shellaced in the same manner as described in operation number 7. Then the 2nd coat color varnish is applied as described in operation number 8. 24 to 48 hours must be allowed for this coat to dry.

11th Operation:—When the second coat color varnish has become thoroughly dry it should be oil sanded as described in operation number 9. In performing this operation be sure that all surplus oil on body panels is entirely wiped up before starting to sand other panels. This sanding must be done carefully to be sure that all surplus dirt, sags

or other panel defects are properly sanded down to a good smooth surface. The surface should then be washed off with a mixture of water and gasoline as specified in operation number 9, and wiped up dry with nainsook. The body at this stage should be carefully inspected to make sure that it is properly touched up and that all crevices, edges, and hinges have been shellaced in.

**12th Operation:**—The body is now ready for the finishing coat of varnish. Finishing varnish must be of a long flowing and elastic nature. The brushes used for this operation may be either 3" Badger or Full Bristle and 1½" Badger or Full Bristle of good quality. If operator is not equipped with the regular finishing varnish brushes, the second coat color varnish brushes can be used after being thoroughly cleaned in clear rubbing or finishing varnish. Great precaution should be taken in cleaning these brushes—immersing them to the heel and working out all surplus dirt by scraping or wiping brush on edge of cup or paint container. When this has been done hang brushes on a nail with stock of brush down. Do not lay brushes on wood or edge of cup as they are bound to accumulate surface dirt and lint. The varnish cups used in this operation must be thoroughly cleaned and all crevices and seams around cup properly shellaced in. By doing this all dirt and lint are sealed in cup and same will not become mixed in the finishing varnish. A clean tack rag should be made and all bare metal spots touched up with flat color to match color varnish. Body is now ready to be tacked off with tack rag and finishing varnish applied. Make sure just before applying this varnish that it has been thoroughly strained through nainsook or four thicknesses of air dry varnish cheesecloth. Two (2) varnish cups or containers to be used in this operation, one for applying the clean finishing varnish and the other for wiping up and laying off. In other words after the finishing varnish has been applied to the surface of body it must first be cut in around edges of body panels with 1½" Badger or Split Bristle Brush. When the edges of panels have been properly cut in, take the 3" brush and apply the finishing varnish in the same manner as with the 1½" brush around edges of panels. It must be understood that finishing varnish is to be applied freely. Apply material in a horizontal position and pick up and lay off in a vertical position. It is suggested that the operator coat from three to four panels in finishing varnish before picking up and laying off in a vertical position. By following these instructions

it will be found that the small air bubbles which appear on surface of body will break and disappear. Also when finishing varnish has stood for approximately five minutes it has a tendency to set up. Then by picking up and laying off all air bubbles will be eliminated. (To be Continued)

### Commutator Brush Cap

The commutator brush cap, part T-3206 is now being made shorter in the skirt, and smaller in diameter. This change will eliminate any possibility of the cap shifting out of position and becoming wedged against the commutator roller.

A quantity of the latest type caps have been shipped to Branches for the purpose of making gratis replacement of old style caps in the hands of dealers, and dealers in turn will be expected to replace, free of charge, old style caps on customers' cars, when inspection or replacement of the commutator is found necessary.

Dealers should immediately place orders with Branches for a sufficient quantity of new style caps to meet their requirements, and should arrange with the Branch to return any old style caps they have on hand.

### Emergency Outfit

A new convenience for Ford owners is shown in Fig. 39, "an emergency outfit" consisting of a small compact carton containing the following items:

Two T 5201	Champion Spark Plugs
One T 6520X	Tail Lamp Bulb
One T 6572HX	Headlamp Bulb



Fig. 39

This convenient package should appeal to all Ford owners, and at the price of \$1.80 should meet with a ready sale. Dealers should prepare for this profitable business by ordering a quantity of these outfits from the Branch.

## New Model "280" Vaporizer

The New Model "280" Vaporizer now being used on the Fordson has many points of advantage over the Model "234" formerly furnished. The more important features are given below,—

(1) Provision made for attaching governor (See article on page 38, describing this).

(2) Tight fitting cover on Float Chamber to exclude dirt.

(3) Stamped steel used for small parts lessens possibility of breakage.

(4) Improved metering of fuel by use of small venturi in primary air and fuel passage.

(5) Large manifold casting strengthened to eliminate any possibility of cracking.

(6) Butterfly throttle valve set  $\frac{1}{8}$ " off center to give proper balance when using a governor.

(7) Design made more simple and compact throughout.

(8) Float and float mechanism attached to cover, instead of inside of the fuel bowl, permitting easier removal and inspection.

(9) Elbow formerly on lower end of vapor tube eliminated to cut out sharp bend in vapor passage. This makes a one piece vapor tube and lowers cost of replacement.

(10) Heat control valve redesigned to prevent sticking, by using a latch instead of a lever for raising and lowering valve. This gives a positive lock when in "On" position.

(11) Heel of float lever extends up to form stop to prevent float from touching the inside of the fuel bowl when bowl is empty. This prevents float from becoming battered or punctured by rattling in the bowl during shipping or handling.

(12) Redesigned float chamber, float valve and larger float. This gives greater buoyancy and tighter seating valve thus insuring against any overflowing of fuel due to vibration when running over hard surface.

(13) Greater accessibility. All screws and nuts can be removed with tools furnished with the tractor. Mixer Chamber can be removed without interfering with large fuel tank. Fuel shifted from gasoline to

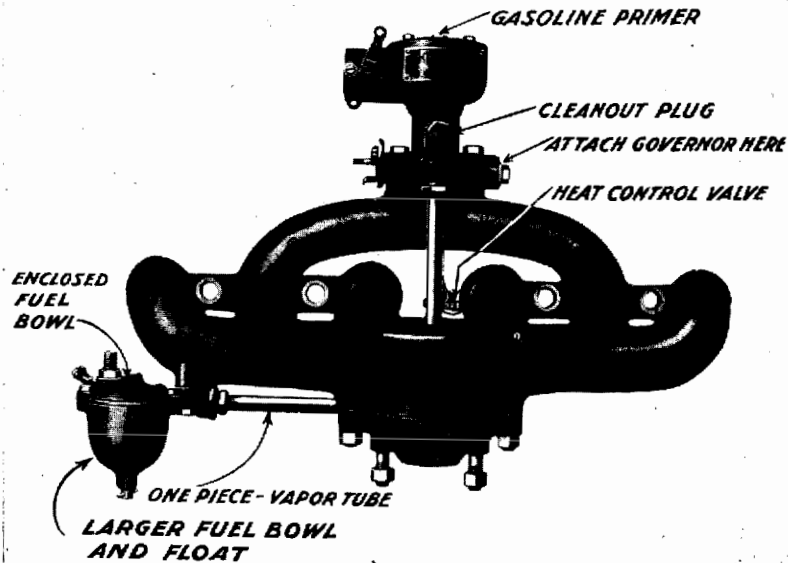


Fig. 40

kerosene from the seat. Clean out plugs added in float and mixing chamber, so that fuel passages can be cleaned without taking off any other parts.

(14) Provision made for easier starting by use of two way valve which allows gasoline from starting tank to be used in the regular float chamber. This eliminates the shifter valve on the mixing chamber.

*It is very important, when the day's work is near completion to turn the two way valve on "Gas" for approximately two minutes before stopping the engine. This will cause the kerosene in the bowl to be entirely consumed and leaves the bowl full of gasoline for starting up next time.*

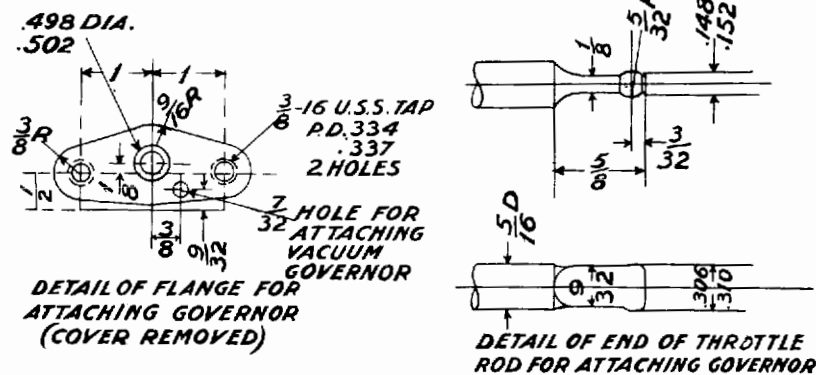
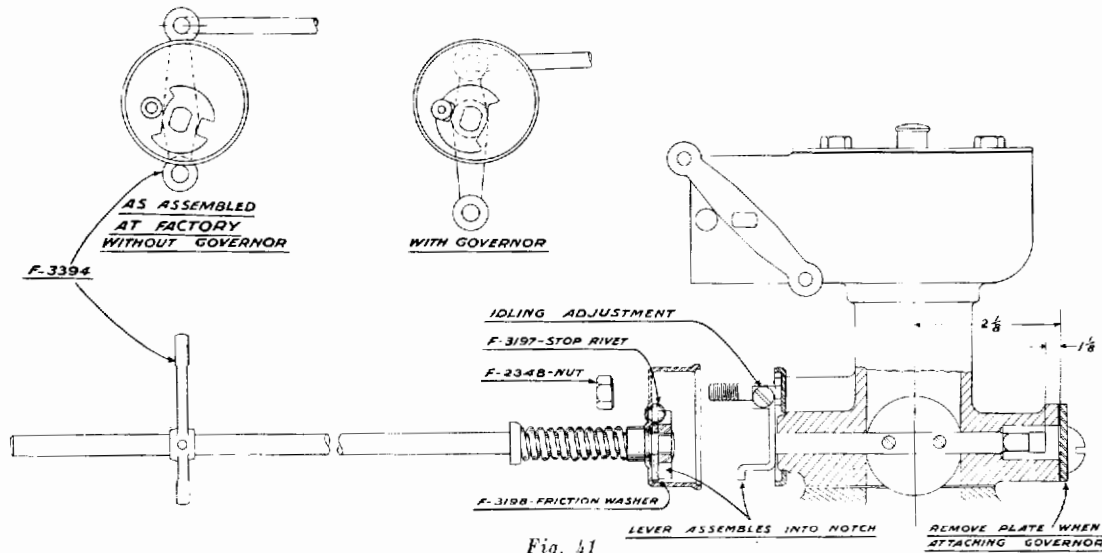
A spring closed priming cock for gasoline is provided on top of mixing chamber. This allows operator to prime directly into cylinders to facilitate starting in cold weather.

(15) New Model is interchangeable with old style. When using the new vaporizer on old tractors the following additional parts must also be supplied extra:

- F-3089X Two way valve.
- F-1939X Auxiliary gasoline tank plug.
- F-3088X Needle valve adjusting rod.
- F-3396X Air washer tube—small.
- F-3202X Throttle control rod assembly.
- F-2348X Throttle control rod assy. nut.

(16) Life of vapor tube increased as fuel now passes thru it when starting as well as when running off main full tank which lessens possibility of tube burning out.

The New Style Vaporizer is provided with



a small flange on the forward end of the Mixer Chamber for attaching a speed governor, should one be desired. A portion of the vaporizer and throttle control is shown in Figure 41.

Note that the small throttle control rod lever, F-3394X is double ended, the long end being assembled upward when the tractor leaves factory.

When a governor is to be installed the lever is turned around one half revolution. In accomplishing this do not remove the rivet which holds the lever on, but instead first remove nut **F-2348X** on the small housing on the manifold after which the rod and cover can be slipped back an inch or so as shown in the illustration. This disconnects the throttle rod from the vaporizer. The throttle rod is now turned in either direction when by a small additional twist the head of the rod can be forced to ride over the stop rivet **F-3197X** (on the inside of the cover) until the spring snaps it into the smaller notch in the head, the cover is then put back on and the

nut replaced. The throttle can now be operated by the governor independent of the hand lever on the steering column and should hold the speed of the engine at about 1000 revolutions per minute at all times.

The hand lever can still be used however under certain conditions even though a governor is attached, for instance, if a lower

or higher engine speed is desired temporarily for any reason, the throttle can be forced closed or open, as the case may be, against the action of the governor. As soon as speed governing is again desired the throttle hand lever is moved until the stop is felt to snap back into its notch when the governor will again take its function of holding the speed constant.

## Specify Car Number When Ordering Lincoln Parts

When ordering Lincoln parts dealers should specify number of car for which parts are required.

The car number is stamped on a plate fastened to the front of the dash under the hood.

### Correction of Typographical Error

Through a regrettable typographical error, the service sales methods described on page 23 of the March Service Bulletin, were credited to the Universal Car Company at Houston, Texas, whereas these dealers are located at San Antonio, Texas.

## Cylinder Assembly for Use in Engine Replacement

Due to increased car production we will be unable to supply Model T motors for service until further notice.

Cylinder blocks bored 1-32" oversize and with the following parts assembled will be furnished to Dealers to be sold when replacement motors are required:

Cylinder  
Valve springs  
Crank shaft  
Time gear—small  
Push rods  
Camshaft  
Time gear—large  
Time gear cover  
Connecting rods  
Cylinder front cover  
Pistons  
Valves

Commutator brush  
Valve cover

The dealer can then very easily assemble the additional units such as transmission, magneto, etc., to the cylinder assembly. The price of

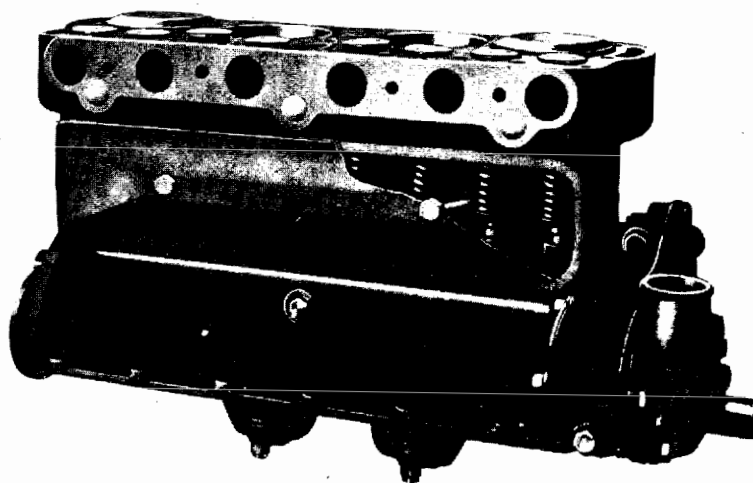


Fig. 43

this assembly as illustrated in Fig. 43 is \$60.00 subject to Dealer's regular discount.

Cylinders bored  $\frac{1}{32}$ " oversize will be shipped in place of standard blocks for repair purposes.

## Replacement Policy on "T" Connecting Rods and Transmission Bands to Dealers and Garages

Branches will exchange Model "T" Connecting Rods bearing genuine Ford Forging trade marks with Dealers at 30 cents net each, with Service Dealers and Garages at 40 cents net each; with owners at 60 cents net each. Connecting Rods returned less caps

will be replaced with new rods complete to Dealers at 45 cents net each; with Service Dealers and Garages at 55 cents net each; with Customers at 75 cents net each.

Fig. 44 shows the three different types of Ford Connecting Rods. The rod designated as "A" is the present type light rod used since the latter part of 1920. Between 1915 and 1920 the heavier type rod listed as "B" was used. Both of these rods have a forging bore of  $1\frac{3}{8}$ " and are babbitted  $\frac{1}{16}$ " thick.

"A" and "B" rods can both be exchanged on the basis outlined above.

The old style heavy rod used prior to 1915 designated as "C" had

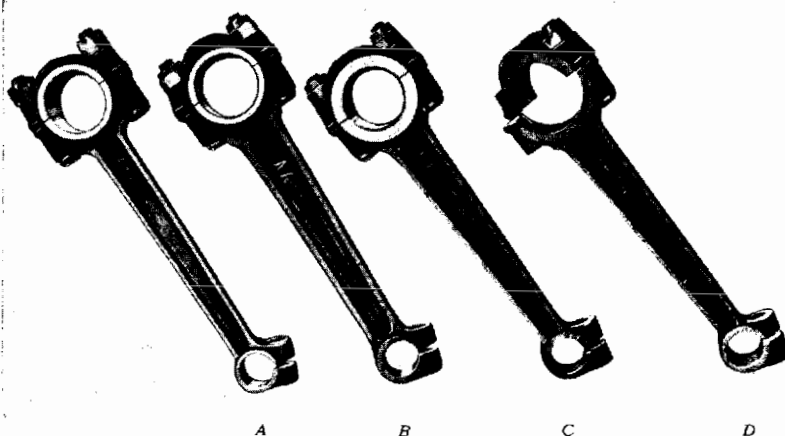


Fig. 44

a forging bore of  $1\frac{1}{2}$ " and was babbitted  $\frac{3}{8}$ " thick. There is no exchange on this rod and Dealers should sell the latest type connecting rods when the old style parts are presented for adjustment. "D" shows the same rod without the babbitt. Note that the cap bolt holes cut into the babbitt.

Transmission Bands may be exchanged with dealers at 25 cents net each; with Garages at 40 cents net each; with Customers at 50 cents net each.

### Reverse Rollers of Timken Worm Thrust Bearing

The thrust of the Fordson worm is transmitted to the worm thrust roller bearing by the nut on the end of the worm and when the tractor is moving ahead the entire load

is taken up by the forward set of rollers of the worm thrust bearing.

As the tractor is seldom driven backwards or reversed and then almost always without draw bar load, there is little or no wear on the rear set of rollers.

When the tractor is taken down it is advisable to inspect the worm roller bearing for wear. This is indicated by roughness of the forward cup or cone, or on the forward rollers themselves. If the parts are worn to any extent it is advisable to reverse the cone and roller assembly. The forward cup may also be reversed if worn or flaked.

Dealers should call these suggestions to the attention of their service men. By adopting these practices it is possible to increase the life of the worm thrust roller bearing and still further reduce the operating cost of the Fordson.

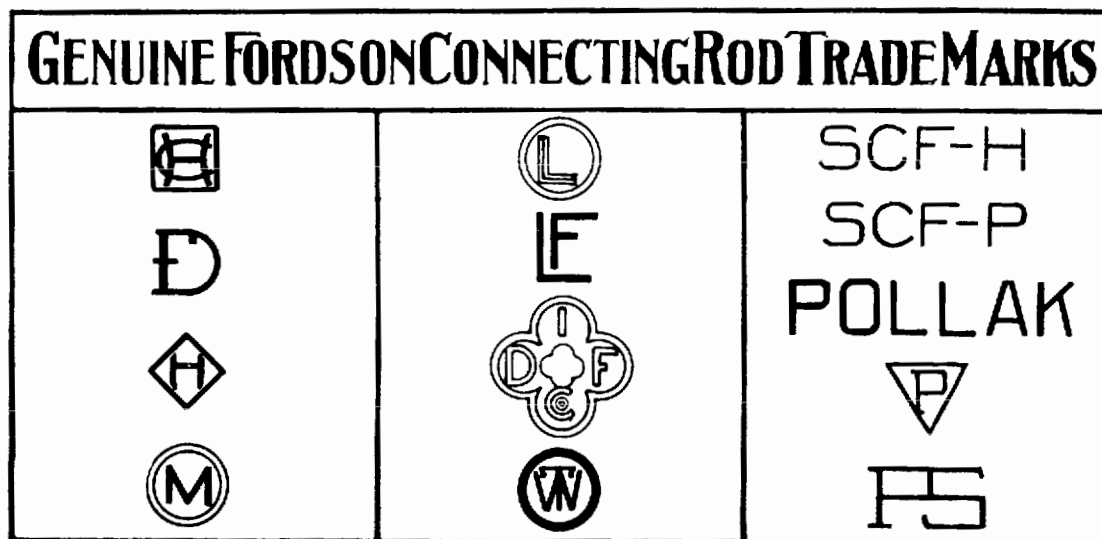


Fig. 45

Connecting rods bearing any one of the trade marks shown above, may be accepted in exchange.

**Cars bearing motor numbers 5,812,609 to 5,922,968  
were shipped during April**

### Serial Numbers of Tractors Shipped

	Motors Assembled at Cork, Ireland	Motors Assembled at Home Plant
March.....	109,892 to 110,209	202,522 to 208,632
April.....	110,210 to 110,430	208,633 to 216,080

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## Inspection Service on Lincoln Cars

THE efficiency of any car depends largely upon the care it receives during the first few months following delivery. Systematic attention to lubrication and mechanical adjustments will insure that excellence of performance that is a feature of all Lincoln cars.

For a period of four months from date of delivery, every purchaser of a Lincoln car is entitled to free inspection service, both as to material and labor, as outlined below:

- 1—Change oil in motor at the end of first 400 miles and each 750 miles thereafter.
- 2—Oil and grease car (including lubricator connections, oil, and grease cups).
- 3—Examine lubrication of transmission and rear axle.
- 4—Check correctness of oil pressure at idling and maximum engine speeds.
- 5—Does oil indicator level register correctly?
- 6—Is gasoline fuel strainer clean?
- 7—Gasoline gauge on tank—check for accuracy.
- 8—Battery—check for water, gravity and connections.
- 9—Generator—does it charge properly?
- 10—Starting Motor—check oiling, brush contacts and commutator.
- 11—Distributor—check all adjustments.
- 12—Check condition of all lights.
- 13—Brakes—check adjustments, both internal and external.
- 14—Front wheels—check alignment and bearing adjustment.
- 15—Wheel rims—check for true running.
- 16—Springs—tighten clips and oil.
- 17—Carburetor—check all adjustments.
- 18—Radiator—do syphon and shutters function properly?
- 19—Timing chain—check adjustments.
- 20—Clutch—see that all adjustments are properly set.
- 21—Clean carbon if necessary.
- 22—Tighten body bolts.

It is advisable that the car be returned to the dealer at the end of the first 400 miles, and thereafter at the end of each 750 miles travelled. After a period of four months a nominal charge may be made for this service.

It is recommended that dealers call Lincoln owners' attention to the advantages of this periodical service to insure their cars being maintained in first class condition.

Free inspection is not expected to cover repairs or labor occasioned by accident, misuse, or neglect.





### Exchange Policy on Tractor Two Lead Worm and Worm Wheels

We have discontinued the manufacture of S-21-F-1528 worm, two lead type.

In replacing a worm of this type, it will be necessary to install S-21B-F-1528B three lead worm, and S-20B-F-1294B, 51 tooth worm gear.

In order that this change may be made with as little additional expense to the owner as possible, dealers are requested to furnish the new style parts at one-half list price.

For the present, we will continue to furnish S-20-F-1294, 35 tooth worm wheel of the older type.

cover furnished with each tractor. This precaution will facilitate starting the tractor in the morning as it will keep the moisture off of the ignition system and will help preserve the appearance of the tractor.

### Identification Card

In Fig. 58 is shown an identification card used by the Ford dealers of Beaumont, Texas, for preventing unauthorized parties obtaining a discount on parts.

Copies of this card are distributed only to those concerns who are entitled to a discount, and it must be presented by a representative of the concern at the time of

### The Starter Ring Gear

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

### Use the Tractor Cover

When tractors are left in the field over night they should be covered with the

Fig. 58

making their purchase. As an additional precautionary measure, a new card of different color is issued every three months.

Our dealers advise that this plan has proven very effective in excluding those parties who were not entitled to a discount.

## Cars bearing motor numbers 5,922,969 to 6,058,671 were shipped during May

### Serial Numbers of Tractors Assembled

	Motors Assembled at Cork, Ireland	Motors Assembled at Home Plant
May	171,290 to 171,444	216,081 to 225,028

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## The Lincoln Timing Chain

The Lincoln cam shaft and water pump driving shaft are driven from the crankshaft by a silent chain which is illustrated in Fig. 59. The water pump driving shaft rotates in a bearing mounted in the chain housing at the right front end of the crank case. This bearing has, extending forward from it, an eccentric portion by which it is possible to increase the distance between the water pump and crankshaft sprockets.

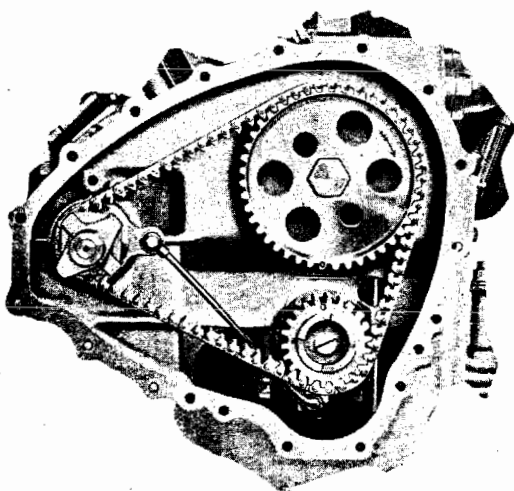


Fig. 59

The Timing Chain should be inspected and checked for adjustment during every inspection service. On a new car or after installing a new chain, an adjustment is usually necessary after driving from 1,000 to 2,000 miles due to the sprockets smoothing up to a good bearing surface. Necessity for adjustment of the chain can be determined by listening for noise resulting from the chain striking the chain case cover or by inspecting the chain for looseness or backlash thru the inspection hole located in the chain case cover.

If it is found that the combined upward and downward deflection of the chain is more than  $\frac{3}{4}$ " the chain should be adjusted. Enough pressure should be brought to bear on the chain to make sure that all the slack is gathered between the cam shaft and water pump sprocket. To adjust the chain proceed as follows:—Remove the lock screws and locks located on the rear side of the chain housing. Then apply the two Spanner Wrenches furnished in the tool kit of every Lincoln Car. (These tools are also listed as Nos. 5675 and 6077 in the Lincoln tools listed on Page 46, in the June Service Bulletin.) One Spanner fits the castellated end of the bronze driving shaft bearing and the other the castellated steel lock nut. Hold the bronze bearing securely from turning and pull up on the lock nut wrench to loosen it and loosen only enough to release the bearing, then pull outward toward frame on the driving shaft bearing wrench to take up the slack in the chain. The chain is properly adjusted when combined upward and downward movement does not exceed  $\frac{1}{4}$  inch. Do not pound on the wrench or apply any other leverage than that obtained by operating the wrench by hand. While holding the wrench in this new position, tighten the lock nut, thus fastening the bearing securely to the crankcase.

If the chain is found to have stretched so much that it takes up all of the adjustment and is still too loose, then it will be necessary to remove the chain entirely and take out the hunting or special adjustment link to shorten it. See Fig. 60. Portion of chain between A and B is the hunting link.

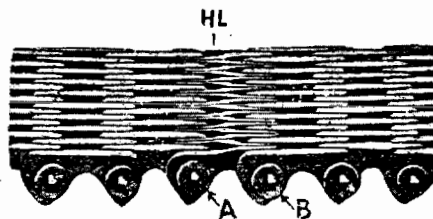


Fig. 60

To do this it is first necessary to remove the front end cover from the motor proceeding as follows:

1. Drain the cooling system.
2. Remove the headlights.
3. Remove the fan belt (loosen fan bracket bolts to do this.)
4. Unbolt fan bracket from distributor and remove complete with fan.
5. Remove the radiator.
6. Remove fan pulley from end of cam shaft, using tool 11878. (Screw turns anti-clockwise.)
7. Remove the cap from front engine support.
8. Remove the bolts from rear flanges on exhaust manifold.
9. Carefully jack up the front end of the engine.
10. Remove the brass protecting caps on threaded ends of two dowels, apply  $\frac{3}{8}$ " nuts and draw out dowel pins in timing chain cover or use tool 11375.
11. Remove the bolts from around the edge of cover. The cover can then be removed.

Hand crank the engine until hunting link is in position on top of camshaft sprocket, cut the heads off seat pins, A and B. See Fig. 60. Then crank the engine so that the hunting link is positioned between the crankshaft and water pump sprockets, and push out the seat pins first and then the rocker pins.

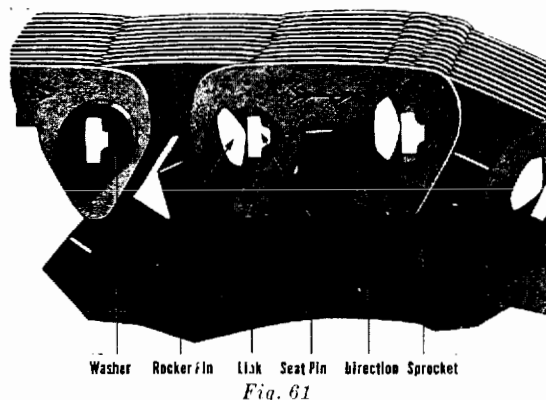
The chain may now be removed. Be sure that these pins are not dropped and left in the crankcase as they may do serious damage.

To replace the chain, if the relative position of the crankshaft and camshaft has been disturbed, carefully turn the crankshaft and camshaft so that the letter "O" on each of the sprockets face each other and are on the same center line through the camshaft and crankshaft; that is, the "O" on the camshaft sprocket tooth pointing downward and between two crankshaft sprocket teeth pointing upward. (See Fig. 59.)

Place the chain around the three sprockets so that the arrows stamped on edge of the chain are pointing in the direction that the chain is to run. This is very important for if the chain is not correctly placed it will be quickly ruined.

Bring the ends of the chain together. (This is done most easily on the camshaft sprocket.) Then replace the pins, being sure that the rocker pin is inserted as shown in Fig. 61. Use a new rocker pin and an extra seat pin to make the alignment of the links. Then hand crank the engine to bring the joint between

the crankshaft and water pump sprockets at the bottom of the housing.



Clamp the new seat pin which is shown in Fig. 61, between copper jaws so as not to injure it and with a light hammer carefully rivet the small washer on the end which will be on inside edge of chain.

Using tool 4542 insert the new seat pin which has the washer riveted to it from the rear or inside edge of the chain, forcing out the seat pin used for alignment. Use care not to disturb the rocker pin while making this change.

After the new seat pin has been properly installed, insert a riveting block (tool 4543) between the inside end of the pin and the crankcase wall. Place another small washer over the head of the pin and with a light hammer carefully and securely rivet it on.

Be sure that the rocker pin is installed correctly, for should it be inserted in the wrong direction it will cause the chain to be noisy and quickly ruined.

If you find that hunting link has been removed from the chain and if the eccentric adjustment is all used up, then it is advisable to purchase a new chain, or return the old one to the manufacturer for repairs.

### Lincoln Spring Washers

A slapping noise in Lincoln springs is often incorrectly attributed to loose or worn spring bolts, whereas usually such a noise results from side play of the springs on the bolts.

Lincoln spring bolts are amply large and carefully fitted so that there are practically no occasions for replacing them.

When noise develops in springs it can usually be overcome by replacing the spring washer with one that is thicker so as to take up the side play.

In addition to the standard washer branches can supply spring washers in four different oversizes of .010", .020", .030" and .040".

### Lincoln Production Data

The following table shows the production date of Lincoln Cars by car number (by 500 cars).

Car No.	Production Date
1.....	September 14, 1920
500.....	November 17, 1920
1,000.....	March 8, 1921
1,500.....	April 29, 1921
2,000.....	June 23, 1921
2,500.....	September 10, 1921
3,000.....	October 27, 1921
3,500.....	March 15, 1922
4,000.....	April 17, 1922
4,500.....	May 2, 1922
5,000.....	June 2, 1922
5,500.....	June 22, 1922
6,000.....	July 14, 1922

### Care of the Body

To preserve the good appearance and finish on the Lincoln Car, careful attention must be paid to the important operation of washing.

Do not use soap on the body, hood, or fenders. Mud, water, grease or oil should never be allowed to remain on the body. If there is mud on the car wash it off before it dries with a volume of water flowing from the hose with little pressure. Heavy pressure or force will drive the mud or grit into the varnish. After the body is thoroughly soaked, use a large, clean soft sponge and rub lightly with a downward motion, keeping the stream of water directed around the sponge; clean the sponge frequently.

In washing a car, begin at the top and work down. Wash and dry one side of the body at a time; for drying use a soft clean moist chamois skin which must be rinsed frequently in clean water and wrung as dry as possible.

Do not wash the hood while it or the engine are warm, as that will destroy the luster of the finish. Do not wash the car in the sun, because it is liable to dry before being chamoised, which will spot the finish.

The undersides of the fenders and running boards should be flooded with water until most of the mud is washed off; the remainder of the dirt and grease may be removed with warm water soap suds, after which it should be thoroughly rinsed with running water.

Always use a clean soap free of alkali. Do not use the same sponge for body and chassis.

### Care of Closed Body Interior

Closed body interior should be cleaned with a vacuum cleaner. In the absence of a vacuum cleaner, the dust may be removed by brushing lightly with a whisk broom. Do not use a stiff bristle brush, as it will pick up the nap and leave a woolly appearance on the broadcloth. Ordinary spots may be removed by fastening a damp cloth over the upholstery and steaming by running a hot iron over the entire surface. Do not steam a portion of the surface but the entire piece. If the hot iron is held over a surface until the cloth is dry, it will leave a shiny spot, which can be removed by going over the shiny surface again.

Grease spots can be removed by ether. In spot cleaning it is necessary to go over the entire surface and not a part of it. Ether raises the nap on broadcloth which makes it necessary to steam the cloth after the spots are removed. Rugs or carpets can be cleaned by rubbing with a sponge washed in gasoline.

Soap and water should not be used to clean closed car upholstery as it spreads spots instead of removing them.

### Care of Top and Curtains

Never fold or lay the top back while damp. Dust or dirt on the outside of the top should be removed with a sponge and soap suds. Use a pure high grade linseed oil soap and do not get soap spots on body or hood. Rinse with clean water and dry with a chamois.

As a precaution, have all paint and enamel work thoroughly wet when washing the top.

Never use cleaners which contain gasoline, as they are detrimental to top material.

Clean inside of top with a vacuum cleaner, however, if a vacuum is not available, then use a bristle brush or whisk broom.

Do not brush celluloid curtain lights but wipe them clean with a damp sponge or soft cloth.

Side curtains should be carried in the compartments provided for them. Each curtain should be folded with the mark indicating its hanging position in view. Curtains should never be folded when damp, and care should be taken in folding the curtains, not to crack the celluloid.

### Glass for Ford Cars

Due to shortage it is often necessary for dealers to obtain windshield and other glass locally. If such a contingency arises, the sketches shown in Figs. 62 and 63 will be found useful in ordering the part required. The thickness of the windshields and the side glass should be held from  $\frac{1}{16}$  to  $\frac{3}{16}$  inches.

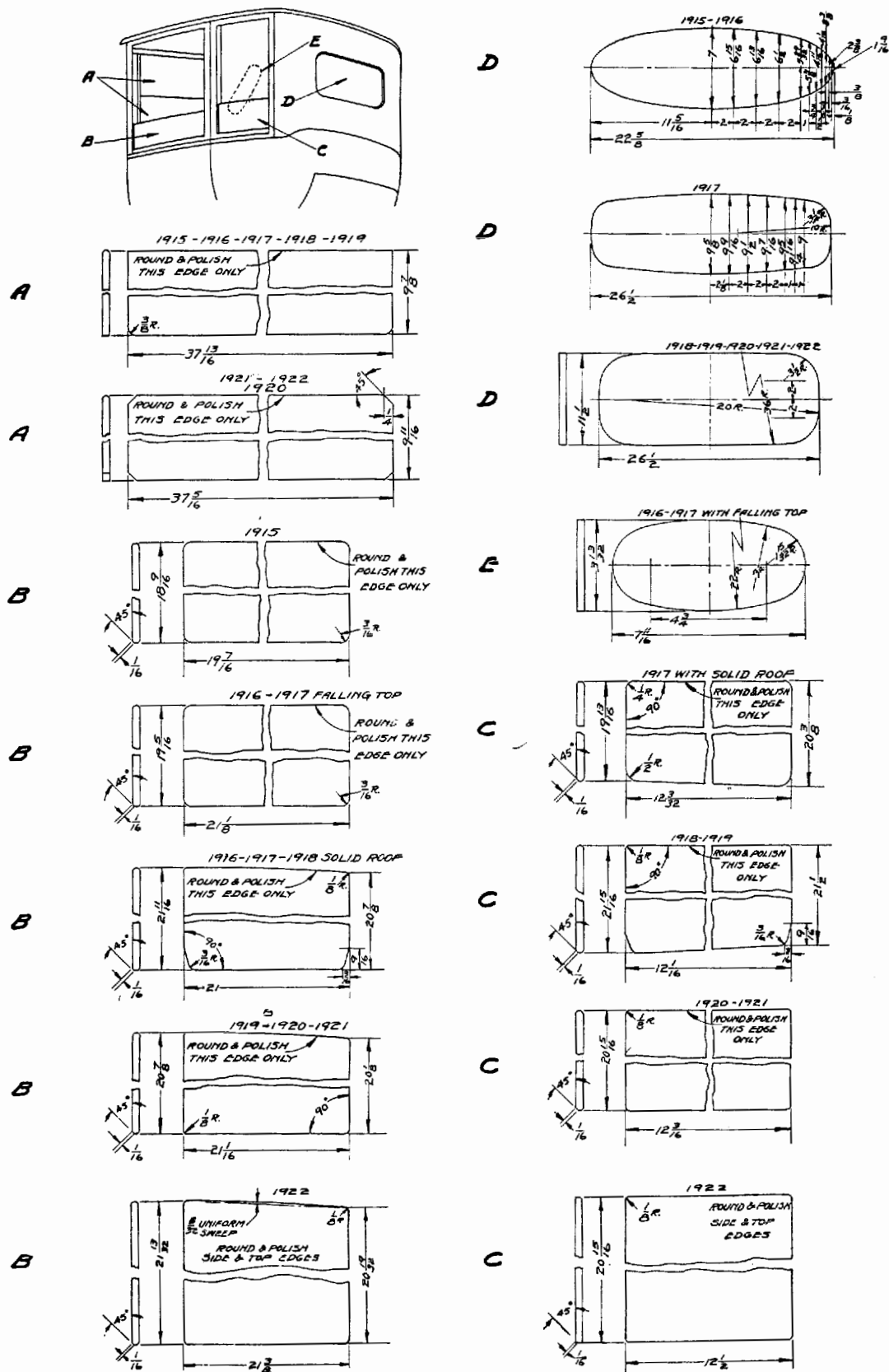


Fig. 62

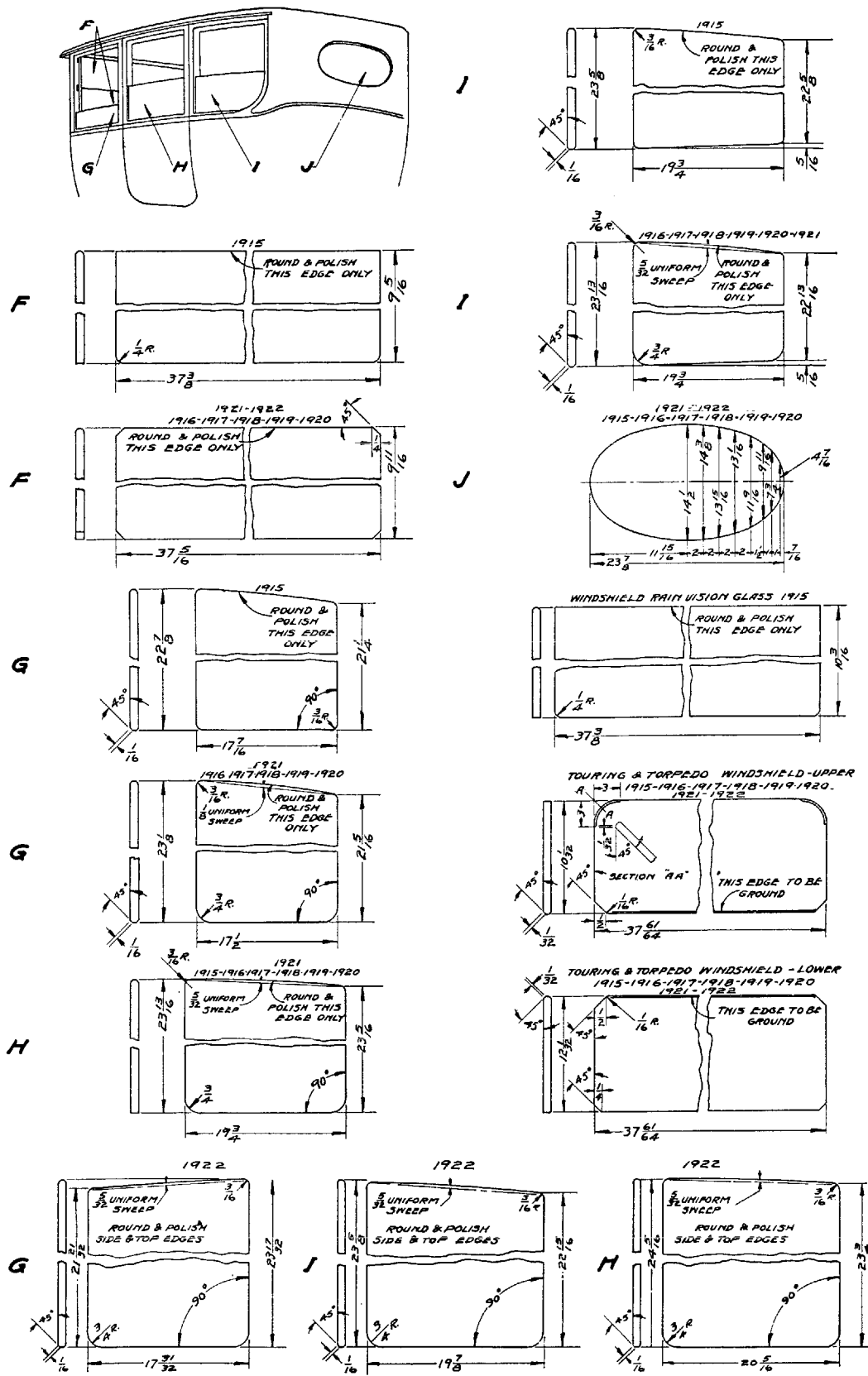


Fig. 63

## Protect Upholstering on Customers' Cars

In order to protect the upholstery on customers' cars from becoming soiled when repairs are made in dealers' shops, we are furnishing dimensions of covers made from eight ounce duck, the use of which will prevent grease spots or oil stains reaching the upholstery.

Upholstering that has been soiled during the course of repairs, not only offsets the work of the dealer, regardless of how efficiently the repairs may have been performed, but invariably results in dissatisfaction on the part of the customer.

In order to insure customers' cars being returned in as cleanly a condition as when received, dealers should provide themselves with as many sets of these covers as is necessary to take care of their service requirements. The cost involved in the making of such covers is negligible in comparison with the results obtained from the standpoint of efficient service and satisfied customers.

### Ford Coupe Body Slip Covers

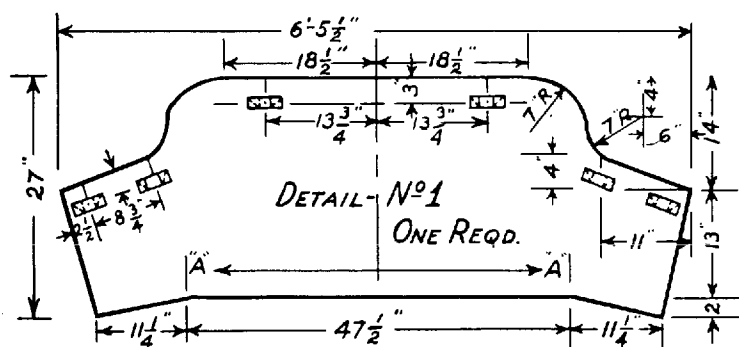


Fig. 64

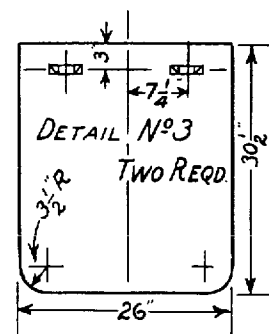


Fig. 66

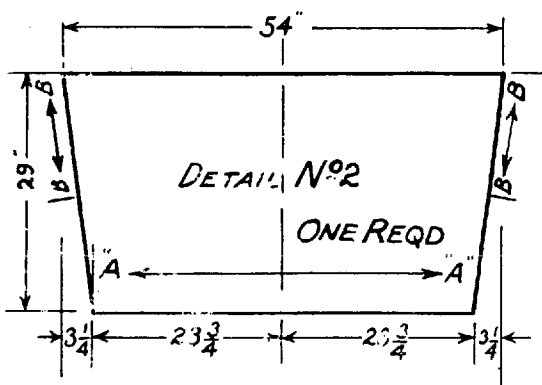


Fig. 65

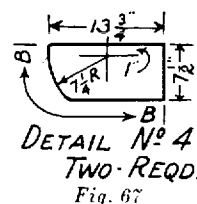


Fig. 67

#### NOTE:

Sections A-A as shown on Details Nos. 1 and 2 to be sewed together.

#### NOTE:

Sections B-B as shown on Details Nos. 2 and 4 to be sewed together.

#### NOTE:

Material for Loops to be cut 2" x 8"—doubled over and sewed down.

## Ford Sedan Body Slip Covers

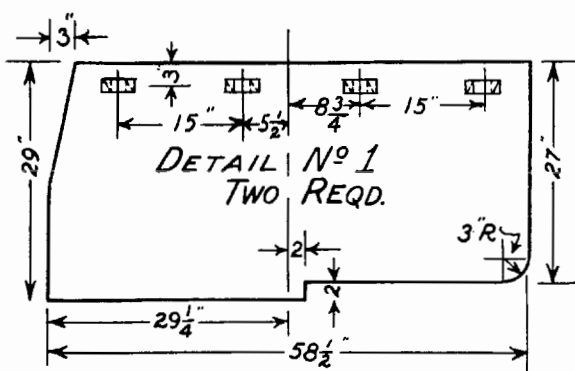
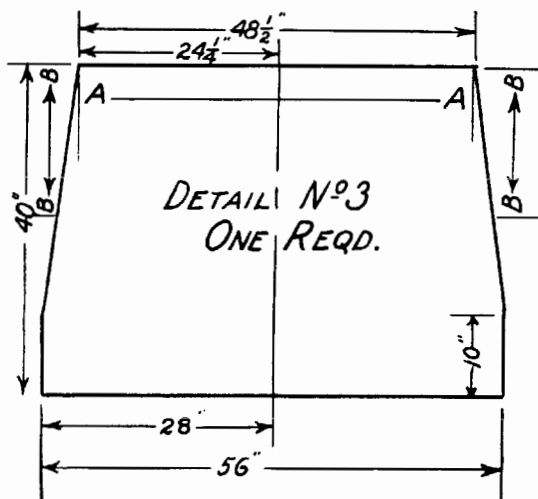
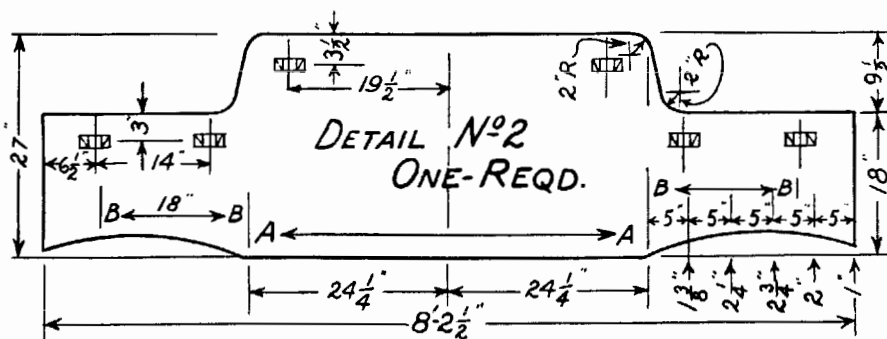


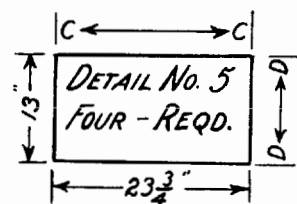
Fig. 68



*Fig. 70*



*Fig. 69*



*Fig. 72*

NOTE:

Sections marked A-A as shown on Details Nos. 2 and 3 to be sewed together.

Sections marked B-B as shown on Details Nos. 2 and 3 to be sewed together.

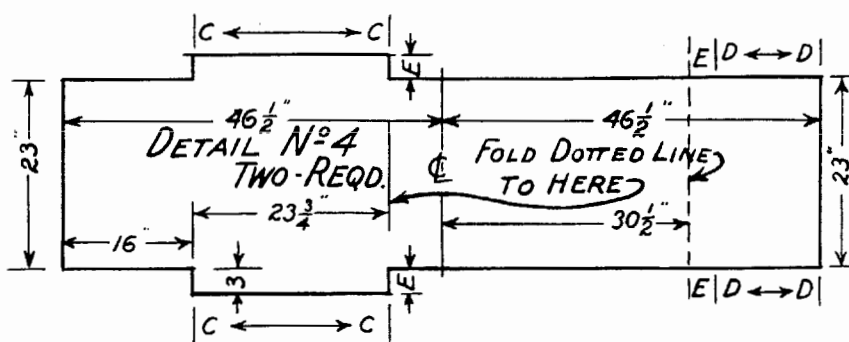
In Detail No. 4 material to be folded over and sections marked **E** to be sewed together.

Sections marked C-C as shown on Details Nos. 4 and 5 to be sewed together.

Sections marked D-D as shown on Details Nos. 4 and 5 to be sewed together.

Material for Loops to be cut 2" x 8" doubled over and sewed down.

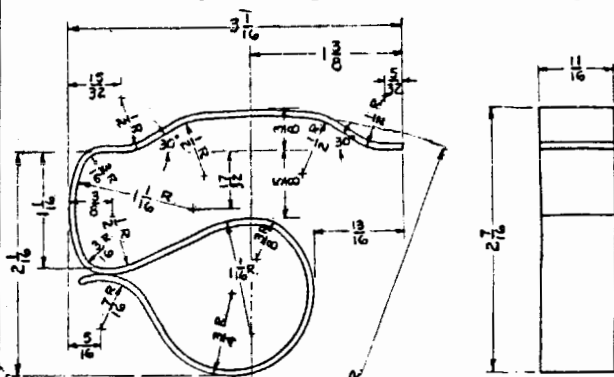
All Slip Covers to be made from 8 oz. Duck.



*Fig. 71*

In Fig. 73 is shown the clamps for holding the covers in place. Two of Fig. 74 are used on the Sedan rear seat back, and two are used on the Coupe seat back. The clamps are forced down between the seat back and rear panel.

Fig. 73 clamps are used for holding the covers on the panels; two of them are used on each panel, therefore eight are required for the Coupe and twelve for the Sedan. The clamps are installed by hooking them into the runway for the windows.



DET-1- PANEL COVER CLAMP  
SPRING STEEL  
STK. 1/16 THICK WGT. 12LB.  
HEAT TREATMENT "SP"  
DEVELOPED LENGTH 10"

Fig. 73

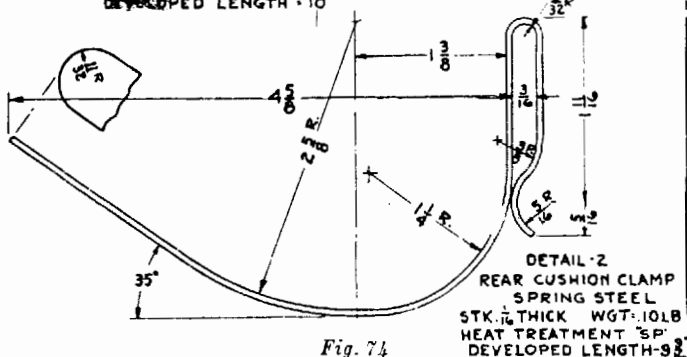


Fig. 74

DETAIL-2  
REAR CUSHION CLAMP  
SPRING STEEL  
STK. 1/16 THICK WGT. 10LB.  
HEAT TREATMENT "SP"  
DEVELOPED LENGTH 9 3/4"

### Lincoln Lubrication

We have discontinued supplying dealers with Lincoln Special Engine Oil, Gear Lubricant and Cup Grease.

Below are specifications of motor oil which should give satisfactory results in the Lincoln motor during Summer weather:

Flash	370 Degrees Minimum
Viscosity @ 100°	450" Maximum
Viscosity @ 210°	55" Minimum
Cold Test 30°	Maximum
Color	No. 5

### Lincoln Alloy Pistons

Beginning with Engine No. 5706, all Lincoln motors have been constructed with specially heat treated alloy pistons.

These pistons can be installed in any Lincoln engine when a complete set is used. When ordering less than a complete set of pistons specify whether alloy or cast iron is desired and give weight which is stamped on the piston head.

Dealers should bear this information in mind when ordering replacement pistons for Lincoln engines.

**Cars bearing motor numbers 6,199,797 to 6,334,196  
were shipped during June**

### Serial Numbers of Tractors Assembled

June

Motors Assembled at  
Cork, Ireland  
171,145 to 171,742

Motors Assembled at  
Home Plant  
225,029 to 234,355

# Ford Service Bulletin

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## A Better Service

**M**OTORISTS of today are giving more thought to the care of their machines than ever before, and are realizing that intelligent and systematic attention not only results in a considerable saving in repair bills, but adds materially to the dependability of their cars.

With the idea of accommodating Ford owners who desire periodical inspection of their cars, the F. B. Connelly Company, Ford dealers at Billings, Montana, have devised the following service plan:

Once a month their service man calls for the owner's car at a definite time previously arranged, and brings the machine to their service station, where it is given the following attention:

- 1—The spark plugs are cleaned and adjusted.
- 2—The commutator is cleaned.
- 3—The coils are adjusted.
- 4—The carburetor is adjusted.
- 5—The battery is tested and refilled if necessary; hold-downs tightened.
- 6—The front wheels are lined up.
- 7—The transmission bands are adjusted.
- 8—The car is oiled and greased throughout.
- 9—The springs are graphited.
- 10—The crankcase of the motor is washed out and the oil changed.
- 11—The headlights are properly focused.
- 12—The tires are inflated to the proper pressure and examined for cuts, etc.
- 13—The car is washed.
- 14—A written report is made of the condition of the machine.

It is generally understood that every Ford buyer is entitled to a general inspection free of charge during the first thirty days following delivery of car; thereafter, any charge made for this service is optional with the dealer.

A service plan that tends to keep Ford cars in proper mechanical condition is bound to create favorable comment from owners, as well as prospective buyers.

## How to Handle Claims for Parts Short or Damaged in Shipments

Care should be used in receipting for carload shipments. Notations of shortages and damages endorsed on paid freight bills by railroad agent establish a carrier's liability and insure prompt payment of claims. On receipt of a carload shipment, all seals, end as well as side should be removed and carefully preserved or a record made of the numbers. The contents of the car should then be checked with the packing sheets. In the event any of the parts are short, the freight agent should endorse such shortage on the freight bill. If any of the boxes or cartons have been broken open, a notation should be made to that effect as a means of protection in event a shortage is found to exist. If any of the parts are found damaged, a notation should be made on the freight bill by the railroad agent showing the extent of the damage.

When shortage is found to exist, the Dealer should report such shortage to the branch having charge of the territory in which he is located, being careful to furnish the initials and number of the freight car, numbers of the seals under which the car was delivered, the packing sheet and receipted freight bill with the agent's notation. A full report should also be made of the condition of the car and contents with particular reference to boxes or packages that may have been opened enroute or damaged in transit by rough handling of car.

We cannot consider any claim for short-shipment unless the seal numbers are furnished, as this is the only protection we have against cars being opened in transit and parts removed. In order that there will not be any delay in getting our cars into the hands of customers, the Dealers should furnish the parts short or damaged from their stock, and order them at once from the branch.

The Dealer's claim will not be prejudiced by proceeding in this way, pending final decision by this Company. If, upon investigation, we find that the shortage is due to our failure to include the parts in the shipment, credit will be issued in favor of the Dealer for parts claimed short. In the case of parts damaged due to faulty loading on our part, credit will be allowed for the parts. If we are not responsible for the shortage or damage, then the Dealer should file claim with the transportation company. In filing claim, the carrier should be furnished with the following documents in support of the claim: original bill of lading, if not previously

surrendered to carrier; a statement by the claimant showing how amount of loss or damage is determined, with all evidence that can possibly be secured; original paid freight bill; original invoice or attested copy; bill for cost of repairs. The absence of bill of lading or paid freight bill should be explained if for any reason they cannot be presented, and bond of indemnity given on form supplied by the carriers.

In case of parts damaged that have been repaired, your invoice showing cost of repairs should be furnished. All cars and parts are sold F. O. B. this factory or our assembly plants. Although we cannot attempt to file claims in behalf of Dealers, we will assist them in recovering from the transportation company by furnishing affidavit of our checkers or any other information obtainable from our record. In the case of LCL (less than carload) shipments of parts, practically the same course should be followed in reporting shortage or damage to this office or filing claim with the transportation company. Special attention should, of course, be paid to reporting the condition of boxes that may have broken open in transit. When giving a receipt to the railroad or express company for delivery of package which has been broken open or shows evidence of having been opened or is otherwise in bad order, notation of such bad order should be made on the delivering company's original freight bill by the carrier's agent, as this endorsement, provided proper affidavit can be made by the shipper regarding packing, etc., will establish the carrier's liability for loss or damage.

Claims should be filed just as soon as the loss or damage is determined. The time limit for filing loss and damage claims with the railroads, express companies and the U. S. post office is six months after delivery, or in case of failure to deliver, within six months after a reasonable time for delivery has elapsed.

Claims referred to this company covering Ford cars and Fordson tractors must be accompanied by information giving the motor numbers. Lincoln car numbers must be given on claims covering Lincoln cars.

Automobiles and tractors are loaded and braced in accordance with certain standards to insure safe transportation under normal railroad handling and the fact that bracing has given way is conclusive proof of rough handling in transit.

### Painting of Ford Closed Bodies

In the May Service Bulletin complete instructions for painting Ford touring and runabout bodies were published. In order that Dealers may be thoroughly conversant with all the details of body painting, we are now publishing detailed instructions for painting the Ford Coupe and Sedan bodies.

Experience has proven that whenever the painted surface is checked it is necessary to remove the old paint and varnish in order to obtain a satisfactory job. It is never advisable to refinish with air drying varnish and paint over enamel as air drying paint or varnish will not adhere to a baked enamelled surface.

#### Operation No. 1

The old paint and varnish must be removed from the body before repainting. To do this apply a good grade of paint and varnish remover over the surface of the old paint on the body, as described in operation No. 1 of the open body painting instructions on Page 34 of the May Service Bulletin.

#### Operation No. 2

It is next necessary to wipe off the surface of the body using old rags or towels. Care must be taken to make sure that all traces of rust are removed from the surface. This can be accomplished by using a solution composed of two parts phosphoric syrup and one part alcohol. A 2" Gibraltar brush should be used to apply this solution over rust spots. When all traces of rust have been cleaned off, the surface of the body should be washed with clear denatured or wood alcohol and thoroughly dried. Then, sand the metal and woodwork to a good smooth surface, using 3-0 sand paper. When the body has been properly sanded, dust it off with a painter's duster and tack rag as described in operation Number 2 of the May Bulletin. It is essential that the surface of the body be perfectly clean and by using the tack rag very carefully, getting into every corner and wiping the panels off thoroughly, all surplus dirt or lint can be removed from the surface.

#### Operation No. 3

A good grade of permanent wood oil filler should be applied on the woodwork and roof. If a wood oil filler cannot be obtained, a wood oil lead primer can be used. The primer should be thinned down to brushing strength and strained into a cup or paint container through two or three thicknesses of nainsook or fine mesh cheese cloth. All metal parts of the body should be primed

with an Oxide Primer—which can be red, maroon or black in color. Both the wood and the metal primers should be applied with a 1½" and a 3" Camel hair brush. These should be put on in a horizontal position and laid off in a vertical position. From 24 to 48 hours should be allowed for the priming coat to become thoroughly dry.

#### Operation No. 4

Next, sand the roof woodwork and outside metal parts, using a 4-0 sand paper. When a good smooth surface has been obtained, it should be dusted down with a painter's duster and tack rag'd as described in a previous operation. When this has been done, the body is ready for the second coat of paint which is known as the lead coat. This is applied in exactly the same manner as the first primer. 24 hours should be allowed for this coat to dry.

#### Operation No. 5

The entire surface of the body, including the roof, should now be sanded with 4-0 paper. It is again dusted off and tack rag'd as previously described. Next, the second coat of surface lead is applied and 24 hours allowed for this coat to dry.

#### Operation No. 6

When the second lead coat is dry and the woodwork and metal parts have been sanded down to a good smooth surface, dusted off and tack rag'd very carefully, the body is ready for the glazing operation. For this operation a good lead glazing putty should be used. This material should be applied as thinly as possible over the entire surface of the body using 1½" and 3" pliable putty knives. Care must be taken to see that all metal and wood defects are properly filled with the glazing material. Screw heads should be filled with hard lead putty which can be made by adding dry white lead to the paste putty that has been used on the inside wood and metal surfaces. 24 hours should be allowed for the glazing coat to dry.

#### Operation No. 7

In this operation the body must be sanded very carefully with 4-0 or 5-0 sand paper. It is essential that a good surface be obtained for the succeeding coats of paint and varnish, therefore the glazing putty must be sanded down as smooth as possible. The operator should rub his hand lightly over the entire surface to make sure that there are no high putty spots. Next, dust the surface of the body and tack rag it. It is then advisable to

shellac around all mouldings, crevices and joints with very thin white shellac, using a 1" Ox hair brush for the operation. The application of the shellac is to seal in any dirt or grit which it is impossible to remove from the mouldings or crevices. Approximately 20 to 30 minutes is required for the shellac to dry, after which the body should be tack rag'd and made ready for the first coat of color.

#### Operation No. 8

The color or ground coat should be strained very carefully into a quart cup and a 1½" and a 3" Camel hair brush used for applying it. This must be put on rapidly at brushing strength because it has a tendency to set up and dry faster than any previous coat. It should be put on freely in a horizontal position and laid off in a vertical position. This coat must be allowed a full 24 hours to dry.

#### Operation No. 9

The body must now be sanded, using 6-0 finishing paper. Care should be exercised not to sand the surface of the body too much as this sanding operation is merely to remove any surface dirt which may have accumulated during the drying of the color coat. If the operator should happen to sand through the color coat it can be touched up with the same material again so as to leave the entire surface of the body in a solid color with no bare spots showing.

#### Operation No. 10

The body is now ready for the first coat color varnish. The color varnish should be properly strained through nainsook into clean cups. 1½" and 3" Badger hair filled brushes are used for applying this varnish. It is advisable to apply color varnish to the roof of the body before applying it to the balance of the woodwork. The color varnish on the lower metal parts should be left until the last. In color varnishing the metal parts, the operator should apply the varnish freely in a horizontal position and lay off vertically. After the roof is finished the operator should strain the color varnish before starting the woodwork and this straining operation should be repeated before doing the lower panel parts, as by so doing it is possible to secure a good clean job. 24 to 48 hours are required for color varnish to dry.

#### Operation No. 11

The body is now ready for oil sanding. In this operation 5-0 or 6-0 finishing paper,

immersed in a mixture of two parts raw linseed oil and one part gasoline is used. Oil sanding is described in detail in operation Number 9 of the May Bulletin. When the body has been thoroughly oil rubbed, it should be washed, using a solution composed of two parts of water and one part of gasoline. A good clean sponge should be used to apply this solution and care must be exercised to remove any surplus oil that may have accumulated in the crevices and corners of the body. As the oil has a tendency to create a gummy surface, it should be washed off immediately after the completion of the sanding and rubbing work.

#### Operation No. 12

It is now necessary for the operator to inspect the body very carefully to make sure that it is of a solid and uniform color and has not been rubbed through around the mouldings, door jambs or window channels. In case any rubbed spots are found a thin coat of color or ground coat can be used to touch up the surface. This can be thinned down with naphtha and will dry very quickly. After this is done the body should be dusted off and the entire surface tack rag'd. The body is now ready for the second coat of color varnish which should be allowed a full 48 hours to dry before the finishing varnish is applied.

#### Operation No. 13

Following the second coat color varnish the body is again oil sanded. After oil sanding, the body should be inspected and the door jambs, window channels and windshield frames coated in with a semi flat black, using a 1½" Camel hair brush. In case the body is to be striped, use a regular painter's striping pencil, dipped in flat color. The striping should be placed approximately ⅛ of an inch below the aluminum belt of the body. 20 minutes should be allowed for the striping to dry before tack ragging the body preparatory to using the finishing varnish.

#### Operation No. 14

In preparing for finishing varnish great care must be taken to see that the paint room is absolutely clean and that all cracks or openings around the doors or windows of the room are sealed with strips of paper or rags so as to exclude any dust. The floors of this room should be kept sprinkled while the operator is finishing the body. The color varnish brushes should be cleansed with high test gasoline so that

they are absolutely free from dirt or grit. New varnish cups should be used and the inside of each cup shellaced carefully around the seams so that surface dirt will be sealed in. The finishing varnish must be strained through two or three thicknesses of nainsook before using. The crevices and corners of the body should be shellaced with white shellac, using a 1" Ox hair brush. Finishing varnish is applied to the roof first, using a 3" flat or small oval brush for applying. After the roof has been finished the body and the woodwork should be tack rag'd and the finishing varnish strained for the second time. The woodwork above the aluminum belt is next to be finished and for this work a 1½" and a 3" badger brush is used. Finishing varnish should be applied very freely and flowed out to obtain a satisfactory job. The operator can flow the finishing varnish on upper half of the body before laying it off. Laying off in this case does not mean wiping up finishing varnish as is the case of color varnish but rather picking up the varnish sags or surplus varnish that may have accumulated on the lower parts of the mouldings or around the hinges and corners. After the roof and upper part of the body have been finished, the varnish should be flowed on the lower panels. It is advisable to allow it to stand on the panels for two or three minutes before laying off, so that air bubbles, which always accumulate in finishing varnish, will break and the varnish flow out satisfactorily.

### Location of Sedan and Coupe Door Check Straps

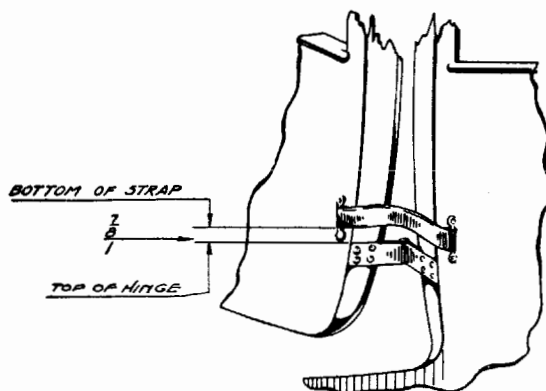


Fig. 76

Above sketch shows the improved location of the door check straps on Ford Sedan and Coupe bodies.

### Testing of Lubricating Oils

Owing to the large number of requests received, we have been obliged to discontinue testing samples of lubricating oils sent in by dealers.

Specifications of oil that should give satisfactory results in the Ford Motor are as follows:

Flash.....	370 F. Min
Fire.....	420 F. Min
Viscosity at.....	100 290 Max
Viscosity at.....	210 50 Min
Cold.....	30 F. Max

Specifications of a combination oil for the motor and transmission of the Fordson, were given on page 182 of the November, 1921 Service Bulletin, while specifications of a summer oil for the Lincoln engine, were published in the July, 1922 Bulletin.

For the use of their trade, dealers should select quality oils sold by well established refiners, as the importance of dealing with concerns of established reputation and reliability cannot be over-emphasized.

When laboratory tests of oils are desired arrangements should be made with commercial testing laboratories, or State Universities.

### Generator Bearings Packed in Cartons

Particular attention is being given to the manner in which generator armature bearings, Catalogue Nos. T 5121 and 5122, are being shipped to dealers for service purposes.

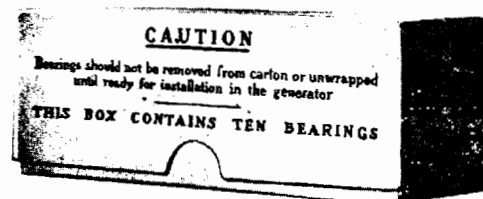


Fig. 77

After being inspected these bearings are individually wrapped in oiled paper and packed ten to a box. This will eliminate any possibility of dirt getting into the bearings while they are in transit or in storage in the dealer's Stock Room. The following instructions are printed on the side of the box:—

"Bearings should not be removed from carton or unwrapped until ready for installation in the generator."

We are certain that the number of generator ball bearing failures can be reduced if dealers will instruct their stock and repair men to follow these recommendations.

### Markings on Axle Shafts

We are no longer marking axle shafts in the key-way but are rolling the script word "Ford" on the rough or unmachined part of the shaft about  $7\frac{1}{4}$  inches from the gear end.

### Use Ford Babbitt

Below are specifications of the babbitt used in Ford and Fordson bearings:—

Copper.....	7.0—7.5%
Tin.....	85.0—86.0%
Lead.....	.10%-Maximum
Antimony.....	7.0—7.5%

From these specifications it will be observed that the amount of lead in genuine Ford babbitt is a negligible quantity.

This is of vital importance as bearings poured from babbitt, containing lead, will wear rapidly and soon pound out.

Dealers should purchase their entire requirements of babbitt metal from Ford Branches. By so doing they will avoid the possibility of securing inferior material from outside sources.

In rebabbitting cylinder blocks, care must be taken to make certain that the babbitt is at the proper temperature for pouring.

Perfect bearings can be poured only with the metal between 800 and 840 degrees Fahrenheit. If a Pyrometer is not available, this temperature may be estimated by the appearance of the metal. At about 900 degrees the pot and metal turn red and the metal "burns," coating rapidly, when the scum is scrapped off. At the proper temperature the metal appears like quicksilver and tarnishes slowly, when the scum is scrapped off, the coat of tarnish showing all colors. When too cold the metal acts sluggish and the tarnish takes on a dull appearance.

Some mechanics check the temperature with a piece of soft pine. The stick should char immediately but will not catch on fire unless held in the metal for some time. The stick should be perfectly dry as moisture on it would cause the metal to fly off, thus endangering the operator. Due to the fact that the melting point of babbitt is higher than that of copper, if the metal is not stirred thoroughly, there will be a tendency for the copper to come out. The result will be con-

dition are obvious since the bearings would be poured principally from tin and antimony and without the proper amount of copper would not be sufficiently hard to hold up under service.

### Raising and Lowering One-Man Top

The new design one-man top and slanting windshield which have recently been incorporated as standard equipment on all Ford touring cars, add greatly to the convenience and general appearance of the car. These improvements are in keeping with the policy of this Company to give purchasers of Ford cars the greatest car value per dollar on their investment.

In order that dealers may correctly instruct owners as to the proper method of raising and lowering the new top, we are giving below detailed instructions regarding this procedure.

First loosen wing screws which hold the front bow to the windshield as shown in Fig. 78, and the fasteners which hold the Gipsy Curtain to the rear bow. When this is done and the front bow is raised clear of windshield, go into the rear of body and remove the second bow from the clevis in the third bow by raising up on the second bow (See Fig. 79). This is done on each side. Next sit down and grasp second bow as shown in Fig. 80. A down and forward pressure throws the front bow over top center letting the top collapse as shown in Fig. 81. As on the old top it is important that the deck and pad are so arranged as to prevent chaffing. One end of the pin at the lower end of the second bow should be fitted into the bracket on rear bow, and the other end should be fitted into the hole in the second member of the front bow. The bows should then be strapped securely to the rests. Fig. 82 shows the top down and properly secured in position.

To raise the top, undo the straps, and kneeling in the rear seat raise front and second bows sufficiently to disengage the pin from the rear bow and second member of front bow (See Fig. 83). This is done on each side. Next grasp first and third bows at the center and pull forward (See Fig. 84.) Then facing forward take hold of front bow second member each side and raise top into position on windshield as shown in Fig. 85. Set ends of second bow in the clevis in the same manner in which they were removed (See Fig. 78). Draw down front end securing it to windshield and fasten Gipsy Curtains to the rear bow.

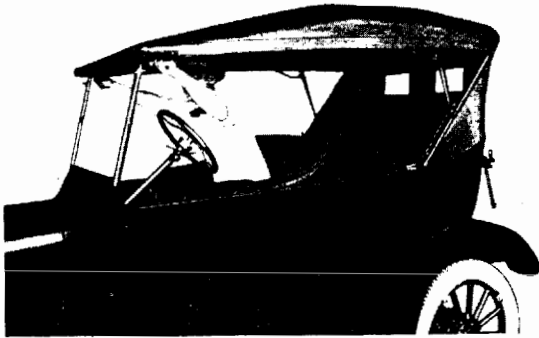


Fig. 78

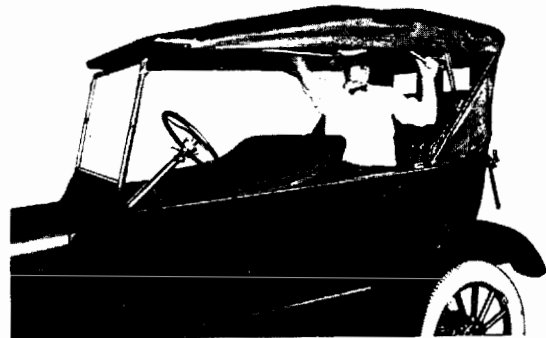


Fig. 79

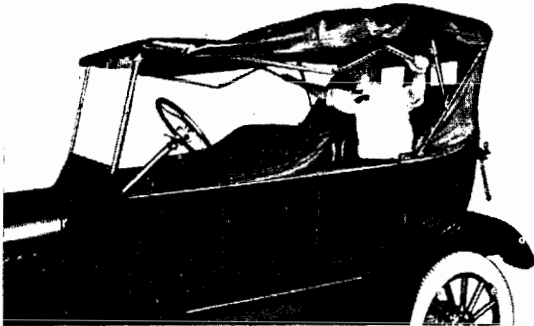


Fig. 80

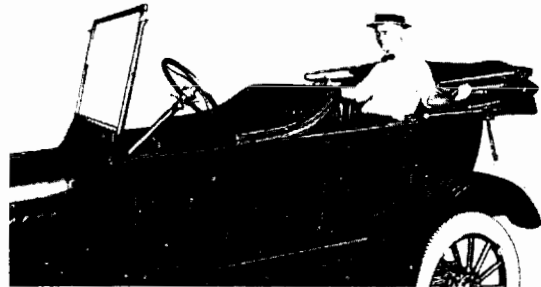


Fig. 81

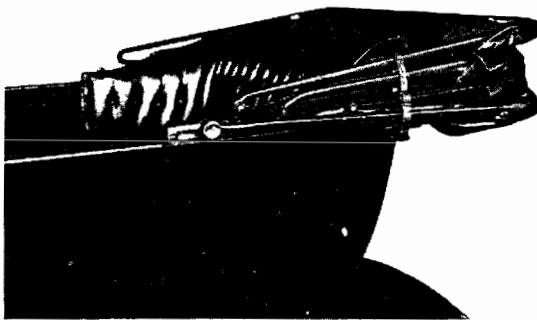


Fig. 82

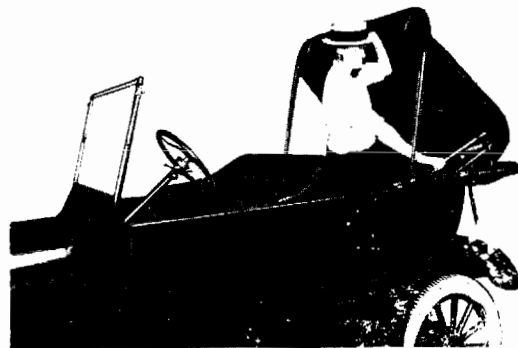


Fig. 83



Fig. 84



Fig. 85

### Fitting Lincoln Pistons

The following information will be found of assistance to dealers and repair men in fitting Lincoln pistons:

Before installing a set of pistons in a Lincoln engine, the cylinder bores should be inspected and measured to make certain that they are not worn out of round. The bores are ground at the factory to 3.375"-3.377" and the pistons to 3.372"-3.373", which gives a clearance of from .002" to .005".

The alloy pistons which are now being used in all Lincoln engines should be fitted with the same clearance as the grey iron pistons, as on account of the vertical slot through the skirt, there is no possibility of their seizing from expansion.

Lincoln piston rings have a clearance up and down in the ring grooves of from .001" to .0025" and when inserted in the cylinder bore should have a gap of from .010" to .030" between the ends when measured at the point touching the cylinder walls. It is of vital importance that the oil groove at the edge of the ring be assembled toward the lower part or skirt of the piston. Also, care should be taken to see that the gaps between the ends of the rings are not assembled directly over each other but instead are spaced at equal distances around the cylinder bores.

The piston rings used on the alloy and cast iron pistons are not interchangeable.

The piston pin is a snug fit in the piston bosses and is prevented from turning or moving endwise in the grey iron piston by a dowel point screw and in the alloy piston by the locating pin. Do not, under any consideration, drive the piston pin into the alloy piston as that procedure will cause the piston to be forced out of round.

Alloy pistons should be immersed in a pan of boiling water for a few minutes which will cause them to expand sufficiently to allow of the pin being pressed in by hand or tapped in lightly. If it is found necessary to tap the pin lightly, in order to fit it in the piston, hold the piston in the hand or against the body and not against a hard object. Such pistons should, also, be inspected and checked after the pin is in position to make sure that they are not out of round.

Lincoln connecting rods are stamped with a serial number on the bolt bosses and the boss on the cap has the same number. Care must be taken when assembling caps to rods that these numbers are on the same side and identical. This insures the cap being placed on the rod in the same position as it was when machined. When the rods are assembled in the motor these numbers, being on the outside edge of the rod, are visible with the oil pan removed.

When assembling alloy pistons on the connecting rods, care must be taken that the piston is turned so the vertical slot, regardless of which block the piston goes into, will face the left side of the motor. This places the slot on the side of the cylinder bore which receives the least thrust. This may be done as follows:—If a forked rod, assemble piston so that slot is on same side as the numbers on the bolt bosses. If a plain rod, assemble piston so that slot is on opposite side to the numbers.

### Lincoln Tire Carriers

Lincoln cars are now equipped with an improved design of tire carrier which makes it impossible to remove the spare tire from extra rim when the latter is locked on the tire carrier.

It will therefore be necessary when ordering tire carrier parts, to specify the serial number of the car for which such parts are required.

## Revised Motor Shipping Records

June 6,058,672 to 6,199,796

July 6,199,797 to 6,334,196

## Serial Numbers of Tractors Assembled

	Motors Assembled at Cork, Ireland	Motors Assembled at Home Plant
July	171,743 to 171,962	234,356 to 244,016

# Ford Service Bulletin

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Vol. 3

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## Checking and Adjusting Connecting Rod Bearings in Lincoln Engine

In the Lincoln engine the connecting rods for the pistons in the left hand block are forked on the crankshaft end and have a bronze bearing, babbitt lined, in which the crankshaft revolves. This bearing must not be adjusted. The remedy for excessive play at this point is to install a new bearing.

The connecting rods for the right hand block move upon the outside of the bronze bearing in the forked rod. They are called the single or plain rods. These rods may be adjusted for wear.

Procedure for adjusting and checking connecting rod bearings:

1. Drain oil from engine.
2. Remove oil pan.
3. Remove oil strainer plate.

To do this, remove the two nuts which hold the oil suction pipe in position on the oil pump, also the screw on each side of the oil pump which clamps the strainer plate to the crankcase. The strainer plate may now be removed, taking care not to break the cork gaskets which are shellaced to each side. The play in a single end rod is checked as follows:

Crank the engine until the rod desired is at the extreme end of the downward stroke. Then remove the cotter pins from the two right hand bolts in the forked rod. Tool 1148 Gauge for checking play in plain rod is then clamped securely in position on these two nuts. (See Fig. 86.) The indicator is adjusted so that the button rests in the center of the plain rod cap. Then grasp the connecting rod midway between the piston and lower end and pull rod up and down with sufficient force to take up all the play, the amount of which may be read upon the indicator. The correct clearance for the single rod is .003". Due to the fact that heat expands the bronze bushing to a greater degree than it does the steel connecting rod, it is imperative that this clearance be not less than .0025". Rods fitted closer than this will seize and burned out bearings will result. If it is found necessary to adjust the plain rod unbolt the caps and replace the shim on each side with one of the

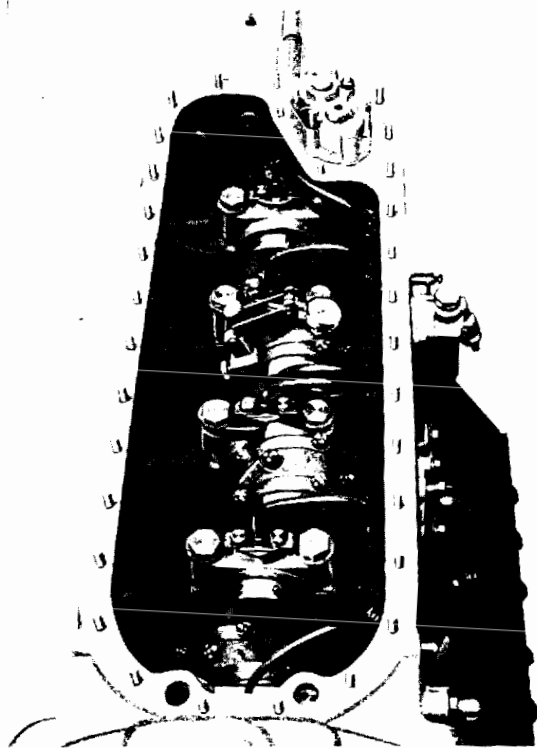


Fig. 86

proper thickness to obtain the correct clearance. Replace the cap and bolt in position and re-check with indicator gauge. Make certain that the cap is replaced so that the numbers on the side coincide with those on the rod, also that all cotter pins, including those removed for attaching gauge, are in place.

To check play of forked connecting rod bearing on crankshaft, proceed as follows:

Unbolt and remove plain rod from the bearing that is to be checked. It is well to remove rod and piston complete for convenience in working. Then crank engine until the forked rod is at the extreme end of the downward stroke. Clamp tool No. 1437 Gauge for

testing play between crankshaft and connecting rod bearing in position on the forward cheek of the crank throw as shown in Fig. 87, and adjust indicator so that the button

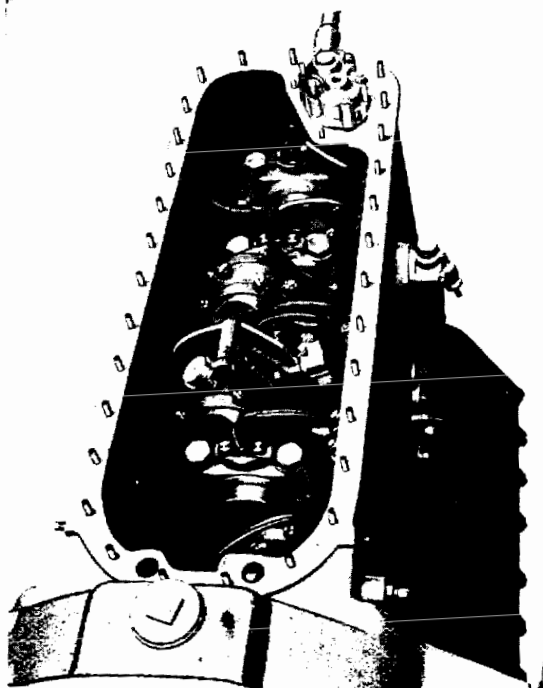


Fig. 87

rests on the center of the bronze bushing; pulling the forked rod up and down will give the existing clearance on the indicator. The correct clearance at this point is .0015". If excessive play exists it will be necessary to replace the bearing. This, of course, necessitates re-adjusting of plain rod to compensate for new bearing.

### Lincoln License Plates

Care should be taken in attaching the front license plate to see that the long arm of the license bracket extends upward instead of

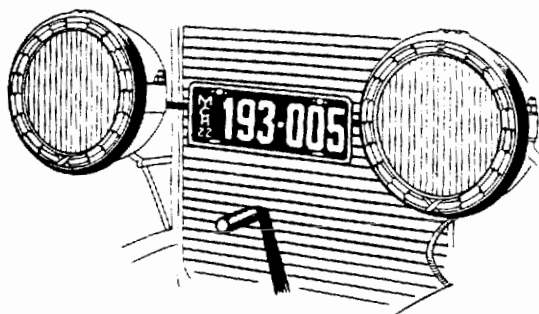


Fig. 88

downward. When the plate is properly attached as in Fig. 88, the tie rod between the headlamps will be approximately in the center of the plate. This will allow clearance for hand cranking the engine when checking spark timing, valve timing, or adjusting valve clear-

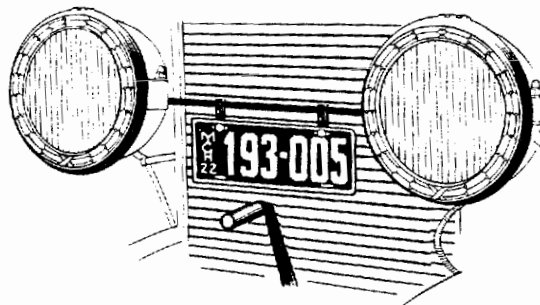


Fig. 89

ance. If the plate is attached so that it hangs as shown in Fig. 89, there will not be sufficient clearance for hand cranking and the operator may suffer injury through striking the plate. Dealers should call this to the attention of all their employees.

### Disconnecting Upper Water Hose on Lincoln

It is not necessary when removing the Lincoln radiator or intake manifold to disturb the hose connections. Unscrew the union nut on the radiator connection, using tool No. 8617 Wrench for radiator union nut and the hose may be disconnected intact.

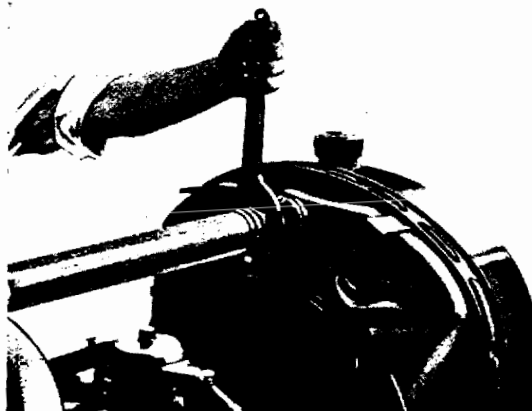


Fig. 90

This feature eliminates the water leaks so prevalent where it is necessary to remove the hose clamp and hose itself and the life of the hose is materially prolonged.

### Lincoln Firing Order

The Lincoln engine does not fire at equal intervals as is customary in the conventional 8 cylinder 90° V Type engine, which fires 4 times each revolution and at 90° intervals. On the Lincoln, due to the 60° angle of the blocks the firing interval instead of being 90° is 60°-120°-60°-120°. This unequal interval between explosions is one of the points of superiority of the engine as it results in a vast reduction of rhythmic vibration.

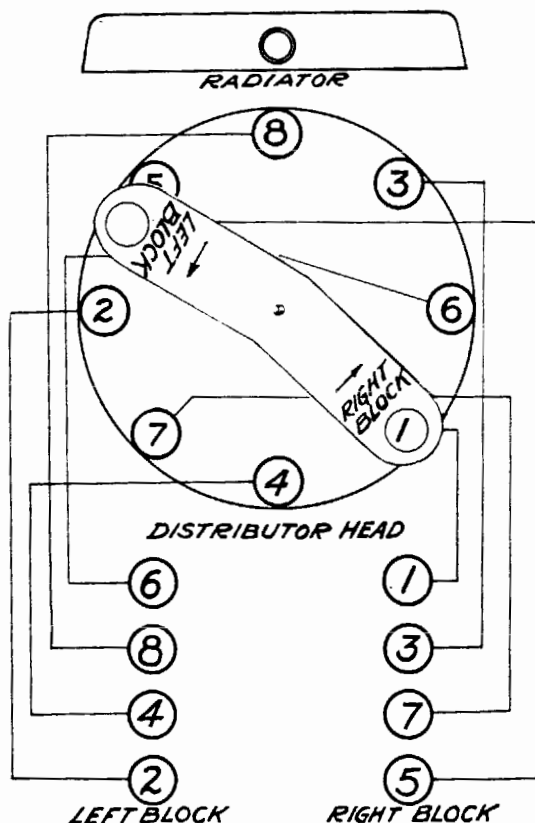


Fig. 91

The timing of the engine is graphically illustrated in Figs. 91, 92, 93. The offset arm represents the distributor rotor which carries the two contact brushes for the right and left blocks. The large circle represents the distributor head with the contacts for the different cylinders. The two vertical banks of circles are the cylinders and are numbered in the order of firing, 1-2-3-4-5-6-7-8. As the arm is revolved note the difference in travel between the firing of cyl. 1 and 2 and cyl. 2 and 3.

A working model cut from cardboard with the assistance of the illustrations may be easily constructed and will greatly assist in

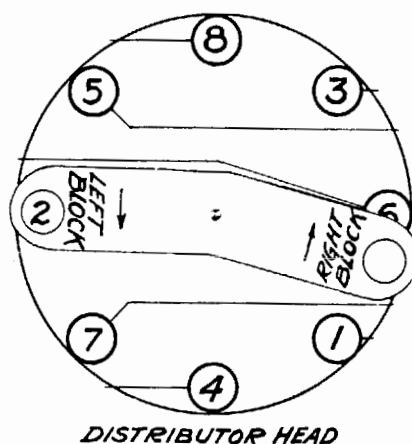


Fig. 92

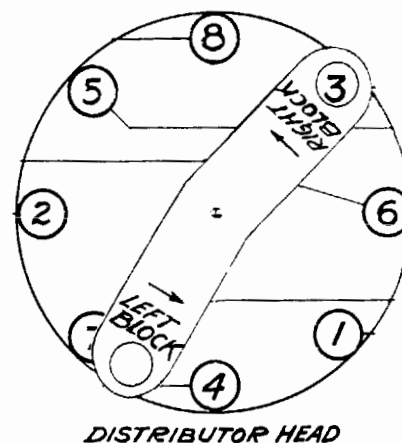


Fig. 93

understanding how the unequal firing interval is obtained.

### Lincoln Pedal Pads

Occasionally reports are received from drivers of Lincoln cars who are under average height, that the clutch and brake pedals are too far from the driver's seat for comfortable operation.

Such cases may be easily taken care of by replacing the standard pedal pads with pads Part No. L-2122B which are 1 1/4" longer than the standard ones. This change brings the pedals closer to the driver's seat and adds greatly to the ease and comfort of driving for persons of short stature.

Upon return to the branch of the original pedal pads Part No. L-2122A in good condition, together with full information, car number, date of delivery, etc., full credit will be allowed.

### Lincoln Crankshaft Bearings

The Lincoln engine has five main crankshaft bearings, which reduce vibration to a minimum and materially prolong the interval between bearing adjustments.

To check the clearance in a main bearing remove the oil feed pipe by removing the two screws which clamp it to the bearing cap and the two nuts which hold it in position on the main oil pipe. Tool No. 1149 Gauge for checking play in crankshaft bearings is then placed in position with the rod from the indicator extending into the oil hole in the cap and resting upon the crankshaft. It is held in position by the two screws, which clamped the oil pipe in place. (See Fig. 94.) The clearance may now be determined by pulling the crankshaft up and down. If it is necessary to adjust the bearing remove the cap, noting the marking so that it will be re-

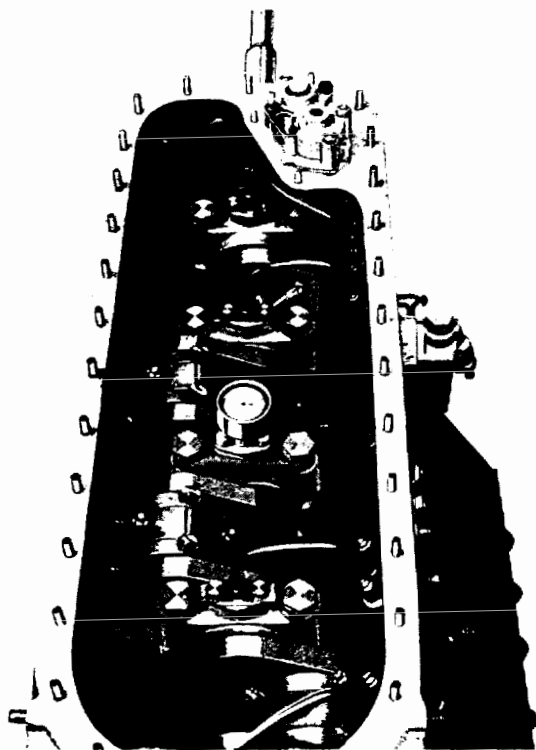


Fig. 94

placed correctly. Remove the shims and replace with thinner ones which will reduce the play to not less than .0015. Carefully file off edges of lower half of bearing shell an amount equal to the difference in thickness of the old and new shims and in such a manner that the two halves of the bearing shell will

meet with pressure when cap is bolted in place. Make certain that the cap is replaced in its original position. Tighten each of the bearing bolts lightly and continue drawing them down alternately until the bearing is properly secured.

Do not overlook replacing the bolt locks.

### Lincoln Overrunning Clutch and Oldham Coupling

The overrunning clutch located in the housing between the water pump and generator allows for the different speeds of the water pump and motor generator when starting the engine. When the motor generator is functioning as a starter it is geared to the flywheel at a 28 to 1 ratio, while the pump shaft which ordinarily drives the generator is being driven by the crankshaft chain at a  $1\frac{1}{2}$  to 1 ratio. Hence the necessity for a device to compensate for the difference in speed of these two units which run at different speeds when starting and at the same speed when driven by the engine.

In this clutch are three rollers which fit in cam-shaped recesses in the inner ring (see Fig. 95). They ride against the inside wall of the outer ring which is attached to the generator shaft. This ring has three notches on its

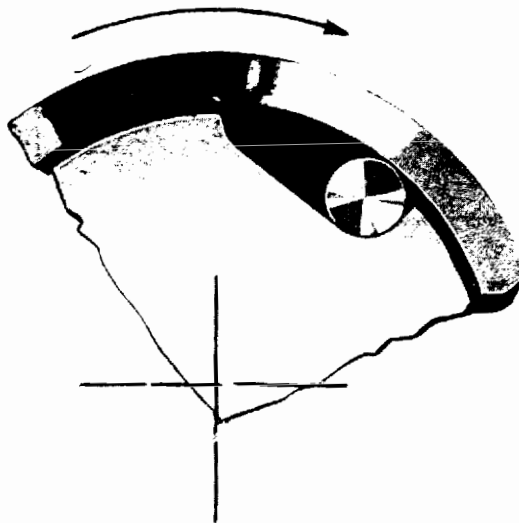


Fig. 95

inside surface  $120^\circ$  apart. When the generator is functioning as a starter it runs much faster than the pump shaft, thereby revolving the outer ring faster than the inner and pushing the rollers down into the deepest part of the groove, which allows the clutch to slip. As the notches in the outer ring pass the rollers the

rollers jump in and out of the notches, thus causing the clicking sound heard when ignition switch is turned "ON." This clicking notifies the driver that the motor generator is revolving preparatory to cranking the engine and also serves as a reminder against leaving the switch "ON" when the engine is at rest.

As soon as the engine starts and the starter pedal is released, the motor-generator is disconnected from the flywheel and is driven by the pump shaft. Thus the inner ring tends to revolve faster than the outer, with the result that the rollers ride up in the recesses and wedge against the wall of the outer ring, thus positively driving the generator.

When the motor is idling very slowly the generator has a tendency to run ahead of the pump shaft slightly, due to its revolving much freer and its greater weight. This causes the rollers to be pushed down into the bottom of the recesses and the clutch slips. As the generator loses its momentum the rollers again ride up and the clutch takes hold. Occasionally when this alternate slipping and holding is taking place and the motor is suddenly accelerated a slight thump will be heard, which is often mistaken for a loose bearing. This is caused by the clutch suddenly taking hold, the rollers having jumped from the bottom of the recesses into the notches in the outer ring, thus suddenly locking the clutch, instead of taking hold gradually as is the case when the notches in the outer ring are not directly

in the place where the rollers strike the wall of the outer ring.

An inoperative overrunning clutch is caused by lack of lubrication. In such cases the clutch (G) in Fig. 96 should be removed, disassembled by removing locking wire (I), thoroughly cleaned, packed with vaseline and reassembled. See that oil placed in cup (C) will feed through at (J). Then assemble clutch to generator shaft, exercising care that key (K) is in place and not pushed out of position. The oil cup (C) is the means for lubricating the front generator bearing and the clutch (G). It should be liberally supplied with oil every 250 miles when engine is stopped so that excess oil will flow down into the clutch.

To eliminate any possibility of noise in the Oldham coupling all cars after car No. 3265 have a disc (A) made of Textoil, a non-metallic composition, instead of steel, and the use of the spring (B) has been discontinued. When replacing the steel disc with the Textoil make sure that this spring is removed and discarded. Cars previous to car No. 3265 also were furnished with a grease cup at (E) instead of the Alemite connection as now constructed. Grease cup should be removed and replaced by Alemite connection on these cars. These discarded parts may be returned to branch, together with full information, car number, mileage, etc., and credit will be allowed. It will be necessary to return spring (B) with the steel disc for credit. This is done to insure the discarding of the spring when reassembling.

The Oldham coupling should be lubricated every 250 miles. Sufficient gear lubricant or 600W oil should be forced into the housing through connection (E) so that it will overflow at the rear of the housing, the same being located approximately opposite the arrow at end of line (A). This will require about 6 full turns of lubricator gun.

### Lincoln Radiator Shutters and Thermostat

The shutters on the front of the Lincoln radiator are controlled by a thermostat housed in the radiator top tank. The shutters are all connected together and operate in unison. The rod which connects them is in turn attached to the operating crank of the thermostat. In case of emergency the shutters may be opened in order to permit of driving the car without overheating the engine. Insert a blunt tool such as a screwdriver under the lower edge of the shutter shown in Fig. 97 and pry outward until the shutter may be caught with the fingers and pulled into a horizontal position. (See Fig. 97.)

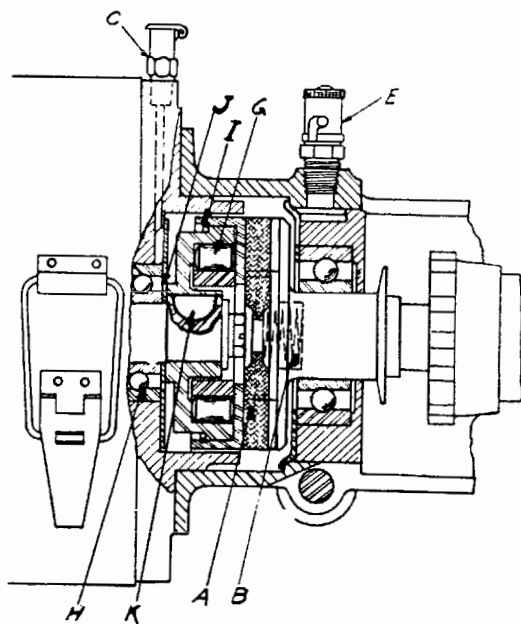


Fig. 96

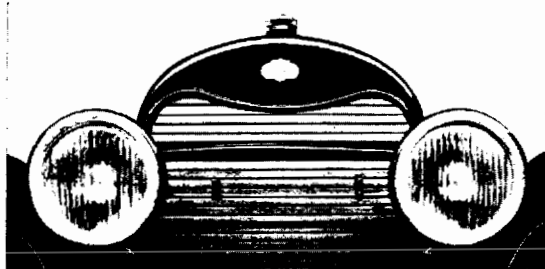


Fig. 97

The clevis pin which connects the shutters with thermostat is now exposed. Remove the cotter and clevis pin and the shutters may be opened.

### Adjustment of Lincoln Brakes

The Lincoln is equipped with two independent sets of brakes, the foot or service brake and the hand or emergency brake. The foot brake is operated by the right foot pedal and the hand brake by the lever at the right of the driver. The foot brake is external or contracting upon, the hand brake internal or expanding within, the brake drum. The brake load is equally distributed to each brake band by pull rods which operate through equalizing bars. The brake bands should be adjusted as nearly alike as possible so that an approximately equal movement of the brake levers will be required to make them grip the drums.

Occasional oiling of the brake levers and connections will considerably increase the efficiency and ease of operation. If they seize too suddenly or squeak when applied a few drops of neatsfoot oil or a mixture of oil and flake graphite applied to the lining will usually remedy this trouble. This should be sparingly applied, as a careless application will greatly reduce the efficiency of the brakes.

#### To adjust foot brake:

Compensation for ordinary wear may be made by turning the nut (4) Fig. 99 and only after considerable use is it necessary to make more complete adjustment. Wear of brake linings cannot be taken up by any adjustment of brake pull rod or by adjustment of the stop screws (6) for lever (10) which are properly set at the factory and bear no relation to adjustment for wear. To make a complete brake adjustment, a Gauge for

adjusting brakes Tool 618 will be found of great convenience. Remove axle shaft, wheel and bearings, slide the gauge into position on the axle as shown in Fig. 98. The gauge represents, and is the same size as, the brake drums. Lubricate all clevis pins and other moving parts in the brake mechanism and work oil in by moving foot pedal and hand lever back and forth several times. Remove cotter pin from the adjusting screw (11) and screw clockwise until the brake lining at this point just clears the drum. Replace cotter. Loosen the adjusting nuts (8) and (9) under the stop (7), using the pair of special wrenches in the tool kit, and screw down until the lower half of the brake band comes up and just clears the drum. Then tighten both nuts securely. Next adjust nut (4); turn by half revolutions in a clockwise direction until the top half of the band just clears the drum. It should now be possible to revolve the drum without any binding or dragging of bands. Pull forward on link (5) until the end of screw (6) is approximately  $\frac{1}{4}$ " away from the stop. If adjustment is correct you will be unable to move drum with the hands. When the brake is fully applied by pushing down hard on the foot pedal the shortest distance from center of pin (13) in lever (10) to the drum should be approximately  $2\frac{3}{16}$ ". The foot pedal pad when completely depressed with the brake tight on the drum must be at least 2" from the floor board. If it is less than this figure the pull rod between the pedal and intermediate brake cross shaft may be shortened to correct this condition.

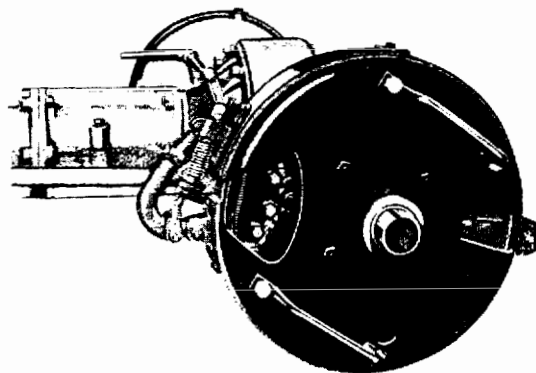


Fig. 98

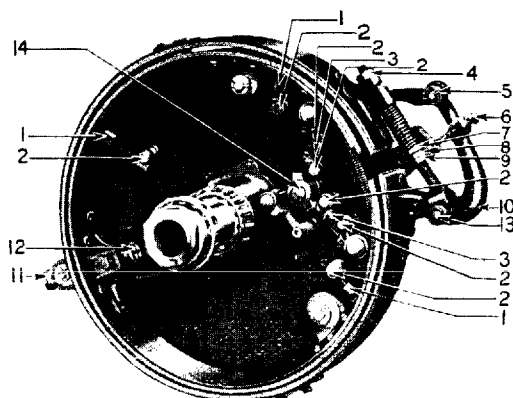


Fig. 99

### Adjusting hand brake:

A limited amount of wear may be taken care of by jacking up the wheel and removing the plug in the brake drum between the wheel spokes. Revolve the wheel until the four clamp screws (2) which secure screw (3) can be seen. Loosen the clamp screws and turn each of the screws (3) a part of a revolution in a clockwise direction, using the special wrench furnished in the tool kit. Pull back vigorously on the hand lever. If the lever stands in the third or fourth notch, the adjustment is satisfactory. When correct adjustment is obtained tighten clamp screws and replace plug. To make complete adjustment, the wheels should be removed as for foot brake adjustment. Loosen the 7 clamping screws (2) which secure (1) and (3). Remove the cotter pin in adjusting screw (12). Apply the Gauge Tool 618 and turn screw (12) until the brake lining just clears the drum. Replace cotter pin. Revolve drum until adjusting screws (3) can be seen. Adjust screws (3) as explained before so that when lever is pulled back vigorously center of the pin (14) will stand  $1\frac{1}{2}$ " from the inside of the drum and the lever will stand in the third or fourth notch. Then tighten the four clamp screws (2) which secure the adjusting screws (3) with the hand lever fully released. Revolve the drum and adjust the two forward upper and lower band adjusting screws (1) as much as possible without causing lining to drag on drum. Revolve drum and adjust rear band adjusting screw in same manner. Then back off these three screws one-half revolution and tighten clamp screws. If adjustments are correct pulling the hand lever back to the second notch will prevent turning the drum with the hands.

### Assembling New Style Ford Windshields and Tops

In assembling new style windshields and tops in knocked-down shipments of touring cars, care must be exercised to prevent throwing a strain upon the lower windshield glass. The correct assembling procedure is as follows:

First position the rubber on the cowl and set the windshield in place with the large beading of the rubber toward the front and the small beading lying on top of the instrument board beading and fitting close to it and the windshield channel. With the rubber in place insert the bracket to body bolts. Then fasten the top to the top irons, open it up, and secure it to the windshield. The bracket to body bolts may then be tightened without danger of straining or twisting the lower windshield glass.

### Wrenches for Lincoln Chain Adjustment

Fig. 100 illustrates the use of spanner wrenches for chain adjustment Tools nos. 5675 and 6077. The procedure governing the use of these tools is described fully in the July *Service Bulletin*.



Fig. 100

### Replacing Ford Rear Axle Housings

The present type rear axle housings are beveled at the point where they join the drive shaft housing, instead of being machined with a shoulder as formerly. When using one

of these new type housings for repairs on a car having the malleable type drive shaft roller bearing housing it will also be necessary to replace the roller bearing housing and drive shaft ball bearing, using the present forging type roller bearing housing T-2583B and present type bearing T-2591-T2591B.

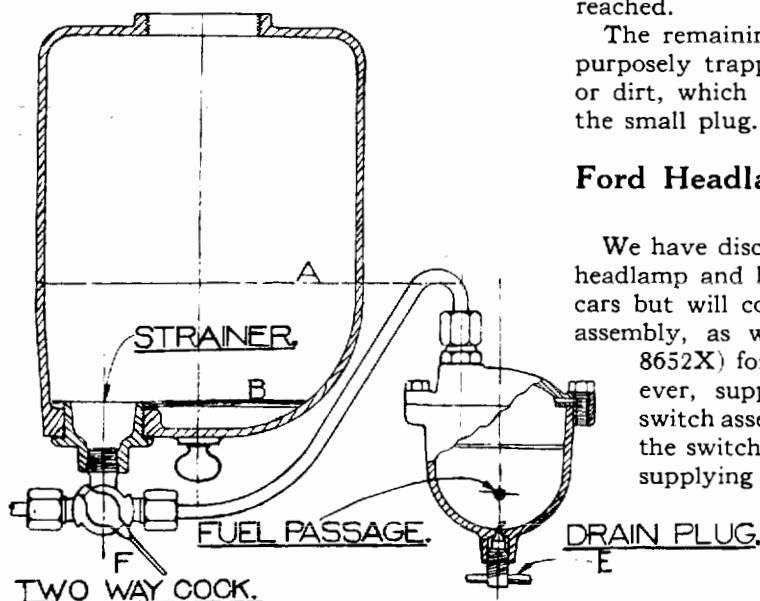


Fig. 101

### Gasoline Level in Starting Tank

There is an erroneous belief that the Fordson cannot be started after the gasoline level has dropped below "A," which represents the bend in the pipe at the carburetor.

Starting when the gasoline is below this level is done in the usual way, i. e.:

See that drain plug "E" is closed. Then turn lever "F" on gasoline and after the priming rod is pulled out to shut the strangling butterfly valve, the engine should start without any difficulty.

After the engine is started, the priming rod should be pushed back far enough to give an even firing mixture.

It is the vacuum transmitted from the vapor tube to the carburetor which raises the gasoline up-hill in the supply pipe (when the level is below "A") until the level "B" is reached.

The remaining liquid (about  $1\frac{1}{2}$  ozs.) is purposely trapped as it may contain water or dirt, which can be drained by means of the small plug.

### Ford Headlamp and Horn Switch Assembly

We have discontinued supplying T-8650X headlamp and horn switch assembly on new cars but will continue to supply this switch assembly, as well as the switch shell (T-8652X) for repairs. We will not, however, supply the headlamp and horn switch assembly, less shell, and orders for the switch less shell should be filled by supplying the T-8650X assembly.

### Window Lifter Rods

In replacing Window Lifter Rods, Parts T-5081X and T-5082X, the new  $\frac{5}{16}$ " rod must be used in place of the old  $\frac{1}{4}$ " rod which has been obsoleted. The installation of the new  $\frac{5}{16}$ " rod will necessitate replacing the window glass channel, lifter rod spring, nuts, and washers, as the old parts will not fit the new rod.

The slight expense incurred in replacing these rods will be more than offset by the increased service received from the new parts.

Dealers should return their stocks of  $\frac{1}{4}$ " rods to the Branch for credit.

## Cars bearing motor numbers 6,334,197 to 6,473,196 were shipped during August

### Serial Numbers of Tractors Assembled

	Motors Assembled at Cork, Ireland	Motors Assembled at Home Plant
August	171,963 to 172,000 250,001 to 250,099	244,017 to 252,532

# Ford Service Bulletin



No. 10

Vol. 3

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## Winter Operation of the Lincoln

### Cooling System

Do not fail to use an anti-freeze solution in cold weather. A driver who does not take this precaution runs the risk of expensive repairs caused by a frozen radiator or water pump and saves but little. We are giving below a table showing the amount of denatured alcohol to use for different temperatures. Approximately  $7\frac{1}{2}$  gallons of liquid is necessary to fill the cooling system.

Amount	%	%	Freezing	Spec.
Alcohol	Alcohol	Water	Point F.	Gravity
$1\frac{1}{2}$ gal	20	80	13 above 0°	.974
$2\frac{1}{4}$ gal	30	70	3 below 0°	.964
3 gal	40	60	20 below 0°	.953
$3\frac{3}{4}$ gal	50	50	24 below 0°	.936

There are various kinds of anti-freeze solutions, some of which contain chemicals which will start corrosion in the radiator core with disastrous results. The safest solution to use is one of denatured alcohol and water.

If the water in the pump freezes the engine will not "crank" over and forcing it may break the pump impeller or do other serious damage. If the solution freezes proceed as follows: Remove radiator cap, thaw and open radiator drain valve, continue the thawing process at the valve and gradually work along the system. Use a moderate heat such as hot water from a hose or applied with cloths. Do not use a flame and do not pour boiling water on the pump as it may be cracked thereby.

**Caution**—One quart of the same liquid used for filling the radiator should be used in the condenser tank after the later has been drained. This may easily be accomplished, after the radiator is filled, by pouring an additional quart of liquid into the radiator. The excess will be conveyed to the condenser tank through the radiator overflow pipe.

The condenser tank as used on the Lincoln is a great advantage when using an anti-

freeze solution in the radiator. The addition of the alcohol lowers the boiling point of the cooling liquid considerably and consequently much more steam and vapor is given off than when water only is used. On most cars the radiator is equipped with an overflow pipe and the vapor is forced through this by the pressure in the top tank and escapes. Thus a great amount of cooling liquid is wasted which on the Lincoln is condensed and returned to the radiator. Instead of the overflow pipe merely allowing the escape of the vapor and excess liquid it is conveyed to a tank where it is condensed and again returned to the radiator as the latter cools. When the liquid in the radiator cools a vacuum is created in the top tank and the liquid in the condenser tank is drawn back into the radiator through the overflow pipe.

In order that the system may function correctly the radiator and the hose connections must be air and water tight or when the liquid in the radiator cools air will be drawn in to relieve the vacuum instead of the fluid in the condenser tank. Do not remove the filler cap while engine is cooling. Care should be taken in installing motometer and similar devices that they fit tightly.

It is good practice to clean the cooling system before adding anti-freeze. Open the drain valve allowing the system to drain. Then remove the strainer for cleaning by unscrewing the plug from the bottom of the radiator strainer housing. After cleaning replace and fill the radiator with clear water. Run the engine for a few minutes and again drain the system repeating the operation until the water runs clear. Should the sediment be extremely heavy it is a good idea to uncouple the hose connections and flush out the radiator and cylinder blocks with water under city pressure. The condenser tank is drained by removing the plug at the front end.

**Note**—When draining cooling system always remove radiator cap.

### Lubricating System

In cold weather it is even more important than in warm weather that the engine oil be drained regularly, as condensation taking place on the cold metal gradually adds water to the oil, and the oil is diluted with fuel caused by the use of the choke, and incomplete combustion in a cold engine. Do not drain the oil pan until the oil is thoroughly warmed either through running the engine or from the car standing in a heated garage.

### Battery

The efficiency of a battery is much lower in cold weather and the owner should arrange for frequent inspection.

### Fuel System

Present day heavy fuels very often contain water and sometimes freeze in the fuel line, usually in the lowest part. For this reason a fuel strainer and sediment bowl has been placed at the lowest point of the line in the left frame channel under the front floor boards. A plug at the bottom of the strainer carries a recess for the settling of sediment and water and also carries the screen. This should be removed frequently in cold weather and the accumulated water allowed to drain.

### Ford and Fordson Coil Units and Vibrators Interchangeable

By increasing the condenser capacity of the Model T coil unit and enlarging the size of the tungsten points on the vibrator and vibrator bridge to equal those of the tractor unit, we have made these parts interchangeable; in other words, the present type coil unit, vibrator and bridge may be used on either car or tractor.

The increased condenser capacity in the coil unit lessens arcing at the points and insures longer service, while the larger contact points make for easier starting and tend to decrease the noise of the vibrators.

Until dealers' stocks of the old style vibrator bridge and coil unit are exhausted, care should be taken to see that none of the old style parts are supplied for tractors. The new style units can readily be distinguished by the increased size of the contact points on the vibrator and bridge.

### Theft of Lincoln Coupe

Lincoln coupe, Engine No. 3364, car No. 3379, bearing New York license No. 286-300, the property of Mr. P. D.

Taylor of Carthage, N. Y., was stolen from the Van Slack Garage, at Carthage, on October 5th, 1922. When stolen, the car was equipped with three Goodyear tires, and one Powertown tire on left rear wheel. The car also carried two Goodyear tires as spares.

We will consider it a favor if dealers and garages will be on the lookout for Mr. Taylor's car, in order that we may render all the assistance we can in its early recovery.

### Unique Method of Displaying Ford Parts

In Figure 102 is shown a photograph of a miniature cannon composed entirely of Ford parts. Our dealer, Dutee Flint, of Providence, R. I., who exhibited this novel display in his parts store window, advises that it has attracted a great deal of favorable attention.

Every successful merchant can attribute a large part of his success to the interest which he has created in his goods and this applies equally as well in the sale of Ford parts as any other commodity.

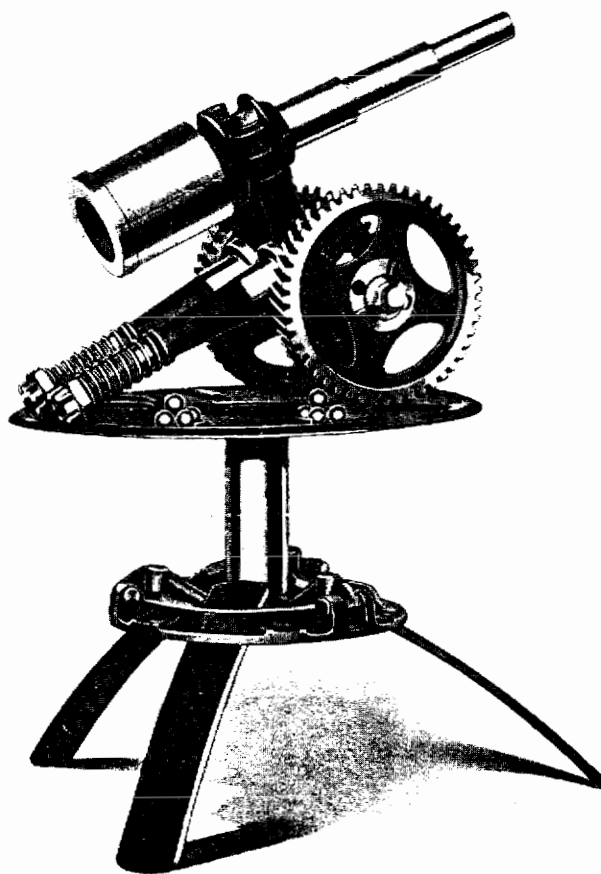


Fig. 102

## Starting The Lincoln In Cold Weather

From investigations conducted in the past we believe that owners and dealers are not giving sufficient attention to the proper procedure for starting the Lincoln car.

From our experience we have found the following procedure productive of the best results:

Place the spark lever in the driving range on the quadrant with the throttle lever open about 1" to 2". We have found some cars on which the throttle does not open until the lever has been moved about 2". This condition should be corrected by adjusting the throttle rod connected to the lower end of the steering gear.

Pull the choke out all the way, or, on cars equipped with the Electro-Fog Generator, until the resistance of the spring is felt. Then with switch "on" and gear shift lever in neutral, depress the starter pedal and crank the engine over from three to five compressions. Then, still cranking, push the choke button in about  $\frac{1}{4}$ ", and the engine should start in the next three or four compressions.

In cold weather the Electro-Fog Generator may be used as follows:

Pull the choke button all the way out and hold in this position for fifteen seconds. Then release the choke and return toward the instrument board until the pull of the spring is no longer felt, which keeps the choke valve closed, and then proceed as outlined above.

In cold weather the starter may be relieved of considerable work by depressing the clutch pedal and holding in this position while cranking.

Do not use the choke with a warm engine as the mixture may be so enriched that the charge will not readily ignite and the engine will be flooded.

Prompt and easy starting cannot be expected from a car with dirty and improperly set distributor breaker points and spark plugs. The breaker points in the distributor should be set at .020", making sure that the gap on both breakers is the same, otherwise the two cylinder blocks will be thrown out of synchronism and a rough running motor will result. Also, the points should be perfectly clean and meet squarely. The spark plugs should be clean and have the points set at a gap of .025".

On cars equipped with the Electro-Fog Generator make sure that the choke valve is tightly closed when the choke button is pulled out until the sliding block on the carburetor choke

rod strikes the end of the clevis. For further information on this point see Fig. 106, Page 78 of this Bulletin.

On cars which do not respond to the treatment outlined, we suggest that the timing be checked as described in the June and July issues of the Service Bulletin. Make sure that the fuel is getting to the carburetor and vacuum tank. In case the vacuum tank is dry it can be filled by closing the throttle tightly and cranking the engine a few moments with the starter. Make sure in cases of this kind that the fuel shut-off valve on the dash is open.

## Advertise Your Service

In Figure 103 is shown a facsimile of a card which our dealers, the Barker Motor Co., of Austin, Texas, use in advertising Ford Sales and Service.



Fig. 103

The method Mr. Barker and his employees have adopted in distributing these cards, is to leave several of them with each concern from whom they have purchased material of any kind. Mr. Barker advises that the plan not only has attracted favorable attention, but the increase in his business is quite noticeable.

A considerable share of the success enjoyed by progressive concerns is directly attributable to comprehensive advertising, and Ford dealers, rendering efficient service, and marketing a car that represents the greatest car value per dollar ever offered, should be quick to realize the advantages gained by bringing these facts to the attention of the public through the medium of intelligent advertising.

### Lincoln Alloy Pistons

The pistons which have been used in all Lincoln engines since engine No. 5705 are made of a specially heat-treated alloy which is very nearly as hard as cast iron. The hard grey iron from which Lincoln cylinders are cast will show a Brinell hardness of 175 to 200, and the piston alloy Brinells at 125 to 165. These pistons have a number of advantages chief among which are:

1st. Extreme light weight contributing greatly toward eliminating motor vibration. This piston weighs 12 to 13 oz. less rings and wrist pin.

2nd. Carbon will not adhere to and build up on this alloy as it does on cast iron.

3rd. Great heat conductivity, tending to keep the piston head cool.

4th. The alloy piston is fitted to the cylinder bore with the same clearance as a grey iron i. e. from .002" to .005". The design of this piston allows for expansion without danger of seizing. The skirt is cut away from the head on both sides of the wrist pin bosses and is slotted vertically on one side (See Fig. 104).

Notwithstanding the fact that the alloy piston is considerably lighter in weight than the thin iron piston, there is still sufficient material used in its construction to insure the rapid dissipation of heat from the piston head.

The piston rings used with the alloy pistons have a deeper section than the ones used with the cast iron, thus giving them a larger bearing area or surface on the sides of the ring groove. The fit of the piston ring in the ring groove and on the cylinder wall are of vital importance in controlling oil pumping and leakage. Contrary to popular belief the gap between the ends of the ring is a minor consideration. If the ring has considerable up and down motion in the ring groove, it will act as a miniature oil pump. (See Fig. 105.) As the piston moves downward the ring moves to the top of the groove. The oil in the cylinder wall is collected in the space under and back of the ring. When the piston starts upward the ring shifts to the bottom of the groove and the oil below and in back of the ring is forced around to the upper side. As the piston reaches the top of the stroke and starts downward the ring again shifts to the top of the groove and the oil is deposited on the cylinder wall at a point above the top ring and, therefore, cannot be carried back with the piston on its down stroke. It will be seen that a large amount of oil will be pumped into the combustion chamber in this manner, as, at a speed of 20 miles per hour

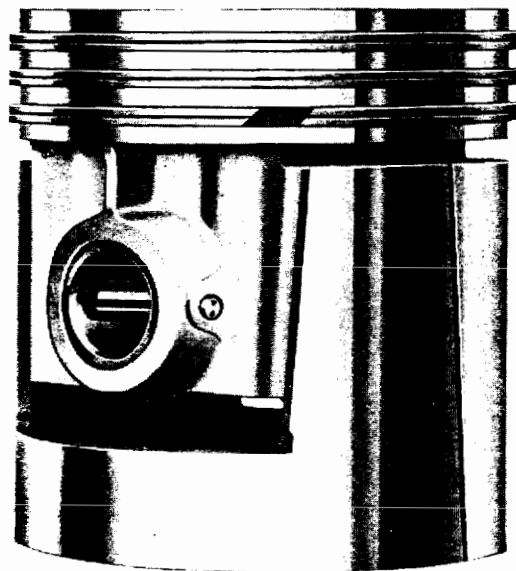


Fig. 104

this action takes place approximately 1000 times in each cylinder while the car is covering one mile.

Leakage past the face of the ring is eliminated in the Lincoln engine with the extreme care with which the cylinder bores are finished and the piston rings inspected. Each ring is tested for flatness, roundness and tension. The rings fit the ring grooves with a clearance of .001" to .0025". The gap between the ends of the ring is from .010 to .020. We have had cases where mechanics have fitted oversize rings to standard pistons in order to close up the gap tightly. Under no consideration should this be done. The piston rings are machined so as to be perfectly round when compressed to the diameter of the cylinder bore. When an oversized ring is compressed to go into a standard bore, it is no longer round but assumes an elliptical shape and the leakage resulting is many times greater than could possibly take place through the gap.

The piston rings, being the point of contact between the piston and cylinder wall, convey the greater part of the heat from the piston head to the cylinder walls which are maintained at an even temperature by the cooling liquid with which they are jacketed. Therefore, it is necessary that a definite clearance be allowed between the ends of the ring to allow for the expansion of the ring caused by this heat. This is even more necessary with an alloy piston than with cast iron, since the alloy conducts the heat much more rapidly than the cast iron and it is not localized in the

piston head to such an extent. Consequently the rings in the alloy piston operate under a higher temperature than those on a grey iron. If the rings are fitted with too small a gap, the ends will touch before the ring is fully expanded. Further expansion of the ring will

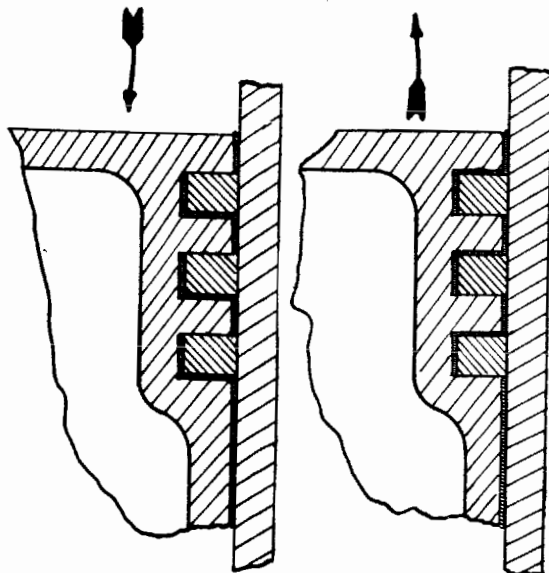


Fig. 105

in all probability score the cylinder wall and break the ring. When fitting alloy pistons the following precautions must be observed: Care should be taken when installing piston rings to see that the small oil groove at the edge of the ring is toward the bottom of the piston. The piston pin has a very snug fit in the bosses. Do not attempt to drive it in place. The piston should be immersed in hot water for 15 or 20 minutes, then the piston pin can be pushed in by hand. Driving the pin in will distort and strain the piston walls. Also make certain that when assembled in the motor, the slot in the piston skirt faces the left side of the engine regardless of which block they are in. This procedure is described in the August issue of the Service Bulletin.

When installing pistons make certain that all pistons are the same weight. The weight is stamped on the head of each piston in ounces and quarter ounces, for example 12.3 is  $12\frac{3}{4}$  oz.; 12.2 is  $12\frac{1}{2}$  oz., etc.

### Lincoln Electro-Fog Generator

The electro-fog generator has been provided to facilitate starting in extremely cold weather. Pulling the choke button on the instrument board all the way out closes the circuit in the switch which is mounted on the back of the intake manifold.

This switch controls the circuit between the battery and the heating or fog producing element in the carburetor. It is thermostatically controlled and automatically cuts off the circuit after 15 seconds contact which is sufficient time for the vaporization of the fuel charge in the heater unit (8).

The heater coil in the chamber (8) is packed with and surrounded by soft mineral wool which absorbs the fuel to be vaporized. This fuel is supplied by the drainage from the intake manifold when the engine is stopped. Pulling the choke button all the way out closes the circuit and causes the heating coil in the chamber to become incandescent thus vaporizing the fuel with which the mineral wool is saturated. This fills the carburetor with a foggy fuel vapor which when drawn into the cylinders is readily ignited.

### Operation

When the carburetor choke button is pulled out approximately  $\frac{3}{4}$ " the resistance of the spring (7) is felt. This part of the operation closes the choke valve in the carburetor. When the choke button is pulled out all the way the spring plate (4) is pushed forward and makes contact with the thermostatic strip (5). Thus the circuit is closed between the battery and the heater element. The thermostatic strip is composed of two different metals which have greatly different expansion ratios, and when this strip is heated by the heavy current passing through it, one of the metals expands more rapidly than the other and the thermostatic strip buckles and pulls away from the spring plate (4), thus breaking the circuit. The carburetor choke button should be held in its final position for 15 seconds. This is sufficient time to permit the generating of fuel fog in the carburetor. If held out longer than this period, the thermostatic switch breaks the circuit automatically. The wire (11) connects the heating element with the switch and the wire (10) connects the switch with the battery through the terminal on the rear of the starter generator.

### Caution

The electro-fog generator should not be operated when the retort containing the heating element is dry as this will cause the burning out of the heater coil. This condition will be brought about by demonstrating the device without turning the engine over several times or from the vacuum tank being dry. No harm will result from operating the generator several times in succession if the engine is turned over three or four times with each trial, as sufficient fuel drains back into the heater chamber to replenish the supply.

It is rarely necessary to adjust the switch. To check the contact time, remove the switch cover, pull the choke button out all the way and observe time necessary for thermostatic strip to break the circuit. This should not be less than 10 seconds or exceed 15 seconds at temperatures ranging from 50 to 75°. Adjustment may be made by loosening clamp screw (2). Turn screw (3) anti-clockwise to shorten, and clockwise to lengthen the time of contact.

**CAUTION:** Contact time should not be checked with the battery testing under 1225 specific gravity or with a warm engine.

### Lincoln Production Data

Car No.	Date
6500 - -	Aug. 10, 1922
7000 - -	Aug. 30, 1922
7500 - -	Oct. 13, 1922
8000 - -	Nov. 20, 1922

### Shifting Gears on Lincoln

Gear shifting may be easily and quietly accomplished if the following procedure is followed:

As soon as the car is under way in first speed or "low," disengage the clutch and shift immediately into second speed. When the car has attained a speed of approximately 15 miles per hour disengage the clutch, move shifter lever from second to neutral position, then engage the clutch and immediately release it again. With clutch fully released the shift is made from second to high speed position.

A little practice will enable the operator to make a very quiet, smooth shift.

### Puller for Lincoln Fan Pulley

The application of Tool No. 15Z-11878 Puller for Lincoln fan pulley is illustrated in

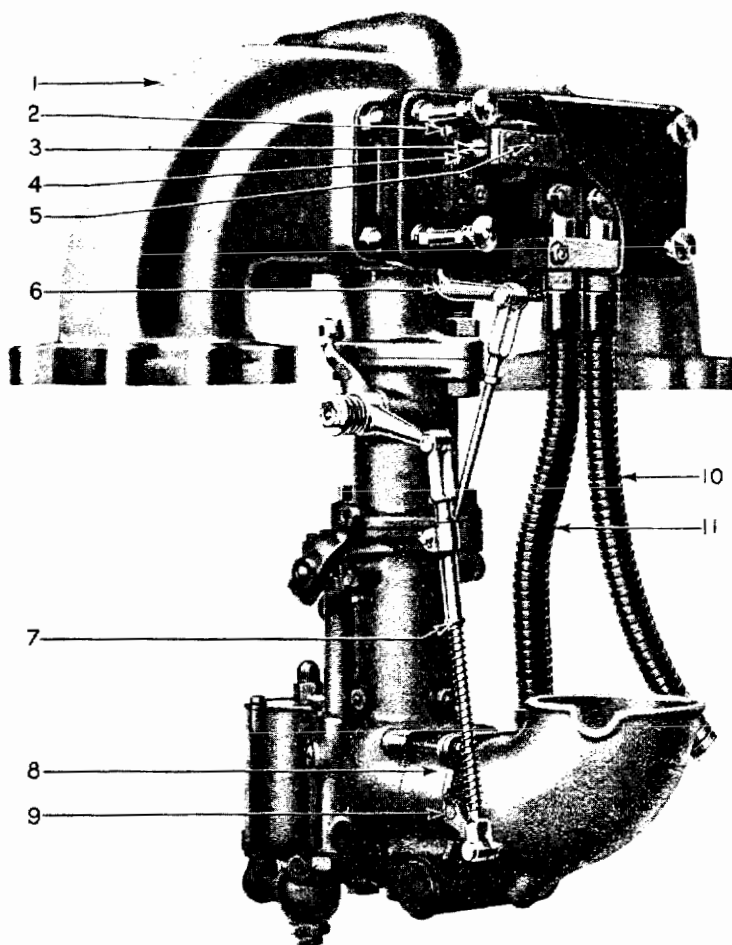


Fig. 106

Fig. 107. This pulley is made from an aluminum casting and breakage is liable to result if removal is attempted without a puller.

### Drive Carefully

Most tire troubles do not come from the use that a tire is put to but the **ABUSE** that it receives. Learn to drive slowly over rough roads and around corners. **DO NOT** scrape and bump into curbstones. **DO NOT** drive in tracks or ruts, this wears and weakens the walls of the tires. Driving at high speed over raised tracks or any other obstructions of like nature will damage the casing.

These few suggestions, if carried out, will make driving more of a pleasure, and help to eliminate the annoyance of unexpected blow-outs and punctures.

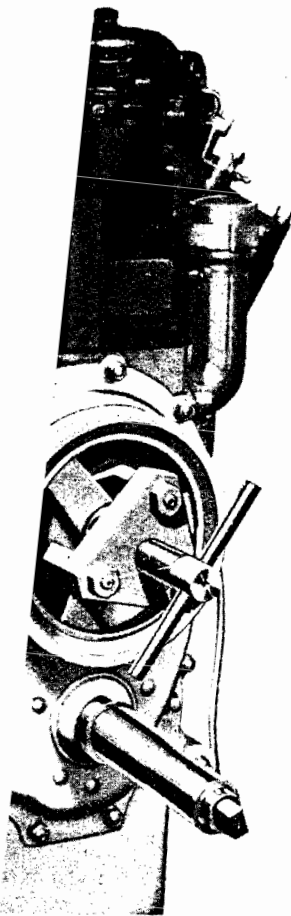


Fig. 107

### Cylinder Assembly

dealers in rebuilding old tractors will supply Tractor cylinder assemblies consisting of the following parts:

- Valves
- Valve springs
- Push rods
- ds Cam shaft nut—large
- ar Cam shaft nut—small
- ar Valve spring cover
- Commutator brush

entage of the parts require rehauling tractors that have for a considerable period, a can be effected for the owner as later by installing a cylinder assembly, pistons and bearings and run in. In localities where a number of tractors in operation it advantageous to carry an cylinder assembly in stock to emergency repairs.

the tractor cylinder assembly Fig. 109 is \$100, less 25% to

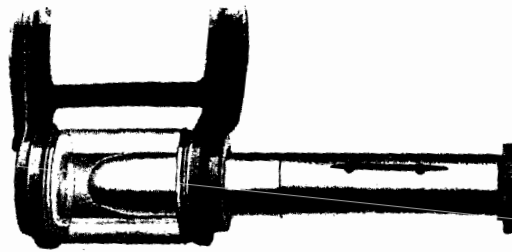


Fig. 108

### Pilot for Lincoln Spring Bolts

Tool No. 15Z-6489 will be found a great convenience when replacing spring bolt spacing washers or springs.

Lincoln spring bolts and bushings are very accurately fitted and assembling is a difficult procedure without one of these tools which not only facilitates assembling but also prevents damage to the thread on the spring bolt.

The procedure for its use is as follows:

- (1) Screw the pilot onto the spring bolt which is to be installed.
- (2) Slide the spacing washer and dust ring into place between the spring eye and shackle.
- (3) Push the pilot and bolt assembly through the shackle until it is in about the position shown in Fig. 108.
- (4) Slide the other spacing washer and dust ring into place and push the pilot through the spring and the other side of the shackle. Make sure that the slot in the head of the spring bolt is engaged with the lug on the side of the shackle and that the dust rings are expanded and fit snugly against the sides of the shackle.
- (5) Remove the pilot, assemble the spring bolt nut and draw up. Make certain that the cotter pin for this nut is replaced.

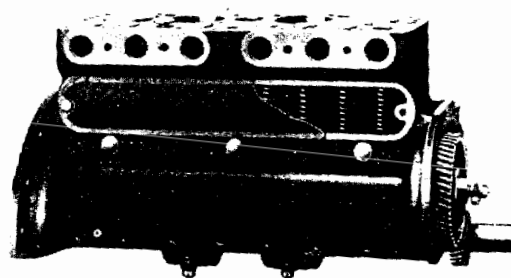


Fig. 109

## Making Use of the New "Lincoln Combination Trade Mark"

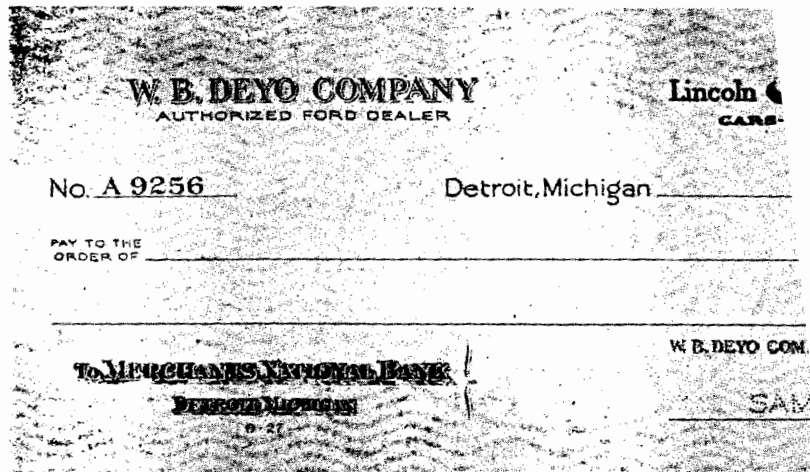


Fig. 110

This sample check, bearing the name of the W. B. Deyo Company, Detroit, illustrates one of many uses for the new Lincoln Ford Fordson combination trade-mark design recently developed by the Sales Department.

Most Ford Dealers are at present using the Ford and Fordson trade-names on their checks, invoices, statements and other stationery forms with good results but the use of the new design gives a play on the entire line of Ford products, and serves to strengthen the associa-

tion of those prod name.

Advertising of this limited, but the cost no wide-awake dealer opportunity to get his

Electrotypes, in var Lincoln Ford Fordson prepared. All dealers as these are available, begin using them on st

**Cars bearing motor numbers 6,473,196 to 6,582,725 were shipped during September**

**Cars bearing motor numbers 6,582,725 to 6,699,999 were shipped during October**

### Serial Numbers of Tractors Assembled

	Motors Assembled at Cork, Ireland	Motors / Hor
September	250,100 to 250,300 253,001 to 253,010	252,533
October	253,111 to 253,290	252,762

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## Synchronizing Timing of Lincoln Engine

Synchronizing timing becomes necessary only when the setting of the plate which carries the two breaker arms has been disturbed.

It is important that the cylinders in the two blocks fire in exactly the right relation to each other as otherwise vibration and a rough running motor will result. In ordinary cases a slight difference in timing in the two blocks is due to a difference in the breaker gaps for the two blocks. Before checking synchronization make certain that the breakers are set to the same gap.

The plate (2) Fig. 111 which carries the breaker mechanism is held in position by three screws, (1), (3) and (4), Fig. 111. The holes for the screws (3) and (4) are elongated allowing the plate to be shifted slightly with screw (1) as a pivot. Shifting the plate changes the relation of the opening and closing of the two breakers.

To check synchronizing proceed as follows:

Remove floor boards and plate over clutch housing, also the distributor head and rotor. Open petcocks and crank motor until No. 1 cylinder is on compression and piston is nearly on top center. Then look at the markings on the clutch ring illustrated in Fig. 112. The marking "1/5" should be nearing the pointer. Have motor cranked slowly by lightly tapping crank handle until mark "RET" is about 2" from the pointer. Retard the spark lever on the steering column all the way and insert a small piece of paper between the breaker points

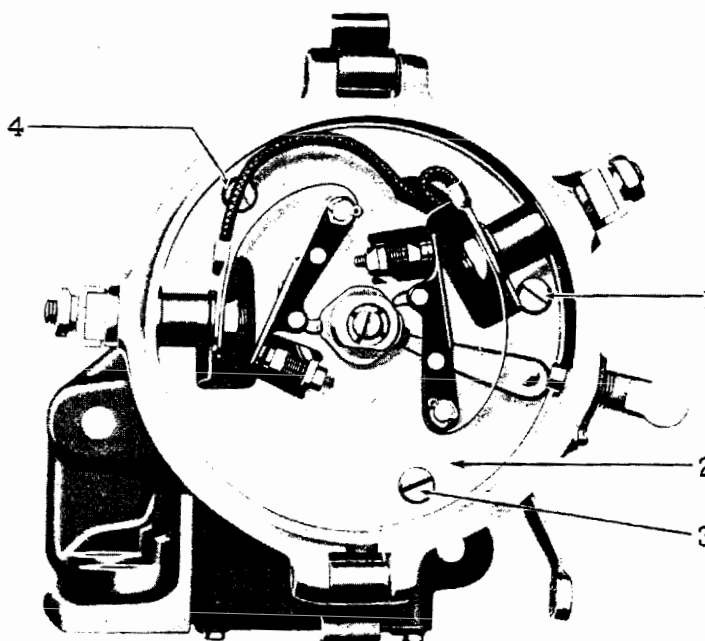


Fig. 111

for the left block. Turn ignition switch "ON" and watch the ammeter closely. At this time it will show from 8 to 10 amperes discharge. Have the motor cranked very slowly by lightly tapping the hand crank. The instant the breakers for the right block separate the ammeter will jump back to 5 to 6 amperes discharge. If "RET" mark is within  $\frac{1}{2}$ " of the pointer, spark timing for the right block is o. k. If necessary to correct spark timing, proceed as noted in June bulletin page 43.

When spark is correctly set for the right block crank the engine until 2/6 approach the pointer. See Fig. 112. Then transfer the piece of paper from the left to the right block breaker and proceed as noted above.

No "RET" mark is stamped on the clutch ring after 2/6 but this can be estimated accurately or measured with a scale. The distance from the line between 2 and 6 to the

point where breaker should separate for left block is  $\frac{3}{8}$ ". If the left block is found to be early, loosen the screws, holding the breaker plate and move the plate very slightly in a clockwise direction. If timing is late move plate anti-clockwise.

Each time the breaker plate is moved the breaker gaps are changed and should be reset before again checking synchronism. The difference in timing on the right and left blocks should not be over  $\frac{1}{8}$ " as indicated on the clutch ring. After completing the operation of synchronizing, it will be necessary to again check timing for the right block. Movement of the distributor cam will not change the relation of the two blocks.

This operation is vitally important and must be correctly performed to result in a smooth running engine.

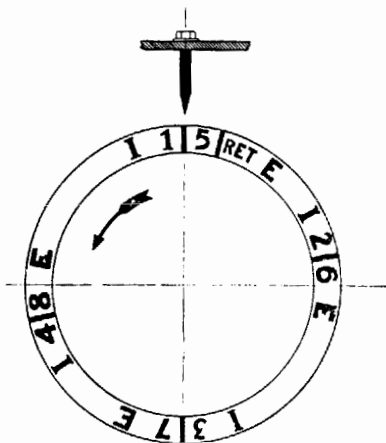


Fig. 112—Fly Wheel and Clutch Ring Marking Diagram

### Air Vent in Lincoln Fuel Tank

When fuel is drawn from the main tank into the vacuum tank a corresponding amount of air must be admitted to the tank to relieve the vacuum created. For this purpose a small hole was drilled in the front of the control valve on the main tank. This has recently been omitted and the vent is now through the fuel tank filler cap. This location eliminates the splashing of fuel on the top of the tank when it is completely filled.

All filler caps in stock should be drilled to eliminate any chance of confusion resulting from installing a cap without the vent hole on a car which has no vent in the valve.

A  $\frac{1}{16}$ " hole should be drilled thru the filler cap  $\frac{1}{2}$ " from the center and through the brass cup inside the filler cap at a distance of  $\frac{1}{4}$  inch from the center. This will eliminate any

chance of error and if one of these drilled caps is installed on a car with a vent in the valve, the double vent will do no harm.

### License Data Lincoln

#### Engine—

No. of cylinders.....	8
Cylinder Bore.....	$3\frac{3}{8}$
Stroke.....	5 $\frac{1}{2}$
Piston Displacement.....	358 cu. in.
Horse Power (S. A. E.)...	36.4

#### Car Number—

A plate showing the car number is fastened to the front of the dash on the right-hand side.

The engine number is stamped on the left side of the crankcase between the first and second cylinders. Note:—After car No. 6585 the car number and engine number are identical except on about 25 cars. These cars have a letter "A" suffixed to the car number.

#### Serial Number—

Sept. 1920 to Dec. 31, 1920.....	1- 834
Jan. 1, 1921 to Dec. 31, 1921.....	835-3151
Jan. 1, 1922 to Dec. 1, 1922.....	3152-8188

#### Weights—

Type	Wheelbase	Shipping Weight
7 Pass. Touring.....	130	4185
3 Pass. Roadster.....	130	3950
5 Pass. Touring.....	130	4135
4 Pass. Coupe.....	130	4140
5 Pass. Sedan.....	130	4385
Limousine.....	136	4590
Town Brougham.....	130	4410
Town Car.....	136	4425
2 Pass. Roadster.....	136	4050
4 Pass. Phaeton.....	136	4155
4 Pass. Sedan (Judkins)...	136	4375
7 Pass. Sedan.....	136	4660
7 Pass. Limousine.....	136	4720
Town Car.....	136	4475
Open Drive Limousine...	136	4500
Chassis.....	136	3205
7 Pass. Touring.....	136	4290
4 Pass. Sedan 2 window...	136	4375
4 Pass. Sedan 3 window...	136	4375
4 Pass. Berline.....	136	4510

There are a number of custom bodies mounted on Lincoln chassis for which we are unable to supply weights. Application for license for these cars should be accompanied by a certified weight slip, in those states which require car weight for computing a license tax.

## Data for Use in Obtaining Licenses

## Serial Numbers of Model T Cars Manufactured During the Fiscal Years

YEAR	SERIAL NUMBER
Oct. 1, 1908 to Sept. 30, 1909	Car and Motor 1 to 11,100
Oct. 1, 1909 to Sept. 30, 1910	Car and Motor 11,101 to 31,900
Oct. 1, 1910 to Sept. 30, 1911	Car and Motor 31,901 to 69,876
Oct. 1, 1911 to Sept. 30, 1912	Car No. 80,000 to 150,000
	Motor No. 69,877 to 157,205
	Car No. 150,001 to 332,500
Oct. 1, 1912 to Sept. 30, 1913	Motor B-1 to B-12,247
	Motor 169,452 to 370,147
Oct. 1, 1913 to July 31, 1914	Car 332,501 to 539,000
	Motor 370,148 to 570,790
Aug. 1, 1914 to April 30, 1915	Car 539,001 to 742,313
	Motor 570,791 to 773,487
May 1, 1915 to July 31, 1915	Motor 773,488 to 855,500
Aug. 1, 1915 to July 31, 1916	Motor 855,501 to 1,362,200
Aug. 1, 1916 to July 31, 1917	Motor 1,362,201 to 2,113,500
Aug. 1, 1917 to July 31, 1918	Motor 2,113,501 to 2,756,251
Aug. 1, 1918 to July 31, 1919	Motor 2,756,252 to 3,277,851
Aug. 1, 1919 to July 31, 1920	Motor 3,277,852 to 4,233,350
Aug. 1, 1920 to Dec. 31, 1920	Motor 4,233,351 to 4,698,415
Jan. 1, 1921 to June 30, 1921	Motor 4,698,416 to 5,114,530
July 1, 1921 to Dec. 31, 1921	Motor 5,114,351 to 5,638,071
Jan. 1, 1922 to June 30, 1922	Motor 5,638,072 to 6,199,796
June 30, 1922 to Nov. 30, 1922	Motor 6,199,797 to 6,844,681

## Shipping Weights of Model T Cars

Year	Coupe	Sedan	Runabout	Touring	Chassis	Truck Chassis	4 Door Sedan
1915 to 1916	1540	1730	1395	1510	1200	.....	.....
1916 to 1917	1540	1730	1380	1500	980	.....	.....
1917 to 1918	1580	1745	1385	1480	980	1450	.....
1918 to 1919	1580	1715	1390	1500	980	1450	.....
1919 to 1920	1580	1750	1390	1500	1060	1395	.....
1920 to 1921	1525	1725	1400	1500	1020	1380	.....
1921 to 1922	*1685	*1875	1380	1485	1070	1430	.....
1922	*1729	*1900	1385	1477	1082	1427	*1915

\*This weight includes starter and demountable rims.

When cars are equipped with starter add 95 pounds.

When cars are equipped with demountable rims and tire carrier add 55 pounds.

## Ford

## Engine—

No. of cylinders.....	4
Cylinder bore.....	3 $\frac{3}{4}$
Stroke.....	4
Piston Displacement.....	176 cu. in.
Horse Power (S. A. E.)...	22.5

## Engine Number—

The engine number is on the left-hand side of the cylinder block just above the inlet connection elbow.

## Lincoln Car Numbers

When ordering parts or sending in reports on Lincoln cars, make it a point to give the Car Number in preference to motor number.

This applies particularly to cars before car No. 6585. Cars after this number have the car and motor numbers identical and cars previous have a different car and motor number.

As all our records are filed by car number, observance of this request will facilitate shipment of parts and answering of correspondence.

When ordering tops or side curtains specify whether long grain or pebble grain material is wanted.

When ordering parts which are furnished in various colors be sure to specify fully color wanted; for instance: Lincoln blue, Cobalt blue or Blue Devil blue, Brewster green, Marne green or Sage Brush green.

### Anti-Freeze Solutions for the Ford

Dealers should caution owners against attempting to get along without an anti-freeze solution in the cooling system. Explain to the operator that even if the water is drained after every run there is a possibility of the radiator freezing. In very cold weather or when driving against a cold wind it is possible to freeze the radiator before circulation starts. Also if one or more tubes are clogged with dirt these tubes will not drain when the cooling system is drained and are liable to freeze and burst.

The ideal anti-freeze solution is first, one that will prevent freezing of the cooling solution without injuring the engine or radiator. Second, that will not lose its non-freezing qualities after continued use, and third, that does not materially change the boiling point of water with which it is mixed.

Kerosene has a lower freezing and higher boiling point than water but the inflammability of its vapor makes its use dangerous and its high and uncertain boiling point might lead to the serious overheating of the engine or even the melting of the solder in the radiator. It also has a marked solvent action on rubber parts. These facts clearly indicate that kerosene should not be used as a non-freezing solution.

Most of the anti-freezing solutions sold under trade names have a calcium chloride base. The calcium chloride compounds exert a greater corrosive action than water on the water jackets of the cylinders and the solder in the radiator. Tests have shown that calcium chloride will completely remove solder from copper and brass. Another disadvantage experienced in the use of calcium chloride, if small leaks occur in the radiator, and the solution comes in contact with the spark plugs and ignition wires, is the liability of short circuits. Calcium chloride solutions should be used with caution if at all on account of their corrosive action.

Alcohol solutions do not exert a greater corrosive action than water alone. Solutions of either denatured alcohol or wood alcohol are apparently the most desirable anti-freeze solutions to use. The table below shows the approximate point at which different denatured alcohol solutions will freeze. Wood alcohol solutions will give a slightly lower freezing point.

20%	13° above
30%	3° above
40%	20° below
50%	34° below

A solution composed of 60% water, 10% glycerine and 30% alcohol is very often used, its freezing point being 8° below zero. Glycerine tends to retard evaporation but the alcohol will evaporate much more rapidly than the water. The solution will therefore become ineffective unless more alcohol is added from time to time. This also applies to solutions not using glycerine.

The cooling system of the present Model "T" car is 2 gallons 7½ pints; with the former type radiator 3 gallons 1¾ pints. It can readily be determined from these figures the amount of alcohol to use.

When storing a car for the winter drain the cooling system. Pour about a quart of alcohol into the radiator allowing it to run through. This will prevent the freezing of any water that did not drain out because of stopped tubes.

As with the car radiator, it is also necessary to put an anti-freeze solution in the radiator of the Fordson tractor during cold weather. The capacity of the tractor cooling system is 12 gallons.

Due to the rush of cold air thru the air washer it is necessary to give some attention to that part during extremely cold weather.

Some operators run the tractor with the float in the air washer removed or raised, others replace the water with kerosene.

Water should be used as late in the season as possible draining it at night to prevent freezing. Kerosene if used at all should only be put in when the temperature is around zero.

### Driving the Lincoln

After the car is in high it should be controlled entirely with the accelerator and brakes. The clutch should not be disengaged except when changing gears or coming to a dead stop. There is much less tendency to skid when braking on slippery pavements if the clutch is not disengaged until the car speed is brought down to 5 or 6 miles per hour. When descending long grades, close the throttle and allow the car to turn the engine over against compression. On steep grades the car should be in second speed before starting down. Exceptionally steep inclines should be descended with the car in first speed or low. Always shift into the lower gear before starting downward. Shifting gears with the car coasting rapidly down hill is dangerous and well nigh impossible.

### Repairing of Batteries

A source of trouble which may develop in any storage battery is loss of electrolyte thru leaking.

Such loss will shorten the life of the wood trays. Grounds may result, putting an unnecessary drain on the battery. One cell may leak and the others not, ultimately resulting in the cell going bad.

The leak may be due to:—

- (1) Cracked jar.
- (2) Leaking seal.
  - (1) Cracked jars must be replaced; they cannot be mended.
  - (2) The seal may leak (a) around the posts or (b) around the cover. A battery loose in the car or a constant strain or pull on either of the terminals will often cause leakage around cover.

It is sometimes difficult to determine whether the loss of electrolyte is due to a cracked jar or to a leaking seal. In either case, the cell must be unsealed. If, after unsealing, doubt still exists, the quickest way to make sure is to replace the jar. The old jar may then be tested at leisure and used for other work if the test shows no leak in it.

If the leak is around the pillar posts this should be evident to the eye and can be remedied by tightening down the seal nuts with a seal nut wrench and then gently hammering over the bottom edge of the connector just above the seal nut to hold the seal nut in place.

To unseal a cell:—

- (1) First remove the connectors. These are solid lead links (fig. 34) and may be removed by taking a wood bit or a drill and boring the connectors  $\frac{1}{4}$  inch deep centrally over each post (fig. 35). Use a  $\frac{5}{8}$ -inch bit. Another method is to play a burning flame on the joint, at the same time pulling the connector with a pair of pliers until it comes loose.
- (2) Clean any dirt or lead from the top of the battery, taking care that none gets inside the cells.
- (3) Remove the filling plugs and gently blow into the filling tubes to remove any gas which may be there and which might ignite later when a flame is brought close. Hand bellows are convenient for this purpose.

- (4) The cells have the single flange type of cover, which has sloping sides flanged outwardly at the base to fit the inside of the jar snugly, while at the top it clears the jar, giving a space of about  $\frac{1}{4}$  inch for sealing. To unseal, it is not necessary to remove the cell from the case. Heat a thin-bladed knife, such as a putty knife, and run it through the sealing compound close to the jar wall all the way around. This will loosen the compound and the element with cover attached can be pulled out of the jar about one-half inch, just enough for the cover to clear the jar. The compound may then be readily removed from the cover with a hot knife or chisel. Or if desired, the element may be left seated in the jar and the compound dug out with a hot knife or chisel. A very effective way of softening the compound for unsealing is to place the cell or battery in a steam box. This consists simply of a box or oven into which live steam is injected at low pressure. By so doing, the rubber parts are made somewhat pliable and are much less likely to be cracked in handling, especially in cold weather. Another method is to stand the cell in very hot water, taking care that the water does not get inside of the cell.

If the jar is to be changed, the element with cover attached should be removed from cell entirely. To do this:—

- (1) Mark the cover and tray so that upon reassembling the element will not be put back reversed.
- (2) Take hold of the two posts with gas pliers and pull the element from the jar. If it should stick, pull the jar along with it and place the cell in very hot water to within an inch or so of the top of the jar. This will soften the rubber and permit the element to be pulled out.
- (3) Before pulling all the way out, let the element rest a few minutes on the top of the jar at an angle so that the battery solution may drain back.
- (4) If element is to be used again, place in water or battery solution until ready to use. This prevents the negative plates from overheating and drying out and will save considerable time during the charge following reassembly.

To replace element in jar:—

- (1) Place the jar in hot water for awhile. This makes it somewhat pliable and less likely to crack under stress.
- (2) Grip the element near the bottom, in order to keep the plates from flaring out. Take care not to let the outside plates start down over the outside of the jar.
- (3) The element should fit snugly in the jar. If it does not, place one or more wood separators between the end plates and the jar, taking care that such separators are cut  $\frac{1}{2}$  inch narrower than the plate, so as not to throw extra strain on the corners of the jar. The ribs of the separators should go against the jar. Do not, however, crowd the jar so that it bulges.
- (4) Tighten the sealing nuts again.
- (5) The thread of the post extends slightly above the sealing nut. When the nuts are tight, take a center punch or sharp nail and carefully drive it on the thread in a few spots about each nut (fig. 41). This will slightly upset the thread on the post and prevent the nut from coming loose.

To insure good sealing, (1) the jar and cover surfaces must be right and (2) the compound must be applied properly.

- (1) To have the surfaces right:—

- (a) *Scrape off any old compound or foreign material that may be on the surfaces.*
- (b) *Kill any acid on the surfaces.* Sealing compound will never stick where there is any acid, no matter how weak the acid. To kill the acid, wash with strong ammonia and then in turn remove this with water on a rag.
- (c) *Remove any grease, vaseline or paraffin that may be on the surfaces.* Some may have gotten on from the hands while fitting the cover. Gasoline or benzine is suitable for this purpose; kerosene is not.

- (2) The proper method of applying the compound:—

- (a) *Heat the compound slowly, until just thin enough to pour. Do not drive off part of it as vapor by applying too much heat.*

- (b) *Dry and heat the surfaces to be sealed with a soft burning flame. (Be careful not to burn the rubber nor to deposit any soot.)*
- (c) *While jar and cover are warm pour in the compound to one-third the depth. Compound must not be lumpy.*
- (d) *Apply the flame (with practically no oxygen turned on) to the compound until it takes hold of the rubber surfaces. This will be shown by the compound creeping up along the jar and cover to a slight extent.*
- (e) *Then fill the grooves to the top and apply flame again until the compound takes hold of the rubber.*

After resealing, connectors must be lead burned or welded. First see that the posts and eyes of the lead connectors are clean and bright. In all lead burning, absolutely clean surfaces are essential to good workmanship. Lead is soft and very readily cleaned with a knife, file, scraper or wire brush. Place the connectors over the posts, slightly tapping them to a firm seat. Before lead burning, blow into the filling tubes to remove any gas which may be there. Lead burn the joint by first melting the parts to be joined and fusing them together and then immediately melt in burning strip until the joint is flush. Do not melt in burning strip until the parts have fused together nor after the joint has cooled, and do not use any soldering acid or other flux. A little practice may be necessary before a good joint can be made.

Add water to the cells until level is just below bottom of filling tube in cover.

Place on charge and reduce rate to 6 amperes when gassing starts.

After charging one hour at 6 amperes take a gravity reading of each cell.

Keep charging at 6 amperes and every hour take reading of cell showing lowest gravity. Continue this until at least three of these readings show that the gravity has ceased rising for at least two hours.

If the gravity in the three cells then varies more than 50 points, it should be adjusted by removing as much as necessary and replacing the low gravity with 1.300 gravity electrolyte or the high gravity with water.

Charge for an hour, repeat readings and adjustments, if necessary, until the gravity in all cells is within a 50 point range.

# Genuine Ford Connecting Rod Trade Marks




































<i>Ford</i>		
 P.K.F. P	 U.S.H.C.D.	
 	B.H.	S.C.Co. A.C. 
	 	
M		 I.D.F.
	 	 D.F.
		
	 DB 	A
 C.F.		
	 S.F.co.	M
		
-E	FROST	W.G.
		K
D.S. 	C-CFP	E

Fig. 113

Above is a revised list of Genuine Ford Connecting Rod Forging Trademarks. Dealers can use this information to advantage in exchanging connecting rods. Rods bearing any other trademarks are to be considered as imitation parts.

### Oversize Cylinders for Fordson Tractors

Fordson cylinder blocks bored  $\frac{1}{32}$ " oversize will hereafter be furnished with reground crankshafts assembled, at a price of \$50.00 less 25% to dealers, under part No. F-2259-R.

As the demand for these assemblies will absorb the total quantity of oversize blocks available at the factory, it is understood that orders for individual cylinder blocks must hereafter be filled with the standard bore.

Tractors that have been in service a sufficient length of time to require new cylinder blocks ordinarily require new crankshafts also, and these reground shafts, which are properly fitted at the factory, permit the installation at a considerable saving in cost.

### Grinding Lincoln Valves

We again call your attention to the necessity for using tool No. 15-Z-12501, special cylinder head when grinding valves in Lincoln engines.

This special head allows valves to be ground or seated under exactly the same conditions as when the regular head is in position.

This tool is listed in the set of Lincoln Service Tools and sells for \$10.00, net.

### Tractor Worm Thrust Bearings

Effective immediately the \$10.00 exchange price on S-22-C Timken worm thrust roller bearing, furnished in replacement of S-22 worm shaft thrust ball bearing, is discontinued.

In view of the fact that Timken worm bearings have been furnished on all tractors put out for over two years we do not believe that we will be working any hardship on Fordson owners now in asking them to pay list price for the Timken roller bearings purchased hereafter for tractors originally equipped with worm ball bearings. We also wish to call

your attention to the fact that the list price of the worm roller bearings has recently been reduced.

### Lincoln Top Boots

Effective at once, top boots will not be furnished as part of the Lincoln car equipment except with the two passenger roadster. Top boots for other type open cars will be furnished hereafter upon request at \$25 less 20% to the dealer.

### Locks on Lincoln Cars

Lincoln cars are equipped with Yale locks on the ignition switch, gear shift lever, tire carrier, tool compartments and cabinets. In addition the enclosed cars are equipped with Yale locks on the doors; all of these locks on standard jobs being operated by the same key.

The lock on the gear shift lever requires only  $\frac{1}{4}$  turn of the key to operate it. When locking, insert the key, grasp the lever by the ball and rock slightly back and forth, at the same time turning the key forward until it can be removed from the lock.

When locking or unlocking the tire carrier, see that the locking eccentric is not binding on the sides of the slot into which it turns. If the key turns hard do not attempt to force it as it is liable to break off in the lock. Turn the clamping screw slightly back and forth using the wrench provided in the tool kit, at the same time turning the key. The tire carrier lock gets very little use and in order to insure proper operation it is good practice to occasionally put a few drops of oil on the threads of the clamping screw as the oil will work down and lubricate the locking mechanism.

The cylinders of Yale locks should never be oiled.

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**Cars bearing motor numbers 6,713,882 to 6,844,681  
were shipped during November**

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### Serial Numbers of Tractors Assembled

November

Motors Assembled at  
Home Plant

257,907 to 262,824

# Ford Service Bulletin

No. 12

Vol. 3

December 1922

Page 89

## Stock Parts Now!!!

**A**LL indications point towards a wonderful increase in parts sales for the coming year. This, coupled with the contemplated production of six thousand cars per day, means that our manufacturing facilities will be taxed to the utmost to meet all demands.

In view of the increased business that is bound to come with the first days of spring, dealers should immediately provide themselves with sufficient service stock to take care of their requirements during the spring months. This matter is of vital importance not only from a standpoint of giving proper service to the Ford trade, but also to realize the profit that should accrue from this end of the business.

The demand for parts during the spring months is three or four times that of December, January and February, consequently, our factory production must be maintained at a uniform rate the year round so that material will be available when required.

As it is impossible for us to warehouse the excess material manufactured during the winter season, we earnestly request the co-operation of all dealers to the extent of stocking sufficient parts for their needs during the busy spring months. In doing this the dealer is merely protecting his own interests and assuming no risk in accumulating material either from the standpoint of price stability or sales possibilities.

Prepare now for 1923—sixty days hence will be too late.

### Inspection of Carload Shipments

Our dealers upon receipt of carload consignments should:

1—See that doors are tight at the bottom. It is possible to force an opening at the bottom of some doors without breaking the seals.

2—Break the seals on the side doors and *keep record* of initials and numbers of seals on *end* and side doors.

3—Immediately check contents of car and especially tools and other accessories with bill of lading and checking sheet. Be sure to look for and count covers and to promptly examine tool boxes **loaded with tractors in open top cars**. The tools should reach you in a box securely strapped by iron bands to the floor of the car. Tool boxes in shipments of tractors in box cars are placed in end of freight car.

In cars containing Model "T" shipments the tool kits, tire pumps and jacks are contained in a box on the floor of the car. In Lincoln shipments removable parts are loaded as follows—

Type 124—7 Passenger Touring—Pull out auxiliary seats; curtains and curtain rods will be found in the well back of these seats.

Type 112—4 Passenger Phaeton—Curtains will be found in compartment back of rear seat. This compartment is accessible thru opening at the top of the seat. Curtain rods are placed in compartment in front of tonneau floor.

Closed cars—Vanity cases are locked in compartment under front seat. The carpets are rolled up and placed in tonneau.

Open cars—Carpets are in place in tonneau. All cars are equipped with a tool kit which is packed in a sealed carton and placed on the floor of freight car under the car and car cover.

4—*If shortage or damage is apparent, call for inspection by railroad agent and have suitable notation placed on freight bill.*

5—See that car is protected by railroad or yourself after breaking seals until car is emptied, otherwise you will be handicapped in obtaining settlement from the carriers for any loss.

6—Impress upon the railroad agent that all our freight is loaded to certain standards and

contents checked and rechecked to make sure the billed quantities are actually loaded so that if shipments arrive damaged or short, it is prima facie evidence that the carriers are at fault.

7—Keep such records as will justify affidavit if the carriers demand it.

8—Consult with our Traffic Department at nearest branch if unable to obtain settlement of a properly supported and just claim.

### Ford Touring Car Tops

Fig. 114 illustrates the two types of tops used on Ford Touring Cars with the inclined windshield. Approximately 100,000 tops, as illustrated in figure "A," were used, after which the top, illustrated in figure "B," was used.

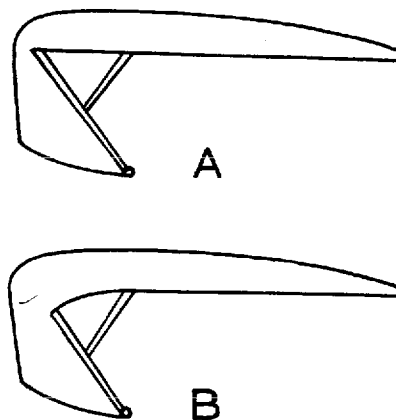


Fig. 114

The top illustrated in figure "A," is referred to in our price lists as "tops with straight side quarters."

This change in the design of the top also changes the design of the rear curtain, rear side curtains, deck assemblies, side quarter and reinforcement assemblies and rear rib sockets. Dealers and owners should bear this in mind when ordering these parts.

### Ford Running Board Brackets

We have discontinued supplying T-4818-336 running board bracket, and when present Branch stocks of this item are exhausted, orders for T-4818-336 running board bracket will be filled with T-4818-2926 running board bracket assembly.

## Increase Your Service Profits By Reducing Labor Charges

**EARL SAXON MOTOR CO.**

**WHY FORD OWNERS SHOULD BRING**  
Their Cars to the Earl Saxon Motor Co.  
for Service and Repairs—

1. We are the authorized Ford dealers.
2. We are equipped with all necessary machinery for properly repairing Ford cars.
3. We use only genuine Ford parts.
4. We tell you to the penny just what it costs you for labor before we start to work on your car.
5. We have a personal interest in your car and want to see that your operative costs are held to a minimum.
6. We are here to serve you and are appreciative of your business.
7. Remember all work is guaranteed, and our customers must be satisfied.
8. Let us serve you, please.

**EARL SAXON**

Authorized  
SALES AND SERVICE

LINCOLN *Ford* FORDSON

Trade Your Old Car In On A  
NEW ONE

WE SELL 'EM ANYWHERE

**EARL SAXON**  
MOTOR COMPANY

MIAMI  
Phone 340

PICHER  
Phone 41

"You Must Be Satisfied"

Fig 115

In Fig. 115 is shown a booklet recently published by the Earl Saxon Motor Company, authorized Ford Dealers at Miami, Oklahoma, which they have distributed to owners and prospective purchasers of Ford Cars in their vicinity. The booklet contains a list of the various repair operations performed on Ford Cars and the exceptionally low charges that have been established by the Saxon Motor Company for performing these operations.

Mr. Saxon advises that since reducing his labor charges, his service profits have increased despite the lower charges. The plan has also proved instrumental in securing new service customers; each new customer, of course, being an excellent prospect for future car sales. This method of advertising averts any feeling that many owners have of being imposed upon when presented with a bill covering repairs made on their cars, as under Mr. Saxon's plan of informing owners what each repair operation costs, the owner knows exactly what his repair

bill with respect to labor will amount to prior to the work being performed.

Any method of advertising, coupled with conscientious effort, that proves to car owners you are interested in reducing their operating expense, is bound to gain their confidence and react to your benefit.

### Hints on Lubricating the Lincoln Alemite connection on fan:

Do not force too much lubricant into this connection. One turn of the handle of the lubricator gun every 250 miles is sufficient. Surplus lubricant is thrown off by the fan and gives the front of the engine and inside of the hood a very unsightly appearance.

### Steering Gear Case:

The steering gear case should be supplied with a lubricator gun full of 600W oil or gear lubricant every 2000 miles. This will force lubricant part way up the steering column tube and prevent the spark and throttle control tubes becoming dry.

### Lincoln Timing Chain

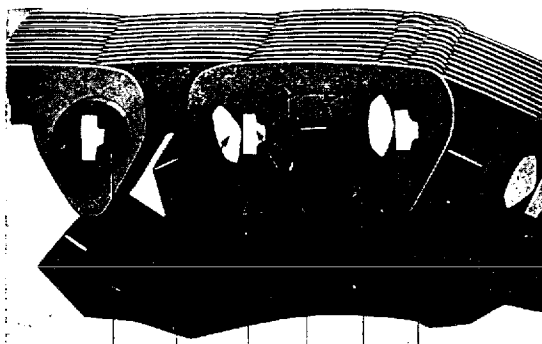
All Lincoln engines since engine number 8500 have been equipped with a new design of front end chain and sprockets. These parts are not interchangeable with the former chain and sprockets; therefore, it is imperative that the car number be given when ordering replacement parts.

The chain used on the first 8500 cars was Type 28; that on subsequent cars is Type 45. The Type 45 chain has the number 4 stamped at one end of the arrow and number 5 at the other. The sprockets for use with Type 45 are also stamped with the number 45 on the front face of the rim. (See Fig. 116.)



Washer RockerPin Link SeatPin Direction Sprocket  
Fig. 116

The sprockets used with Type 28 chain and the chain itself have no distinguishing marks. (See Fig. 117.)



Washer RockerPin Link SeatPin Direction Sprocket  
Fig. 117

In connection with this change it might be well to note the change in the number of teeth on the sprockets:

	Type 28 Chain	Type 45 Chain
Camshaft	44	42
Crankshaft	22	21
Water Pump and Generator Shaft	15	18

When changing the front end chain on engine from Type 28 to Type 45, it will be necessary to replace the following parts:

Cam shaft sprocket

Crank " "

Water pump generator sprocket

" " " " cross  
" " " " driving flange.

The same procedure for adjustment applies to both types of chain. Chain should be inspected and adjusted if necessary every 1500 miles and more frequently if car is driven at high speeds. The slack or total up and down deflection of the chain between the camshaft and accessory shaft sprockets should never be less than  $\frac{1}{4}$ " nor more than  $\frac{3}{4}$ ".

A chain that is adjusted too tightly will cause a whine in the front end at idling speed and excessive wear of the chain and sprockets. A chain that is too loose is liable to jump one or more teeth on the crankshaft sprocket thus throwing the engine out of time. Should the chain jump one or two teeth the engine will still run but will not develop its normal power or speed. If the chain jumps more than three teeth the engine will not run.

An engine on which the front end chain has jumped will show the following symptoms:

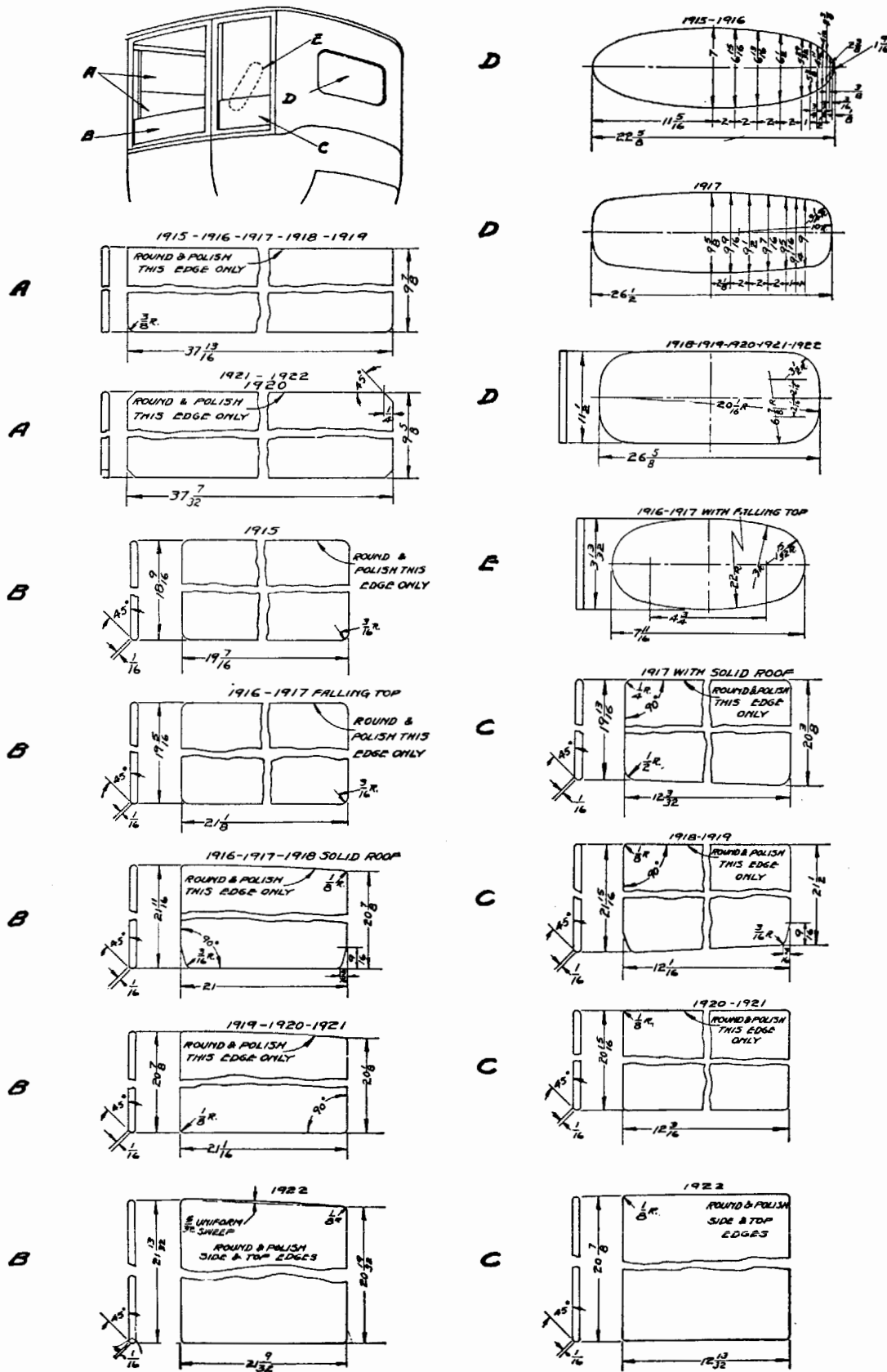
- (1) A very noticeable lack of power.
- (2) Spark timing very late.
- (3) A peculiar fluttering noise in the carburetor with wide open throttle.

In order to determine whether or not the chain has jumped without disassembling front end proceed as follows: Hand crank engine watching the exhaust valve for No. 1 cylinder right block. When this valve is nearly closed, remove floor boards and cover over clutch ring. If timing is correct the "I" mark on the clutch ring for 1/5 should be nearing the pointer. Tap hand crank until "I" is directly under the pointer and note that exhaust valve tappet for No. 1 cylinder is still tight. Crank the engine until "E" for 1/5 is under the pointer. Note that inlet valve for No. 1 cylinder is now tight and exhaust valve tappet loose.

If the chain has jumped the exhaust valve tappet becomes free before the "I" comes under the pointer and with "E" under the pointer the inlet valve tappet is loose.

### Glass for Ford Cars

The sketches shown in figures 118, 119 and 120 are a revision of those published in the July, 1922, issue of the Service Bulletin and contain information covering glass for the inclined windshield of the present Touring Car and Roadster, and also the glass required for the 4-Door Sedan.



**Fig. 118**

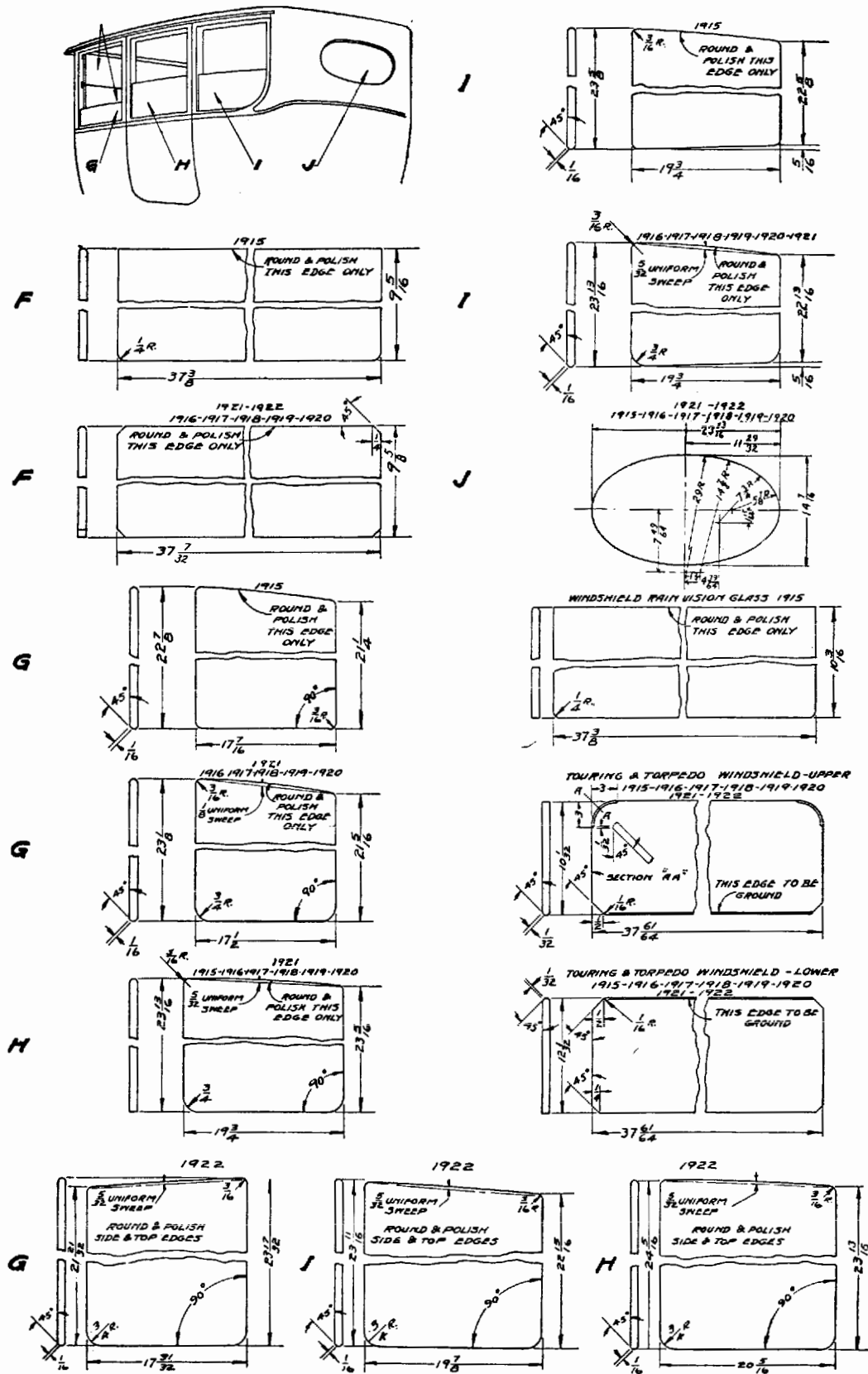
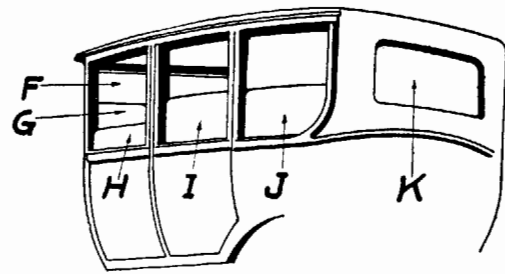
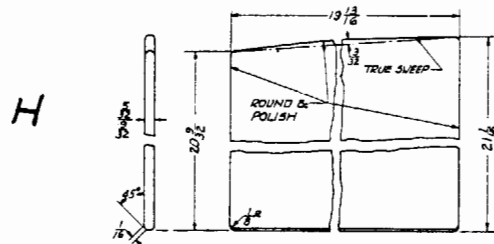
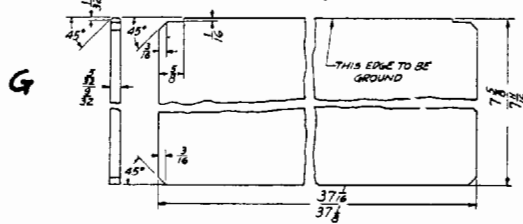
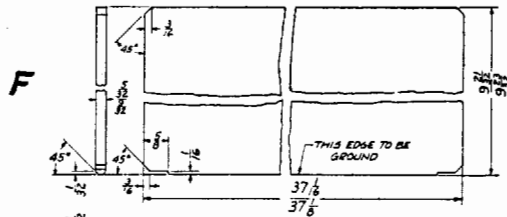
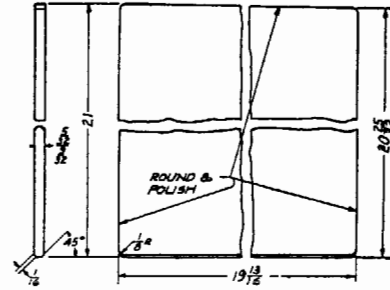


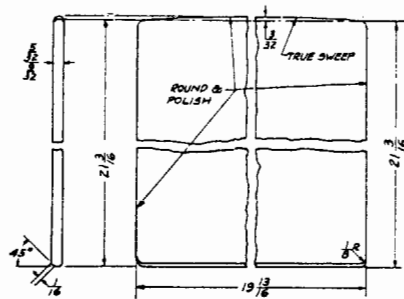
Fig. 119



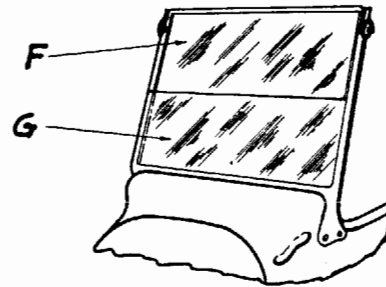
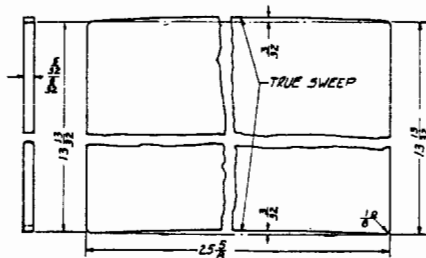
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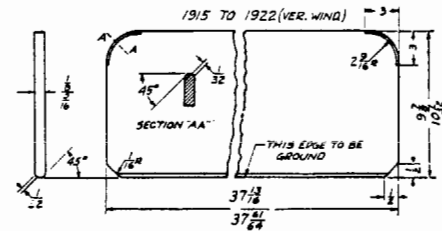
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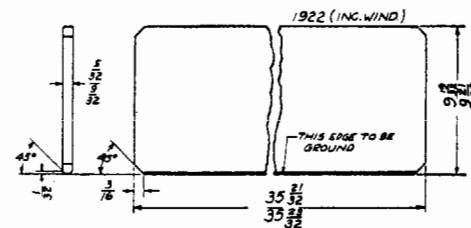
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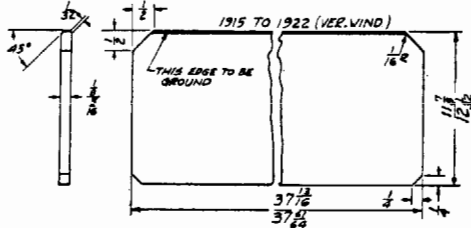
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F



G



G

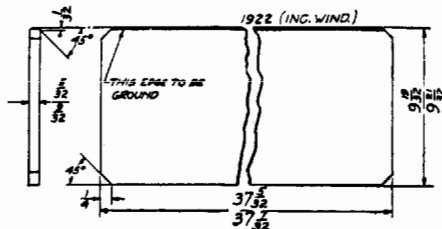


Fig. 120

### Returning Fordson Connecting Rods and Main Bearing Caps

Tractor connecting rods and main bearing caps are being returned in very poor condition for rebabbiting. In many instances these parts are heavily coated with rust and have the babbitt melted out when received from dealers. The expense of putting such parts in condition for service is oftentimes as great, if not greater, than the cost of producing new materials.

Hereafter Branches will not allow credit to dealers on tractor connecting rods and bearing caps that are received with babbitt melted out and in a rusted condition.

Dealers should oil all connecting rods returned to branches to prevent rust accumulating in transit.

### Shipment of Tractor Bearings

We find that many of our dealers are sending Tractor ball and roller bearings direct to the bearing manufacturers for inspection.

This causes a great deal of needless confusion, as the bearing companies have no authority to deal direct with dealers or owners. All matters of this nature should be taken up with your branch.

We also desire to direct your attention to the necessity of properly packing all tractor bearings returned to branches.

In shipping broken ball or roller bearings care must be taken to pack and tag the separate parts such as rollers, cups, balls, ball races and retainers, so that they can be matched up and identified. This is of vital importance as branches will not allow credit on broken bearings that cannot be identified.

## GENUINE FORDSON CONNECTING ROD TRADE MARKS

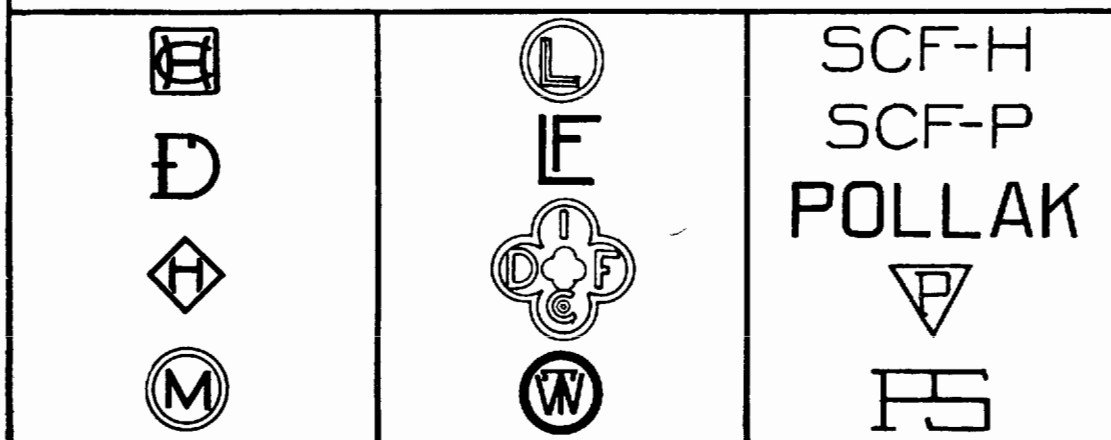


Fig. 121

Connecting rods bearing any one of the trade marks shown above, may be accepted in exchange

## Cars bearing motor numbers 6,844,682 to 6,953,070 were shipped during December

### Serial Numbers of Tractors Assembled

CORK, IRELAND  
November  
253,291 to 253,479  
December  
253,480 to 253,562

HOME PLANT  
December  
262,825 to 268,582