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FORDVILLE MOTORS LIMITED FORD, ONTARIO

Mr. Ford Car Owner:

It has been the policy of many Ford Car owners in the past to lay their cars up during the winter months. However due to improved road condition and better service facilities winter driving is coming more and more into prominence.

We are making a special offer during the coming winter to Service Ford owners who drive their cars all winter and Ford owners who can better afford to have their cars serviced during the winter than in the summer months. We are also making a special offer during the coming December, January, February and March. If your car needs attention do not fail to get in touch with us. This will save you money and valuable time later. Do not wait for the spring rush to start out. Make your arrangements now.

See us before December the First for our special offer.

FORDVILLE MOTORS LIMITED

In order to keep your staff together and cut down overhead, you can afford to give your car owners a special offer during the Winter months. A letter similar to the above should be a business getter for you.

Ford Mechanics' Section

(Continued from page 28, Sept., 1924, Service Bulletin)

The Ignition System

How to find Trouble and make Repairs

The repairs on the Ignition system are comparatively simple when the actual trouble has been located. When Ignition trouble arises, it is necessary to analyze the complaint, in order to avoid unnecessary dismantling of parts which is often caused by jumping to conclusions. We will endeavour to give you a method of checking the system which should save much time and annoyance in making repairs.

If Engine Fails to Start

As nearly all Ford cars are equipped with a Starting system we are assuming that the ignition switch on the dash is turned on the battery switch. The spark lever fully retarded, turn the engine over slowly by hand and listen for the spark coil to vibrate as commutator roller passes over segments. If the coils do not vibrate, it is a sure sign that the current is not getting through.

Proceed as follows: Turn the light switch. If lights operate, the trouble must be between switch and commutator. Examine all wires for loose connections or breaks from the switch to the commutator. If the lights fail to operate when turned on the switch, examine all wires between battery and switch, especially examine the ground connection on battery. If the wire is O. K., examine the coil box, as the coils may not be making a proper contact with the contact springs in the back of the box. This can be remedied by either bending out the spring contact in the back of the box, or shortening the metal strip holding the box sides at a proper distance. Next, examine the commutator for glazed segments, which prevent the roller from making the proper contact with segments. The use of too heavy oil often prevents the roller from making connection in cold weather. This is often quite noticeable on Ford tractors. If engine runs properly on battery, but not on magneto, the trouble is either in the red magneto wire on the switch, or the magneto itself.

The magneto should be tested with a magneto tester or by hooking it up with the Allan Test Stand and taking your reading

from the large dial on the stand, following instructions as given on the dial. If the magneto is dead or shows a low reading, it may be because some foreign substance has become lodged around the magneto terminal posts. This can usually be corrected by removing as soon as the terminal has been removed. If upon making this inspection, you find there is no indication of a shortage at this point, trouble may be caused by weak magnets or a short on ground coil.

This trouble can often be remedied by recharging with a magneto charger or by a set of 5 or 6 storage batteries, which will be explained later. If re-charging will not remedy the trouble, it will be necessary to remove magnets and replace the defective parts.

To Re-Charge the Magneto

To re-charge the magneto using the Wonder Charger. Proceed as follows:

It is absolutely essential to have the fly-wheel in the correct position while re-charging. This position is simply and quickly arrived at, by the aid of a magnetic compass. The correct position of the flywheel is located by placing a compass on top of the transmission cover $1\frac{1}{2}$ inches on centers, to the right-hand and two inches to the rear of the binding post of magneto terminal. Crank the engine over very slowly until the blue (the north seeking end of the compass needle) end of compass needle swings around and points directly towards the front of the car (on parallel lines from its $1\frac{1}{2}$ -inch offset position). The magnets are now in the correct position to receive a re-charge. Now remove the magneto binding post and hold the plug on the end of the cable down tight on the coil outlet. You can ground the other end of cable by clamping it on to some metal part of engine, or by holding it with left hand against transmission cover. The latter is a good way in case the magneto is shorted.

The make and break of the current is most effective. Keep the snap switch on for a duration of thirty-five seconds, approximately five seconds at a time, with a lapse of a second or so between. If the field coil is O. K. the job is complete.

back of the lower bridge and pressing up on it, reducing the spring tension of the vibrator spring. If the coils show too low a reading, tap the rear of the bridge with a rawhide mallet. This, on the other hand, increases the spring tension and ampere reading.

Proceed according to these instructions on all four points. If the coils show two or more sparks at a time, it is an indication that the cushion spring on the upper coil is not functioning properly. This cushion spring can sometimes be adjusted by either springing the upper bridge slightly upward or downward in the center. However, care must be exercised in making this adjustment, or you may ruin the assembly entirely.

To be Continued

One of Many

The following extract taken from one of our Service experts reports, is only one of many similar received on recommended equipment.

"Dealer has installed a new K. R. Wilson combination machine, and although previous to its installation, he was very much against buying it, as he claimed he could not get his money out of it, he is very pleased with it and thanks us for persuading him to buy it."

You cannot make a mistake when purchasing equipment recommended by our Service Experts. Each piece of equipment recommended has been proven by us to be O. K. before it is recommended to you. We also know that the user of this equipment will pay many times its cost through coming in contact with numerous dealers with all sizes of contracts using up-to-date methods of repairing.

Care of Battery in Winter

In the winter, it is especially important not to allow the battery to become discharged, as there is danger of the electrolyte freezing. A fully charged battery will not freeze, except at an extremely low temperature. The water expands as it freezes, loosening the active materials, and cracking the grids. As soon as a charging current thaws the battery, the active material is loosened, and drops to the bottom of the jars, with the result that the whole battery may disintegrate. Jars may

also be cracked by the expansion of the water when a battery freezes.

To avoid freezing, a battery should therefore be kept charged. The temperatures at which electrolyte of various specific gravities freezes are as follows:

Specific Gravity	Freezing Pt.
1.000.....	32° F.
1.050.....	26° F.
1.100.....	18° F.
1.150.....	5° F.
1.200.....	16° F.
1.250.....	58° F.
1.280.....	92° F.
1.300.....	96° F.

—Automobile Storage Battery

Change Oil Often

Experience has shown that too many Ford owners overlook the importance of frequently changing the oil in the crankcase, particularly during cold weather, when there is a greater tendency toward crankcase dilution, due to the gasoline being less volatile with the result that it works past the pistons to a much greater extent. Frequent use of the primer in starting a cold engine also tends to create a similar condition.

Car owners are beginning to realize that the life of the engine depends largely upon how frequently "oil changes" are made, and the difference between a long and short lived engine rests mainly on this point of lubrication. The mere fact that the oil in the crankcase is up to a certain level, does not, necessarily, mean efficient lubrication. That the customer is ignorant on this point is indicated by the expression which is frequently heard "Why, my car does not use any oil—in fact, there is more in the crankcase than there was a month ago." This goes to show that the lubricating oil is being diluted by a rich gasoline mixture, and within a short time its lubricating properties will be broken down and destroyed.

In order to be insured against using thin, broken down, diluted oil, it is essential that the oil be changed in a new engine after the car has traveled 400 miles. This operation should be repeated every 750 miles thereafter.

The dealer should also take this opportunity to impress upon his customers the value of using a high grade oil, as a cheap lubricant means rapidly wearing pistons, cylinders and other bearing surfaces.

New Design Camshaft and Bearing

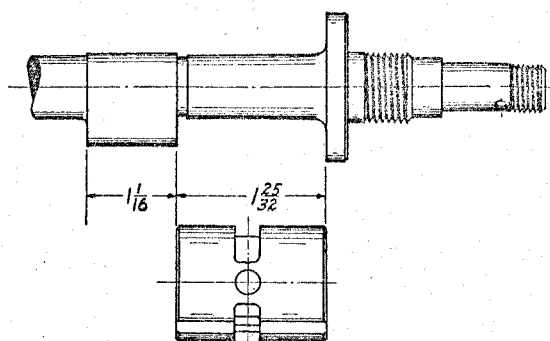


Fig. 28

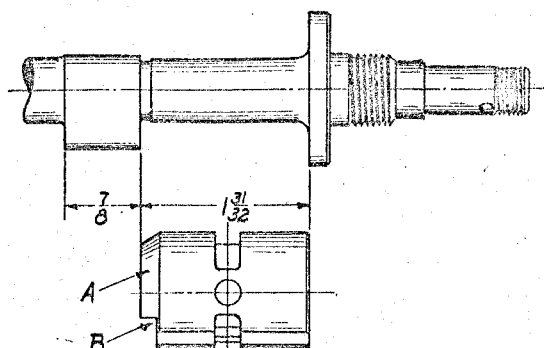


Fig. 29

An engineering change was recently made in the model T camshaft 3041-410 by lengthening No. 1 exhaust cam $\frac{3}{16}$ " and shortening the camshaft front bearing T 411 the same amount. Figs. 28 and 29 illustrate the changes that have been made in these parts. It will be noted that the notch "B" and the 30 degree chamfer "A" on the rear end of the old style bearing has been eliminated on the new type.

The length of No. 1 cam on the new design camshaft has been increased from $\frac{7}{8}$ to $1\frac{1}{16}$ ". This change of course decreased the distance between the cam and flange, the distance between these points being $1\frac{25}{32}$ " on the new shaft and $1\frac{31}{32}$ " on the old type.

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

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

After your stock of old style camshafts is exhausted you will furnish the new type shaft and new type front end bearing in filling any

orders you receive for the old style shafts. Having to purchase a new front bearing under such circumstances should not prove objectionable to customers, as the additional cost of the bearing is slight and furthermore it would not be good practice to install a new camshaft without replacing the front bearing.

Adjusting the Brake Pull Rods

The Brake Pull Rods are adjusted so they will pull evenly on both wheels, and the brake will be set tightly when the hand brake lever is in a vertical position. The adjustment is made by turning the threaded clevises on the ends of the pull rods. Ordinarily the pins will slip into the clevises readily. However if trouble is experienced, place the hand brake, lever forward and draw the pull rod so that the hub brake lever enters the clevis. Insert a drift through the clevis and lever holes to draw them into line. The drift may be made from a piece of $\frac{1}{4}$ " round steel bent at right angles and tapered at the ends. When the clevis and lever holes have been lined up properly withdraw the drift and insert the pin. Then try the brakes to see that they are set evenly, proceeding as follows: With the rear axle jacked up pull the hand brake lever back as far as it will go. Next examine wheels to see whether they are both tightly locked, if not, readjust until both wheels are locked, then release hand brake and examine wheels to make sure the brakes are not dragging.

The Lincoln Clutch

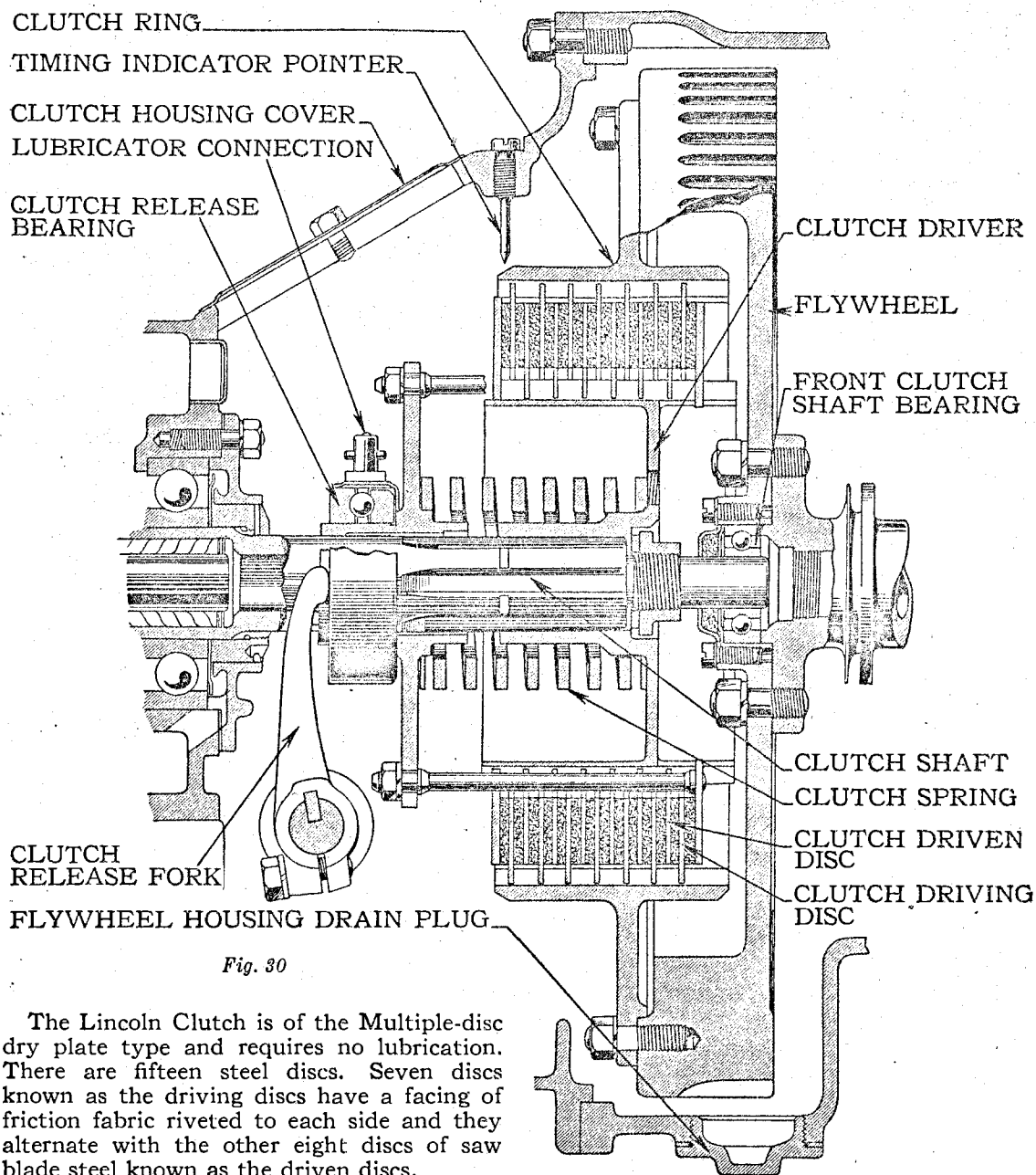


Fig. 30

The Lincoln Clutch is of the Multiple-disc dry plate type and requires no lubrication. There are fifteen steel discs. Seven discs known as the driving discs have a facing of friction fabric riveted to each side and they alternate with the other eight discs of saw blade steel known as the driven discs.

The driving discs have teeth in the outer diameter meshing with, and sliding in, the internal teeth in the clutch driving ring which is bolted to the flywheel.

The driven discs have teeth on the inner diameter, meshing with and sliding on corresponding teeth on the clutch shaft driver. When the clutch is engaged a heavy coil spring firmly compresses the two sets of discs

together so that the power from the engine is carried through into the transmission. The pressure which the spring exerts on the two sets of discs is released when the clutch pedal is pushed down, the clutch release fork compressing the spring through the clutch release bearing, and the driving discs continue to revolve with the flywheel. The driven discs, which are in effect integral with the trans-

mission gearing, become stationary when the clutch pedal is depressed.

Do not habitually rest the foot on the clutch pedal while driving. Although unnoticed, this may release the spring pressure just enough to cause the clutch to slip thus causing needless wear on the facing on the discs. Continual slipping of the clutch is liable to

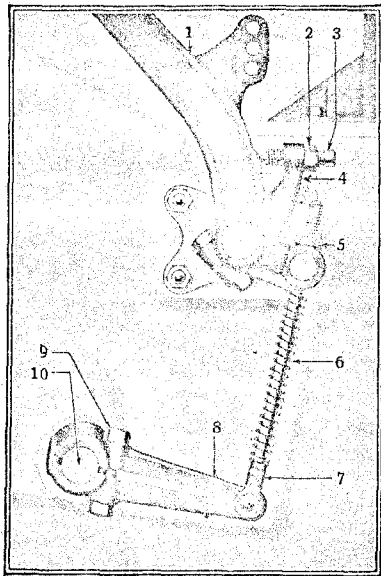


Fig. 31

Clutch Pedal Adjustment

Reference No.	Part Name
1.	Clutch pedal.
2.	Lock nut for pedal adjusting screw.
3.	Clutch pedal release stop arm adjusting screw.
4.	Clutch pedal release stop arm.
5.	Clutch pedal adjusting nut.
6.	Clutch pedal release rod spring.
7.	Clutch pedal release rod.
8.	Clutch release shaft arm.
9.	Clutch release shaft arm clamp bolt.
10.	Clutch release fork shaft.

result in buckled or warped clutch plates. The clutch pedal is adjusted when the car leaves the factory and should need no further attention until the facing on the discs has worn so that although the pedal will return to its normal position the discs are prevented from fully engaging by the set screw stop (3) Fig. 31. This condition causes slipping and rapid wear. To determine if the pedal is correctly adjusted, press down on the pedal pad. There should be approximately one inch free travel before the pressure of the clutch spring can be felt and the clutch starts to disengage.

The point at which the clutch starts to disengage can be determined by removing

the clutch housing cover on top of the transmission case and noting when the clutch release fork engages the clutch release bearing at the rear of the clutch spring spider. See Fig. 30. If no free motion exists at this point or if the clutch release fork rests against the clutch release bearing adjustment is necessary and should be made.

Turn the nut (5) Fig. 31 anti-clockwise or upward one half revolution at a time, until the clutch pedal will move forward approximately one inch (measured at the foot pad) before commencing to release the clutch.

Care of the Clutch

The clutch itself requires no lubrication. Every 750 miles when the car comes in for general inspection remove the flywheel housing drain plug and drain out any lubricant which may have worked into the clutch housing from the transmission. Occasionally the friction facing with which the driving discs are faced acquires a gummy coating and becomes glazed causing the clutch to slip and making gear shifting difficult. The clutch should then be washed out. Remove the clutch housing top cover and pour a gallon of high test gasoline into the clutch housing. Then start the engine and alternately engage and release the clutch for several minutes to allow the gasoline to work in between the plates. Then drain the housing. Thoroughly lubricate the rear starter generator bearing and the clutch release bearing after this operation as the oil will be washed out of these bearings when flushing the clutch housing.

When the clutch plates become badly glazed from continued slipping, the clutch should be disassembled for repair. Tack a large sheet of sandpaper on the workbench or flat surface and rub the driving discs back and forth on this until the glaze is removed and a new surface is presented. Warped or buckled plates should be replaced as they will not allow the clutch to release fully causing difficulty in gear shifting.

The shaft which carries the clutch is supported on annular bearings. The rear, in the transmission, and the front, in the flywheel. The rear bearing is lubricated from the transmission and the front bearing is packed with lubricant when assembled and the lubricant is retained by means of the felt washer and cap. This bearing should be cleaned and repacked whenever the clutch is removed.

The release bearing has a lubricator connection attached and should be lubricated

Continued on page 40

Anti-Freezing Solutions

With the approach of cold weather, it is necessary to give some thought to the question of anti-freezing solutions for the radiator and cooling system.

Dealers should caution owners against attempting to get along without an anti-freezing solution and explain that even if the water is drained after every trip, there is a possibility of the radiator becoming frozen. In very cold weather, or when driving against a cold wind it is possible to freeze the radiator after circulation starts. Also if one or more tubes are blocked up with dirt the water will not drain off.

The ideal anti-freezing compound is, first, one that will prevent freezing of the radiator liquid without injuring either engine or radiator; second, that will not lose its non-freezing properties after continued use, and third, that does not materially change the boiling point of water when dissolved in it.

Kerosene has a lower freezing point and a higher boiling point than water, but the inflammability of its vapor makes it dangerous to use, and its high and uncertain boiling point might lead to the serious overheating of the engine, or even to the melting of the solder in the radiator. It has 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 engine jacket and on the solder in the radiator. Tests have shown that calcium chloride solutions will completely remove solder from copper and brass. Another troublesome effect with calcium chloride solutions is experienced if small leaks occur in the radiator, and the solution comes in contact with the spark plugs and ignition wires, as a short circuit is liable to result. Calcium chloride compounds should be used with caution, if at all, on account of their corrosive action.

The alcohol solutions do not exert a greater corrosive action than water alone. Solutions made from either wood or denatured alcohol seem to be the most desirable anti-freezing solutions to use. The table below shows the approximate point at which the different alcohol solutions freeze:

20% solution freezes at 15° above zero.

30% solution freezes at 8° below zero.

50% solution freezes at 15° below zero.

A solution composed of 60% water, 10% glycerine and 30% alcohol is very often used, its freezing point being eight degrees below zero. Although glycerine tends to retard evaporation the alcohol will evaporate much faster than water. The solution will become weak and ineffective unless more alcohol is added from time to time.

When storing a car for the winter, first drain the circulating system. Then put about a quart of alcohol in the radiator, allowing it to run through. This will prevent the freezing of any water that on account of stoppage in the tubes did not drain out.

As with the car radiator, it is also necessary to put an anti-freezing solution in the radiator of the Fordson tractor during cold weather. The capacity of the tractor cooling system is 11 gallons.

Due to the rush of cold air through 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 removed or raised in the air washer. Others have been known to 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.

The Lincoln Clutch

Continued from page 39

with the pressure gun every 2,000 miles, using gear lubricant.

When the clutch is torn down care should be taken that the plates are assembled correctly. The rear disc is a tight fit on the clutch driver hub. This disc is easily identified as it is approximately twice as thick as the other plates. The rear driving disc is a close fit in the driving ring and can be identified by the saw slot in one tooth and the word "Rear" which is stamped on the lining.

On cars of earlier production this rear disc had a number of teeth slotted and sprung outward slightly to take up any existing play. These slots have now been removed except the one small one left for identification purposes and the teeth now fit with only .002 to .006 backlash.