REFERENCE BOOK

1942

Ford Motor Company DEARBORN, MICHIGAN

MERCURY

Reference Book

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1942

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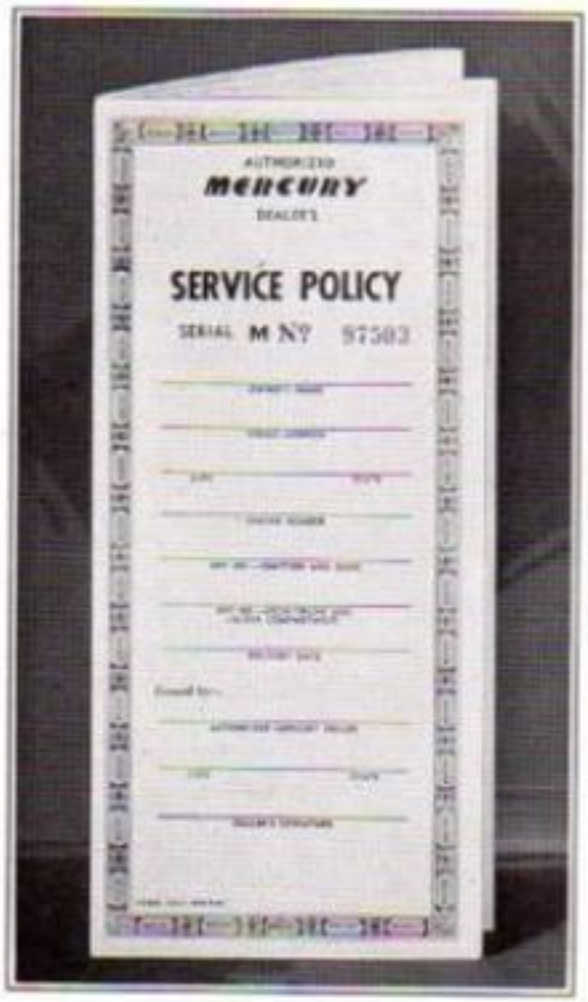
Ford Motor Company

Dearborn, Michigan

NEW CAR INSPECTION SERVICE

Because of the importance of correct lubrication during the first few hundred miles of operation and possible need of minor adjustments, the car should be taken to your Mercury dealer for the 300 mile and 1000 mile inspection. This service is assured you by the "Service Policy", a copy of which is illustrated on this page. This policy was no doubt presented to you by your dealer when he delivered your car and we suggest you read it carefully so you will be familiar with the various services to which you are entitled.



Service While Touring

As explained in the Service Policy, these inspections and lubrication services can be performed by any Mercury, Lincoln, or Ford dealer in the event you are on an extended trip at the time these services are due. The dealer performing the work will make a charge of $1.50* for either the 300 mile or 1000 mile service, but this amount will be refunded to you by the dealer from whom your car was purchased on presentation of the paid bill together with your service policy.

*Subject to change without notice.

DATA

Engine

V-type. Included angle of cylinders	90 degrees
Number of cylinders	8
Cylinder Bore	3.187 inches
Stroke	3.75 inches
Piston displacement	239 cubic inches
Taxable horsepower rating	32.5

Engine Number

The engine number is also the serial number of the car and is located at rear of engine on the top of the clutch housing.

Key Number

Key numbers should be noted so that in case of loss, new keys may be obtained. Key numbers are indicated on metal tags attached to new car keys.

Wheelbase

118 inches.

Tires

6.50 x 15. Recommended pressure 24 pounds.

Capacities

Engine oil pan	5	quarts
Liquadrive Flywheel	10½	pints
Transmission	2.75	pints
Rear Axle	2.5	pints
Cooling system	22	quarts
Gasoline tank	17	gallons

Weights

Information on the weight of various body types can be obtained from authorized Mercury dealers.

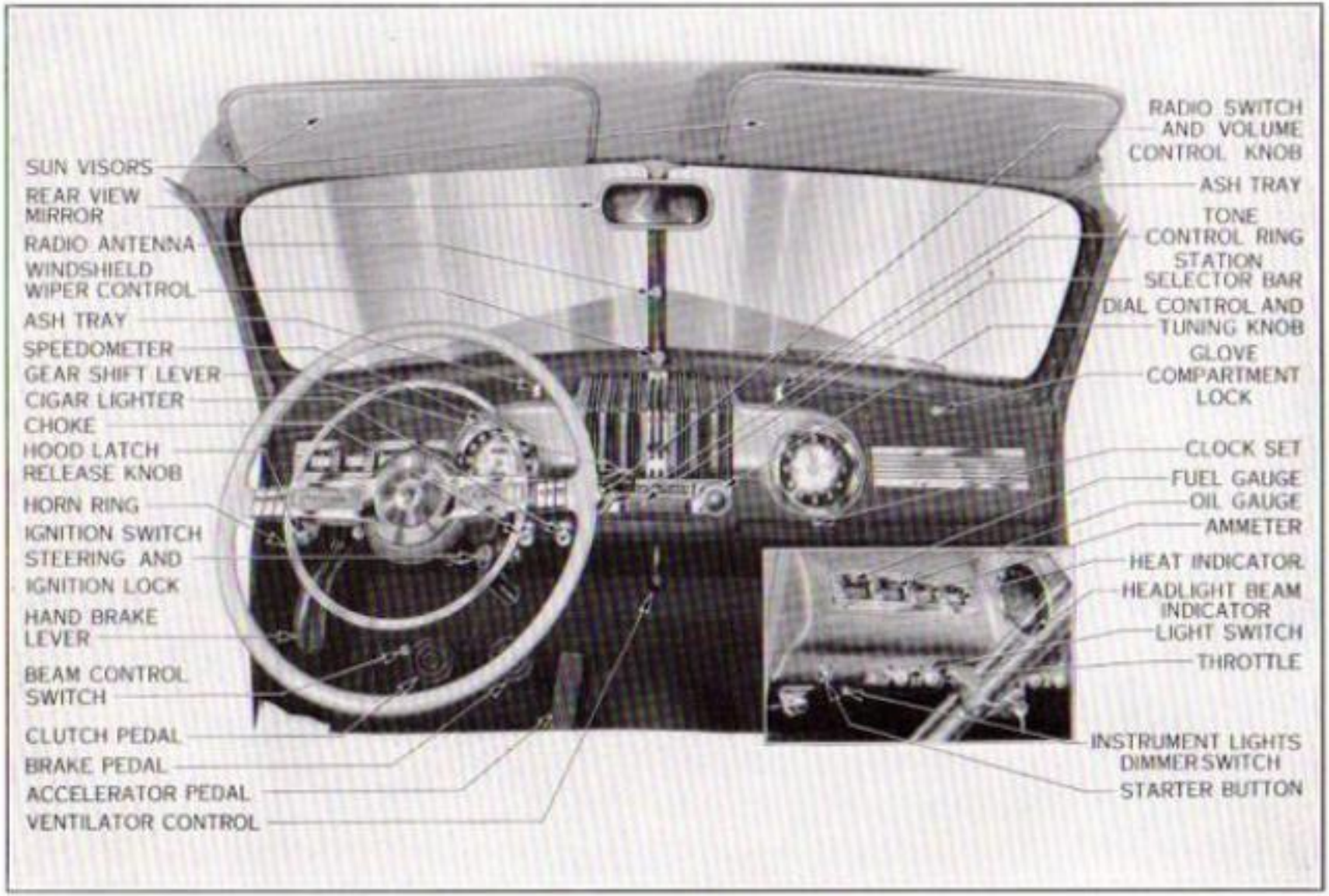


Fig. 2—Instruments and Controls

SUGGESTIONS FOR CARE OF NEW CAR

Due to the accuracy in the manufacture of moving parts and the smoothness of bearing surfaces, your Mercury car is ready for conservative driving as soon as delivered. Best results can be obtained by moderate speeds at the start, gradually increasing speed, if desired up to 60 or more miles per hour after the first 500 miles. By driving the car at moderate speeds during this period, all parts of the engine are maintained at more uniform temperature and stresses, making less likelihood of the original clearances being changed by abnormal expansion of any of the parts.

When the engine is cold, it is a good practice to warm it up slowly by running it at normal idle speed for a short period. This warming up process should not be hastened by speeding the engine beyond a fast idle. It is particularly important with a new car that the automobile be driven at moderate speeds until the engine has become thoroughly warm.

Form the habit of occasionally glancing at the instruments on the instrument panel. This applies particularly to the temperature gauge so as to make sure the temperature of the engine is kept within the normal driving range. Have your dealer change the engine oil and lubricate the car at 300 miles.

Locking the Car

The car is equipped with a coincidental lock built into the bracket which supports the steering column at the instrument panel. One operation locks both steering gear and ignition switch.

The car cannot be locked with ignition switch "ON."

The ignition and doors lock with the same key. A separate key is provided for the glove compartment, rear deck door and tire lock.

STARTING ENGINE

Be sure that the gear shift lever is in neutral position.

Depress accelerator pedal slightly.

Turn the ignition switch lever "ON". Press starter button on lower left side of instrument panel and, if the engine does not instantly start, pull out the choke control located on the instrument panel to the right of the steering column. While the engine is cranking, push choke control in until it is about three quarters open.

The engine will usually start in a few seconds. Longer periods of cranking with choke button out should be avoided as the engine may be flooded, in which case it is necessary to pull the hand throttle button all the way out and crank engine with the switch still on. When the engine starts, release the starter button at once, push the hand throttle in and then move the choke button to a point which gives the smoothest running condition. The choke button should be pushed all the way in as soon as the engine runs smoothly.

Cold Weather Starting

In extreme cold weather it is advisable to keep the clutch released until engine starts. By keeping the clutch released while engine is cranking, the starter motor is relieved of the extra load resulting from turning the transmission gears in the stiffened lubricant. Cold weather starting requires a judicious use of the choke button. When starting the engine in extreme cold weather, the choke button may be kept fully out until the engine starts as the auxiliary valve in the choke

butterfly will open and permit sufficient air to enter so that the engine will continue to run. However, as soon as the engine starts the choke should be pushed in to best running position. When the engine runs smooth it should be pushed all the way in.

COOLING SYSTEM

General Description and Operation

The water in the cooling system is circulated by two centrifugal type water pumps. A pump is located at the front of each cylinder bank close to the bottom of the water jacket. Both water pumps in addition to the generator, are driven by a V-belt from a pulley on the crankshaft.

The water pumps do not require any attention as to lubrication, or adjustment to prevent water leaks since they are the pre-lubricated type and are so designed that the water seal around the shaft is automatically maintained.

The Fan

The fan is mounted on a separate bracket attached to the generator support bracket. A small V-belt running from a separate pulley on the crankshaft drives the fan pulley. Lubrication of the fan shaft is accomplished by an oil reservoir in the fan pulley. Light engine oil of SAE 20 viscosity should be used in the fan pulley and it is recommended that one ounce be added each 5,000 miles. The oil can be placed in the reservoir after removing the slotted plug in the hub of the pulley directly behind the fan blades. After adding this amount of oil, hold a piece of cloth over the filler hole and turn

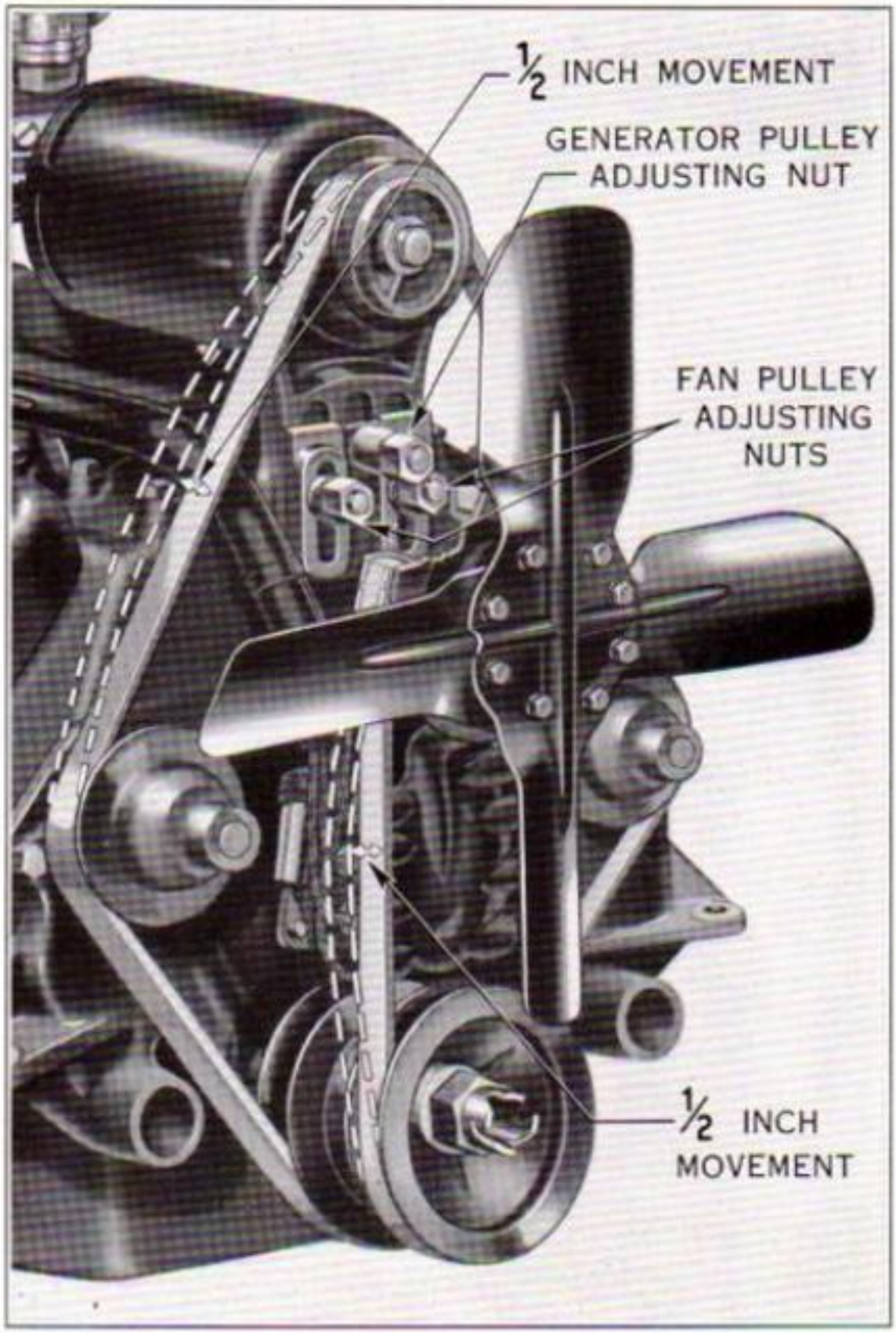


Fig. 3—Cooling System

fan until the filler hole is on the bottom, so the surplus oil will drain out. Then replace plug.

Adjustment of the Fan and Generator Belts

Both the generator and fan belts must be adjusted at the same time. There should not be more than 1" total movement (½" each way) when the belt is firmly grasped midway between the two pulleys as indicated by the dotted line and arrows in Fig. 3.

To adjust the tension of the fan belt, loosen the two nuts which hold the fan shaft bracket to the generator bracket. Then loosen the generator Pulley Adjusting Nut and move the generator assembly upward until the generator belt has the proper tension. Hold the generator assembly in position until the generator Pulley Adjusting Nut has been tightened. After securing the proper tension on the generator belt, move the fan assembly upward in the slotted bracket on the generator support until the fan belt likewise has approximately ½" movement as indicated in Fig. 3. Then tighten the two nuts which hold the fan shaft bracket in place on the generator support.

Thermostats

Thermostatic valves are provided in the engine cylinder heads where the upper hoses are connected.

These thermostats retard the circulation of water in the cooling system until the engine temperature has been raised to a point where maximum performance and economy will be secured.

Radiator Filler Cap

The radiator filler cap is located on the top of the upper tank of the radiator and is easily accessible by

merely lifting the hood. To remove the radiator cap, turn counter clockwise as far as possible, then push down and continue to turn in the same direction until the cap comes off.

The level of the cooling liquid in the radiator should be checked regularly and water should be added if the level seems low after the engine is thoroughly warm. The water in the cooling system must be as nearly neutral as possible. In sections of the country where only alkaline, acid or saline waters are available, the addition of Ford Rust Inhibitor is recommended, as this will minimize the corrosive action of such water. Your Ford dealer can supply this inhibitor.

Draining the Cooling System

There is a separate drain cock for each bank of cylinders, located at the front of the cylinder block directly behind the lower hose connection. The drain cocks on both right and left sides of the block should be opened to completely drain the cooling system. 22 quarts of fluid are required to refill after draining.

Heat Indicator

The heat indicator located in the instrument group is of the electric type and shows the water temperature in the radiator. (Note—The gauge operates only when the ignition switch is "ON." The indicator hand points at the "hot" end of the gauge when the ignition switch is "OFF."

Anti-Freeze Solution

Genuine Ford Anti-freeze may be obtained from Mercury and Ford dealers. Ethylene Glycol, radiator glycerine, or alcohols are also satisfactory anti-freeze

solutions. These are all organic liquids and like water will cause rusting in any system containing iron. This iron rusting can be controlled by the use of a rust inhibiter which can be obtained at Mercury and Ford dealers. Ford Anti-freeze, Ethylene Glycol, and some brands of alcohol, as marketed, contain an effective inhibiter to control this corrosion.

Among the inorganic anti-freezes commonly offered to the public, calcium chloride solutions are probably the most destructive. However, other solutions such as honey, glucose, sugar, also oils, are harmful and should be avoided.

After the anti-freeze solution is drained in the spring, put in a Summer rust preventive.

FUEL SYSTEM

Fuel Tank

Fuel may be drained by removing the plug in the bottom of the tank.

The tank is provided with a trap to catch water or sediment. This trap is cleaned by removing the drain plug and allowing a small quantity of fuel to run out.

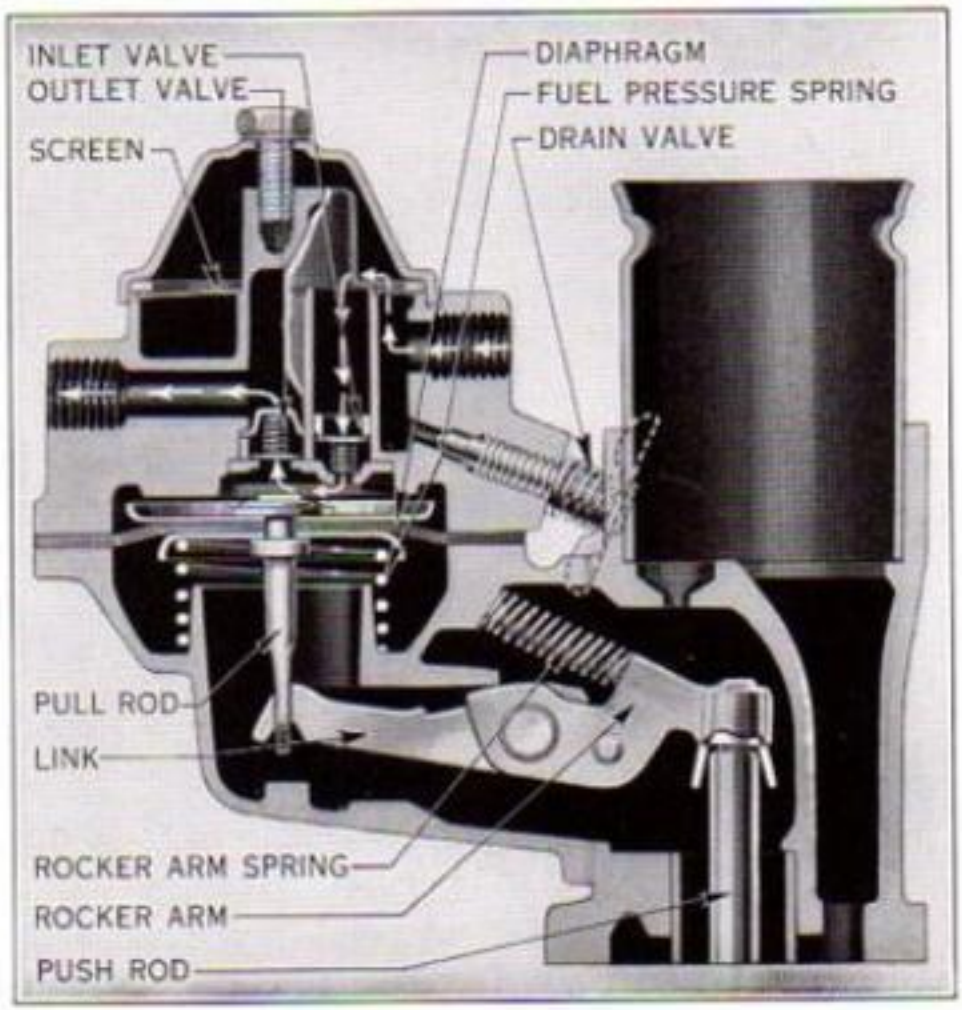


Fig. 4
Fuel Pump

Fuel Gauge

The fuel gauge located in the instrument group is of the electric type and is operated by a float in the gasoline tank. This gauge is automatic in its action and should require no attention.

NOTE—The ignition switch must be "ON" before the gauge will register.

Fuel Pump

The fuel pump is located on the top of the engine behind the carburetor and is driven by a push rod actuated by an eccentric on the camshaft. Being automatic in action, the pump requires little attention other than occasional cleaning of the screen and draining to remove any sediment or water. (See Fig. 4).

The pump provides a trap for sediment or water which is drained by means of a valve shown in Figure 4. When draining the pump it is important to break the air lock in the fuel line by loosening the cap screw at the top of the pump. This facilitates draining.

In case of running out of gasoline, it will require approximately 20 seconds of cranking the engine with the starter before the pump is primed and again supplies gasoline to the carburetor.

Carburetor

The carburetor is of the dual down draft, plain tube type with accelerating pump and auxiliary valve choke. All orifices are fixed with the exception of the idling jets which are controlled by the idling adjusting screws. (See Fig. 5.)

Adjustment

The idle speed of the engine should be set by means of the throttle stop screw (See Fig. 5) to a speed equivalent of seven miles per hour (450 RPM).

Idle mixture adjustment. Before making adjustment, the engine must be warmed up to normal operating temperature.

The idle adjustment shown in Figure 5 controls the quantity of the gasoline-air mixture for low speed operation.

Turning adjustment "out" gives a richer mixture. Turning "in" gives a leaner mixture. Adjust one side of the carburetor at a time. Turn the adjustment in slowly until the engine begins to lag or run irregular, then slowly turn out until the engine begins to "roll." Finally, turn in the adjustment again just enough so that the engine runs smoothly. This adjusts the mixture for one side of the engine; follow the same procedure for the opposite side. (Mercury and Ford dealers have special equipment for checking and adjusting carburetors.)

Accelerator Pump

During summer weather the accelerating pump stroke is shortened by connecting the accelerating pump link in No. 1 position. (See Fig. 5.)

For winter operation, the accelerating pump link should be connected in position No. 2. Connecting link in position No. 3 is advisable only in extreme cold weather. (See Fig. 5.)

Caution—NEVER attempt to operate the engine and make carburetor adjustments in a small, unventilated garage. Carbon monoxide gas, produced by all gasoline engines, is a deadly insidious poison when inhaled.

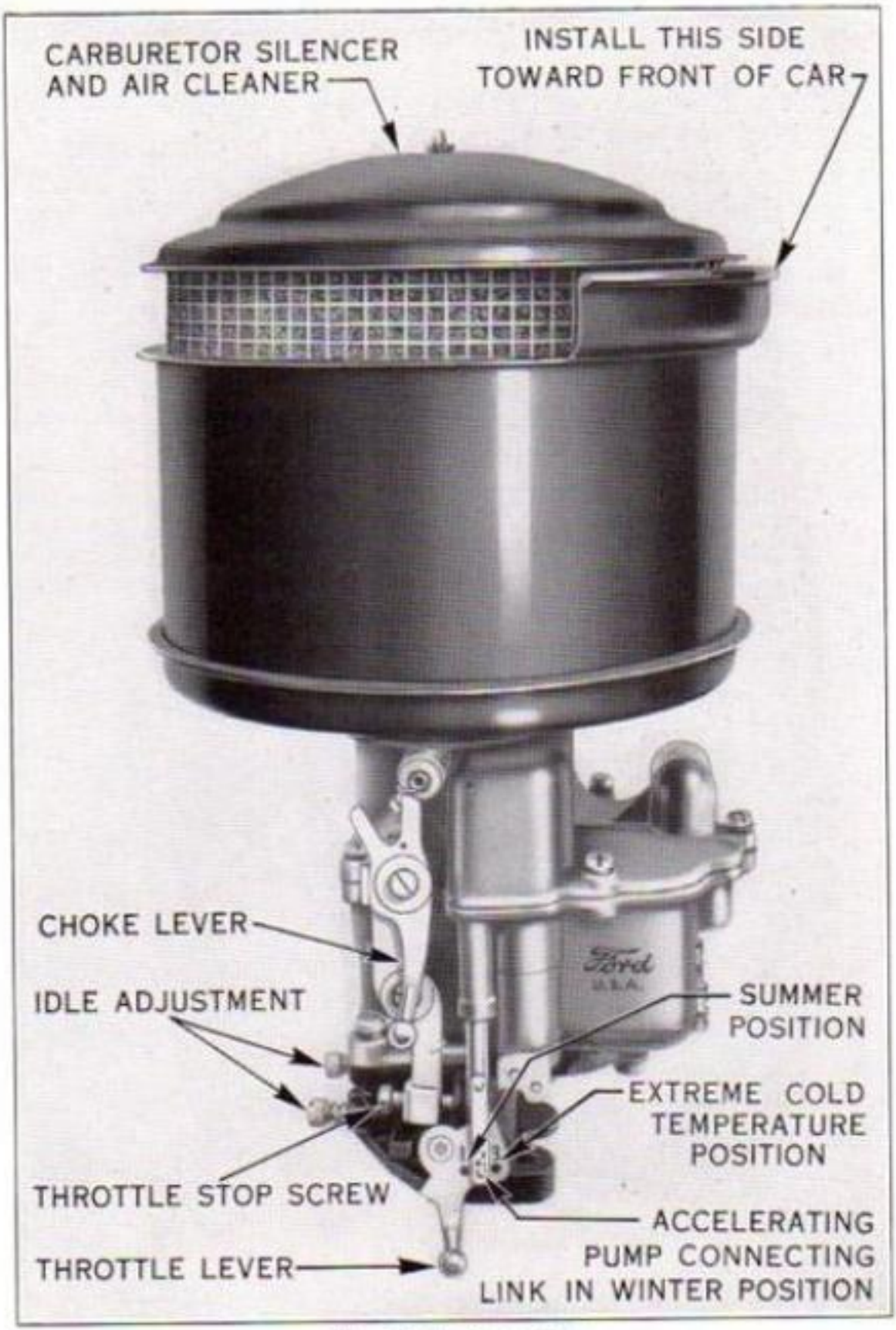


Fig. 5—Carburetor

Air Cleaner and Carburetor Silencer

The air cleaner and carburetor silencer (See Fig. 5) is attached to the carburetor air intake. This unit cleans the air going into the carburetor and quiets carburetor operating noises.

The air cleaner should be cleaned periodically, depending upon the condition of the roads over which the car is operated. To clean, remove top cover and filter unit. Wash filter unit in gasoline, after which dry thoroughly, then submerge in a good grade of engine oil and allow to drip dry before reinstalling. (Do not oil the felt in top cover.)

Cars which are operated in dusty territories, or over unpaved roads, should be equipped with an oil bath air cleaner. This type air cleaner can be obtained from Mercury dealers.

ENGINE AND IGNITION

The Mercury engine is accurately made, carefully assembled, and thoroughly tested. Every precaution has been taken to provide trouble free operation, and with normal care the occasion for making emergency repairs or adjustments on the road will be remote.

The instructions and illustrations under this heading are for general information and are not intended to be complete for making major repairs. It is recommended *all* repairs or adjustments be made by authorized Mercury or Ford dealers.

Engine Operation

If the engine will not start it is probably due to one of the following causes:

1. The cylinders have become flooded with gasoline, due to excessive use of the carburetor choke.

Remedy: Pull the throttle button all the way out. Without turning on the ignition switch, crank the engine with the starter for approximately thirty seconds to exhaust the rich gases; then proceed in starting the engine as outlined on page 8.

2. Insufficient gasoline reaching the carburetor may be caused by an empty gasoline tank, clogged gasoline line or worn or clogged fuel pump.

Remedy: In case of running out of gasoline it will require approximately twenty seconds of cranking the engine with the starter before the pump is primed and will again supply gasoline to the carburetor. A clogged gasoline line can be cleaned by disconnecting the lines at each end and blowing out the obstruction. In case of a worn or clogged fuel pump, remove and clean strainer and drain sediment trap (See Fig. 4). Make sure the inside of the pump is free from dirt, also check to see if all gas line connections are tight. In case replacement of pump parts becomes necessary it is advisable to consult a Mercury or Ford dealer.

If sufficient gasoline is reaching the carburetor, a spray of gasoline will be produced at the high speed discharge nozzle in the carburetor every time the accelerator pedal is depressed. (It will be necessary to remove the air cleaner to observe this.)

3. Faulty ignition may be determined by holding a spark plug wire approximately ¼ inch away from the cylinder head as the engine is cranked with the starter. If a spark is not noted from each of the wires the cause is due to open ignition circuit, distributor points or coil. It is, of course, assumed the storage battery charge has not become exhausted.

Remedy: Check for loose connection or broken wire. If fault is located to be the distributor or coil, it is suggested you consult a Mercury dealer.

Crankshaft Main Bearings

There are three crankshaft main bearings of the replaceable type. They do not require adjustment.

Connecting Rod Bearings

The connecting rod bearings are of the replaceable type and do not require adjustment.

Valves and Lifters

The clearance is accurately set and no adjusting screws are used.

The correct clearance for intake valves is .011 - .012 and for exhaust valves is .013 - .015 of an inch.

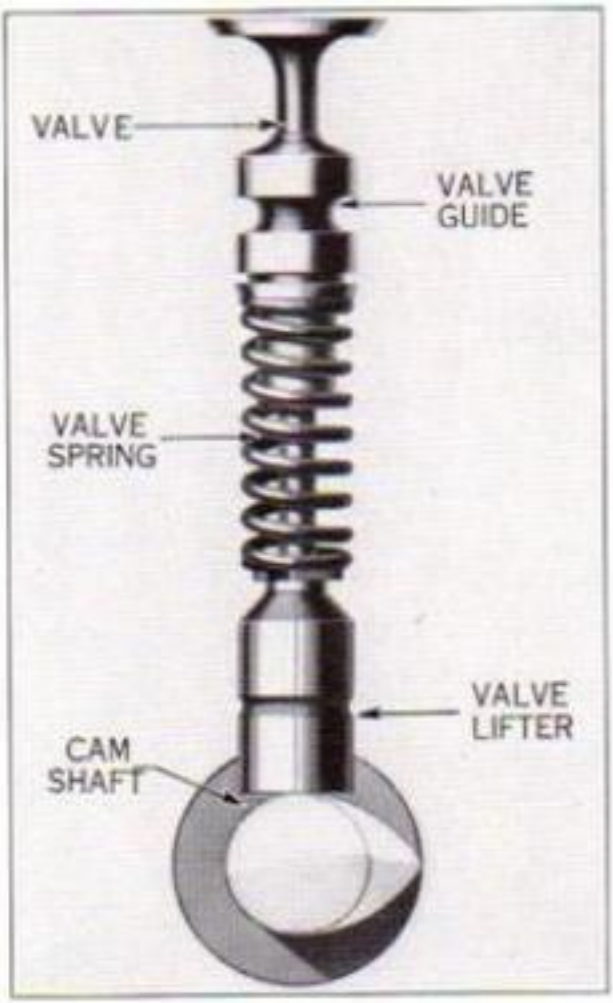


Fig. 6
Valve and Lifter Assembly

The correct position of the valves when checking clearance is as follows: Turn engine until number one piston is at top of cylinder on the compression stroke. Both intake and exhaust clearance on this particular cylinder may be checked at this point. Proceed with the balance of cylinders in rotation according to firing order. (Firing order 1-5-4-8-6-3-7-2.)

Camshaft Setting

The camshaft is driven by a fabric helical gear in mesh with a steel gear on the crankshaft. The camshaft and gear assembly is installed with the mark on the cam gear at the bottom corresponding with the mark on the crank gear. (See Fig. 7.)

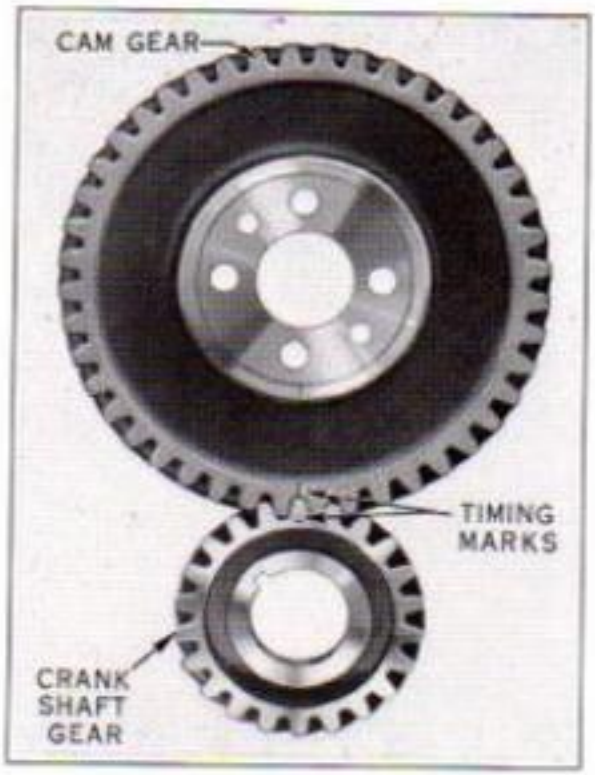


Fig. 7
Timing Gears

Ignition

The current for igniting the gas mixture in the cylinders is provided by the storage battery. The ignition coil transforms the low tension current to a high tension current of sufficient voltage to bridge the gap between the points of the spark plugs. The distributor points interrupt the flow of low tension current at regular intervals, while the distributor rotor distributes the high tension current to each spark plug in proper firing order.

Distributor

The distributor is located at the front of the engine and is driven directly by the camshaft, thus eliminating many parts.

Spark timing is automatically advanced or retarded by centrifugal governor weights in the distributor. A vacuum brake automatically retards the spark timing in direct proportion to the load. (See Fig. 8).

The distributor vacuum brake consists of a plunger or piston which is held against the braking surface of the

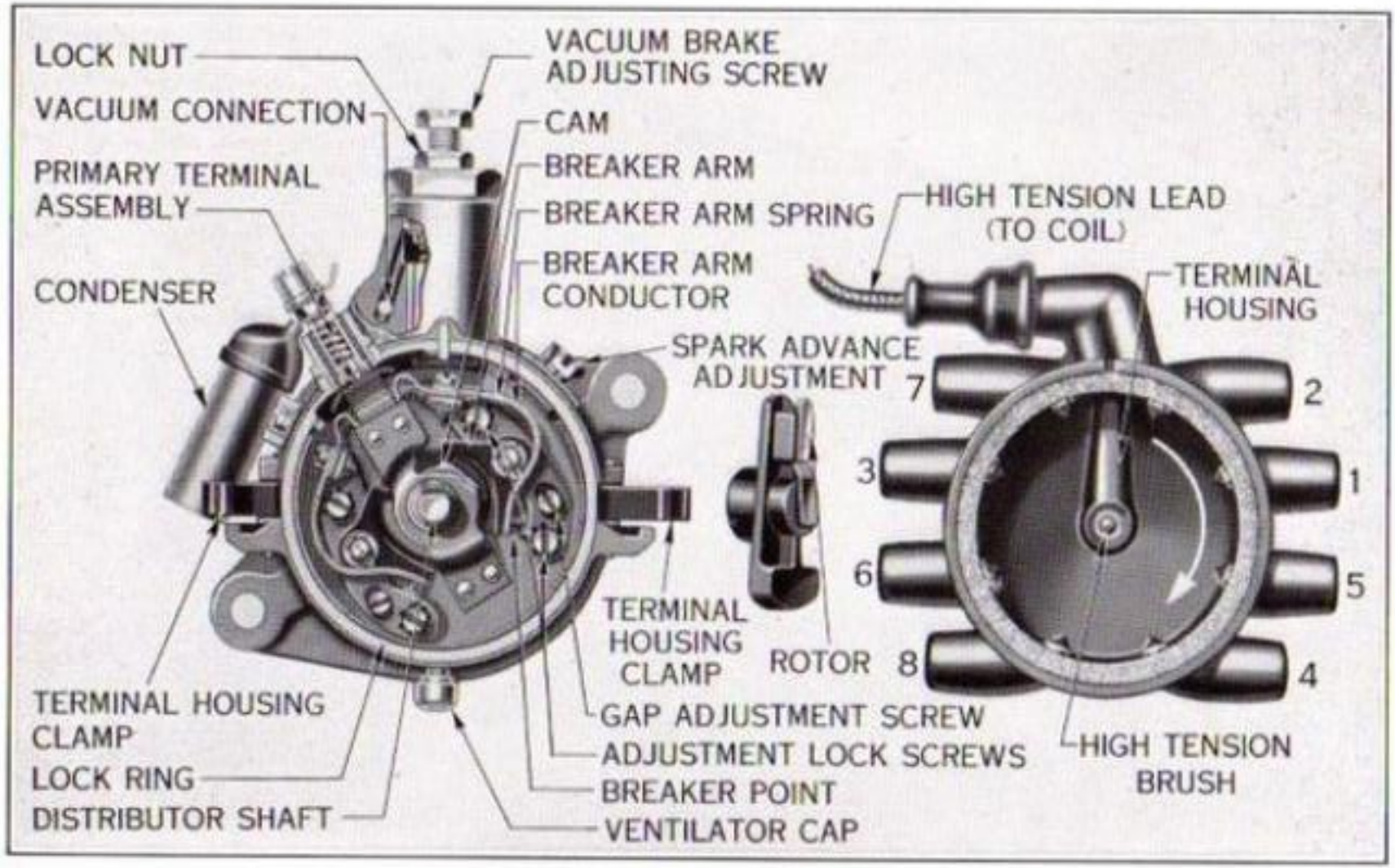


Fig. 8—Cross Section of Distributor

governor plate by a spring of adjustable tension. As the rapidity of combustion is dependent on the degree of compression, the need of a retarded spark for quick acceleration or power is dependent on both engine speed and throttle opening.

To meet the requirements of the fuel used and the type of service in which the car is operated an adjustment is provided on the vacuum brake. (See Fig. 8.)

Adjustment is obtained for a particular fuel as follows: Back off the adjustment on the vacuum brake (See Fig. 8) until the engine "pings" under load. Then turn the adjusting screw in just enough to remove the ping. Tighten the adjusting screw lock nut to preserve the adjustment.

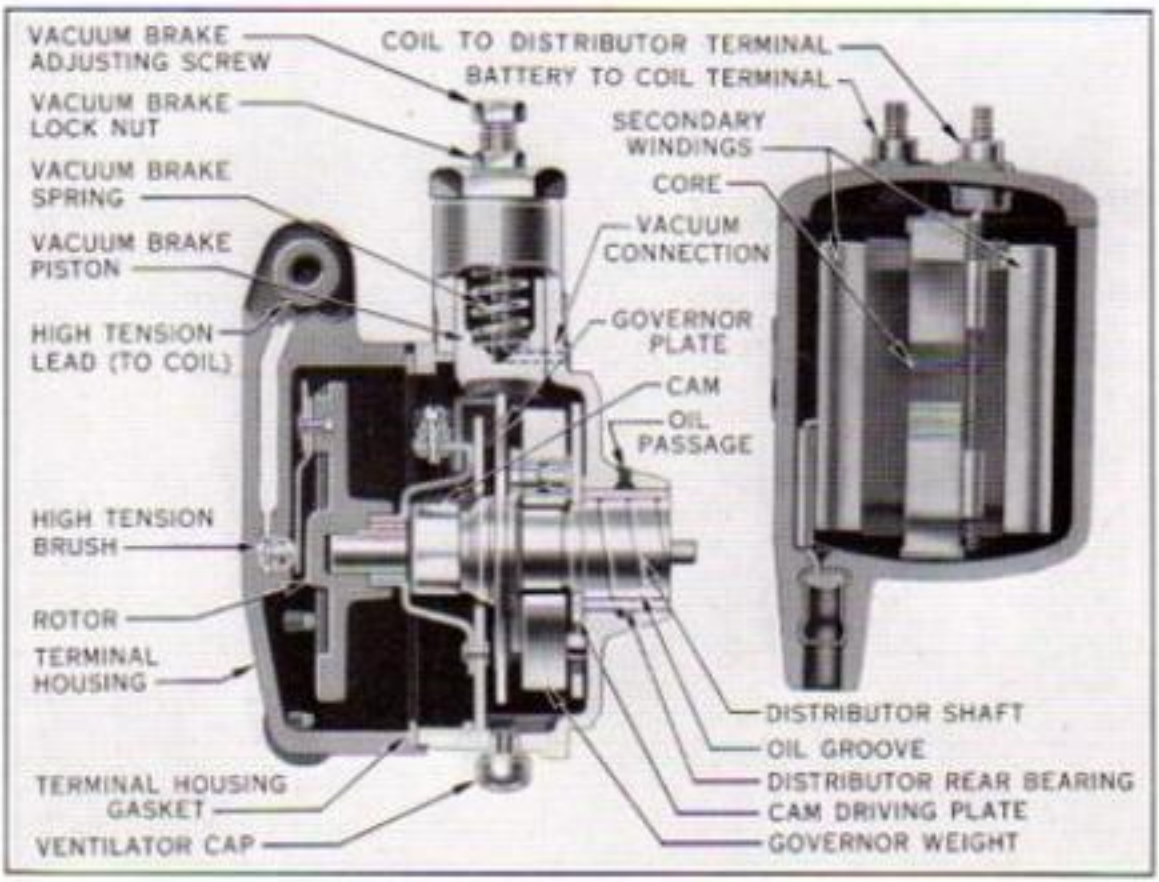


Fig. 9
Longitudinal Section of Distributor

Breaker Mechanism

The breaker mechanism includes an eight lobe breaker cam, two sets of breaker points and one condenser (See Fig. 8). The left hand breaker points function to open the ignition circuit. The right hand breaker points close the ignition circuit.

In the above reference to right hand and left hand, the engine and distributor should be viewed from the driver's seat and not as shown in Fig. 8.

The proper setting for the distributor breaker point gaps is .014 to .016 with breaker arm on the high point of the cam.

Rotor

The rotor distributes the high tension current to the spark plugs. (See Fig. 10.) The eight high tension terminals which are placed around the distributor plate are numbered. The wires from each of the terminals are connected to the spark plug on the cylinder which is indicated by the corresponding number.

Spark Timing of Engine

The correct spark timing of the distributor is four degrees (crankshaft) before top dead center. When such adjustments to the distributor are needed however, it is advisable to have them made by an authorized Mercury or Ford dealer who are specially equipped for this service. Adjusting breaker points and checking the governor mechanism without special equipment would be guess work. No other one thing affects the operation of a car as vitally as incorrectly adjusted ignition which is reflected in poor performance, high fuel consumption and over-heating of the engine.

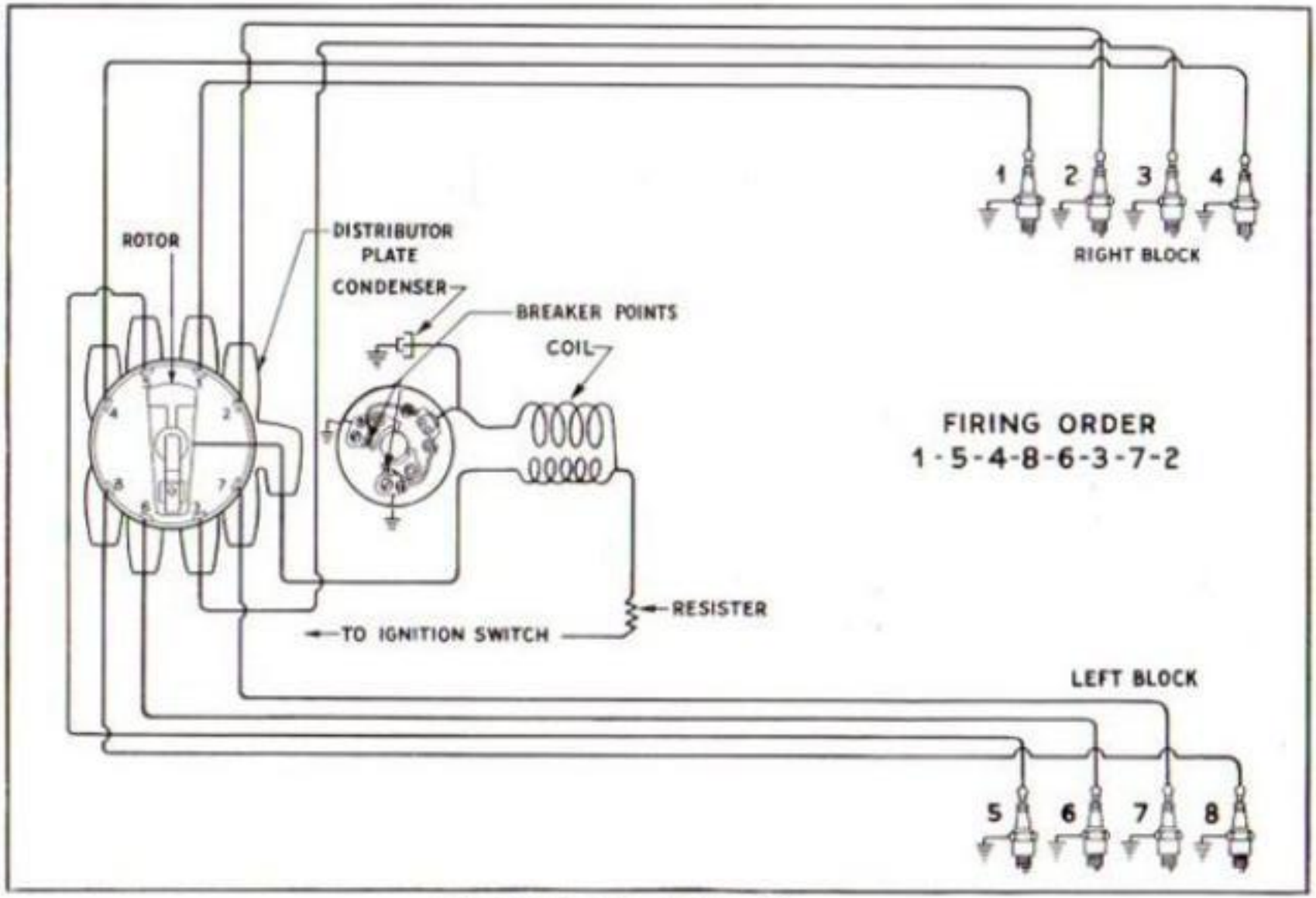


Fig. 10—Ignition Wiring Diagram

Spark Plugs

Spark plugs should be examined occasionally and cleaned. Care should be observed in correctly setting gap to .027 inch.

The particular spark plugs used as factory equipment are best adapted to the requirements of the Mercury engine and should be used for replacement.

CLUTCH

The clutch is of the single plate type, composed of two major units—the pressure plate cover assembly and the clutch disc. (See Fig. 16.)

The pressure plate cover assembly contains the pressure springs, pressure plate and release levers.

The release levers are mounted on needle roll bearings and so designed that the centrifugal force from the rotation of the clutch increases the pressure on the driven member as the speed of the engine is increased. This feature permits a light pedal pressure when shifting gear at normal engine speeds and prevents clutch slippage at the higher speeds.

The steel clutch disc has friction facing rings riveted on each side. There are six segments formed in the disc which give the required amount of cushioning to insure smooth clutch engagement and long life of the friction facing.

A mechanical damper incorporated in the hub of the clutch disc serves to insure quiet operation of the transmission and absorbs the shock of sudden clutch engagement. This damper is adjusted correctly at the factory and should not require further attention.

No adjustment is required on the clutch other than to maintain the required amount of free travel in the clutch pedal. (See "Pedal Adjustment.")

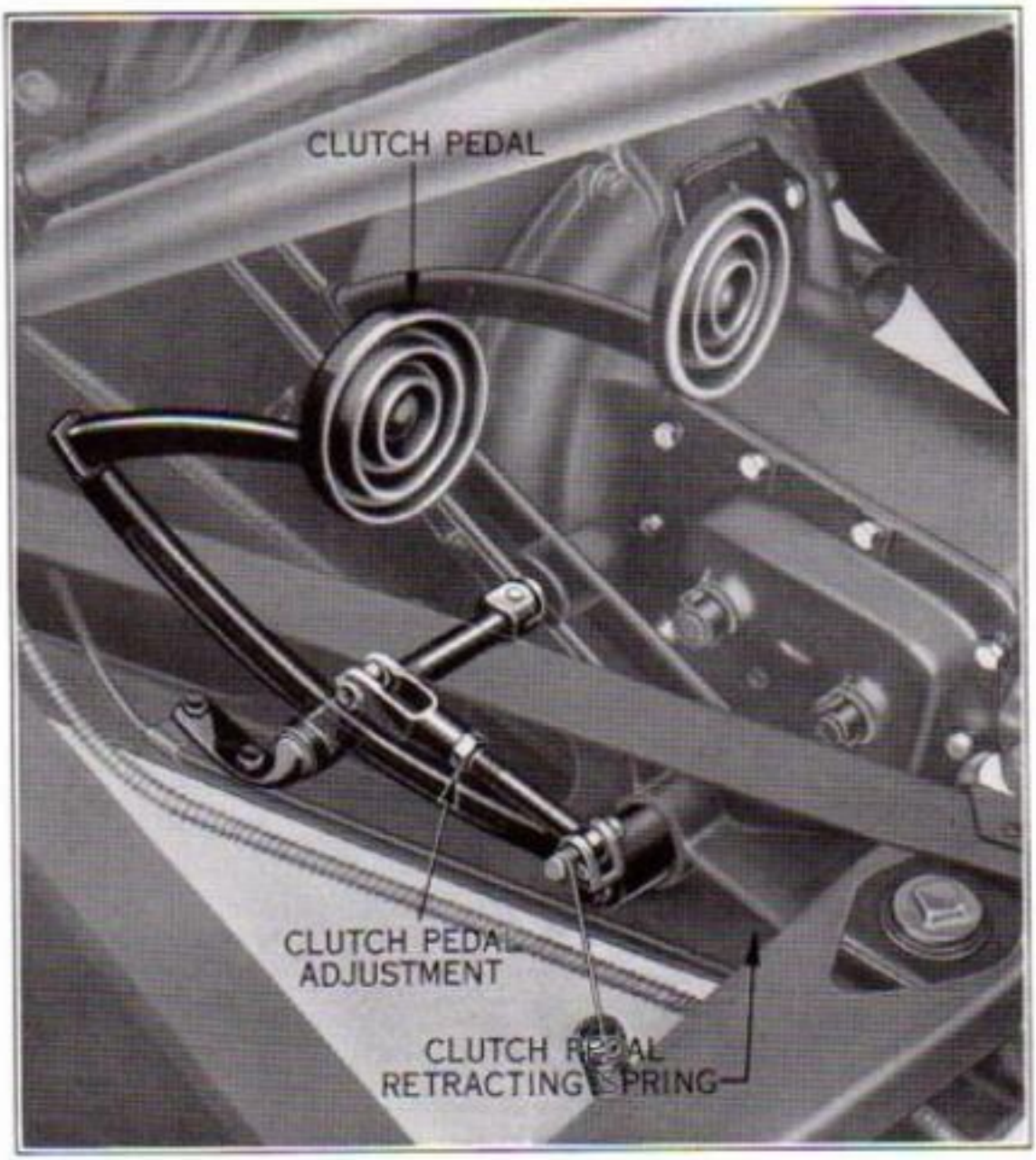


Fig. 11

Clutch Pedal Adjustment

Pedal Adjustment

The pedal should have approximately 1 to 1¼ inches free travel before it begins to disengage the clutch, with engine idling or stopped. **This is important.**

The amount of movement can easily be determined by moving the clutch pedal down with a slight hand pressure. This free movement will become less as the mileage on the car increases. If movement less than 1 inch is noted, the clutch pedal adjusting rod should be shortened. (See Fig. 11). Decreasing the length of the rod by screwing the clevis in increases the amount of free movement.

Caution—Don't "ride" the clutch pedal. Driving with the foot resting on the pedal will result in excessive wear of the clutch facings and clutch throw-out bearing. This will necessitate frequent adjustment of the clutch pedal and result in premature clutch replacement.

The pilot bearing located in the center of the flywheel for supporting the front end of the clutch shaft and the needle rolls in the clutch fingers, also the clutch throw-out bearing, are lubricated at time of assembly and no further lubrication is required.

GENERAL LUBRICATION

(See Figure 13)

Transmission

Summer lubricant for transmission should conform to S. A. E. specification No. 90.

Winter lubricant should conform to S. A. E. specification No. 80.

2¾ pints required to fill.

Rear Axle

Summer lubricant for rear axle should conform to S. A. E. 140 (Mild Extreme Pressure.)

Winter lubricant should conform to S. A. E. 90 (Mild Extreme Pressure). Below zero S. A. E. 80.

2½ pints required to fill.

Water Pumps

Water pumps receive lubrication from oil in the engine and require no attention.

Chassis

All moving parts of the chassis, king pins, spindle connecting rod ball joints, steering drag link ball joints, etc., are to be lubricated only with pressure gun lubricant. Suitable lubricator connections for pressure gun use are provided at these points.

Wheel Bearings

Use Ford wheel bearing lubricant M-4664 for front and rear wheel bearings. This lubricant is available from Mercury and Ford dealers.

Universal Joint

Use universal joint lubricant (cylinder oil soda soap grease.)

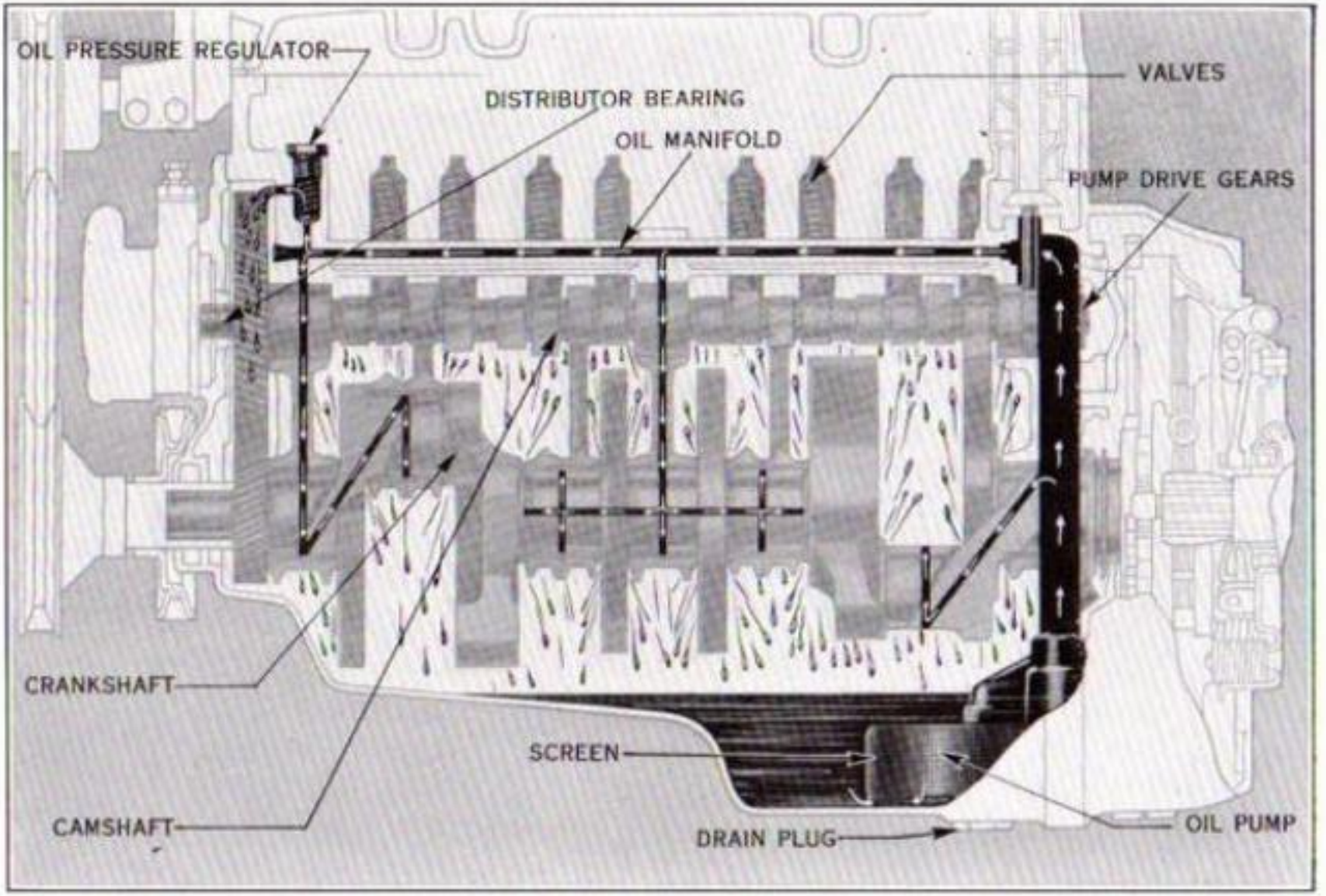


Fig. 12—Engine Oiling System

MERCURY SERVICE

LUBRICATION AND MA

EACH 1000

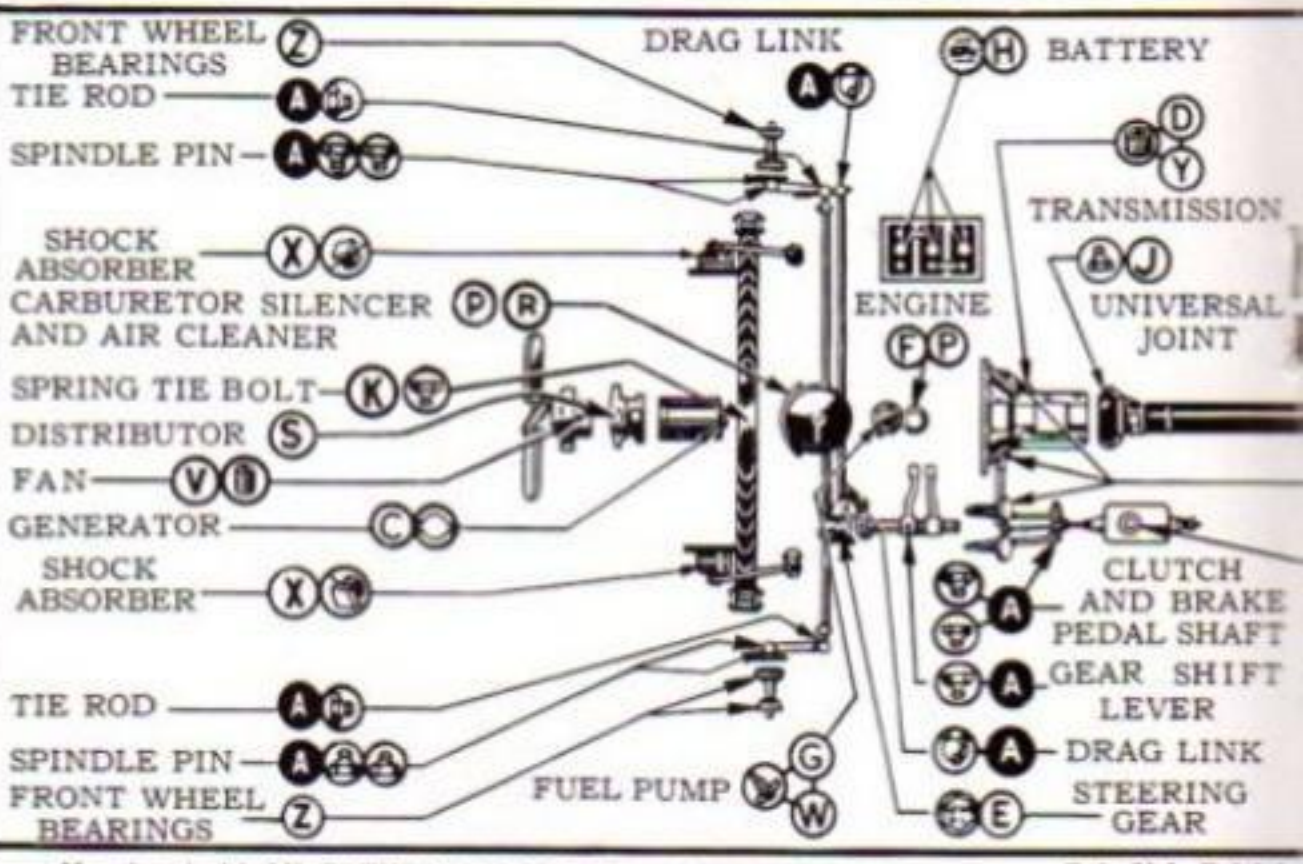
(A) PRESSURE GUN LUBRICANT

(C) ENGINE OIL
Generator, Brake Clevis Pins and Accelerator)

(D) ADD MILD EXTREME PRESSURE GEAR OIL to Level of Filler Plug:
Winter S.A.E. 80
Summer S.A.E. 90

(E) ADD MILD EXTREME PRESSURE GEAR OIL to Level of Filler Plug:
Winter S.A.E. 90; (Below Zero) S.A.E. 80
(In Steering Gear use S.A.E. 90 for All Seasons)

(F) Drain, Flush and Refill with 5 QUARTS ENGINE OIL EVERY 2000 MILES. Recommended Oil:
Temperature above 32° F.—S.A.E. 30;
Temperature above 10° F.—S.A.E. 20 or 20W;
Temperature above —10° F.—10W;
Lower Temperatures—10W plus 10% Kerosene



(R) If equipped with OIL BATH AIR CLEANER clean thoroughly, replacing oil with same grade as recommended in "F"

(S) Ford Distributor LUBRICANT M-4601 On Cam Lobes

EACH FALL
or every 5000 miles

(T) FORD WHEEL BEARING LUBRICANT M-4664
Use hand gun sparingly

(U) Drain, Flush and Refill with MILD EXTREME PRESSURE GEAR OIL:
Winter S.A.E. 90
Summer S.A.E. 140

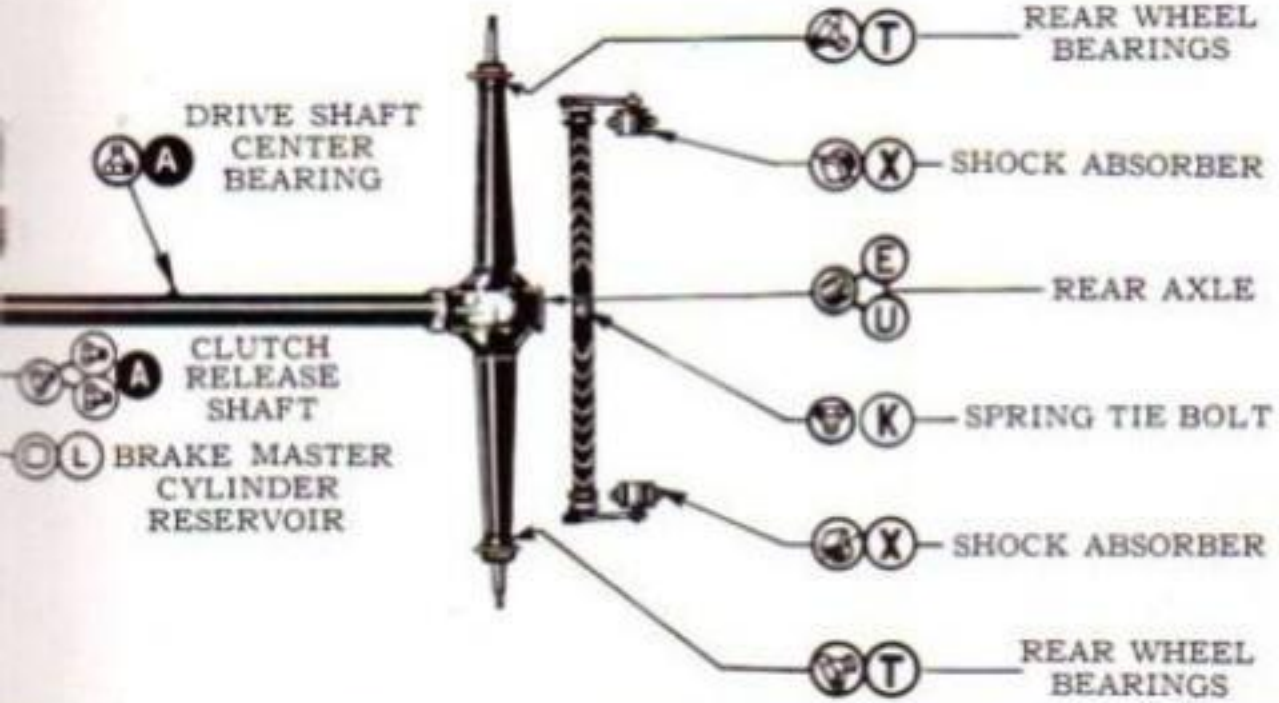
		CAPA
Engine oil pan, V-8	5 qts.	
Transmission	2.75 pts.	

Fig. 13—LUBRICATION AN

E CHART MERCURY
NTENANCE – 1942 CARS

MILES

- (G) Drain Sediment
- (H) Add Distilled Water
- (J) UNIVERSAL JOINT LUBRICANT (Cylinder Oil Soda Soap Grease)
- (K) FORD SPRING LUBRICANT M-4628
- (L) ADD FORD BRAKE FLUID M-3833 —Correct Level ½" from Top
- (N) LUBRICANT IMPREGNATED Wax On Hood Lacings Door Striker Plates and Dovetails
- (O) PENETRATING DRIPLESS TYPE LUBRICANT for Door Hinges
- (P) Wash Screen in Gasoline— Wet with Engine Oil When Dry



AND SPRING
(whichever occurs first)

- (V) ADD ONE OUNCE ENGINE OIL S.A.E. 20 then Drain out surplus
- (W) Remove and Clean Screen
- (X) ADD FORD SHOCK ABSORBER FLUID to Level of Filler Plug
- (Y) Drain, Flush and Refill with MILD EXTREME PRESSURE GEAR OIL: Winter S.A.E. 80 Summer S.A.E. 90
- (Z) Clean and Repack with FORD WHEEL BEARING LUBRICANT M-4664 if Required

CITIES —

Cooling system, V-8	22 qts.
Fuel tank	17 gals.

D MAINTENANCE CHART

Chassis Springs

To avoid clogging of oil grooves in spring leaves and insure proper lubrication, it is imperative that the ***recommended special lubricant*** be used. See your Mercury dealer about this.

Engine Lubrication

The engine is lubricated by means of a gear type oil pump driven by the camshaft through spiral gears. (See Fig. 12.)

Oil under pressure is carried to the oil manifold and distributed to the bearings of the camshaft and crankshaft.

The pressure is regulated by an oil pressure regulator located in the oil manifold. The timing gears are lubricated by excess oil from this oil pressure regulator. (See Fig. 12.)

Oil Change

After operating a new car 300 miles, the oil should be drained from the engine by removing the drain plug located in the bottom of the oil pan. After the oil has drained, replace plug and refill with 5 quarts of oil of the proper viscosity (See page 36). Oil pan should be drained and fresh oil added every 2000 miles thereafter. (See page 36 for oil specifications.)

Oil must be added between oil changes as the individual engine requires, depending upon driving speed, operating temperature, etc.

Oil Level Gauge

When the oil pan is full the oil level gauge will show "full." (See Fig. 14). Any excess oil which raises the oil level above this point will be quickly consumed and give the effect of excessive oil consumption. Keep the oil level between the "full" and "danger" marks on the gauge.

To ***avoid over-filling*** it is important not to add oil while the engine is running, or immediately after the engine has been stopped. The reason for this is that a considerable quantity of oil is suspended in the circulating system and until this has had sufficient time to drain into the oil pan, the gauge will not accurately register the amount of oil in the engine.

Fig. 14
Oil Gauge

Oil Pressure Gauge

The electric oil pressure gauge in the instrument group indicates the oil pressure to the engine bearings. The pressure should be approximately 30 pounds with the oil at normal engine operating temperature. The oil pressure will be higher with a cold engine.

Failure of oil gauge to show pressure generally indicates insufficient oil and the supply should be checked immediately.

Engine Oil

Engine oils of the following viscosity numbers are recommended for use in the various temperature ranges indicated.

Temp. above 32° F.....S.A.E. 30
Temp. above 10° F.....S.A.E. 20 or 20W
Temp. above —10° F. (below 0°).....10W
Lower temperatures.....10W plus 10% Kerosene

Operating conditions will necessarily modify these recommendations inasmuch as the intermittent driver may find it advisable to use an oil one or two grades lighter than the continuous operator. The grades recommended above are for average conditions of operation.

Five quarts are required to refill the oil pan. (See Fig. 13).

TRANSMISSION

The transmission is of the synchronized gear type, providing for three speeds forward and reverse. Helical silent gears are used throughout. Figure 16 shows the gears in neutral position.

The gear shift control on the steering column (See Fig. 15) gives the same "H" type shift as the vertical lever used on previous models. Operation of the steering column gear shift lever, from the neutral position, is as follows: *reverse*, lift up on lever and move forward; *low*, lift up and move backward; *second*, push lever forward with slight downward pressure; *high*, pull backward with slight downward pressure. (See Fig. 15.)

Two units function in transmitting the power through the transmission; the transmission drive shaft and the countershaft gears. The main shaft projects into, and transmits power to the transmission.

The transmission main shaft is splined and carries the low and reverse sliding gear, the second speed main

shaft gear and also the synchronizing unit. This shaft and the clutch shaft form the direct or high speed power connection from the engine through the clutch to the propeller shaft which drives the rear axle. (See Fig. 16.)

The pilot bearing for front end of clutch shaft is mounted in the center of flywheel. This bearing is inoperative except when the clutch is released. It is lubricated when assembled into the car and does not require further lubrication.

The main drive gear, is integral with the clutch shaft and is constantly in mesh with the countershaft driving gear on the countershaft assembly.

When the car is at rest with the engine running, the clutch engaged, and the gear shift lever in neutral posi-

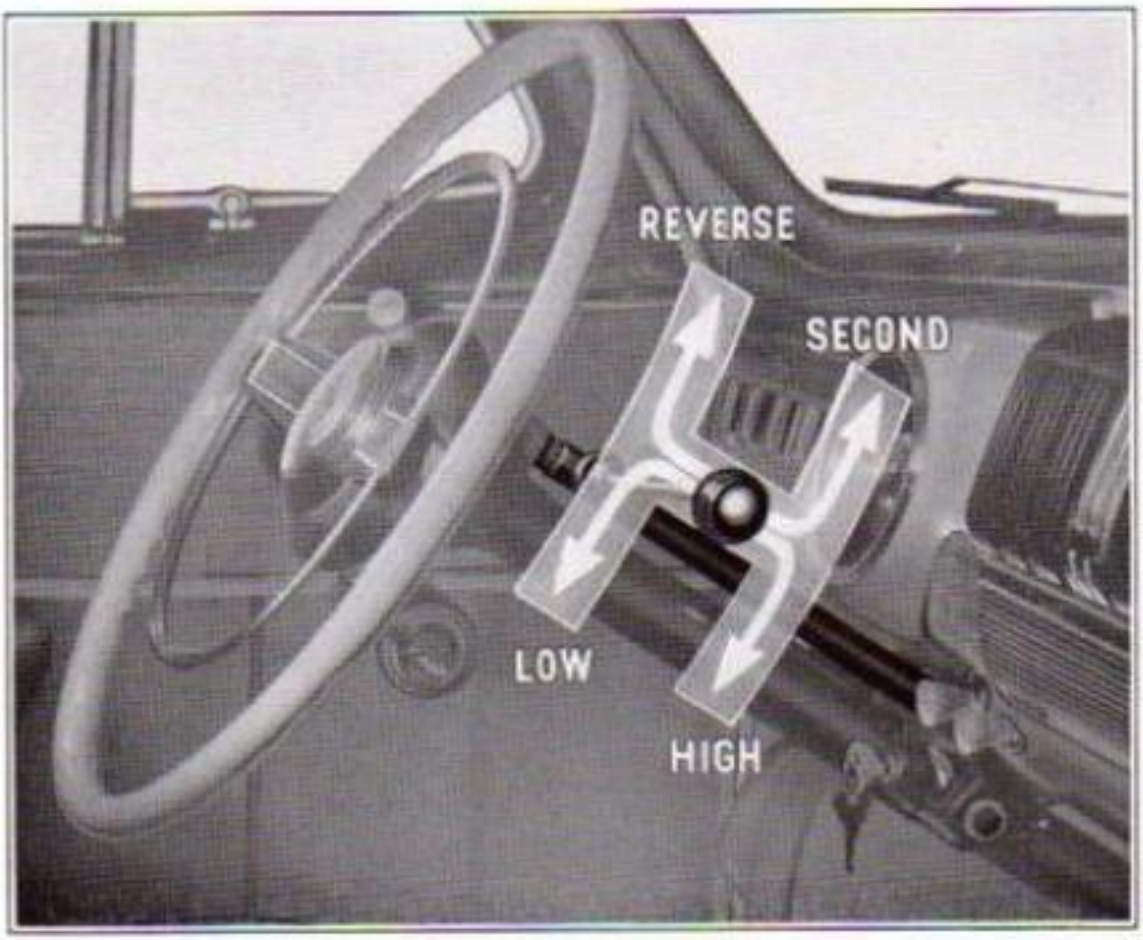


Fig. 15—Gear Shift

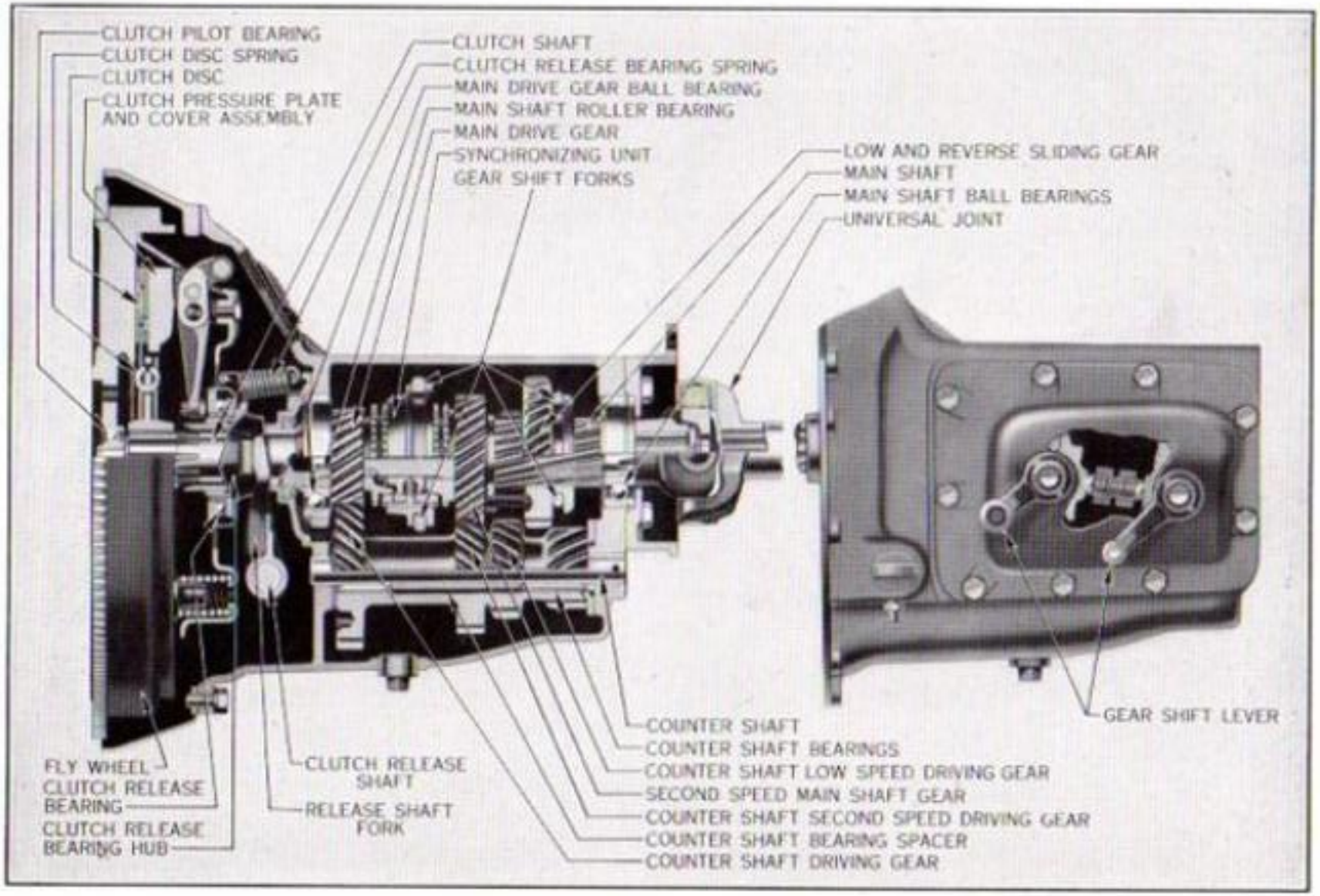


Fig. 16—Transmission

tion, all gears are in motion except the gear synchronizing unit and the low and reverse sliding gear. No power can be transmitted to the propeller shaft and rear axle until either the gear synchronizing unit is meshed with the main drive or second speed main shaft gear, or the low and reverse sliding gear is meshed with the countershaft low speed driving gear or reverse idler gear. (See Fig. 16.)

Gear Synchronizing Unit

The "blocker type" gear synchronizing unit shown in Fig. 16 slides on the transmission main shaft. It is equipped with friction cones on either side and has an outer ring which is engaged by the shifter fork, controlled by the shifter lever. The ring is retained centrally on its hub by spring actuated plungers and is capable of sliding either forward or backward to engage either the main drive gear or second speed main shaft gear at option. (See Fig. 16.)

When the shift is made either from first to second or second to high gear or from high gear to second, the friction cone in the gear synchronizing unit comes in contact with the mating cone on either the main drive gear or second speed main shaft gear. (See Fig. 16.) This causes the gears to turn at the same speed. Further movement of the lever causes the outer ring of the synchronizing unit to be pushed further forward or backward as the case may be, meshing the main drive gear or second speed main shaft gear. This operation is completed in practically one continuous deliberate movement of the shifting lever.

Lubrication

Summer lubricant for the transmission should conform to S. A. E. 90.

Winter lubricant should conform to S. A. E. 80.

Change each Fall and Spring, or every 5,000 miles, whichever occurs first.

2¾ pints of lubricant are required to fill to level of filler plug on right side of transmission. (See Fig. 16.)

LIQUAMATIC DRIVE
(Extra Equipment)

The Liquamatic Drive which combines a liquid flywheel or coupling with an automatic transmission, eliminates the necessity for manipulation of the clutch or gearshift lever after the initial starting operation. After starting the engine, the clutch should be disengaged while the gearshift lever is placed in the high speed position (Fig. 15.) The clutch should then be engaged and all subsequent gear changes in the transmission are automatically controlled by the action of the foot accelerator. In other words, it is merely necessary for the operator to steer the car and control its speed by the use of the foot accelerator and brake unless, of course, abnormal driving conditions are encountered.

Driving the Car

Depressing the accelerator after placing the gearshift lever in position as described above, causes the car to get away smoothly and quickly. This is made possible by the fact that the transmission gears are actually engaged in second speed for the initial start. Releasing pressure on the accelerator immediately causes the transmission to shift into high speed and it will remain in that gear until the car speed drops below 10 miles per hour. When coming to a temporary stop, such as a traffic light, merely step on the brake pedal, giving no attention to either the clutch pedal or gear shift lever. To reverse the car, depress the clutch pedal

and place the gear shift lever in the customary reverse position. (Fig. 15.)

When conditions necessitate the use of low gear, disengage the clutch, shift lever to the low gear position and re-engage the clutch in the customary manner. Release the clutch and move the gear shift lever from low speed position directly into high speed position whenever the car is in motion.

Accelerating Rapidly

At speeds below 35 miles per hour, the transmission automatically shifts into second speed when the accelerator is depressed all the way to the floor board. When pressure on the accelerator is again released so that motor speed and car speed are equal, the transmission again shifts from second into high speed.

Descending Steep Grade

Placing the gearshift lever in the second speed position, see Fig. 15, automatically locks the transmission in second speed. The gearshift lever should, therefore, be moved to the second gear position when descending a hill which is sufficiently steep to warrant using the engine as a brake. The only other occasion for using this position is in the event a partially discharged battery makes it necessary to push the car in order to start the engine.

The gearshift lever should be placed in the low position when driving through mud or sand which requires maximum power at the rear wheels.

Oil Capacity

The capacity of the Liquid Coupling is 10½ pints of 10-W oil. Oil changes are unnecessary but it is advisable that the oil level be checked by an authorized Mercury, Lincoln or Ford dealer if there is any indication of excessive slippage.

FRONT AXLE

The front axle is of the I-Beam type and is held in position by a radius rod, supported at the rear end by a pivot connection.

This method of mounting holds the axle in correct position with respect to steering connections, regardless of road conditions or speed of the car.

The steering tie rod is at the rear of the axle and is adjustable for aligning the wheels in respect to toe-in.

Alignment of Front Wheels

Alignment of the front wheels is an important factor in tire economy and ease of steering. When wheels are improperly aligned, the tires when rolling over the ground, are given a sidewise sliding motion which rapidly wears the tire treads.

The front wheels should have a toe-in of $\frac{1}{16}$". This measurement is taken between the wheel rims at the front and rear of the wheels at a height equal to the center of the wheel from the ground. The rear measurement should never be more than $\frac{1}{16}$ inch greater than the front measurement. If the difference between the two measurements is other than this, it is an indication the wheels are out of alignment and the car should be taken to a Mercury dealer for adjustment. In case of emergency, however, the following instructions should be observed.

Loosen the clamp bolts at each end of the steering tie rod. One end of the tie rod carries right-hand threads and the other end left-hand threads, so by turning the tie rod one way or the other the distance between the rod ends is lengthened or shortened the amount necessary to give the wheels the proper toe-in.

Adjusting Front Wheel Bearings

If there is excessive play in the bearings they can be adjusted as follows:

Jack up front of car and remove outer and inner hub caps. Remove cotter pin from the bearing nut and tighten nut to a slight hand pressure with a suitable wrench until there ceases to be any looseness in the bearing. Then turn the adjustment back approximately ⅛ turn and replace cotter pin in the nut. (Always back off nut rather than tighten to replace cotter pin).

Lubrication of Front Wheels

Bearings should be cleaned and repacked with grease about every 5,000 miles under normal driving conditions.

Use Ford wheel bearing grease, M-4664, available at Mercury and Ford dealers. (See Fig. 13.)

REAR AXLE

General Description and Operation

The rear axle is of the three quarter floating type, the weight of the car being carried directly on the axle housing rather than on the axle shafts. (See Fig. 17). This allows the axle shafts to function only to rotate the wheels. The rear axle gears and bearings are very carefully adjusted at the factory and need no further attention other than proper lubrication.

Lubrication

Summer lubricant for the rear axle, use mild extreme pressure gear oil S. A. E. 140.

Winter lubricant, use mild extreme pressure gear oil S. A. E. 90. (Below zero) S. A. E. 80.

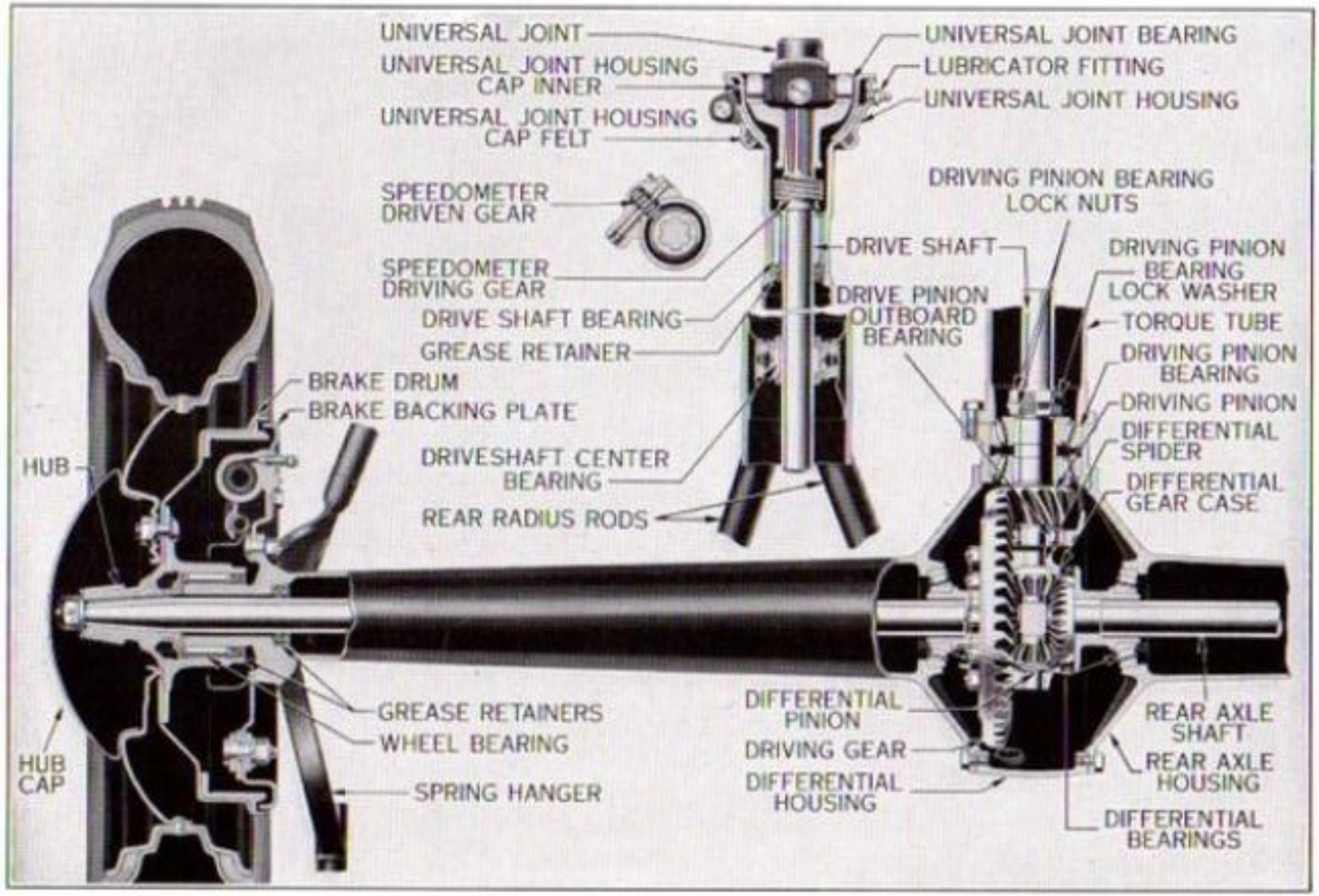


Fig. 17—Rear Axle

Change lubricant each Fall and Spring or every 5000 miles, whichever occurs first.

2½ pints are required to refill the standard axle to level of filler plug after draining and flushing.

Torque Tube and Propeller Shaft

While the primary function of the torque tube is to counteract axle torque and take the driving thrust, it also encloses the propeller shaft and determines the position of the rear axle. This latter feature relieves the rear spring of any duties except carrying the load and absorbing road shocks.

Speedometer Drive Shaft

The speedometer drive shaft is driven by a spiral gear and pinion mounted at the front end of the torque tube. Lubrication is provided for these parts from the universal joint.

Propeller Shaft Bearings

A roller bearing is contained in the forward end of the torque tube in which the end of the propeller shaft rotates. This bearing is automatically lubricated from the universal joint. A similar bearing located at the center of the propeller shaft, receives lubrication through a pressure gun fitting in the torque tube. (See Fig. 13.)

Lubrication of Rear Wheels

Use M-4664 Ford wheel bearing grease in the rear wheels. Use hand gun on rear wheel bearing fittings and avoid injecting an excessive amount of lubricant. (See Fig. 13.)

Universal Joint

Lubricate each 1000 miles. Use cylinder oil soda soap grease. See Fig. 13 for location of fitting.

BRAKES

General Description and Operation

The braking system consists of hydraulic internal expanding brakes on each of the four wheels. The hand brake lever provides for using the rear wheel

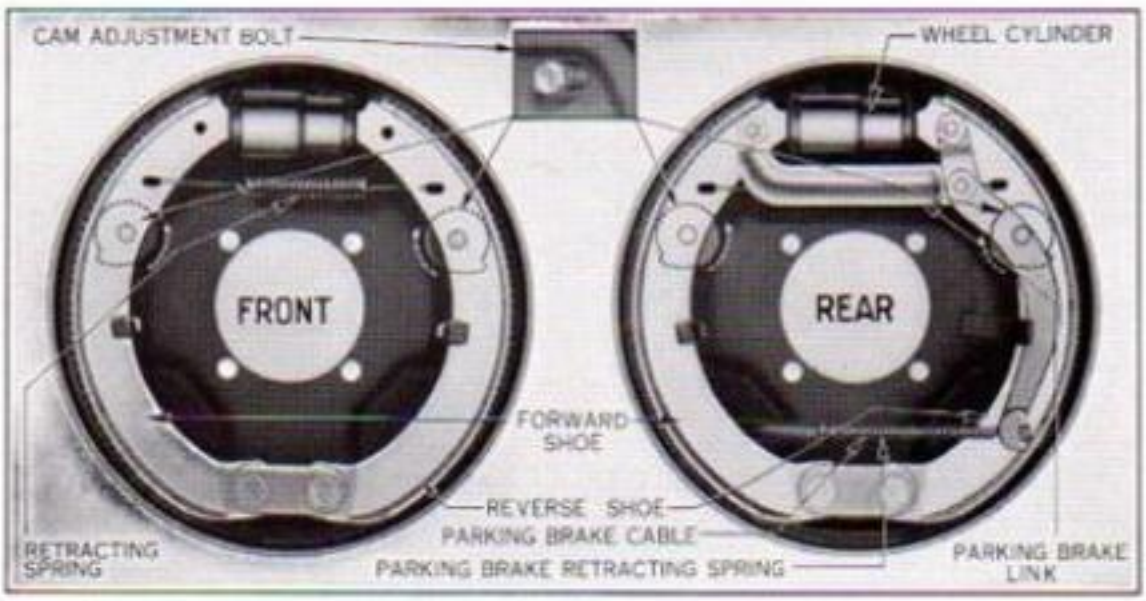


Fig. 18
Brake Shoe Assemblies

brakes as a parking brake. A Moulded type lining is used on both the "forward" and "reverse" brake shoes.

Adjustment

To assure proper brake adjustment, it is recommended this important service be performed by an authorized Mercury or Ford dealer.

For the purpose of making an emergency adjustment, should the occasion arise, proceed as follows:

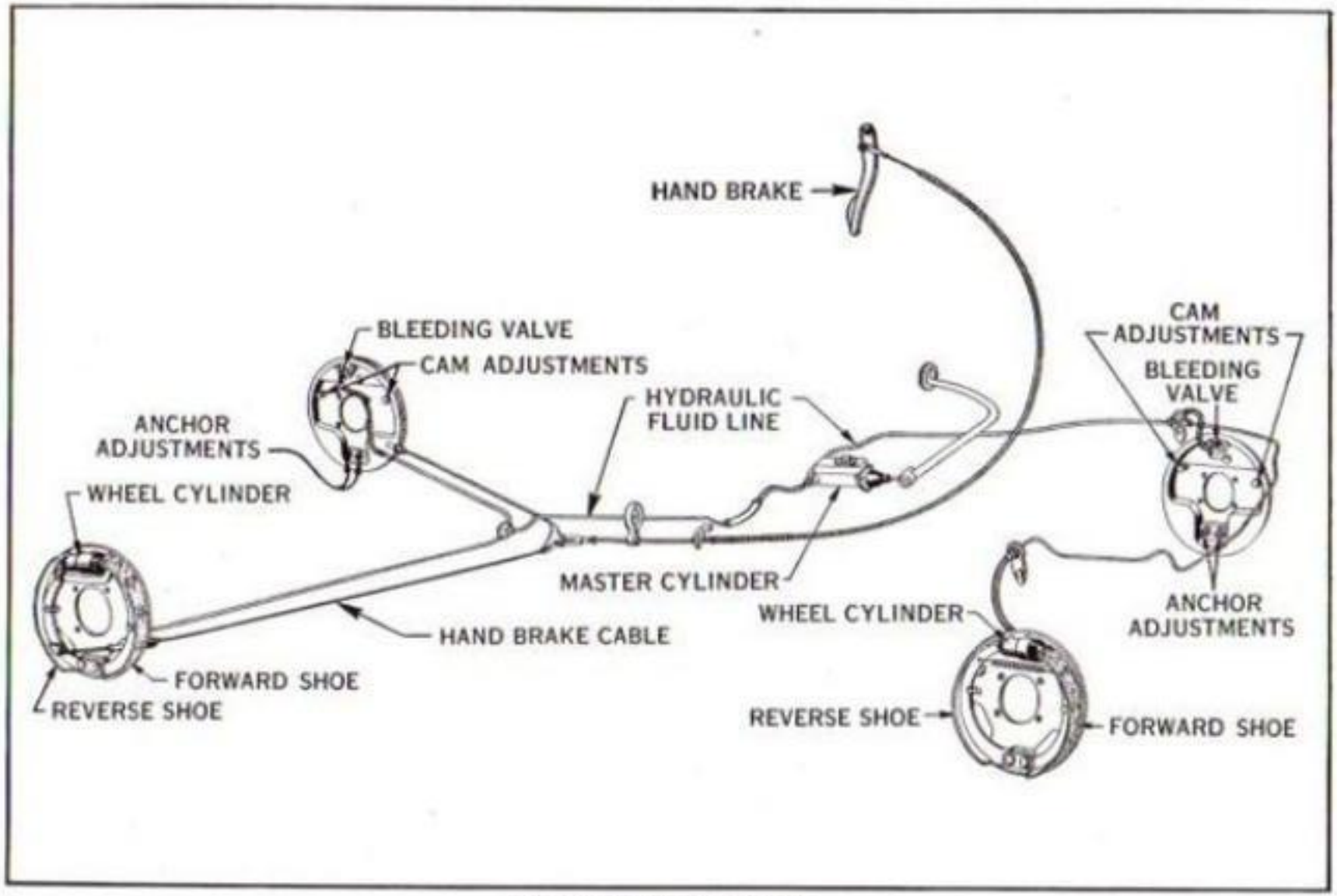


Fig. 19—Brake Hook Up

Make sure hand brake is in fully released position and then at *each wheel*—1. Jack up until tire clears floor. Turn the cam adjusting bolt of the "forward" shoe in direction indicated by arrow in Fig. 18 until shoe is solid against the drum and wheel cannot be turned by hand. 2. Back off just sufficiently so wheel can be turned without brake drag. 3. Adjust the cam adjusting bolt of the "reverse" shoe in same manner, except turn bolt in opposite direction, as indicated in Fig. 18. 4. Lower wheel to floor.

Important

The master cylinder reservoir must be kept filled to within one quarter inch of the top with genuine Ford hydraulic brake fluid (See Fig. 19). Insufficient fluid in the reservoir will result in air getting into the system. This will cause the brakes to become "spongy" and ineffective, and will necessitate "bleeding" some of the fluid out of the brake system. This operation should be done by a Mercury or Ford service station.

STEERING GEAR

The steering gear is of the "hour glass" worm and roller type. Ratio is 18.2 to 1.

Adjustment for Wear

To adjust for closer mesh of the roller and worm, remove cap from mesh adjustment (See Fig. 20). Slide off lock plate far enough so adjustment screw can be turned. Place steering wheel in straight ahead position. Tighten mesh adjustment screw into the housing, then back off just enough to prevent binding. Set lock plate in position and replace cap.

End play in the steering worm is controlled by shims. Adjustment should not be required for many thousands of miles. When required, a Mercury dealer should be consulted.

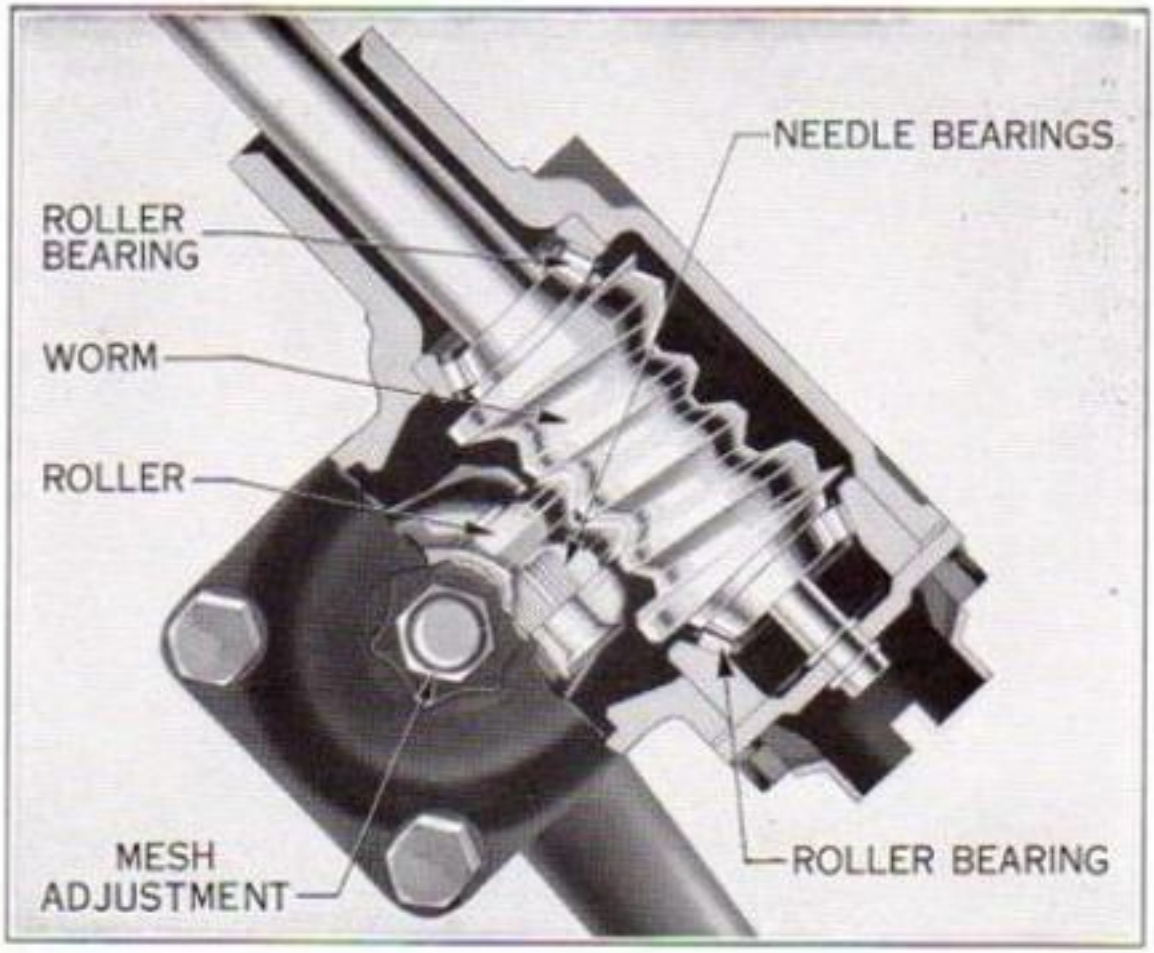


Fig. 20
Steering Gear

Lubrication

Add gear lubricant to level of steering gear filler plug every 1000 miles. Use mild E. P. gear oil, S. A. E. 90.

ELECTRICAL EQUIPMENT

Battery

The battery is located on the forward side of the dash in the engine compartment. It is of the 6 volt type, using 17 plates and has a capacity of 120 ampere hours.

Every two weeks check the battery solution (electrolyte) to see that the level is maintained above the top of the plates. Add distilled water only and fill each cell to the top of the filler neck. When the filler caps are screwed in place the correct level of the solution will automatically take place—a feature of the Ford battery.

During cold weather a battery loses some of its efficiency and the demands upon a battery become greater due to more energy required to crank the engine.

The charge in the battery can be conserved by being cautious in the use of electrical equipment and special electrically operated accessories all of which draw on the battery.

Never bring a flame or spark near the battery, as the gas given off from a battery while charging is highly inflammable.

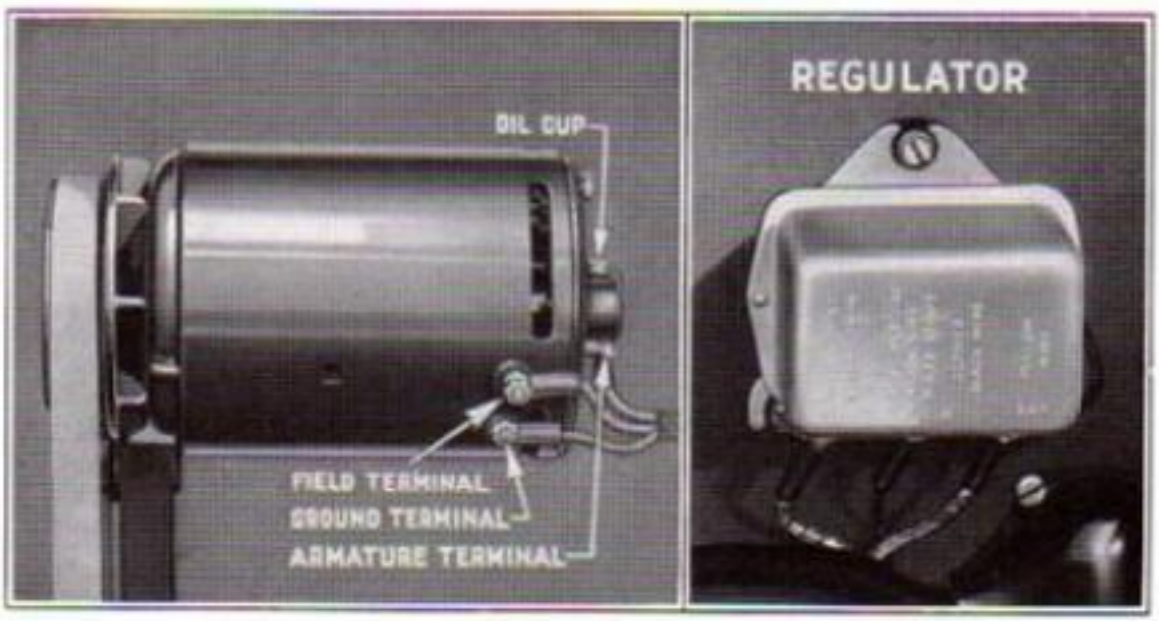


Fig. 21
Generator and Regulator

Generator

The generator delivers electrical energy for charging the storage battery which serves for operating the lights, ignitions, horns, etc. A two brush type gener-

ator is used and output is automatically controlled by a regulator.

Generator Regulator

This unit (See Fig. 21) is mounted on the engine side of the dash. The cutout section is an automatic switch which closes the charging circuit between the generator and battery as soon as the generator supplies sufficient current to charge the battery and immediately opens this circuit when the generator is not charging so as to prevent the battery discharging back through the generator.

The regulator section of the unit is also automatic in its action and requires no attention. Output of the generator is controlled by the regulator to vary with the load, and condition of the battery.

Ammeter

The ammeter is located in the instrument group (See Fig. 2). The dial will indicate whether current is being charged into or discharged out of the battery. The current flow is controlled by the generator regulator and the amount of charge will vary with the load and the condition of the battery. When the voltage of the battery reaches a predetermined value, the indicator hand will drop to a lower charging rate. The indicator hand may fluctuate slightly at this point due to the action of the generator regulator.

Starting Motor

The starting motor is mounted to the flywheel housing and its power is transmitted to the engine through an automatic drive.

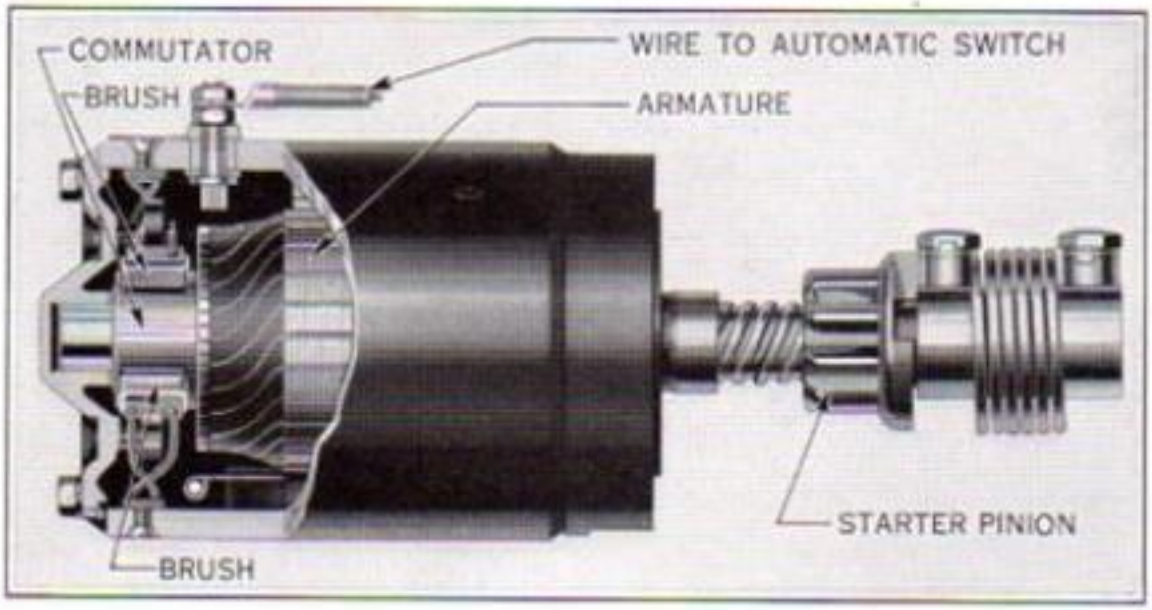


Fig. 22
Starting Motor

A magnetic type switch is located on the engine side of the dash. This switch closes the electrical circuit of the starting motor when the starter button on the instrument board is pressed.

Rotation of the starter motor shaft causes the pinion of the automatic drive to advance and mesh with the flywheel. After the engine starts, and the flywheel speed exceeds that of the starter motor, the pinion releases from the flywheel automatically.

The starter bearings do not require lubrication.

Light Switch

The light switch control is located on the instrument panel to the right of the starter button and the beam control switch is on toeboard at the left of the clutch pedal. (See Fig. 23.)

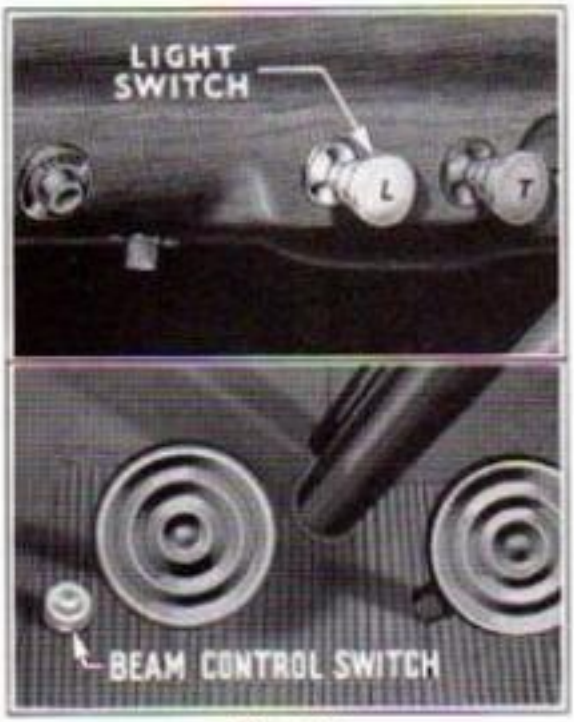


Fig. 23

Light Switch and Beam Control Switch

With the light control pushed all the way in, lights are disconnected. Pulling the control out to its first position connects the parking, tail lights and instrument lights. Pulling the control all the way out to its definite stop connects the headlamps through the beam control switch on the toe-board and disconnects the parking lights. Pressing the beam control switch alternately lowers the headlamp beam for "traffic" driving and raises the beam for "country" driving. A small red light appears at the bottom of the speedometer dial when beam is in the high position for "country" driving. (See Fig. 2.)

A rheostat switch located under the instrument panel, controls the instrument lights independent of the other lights. (See Fig. 2.) Turning the knob of this switch permits the operator to dim or brighten the instrument lights as desired.

Circuit Breaker

The lighting system is protected by a circuit breaker located on the dash under the cowl.

The normal demand for current does not affect the circuit breaker but in the event of an abnormally heavy demand for current, such as would be caused by an accidental short circuit or defect in any of the lighting circuits, the unit is affected causing the contacts to vibrate and intermittently cut off or interrupt the flow of current. This interruption will continue until the cause is removed or the light switch is turned off. The circuit breaker thus protects the switch and wiring from destruction, also the storage battery from being rapidly discharged. As soon as circuit overload is removed, the breaker automatically restores the normal circuit.

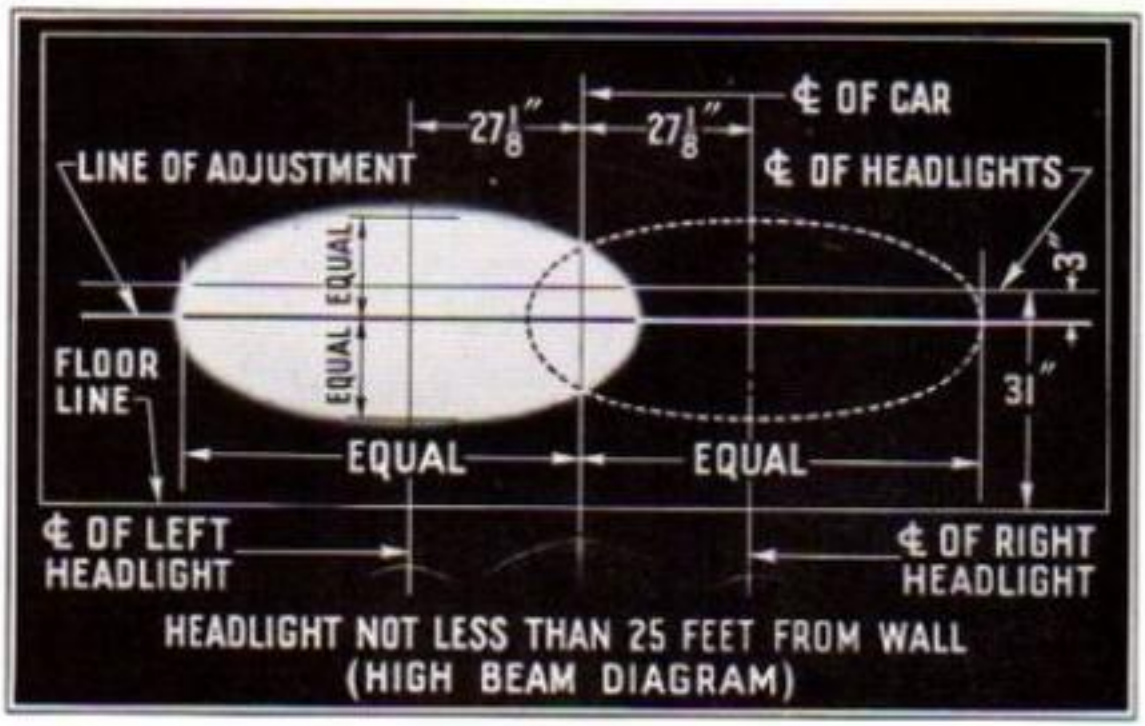


Fig. 24

Diagram for Headlamp Adjustment

Headlamps

Headlamps are of the "Sealed Beam" type, in which the lamp, reflector and lens are one sealed unit. Because of the air tight feature of the sealed beam unit, the efficiency of the light remains practically unimpaired for its entire life. When the filament finally burns out, an entire new unit is used for replacement.

There are two filaments in each headlamp unit, one to provide a "**country**" or high beam for illuminating the highway when no other vehicles are approaching, the other filament gives a "**traffic**" or low beam for use in cities or whenever vehicles are approaching.

This "traffic" or low beam should always be used when meeting other cars to avoid the danger of dazzling light shining into the eyes of approaching drivers.

The "**traffic**" beam has the "hot spot" lowered and shifted to the right to provide illumination of the edge of the road and ditch area for safe passing of approaching vehicles. **In cold weather, do not turn the headlights "on" until the engine has been started.**

Headlamp Renewal and Adjustment

To replace a headlamp unit, first remove outer rim by taking out screw at bottom and lifting rim from top clip (See Fig. 25). Second, loosen the three retainer ring screws and turn ring to the right to release. Third, remove and replace headlamp unit, making sure plug connection is made to the new lamp before installing retainer ring in place.

The parking light bulbs are replaced by removing the screws which hold the outer rim to the fender. Then remove the two screws which hold the lens in place, after which the lens and bulb can be removed.

Vertical and horizontal adjustments of the headlamps are controlled by adjustment screws indicated in Fig. 25. These two adjustment screws allow the headlamp unit to be tilted up or down or to either side to conform with the recommended setting as shown in Fig. 24. To make this adjustment it is first necessary to remove the outer rim of the headlamp so the adjusting screws are accessible.

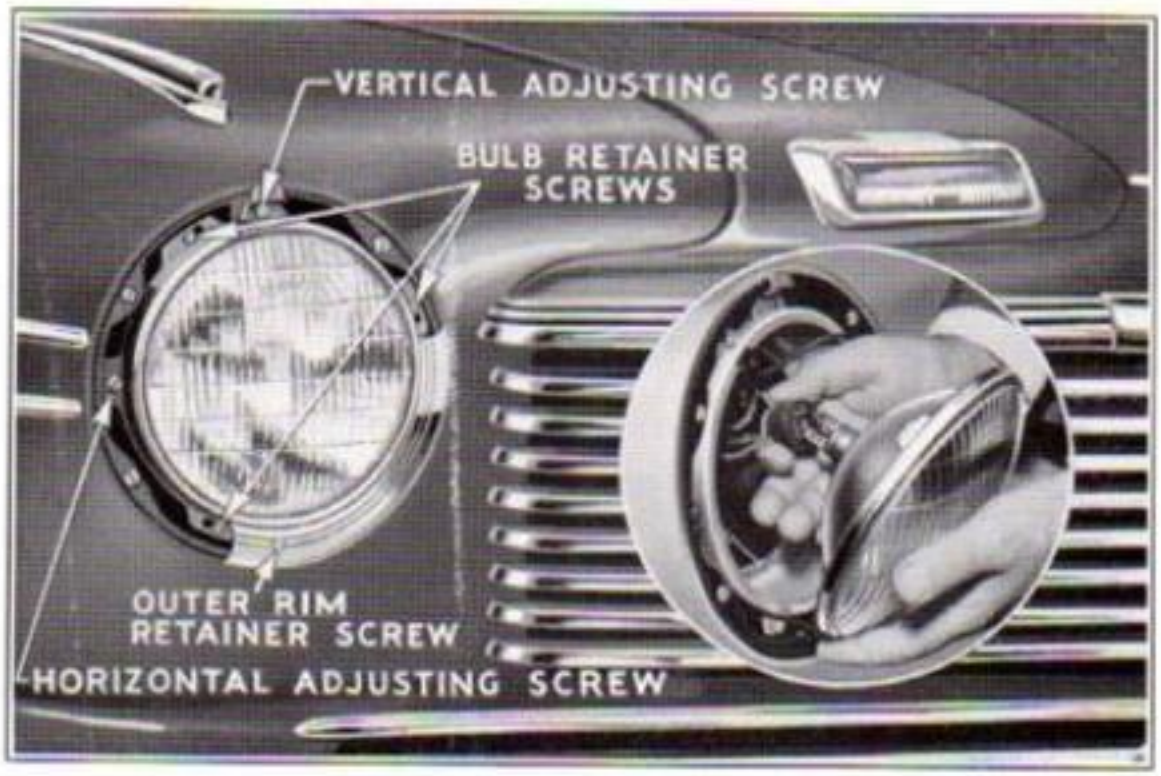


Fig. 25—Headlamps and Adjustments

BODY

Washing and Polishing

To keep the baked enamel finish of your car in good condition, wash with plain water, using a sponge. Dry with a damp chamois.

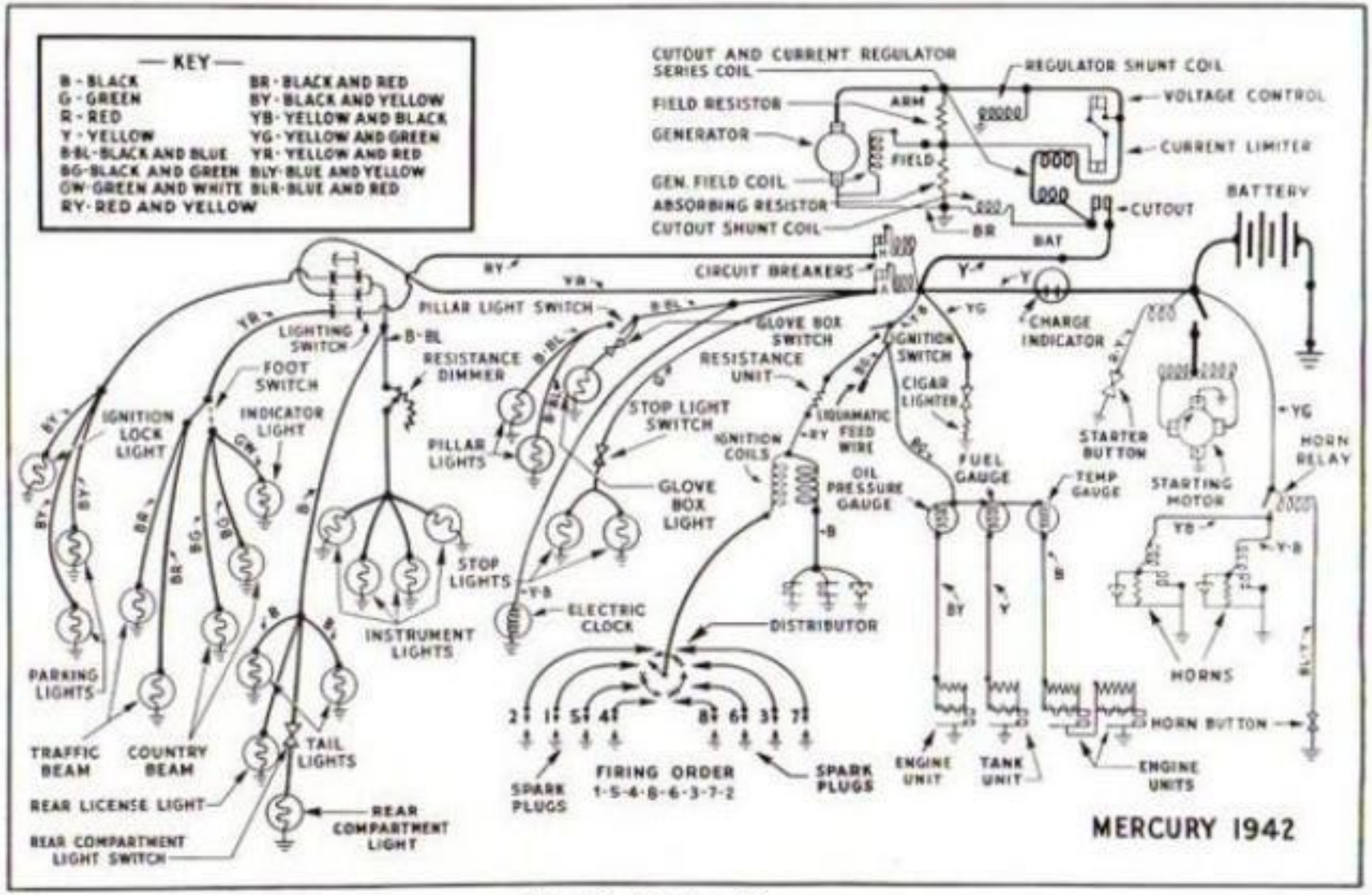


Fig. 26—Wiring Diagram

When a "scum" develops on the surface of the finish which is not readily removed with plain water, use Lincoln-Zephyr Cleaner and Polish or Lincoln Body Polish, available through Mercury and Ford Dealers.

Automatic Top (Convertible Coupe)

The automatic top is operated by two electric motors, one in each side of the body. These are controlled by a switch located on the left side of the instrument panel. The following should be observed in the operation and care of the automatic top:

1. Do not raise or lower top when car is in motion.

2. When car is operated with top in lower position for any length of time it is important that padded portion of top material be pulled out from between bows and slat irons to prevent pinching and chafing of the material.

3. If the top is lowered without installing the top boot, be sure the boot is not stored under the top as this may prevent the top from completely lowering.

EQUIPMENT

Speedometer

The speedometer indicates miles per hour, trip mileage and total mileage. A knob under instrument panel to the left of the steering column, is for setting the trip mileage.

Clock

A knob for setting the clock is located at the bottom of the dial. When the battery is disconnected for any reason, the clock becomes inoperative during the period of disconnection and should be correctly set after the battery is again connected.

A 3 ampere fuse in the back of the clock is provided for electrical protection.

Lighter

The lighter is located on the instrument panel to the right of the steering column. (See Fig. 2.)

Shock Absorbers

Shock absorbers are of the double acting hydraulic type and are adjustable for resistance. Every 5000 miles all instruments should be checked for sufficient fluid. The addition of **Ford Shock Absorber Fluid** and seasonal adjustment can best be done by a Mercury dealer.

TIRES

Inflation

Improperly inflated tires will effect the riding qualities of your car and increase fuel consumption, also cause excessive tire wear.

The pressure recommended by the tire manufacturer is 24 pounds for both front and rear.

CHANGING TIRES

1. To Remove Top Bead

Deflate tube completely. Loosen both beads from rim ledges, using tire iron if necessary.

Fig. 27—Removing Top Bead

Stand on tire with feet about 15" apart opposite valve and force bead off bead seat into drop center part of rim. (See Fig. 27).

Caution—Care should be taken that the soft rubber tip on the inner edge of the tire bead is not damaged by tire iron, as such damage will have a tendency to

chafe the inner tube. It is advisable to coat the inside and outside of the tire beads with soft soap, which will assist in removing the bead over the edge of the rim and also protects the inner edge of the bead.

Insert the two tire irons about 8" apart between bead and rim flange near valve, and pry short length of bead over flange. (See Fig. 27).

Leaving one tire iron in position, follow around rim with other iron to remove remainder of bead. Remove tube.

Fig. 28—Removing Bottom Bead

2. *To Remove Bottom Bead*

Stand wheel in upright position with bead in drop center part of the rim at bottom. Insert tire iron between bead and rim flange at top side of wheel, and pry wheel out of tire as shown in Fig. 28.

3. *To Mount Tire with Wheel on Floor*

Inflate tube until barely rounded out and insert in casing. See that balance mark on casing is opposite valve stem. Before mounting tire casing use soft soap on tire beads. Place tire on rim, guiding valve through valve hole.

Fig. 29—Applying Bottom Bead

4. *To Apply Bottom Bead*

Push bottom bead down into drop center part of the rim at valve and force remaining portion of bead over rim flange.

A tire iron may be needed to pry the last portion of bead over the flange. (See Fig. 29).

Fig. 30—Applying Top Bead

5. *To Apply Top Bead*

At point on opposite side of wheel from valve insert tire iron between top bead and rim flange, prying bead over rim flange. Holding this iron in position continue prying with other iron, working around rim until bead is in place. (See Fig. 30).

Inflate slowly and see that tire is centered on rim on both sides. This "centering" may be done by bouncing tire after approximately 15 pounds of air pressure has been added. Finish inflating.

Caution—When mounting either of the front wheels on the car, it is advisable to have another individual apply the foot brake so the brake drum will be held in position. This will permit easier mounting over the studs in the drum.

In addition to the usual balance mark, some tires are marked with an "L" or "R" near the bead. Tires with the "L" are intended for use on front wheels, however they may be used on rear wheels. Tires with the "R" should be used on rear wheels.

To obtain the best balance, wheels should be mounted on drums, so the letter "L" or "R" is near the notch in the brake drum rib.

Car Jack

Before placing the jack in position to raise the car, make sure the hand brake lever is firmly applied. Place

the jack underneath the bumper as illustrated in Figure 31 and raise the jack body until the projection (2) on the top of the body engages the bumper. If necessary to slide the jack body down on the bar during this operation, press down on the release lever (1) with the thumb. The jack bar must be in a vertical position.

Insert the handle (4) in the operating lever (3), and lift up on the end of the handle to raise the car.

To lower the car, place the handle on top of the release lever (1), Figure 32, and press down gently.

CAUTION: The jack bar must not be lubricated but should be cleaned with gasoline occasionally.

Fig. 31
Raising Car

Fig. 32
Lowering Car

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