MERCURY

REFERENCE BOOK

1939

Ford Motor Company

DEARBORN, MICHIGAN.

MERCURY 8

Reference Book

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Ford Motor Company

Dearborn, Michigan

FOREWORD

This reference book has been prepared with the thought of assisting and guiding you in the proper care and maintenance of your new Mercury 8.

You will find the contents written in everyday language, and we believe, in the short time required to read it, you will receive a comprehensive knowledge of the car. Pages 4 and 5 will be found to be of particular interest to you, at the beginning of your Mercury 8 ownership.

For convenient reference, we suggest you keep this book in the glove compartment of your car.

INSPECTION SERVICE

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 which is a feature of the Mercury 8.

Free inspection service is rendered on a new car for a specified time as outlined in the Service Policy Folder which purchaser receives at time of delivery.

The inspection service rendered during the new car service period covers the checking of 30 points, 12 of which are checked with a Laboratory Test Set. This Test Set analyzes all engine conditions with more than human accuracy.

Throughout the life of the car, the owner is entitled to have it road-tested without charge, as often as desired by an authorized Mercury dealer, provided no dismantling of parts is required.

MERCURY SERVICE

Mercury service is available from the nation-wide organization of Mercury and Ford dealers.

Through this group, service is obtainable throughout the country and in most parts of the world.

Mercury dealers are equipped to render complete service. Your car will be serviced by men of mechanical ability, trained in appreciation of quality and precision manufacturing which qualifies them to render satisfactory service.

Ford dealers throughout the country are in a position to assist Mercury owners should emergency service become necessary.

Service Charges

In order that maintenance cost may be kept as reasonable as possible, Mercury dealers are provided with a manual suggesting uniform charges for service work. Service operations for which a flat rate can possibly apply are in this manual. The labor charge is based on the shortest time for performing the particular operation consistent with good workmanship.

Repair Parts

Mercury dealers carry genuine Mercury repair parts. Genuine parts have the same quality and precision as those originally used in the car and are recommended for service replacements.

DATA

Engine

V-type. Included angle of cylinders	90 degrees
Number of cylinders	8
Cylinder bore	3.185 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.

Wheelbase

116 inches.

Size of Tires

6.00 x 16. Recommended tire pressure 30 pounds.

Capacities

Engine oil pan	5 quarts
Transmission	2.5 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.

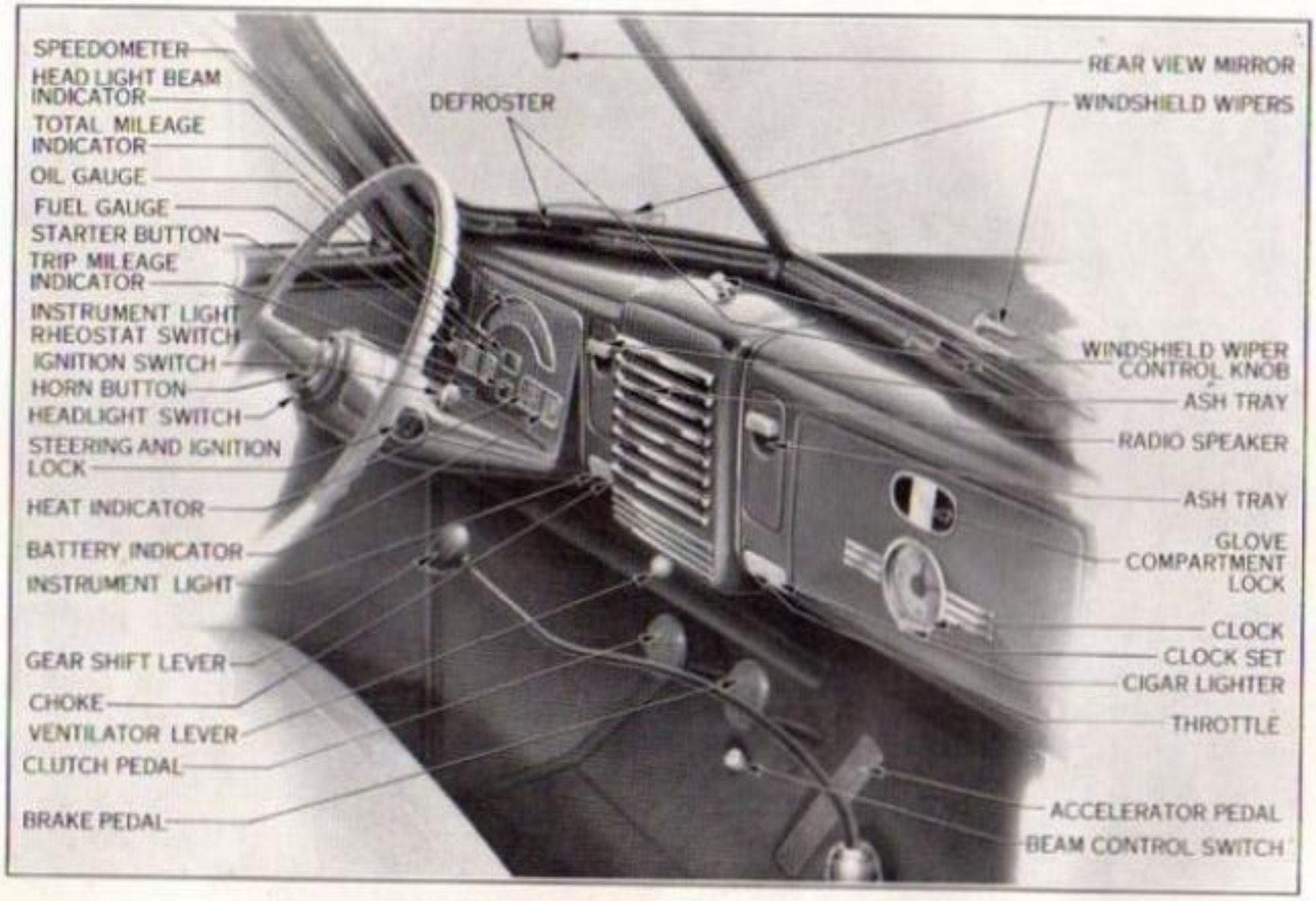


Fig. 1—Instruments and Controls

DRIVING NEW CAR

When you receive your car it will have a sufficient amount of oil in the engine, complete chassis lubrication, and cooling medium in the radiator.

The Mercury needs no "breaking-in" because of the unusual accuracy in manufacture of moving parts, smoothness of bearing surfaces, and clearances which are correct. The car does not need to depend on a long "breaking-in" period to eliminate tightness and insure smooth running.

You can drive your car up to 60 miles per hour from the start. After the first 100 miles you may drive as you desire. This means you can enjoy your Mercury from the beginning, which is important particularly if you are planning on starting a long trip, or if you use your car for business.

Drain the engine oil after the first 300 miles of operation and replace with new oil of the correct viscosity (for oil change and lubrication see pages 34 and 36).

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 below the instrument group. 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 and at the same time 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

Two water pumps are used to circulate the water in the cooling system. A pump is located at the forward end of each bank of cylinders.

A V-belt drives the pumps and generator from a pulley on the crankchaft.

The pumps differ from the conventional type as no adjustable packing gland is used. The water seal around the shaft is accomplished by an automatic feature inside the pump which eliminates the need for adjustment.

Pump Lubrication

No attention required as the pumps receive lubrication from oil in the engine.

How to Adjust the Generator Belt

The adjustment is made by loosening the generator support bolt and moving the generator upward. The proper adjustment is 1" inward or outward movement of the belt at a point half way between the water pump and the generator pulley. (See Fig. 2.)

Radiator

The radiator is of the flat tube type. The hot water flows downward from the upper tank through the tubes to which are attached thin copper plates or fins. Air is drawn between these fins around the tubes by the fan and heat is carried away, thus cooling the water.

The radiator filler cap is located on top of the radiator under the hood.

Draining the Radiator and Engine

A drain valve at the bottom of the radiator, is provided for draining the water from the cooling system. (See Fig. 2).

To control rusting in the cooling system, a rust inhibiter is put in the radiator at the factory. If the cooling system is drained rust inhibitor should be added when it is refilled, except when a cooling fluid is used which contains an anti-corrosion ingredient. This rust inhibiter can be obtained at Mercury and Ford dealers.

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 are obtained. Thermostats are not adjustable and require no attention.

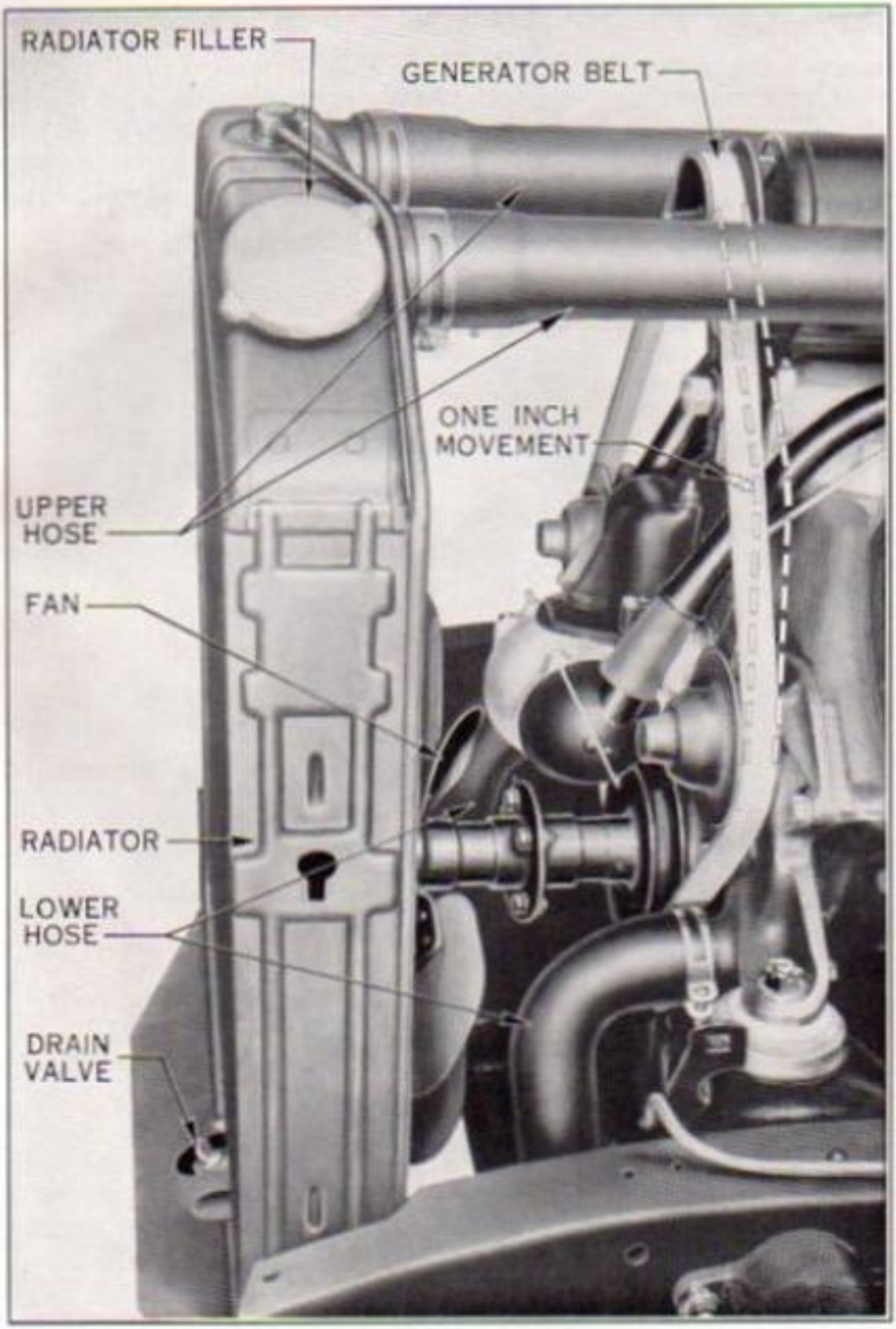


Fig. 2—Cooling System

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," and will not record accurately with insufficient cooling medium in the radiator. 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. Ethylene Glycol, some radiator glycerines 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.

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.

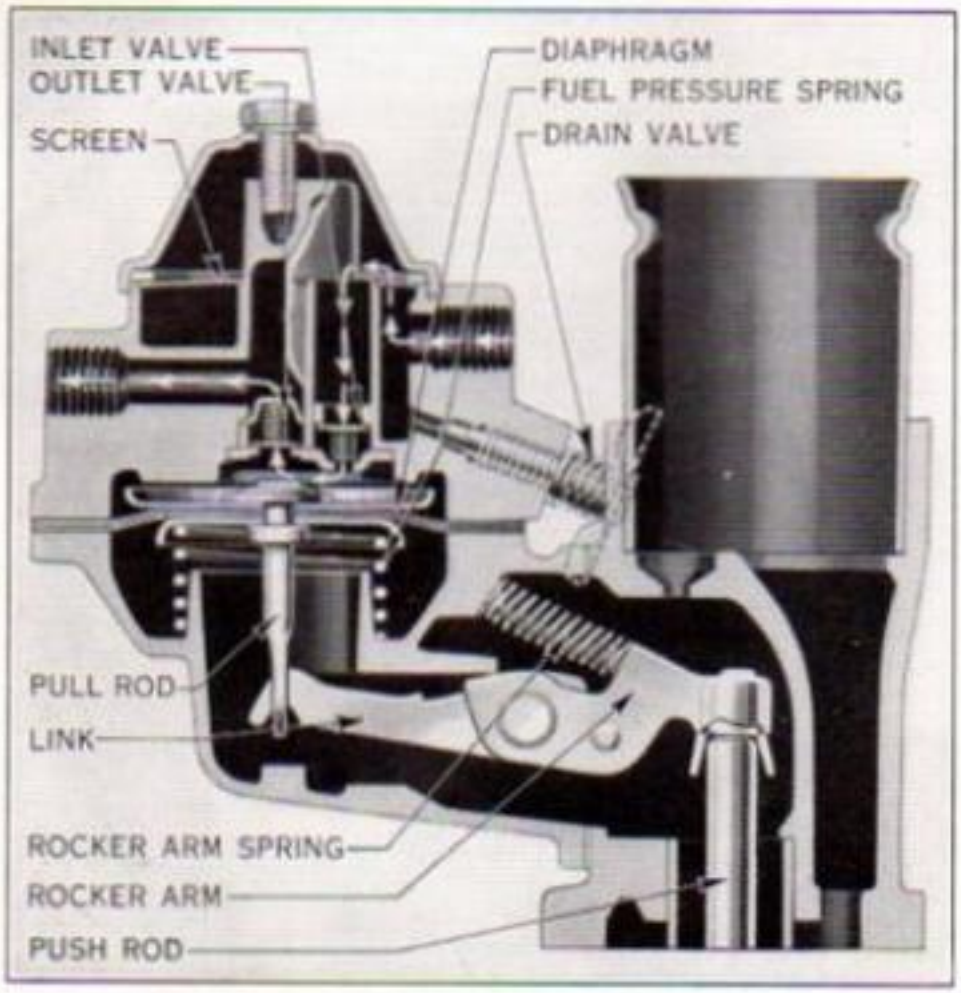


Fig. 3
Fuel Pump

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 draining to keep it free from dirt. (See Fig. 3.)

The construction of the pump provides a trap for sediment or water which can be drained off by means of the valve in the side of the pump.

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. The carburetor is entirely automatic in action. All orifices are fixed with the exception of the idling jets which are controlled by the idling adjusting screws. (See Fig. 4.)

Adjustment

The idle speed of the engine should be set by means of the throttle stop screw (See Fig. 4) to a speed equivalent to five miles per hour.

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

The idle adjustment shown in Figure 4 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. 4.)

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. 4.)

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.

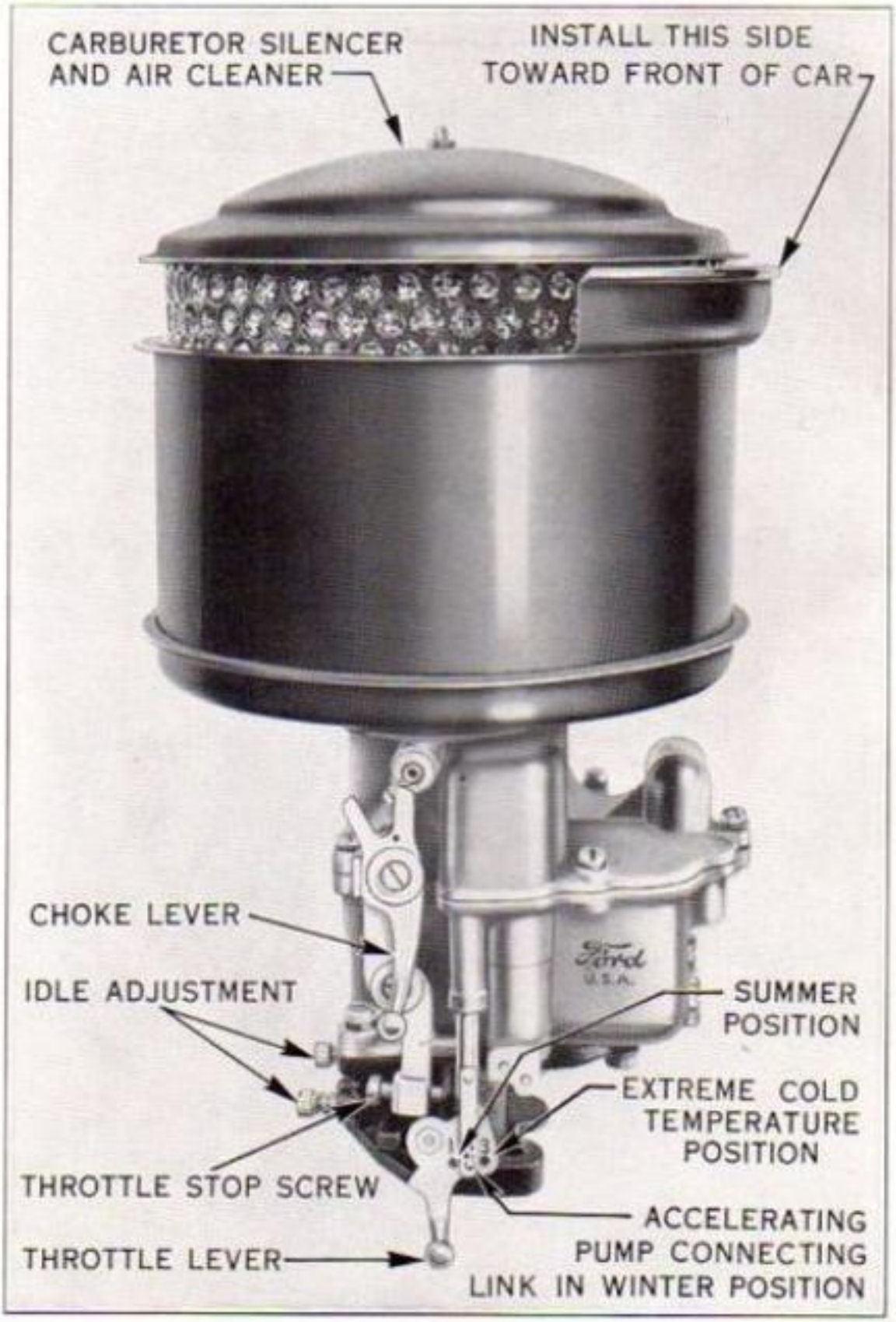


Fig. 4—Carburetor

Air Cleaner and Carburetor Silencer

The air cleaner and carburetor silencer (See Fig. 4) 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 description and illustrations under this heading are for general information. The instructions are not intended to be complete in detail for making major repairs. It is recommended that repairs or adjustments of a minor or major nature be made by a Mercury dealer.

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 9.

2. Insufficient gasoline reaching the carburetor may be caused by an empty gasoline tank, clogged gasoline line or faulty 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 faulty fuel pump, remove and clean strainer and drain sediment trap (See Fig. 3). 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 both intake and exhaust valves is .0125 to .0135 inch.

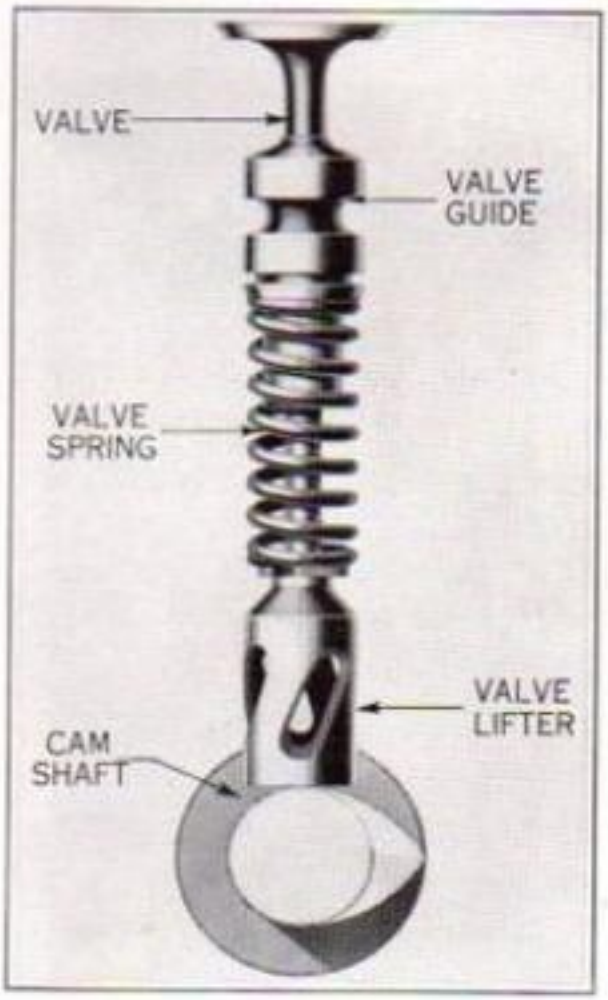


Fig. 5
Valve and Lifter Assembly

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 composition 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. 6.)

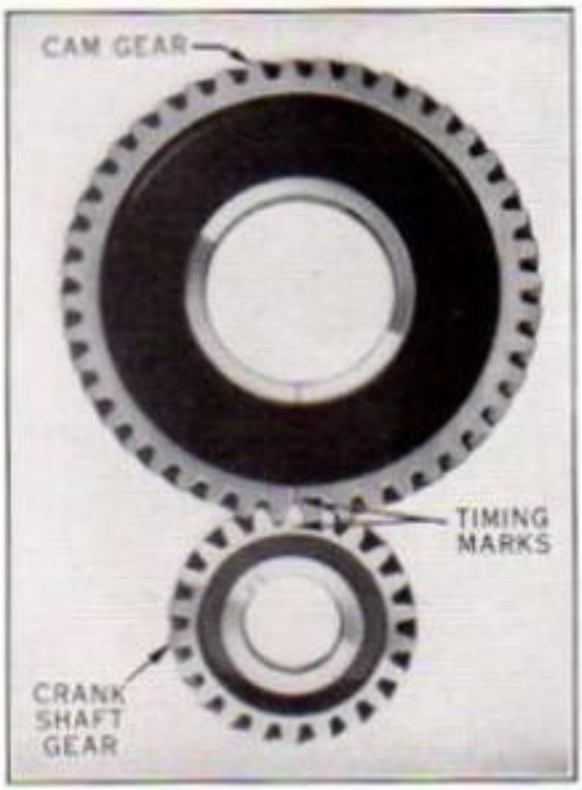


Fig. 6
Timing Gears

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. 7)

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

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 not dependent entirely on engine speed.

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. 7.)

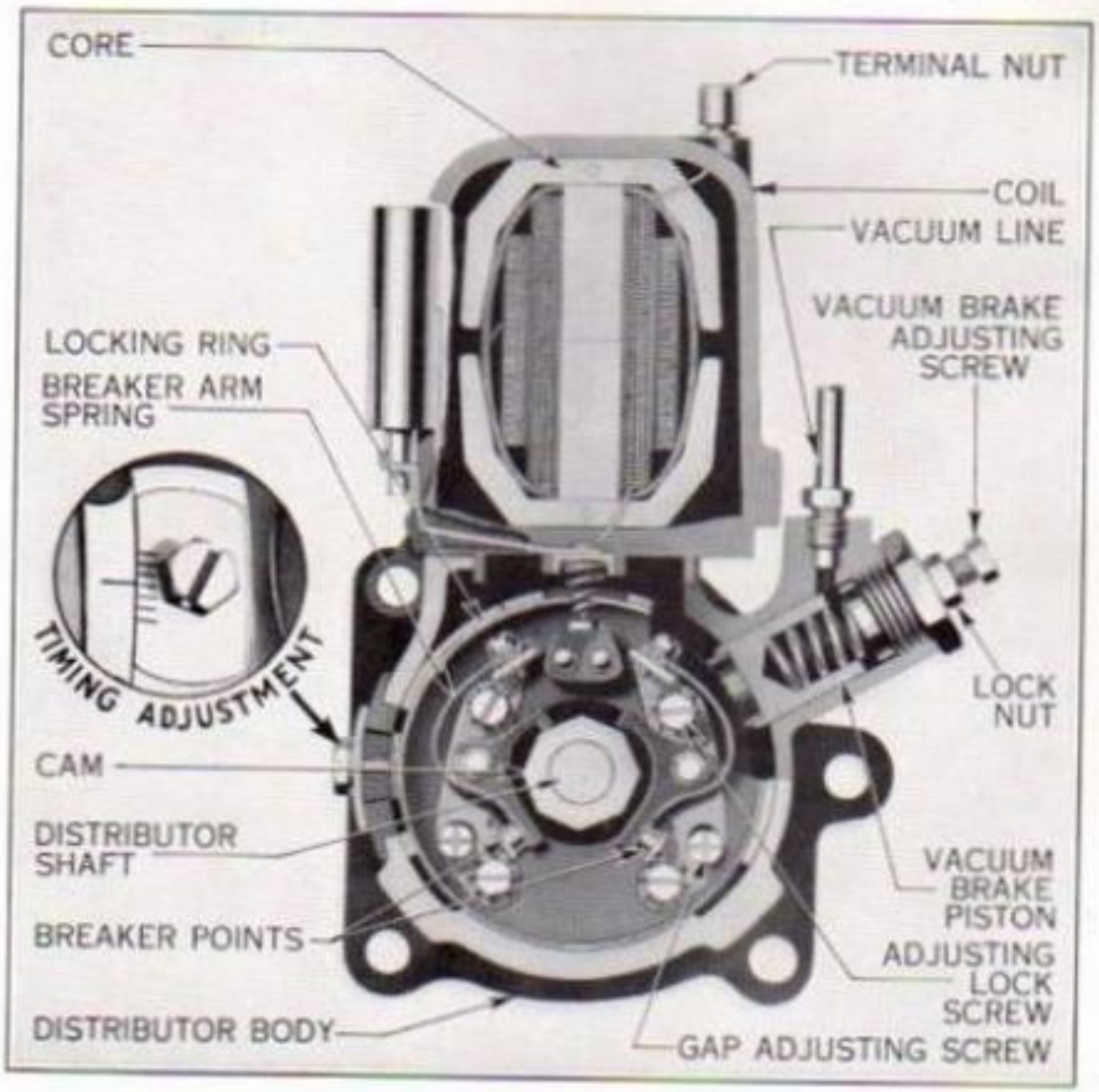


Fig. 7
Cross Section of Distributor

Adjustment is obtained for a particular fuel as follows: Back off the adjustment on the vacuum brake (See Fig. 7) 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.

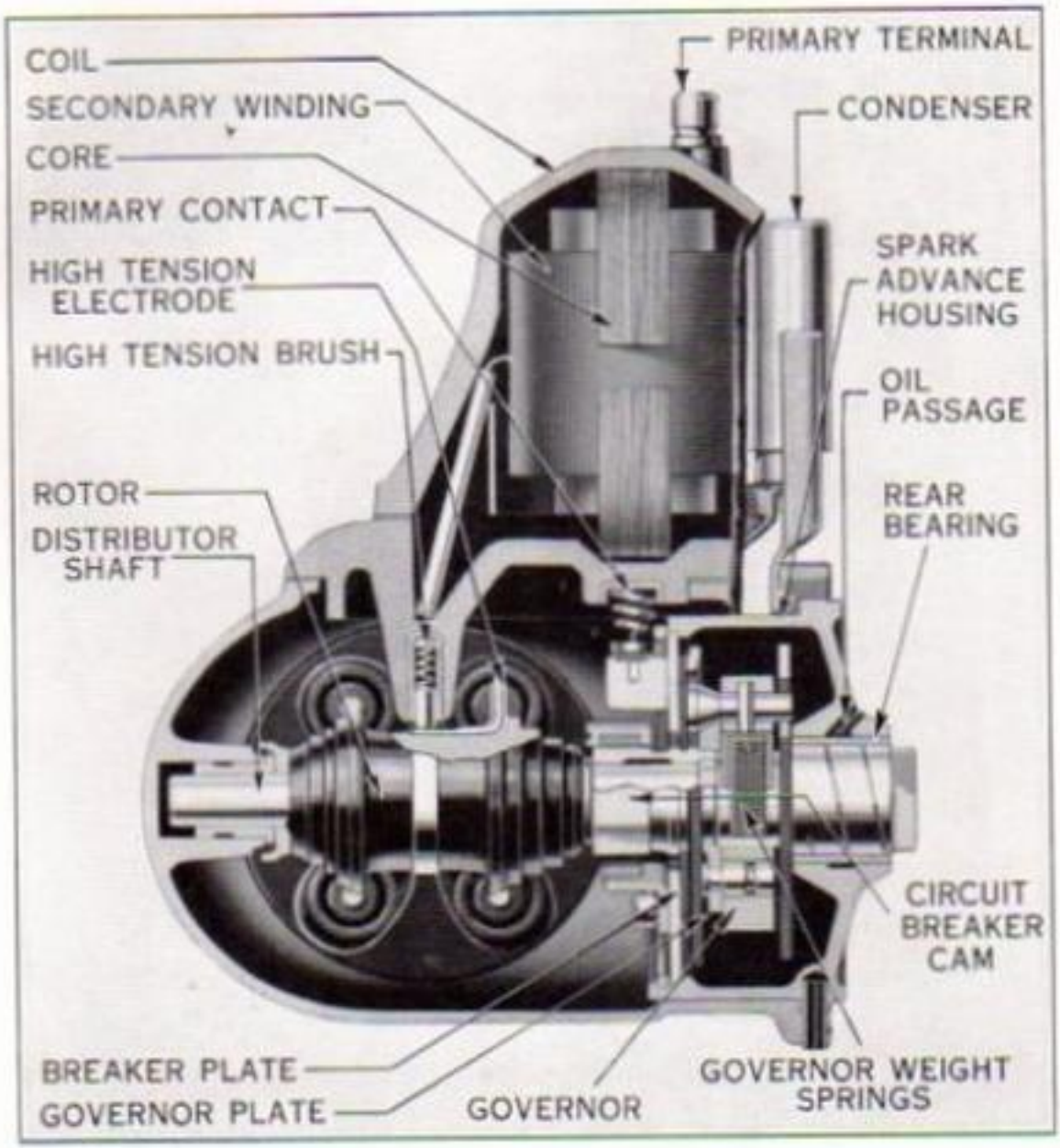


Fig. 8
Longitudinal Section of Distributor

Breaker Mechanism

The breaker mechanism includes an eight lobe breaker cam, two sets of breaker points and one condenser (See Fig. 7). 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. 7.

The proper setting for the distributor point breaker 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. 9.) The eight high tension terminals which are placed around the distributor plates 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

It is advisable to have adjustments to the distributor made by an authorized Mercury or Ford dealer as they 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 overheating of the engine if the ignition is retarded.

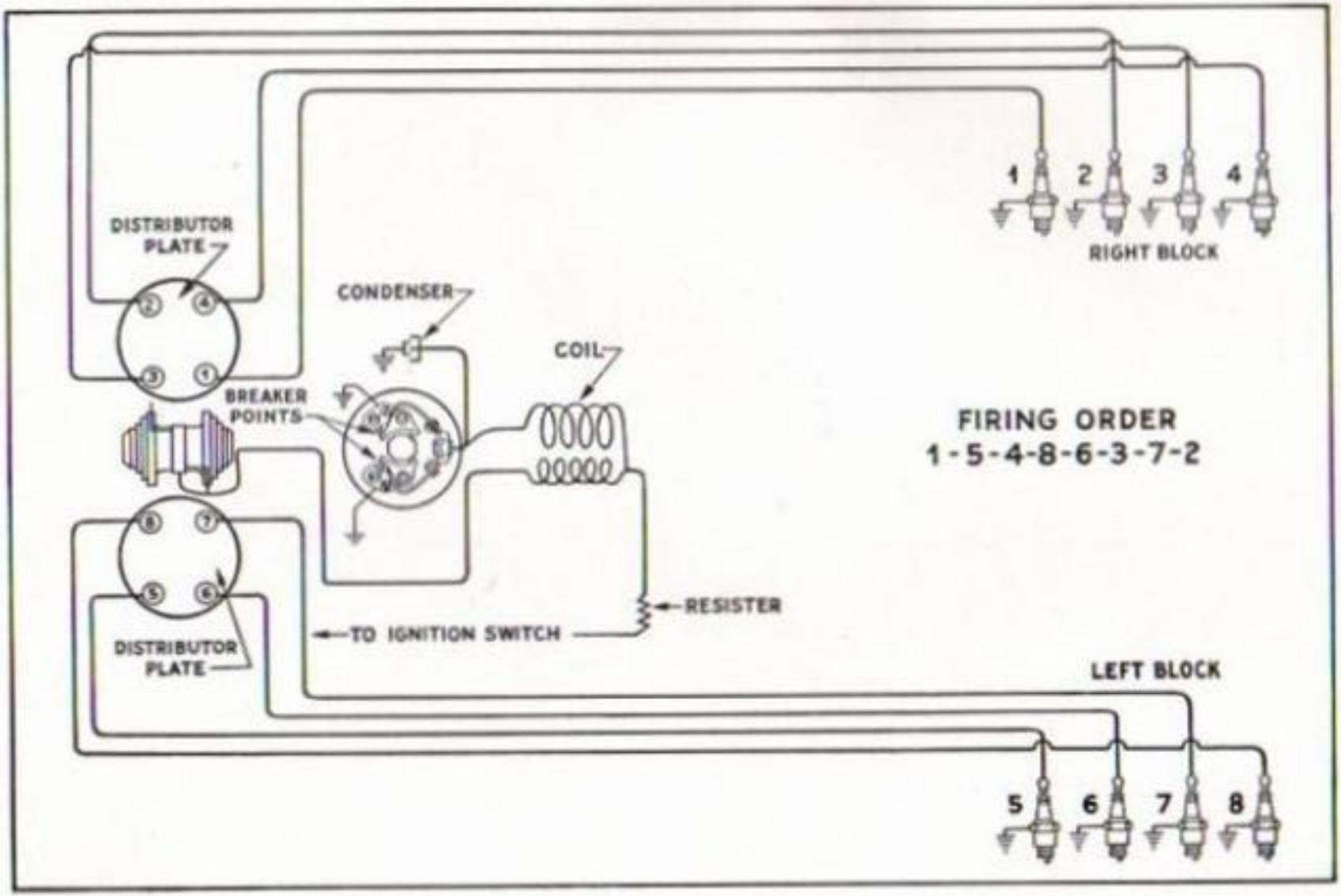


Fig. 9—Ignition Wiring Diagram

Spark Plugs

Spark plugs should be examined occasionally and cleaned. Care should be observed in correctly setting gap to .025 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.

Lubrication of Distributor

An oil cup is provided on the distributor housing for oiling the forward bearing of the distributor shaft. This oiler is accessible from the left side of engine. Oil each 1000 miles, using light engine oil. The bearing at the rear end of the distributor receives oil from the interior of engine and requires no attention.

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. 14.)

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 driven member 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.")

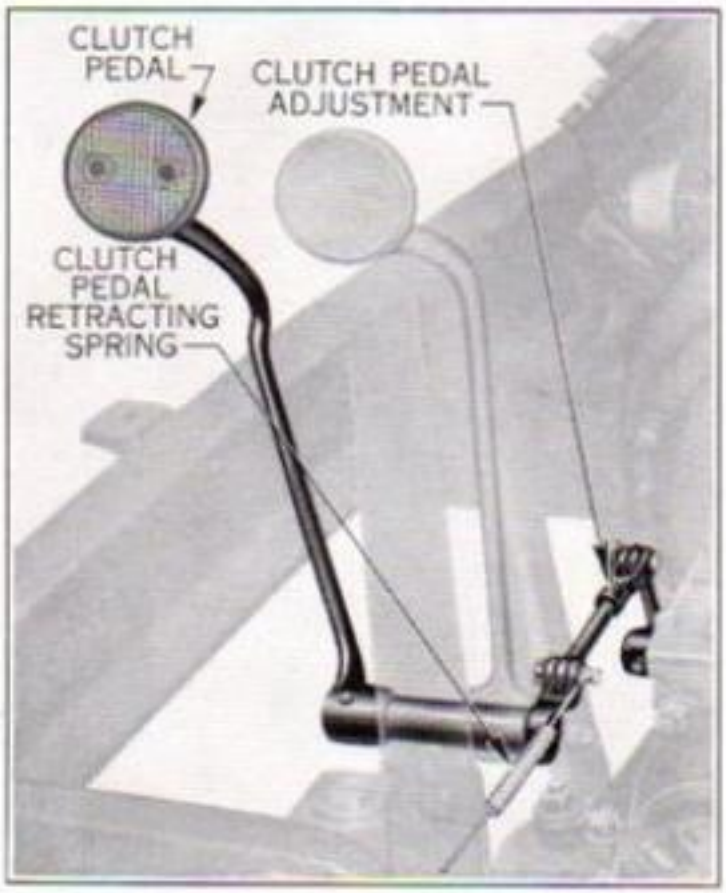


Fig. 10
Clutch Pedal Adjustment

Pedal Adjustment

The pedal should have approximately 1½ to 2 inches free travel before it disengages 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 will become less as the mileage on the car increases. If free movement less than 1½ inches is noted, the clutch pedal adjusting rod should be shortened. (See Fig. 10). 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 12)

Transmission

Summer lubricant for transmission should conform to S. A. E. specification No. 140.

Winter lubricant should conform to S. A. E. specification No. 90.

2½ 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).

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 fiber grease for front and rear wheel bearings. This grease is available from Mercury and Ford dealers.

Universal Joint

Use cylinder oil soda soap grease.

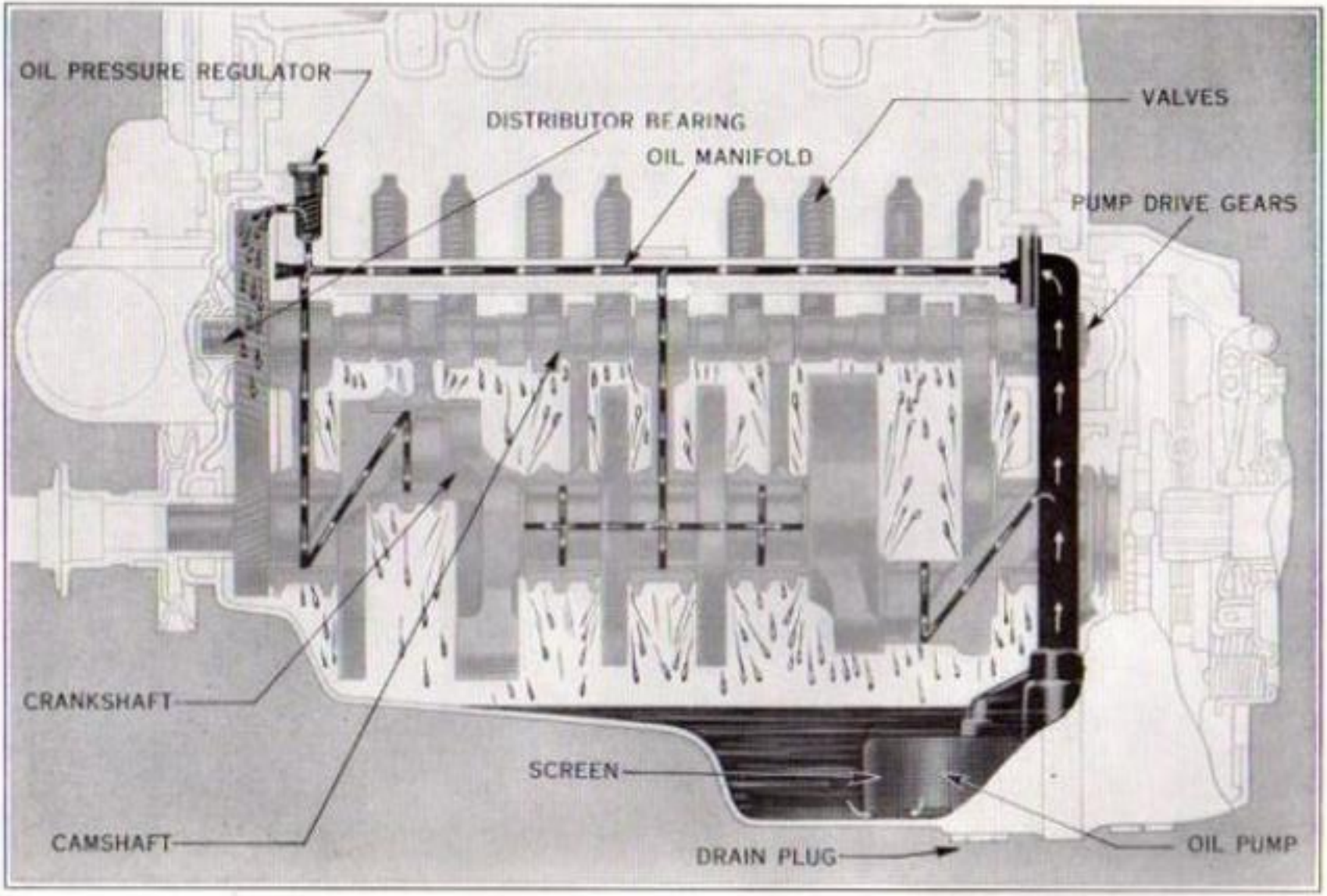


Fig. 11—Engine Oiling System

SERVICE MERC
LUBRICATION AND MAI

EACH 1

(A) PRESSURE GUN LUBRICANT.

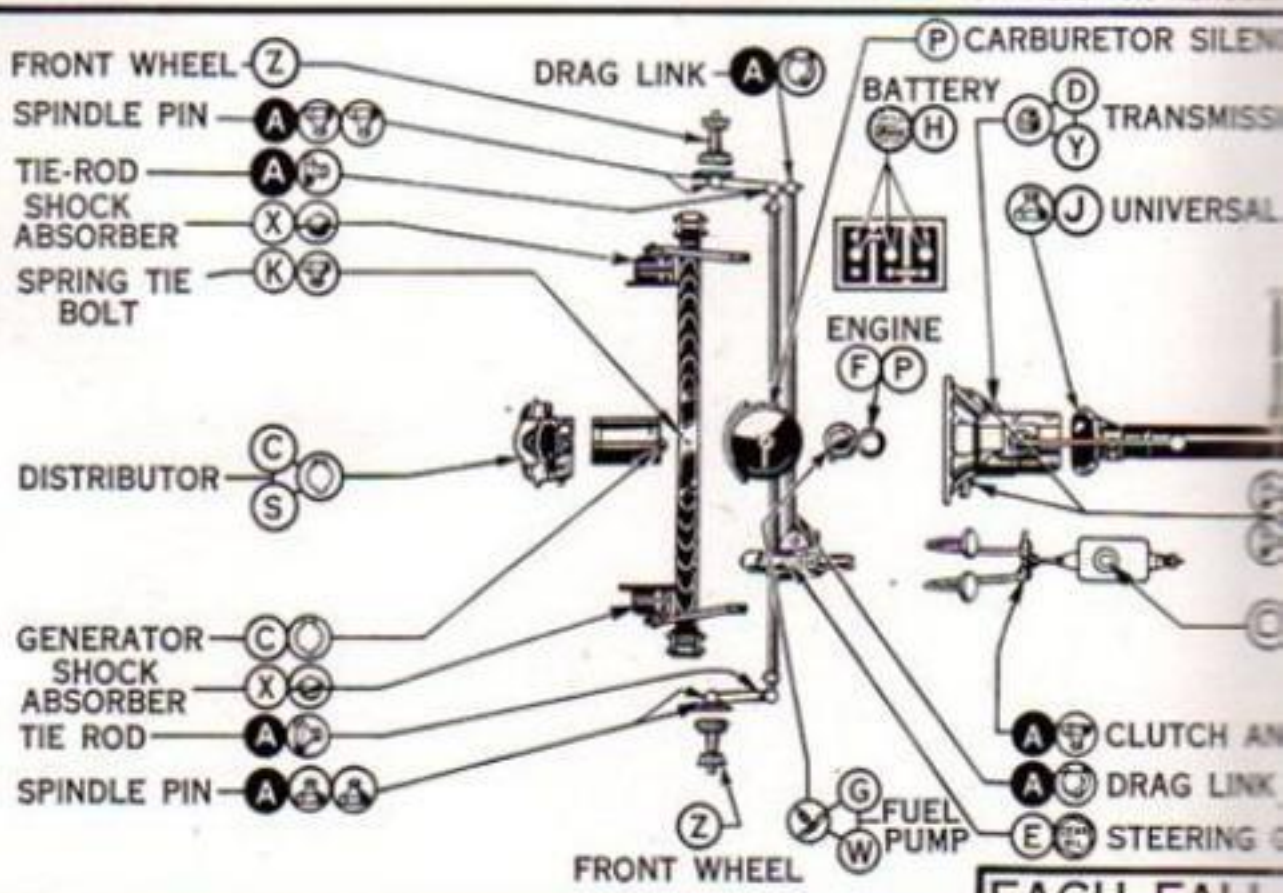
(B) M-544 FORD WHEEL BEARING GREASE

(C) ENGINE OIL (DISTRIBUTOR SHAFT, GENERATOR, — BRAKE CLEVIS PINS, AND ACCELERATOR.)

(D) ADD GEAR OIL TO LEVEL OF FILLER PLUG:
WINTER S.A.E. VISCOSITY 90.
SUMMER S.A.E. VISCOSITY 140.

(E) ADD MILD EXTREME PRESSURE GEAR OIL TO OF FILLER PLUG: WINTER S.A.E. VISCOSITY SUMMER S.A.E. VISCOSITY 140. (IN STEER FOR ALL SEASONS, USE S.A.E. 90)

(F) EVERY 2000 MILES DRAIN AND REFILL WITH ENGINE OIL.
RECOMMENDED OIL:
TEMP. ABOVE 90° F. S.A.E. 40; TEMP. ABOVE 32° F.
TEMP. ABOVE 10° F. S.A.E. 20 OR 20W; TEMP. ABO
LOWER TEMPERATURES--10W PLUS 10% KEROSE



EACH FALL
OR EVERY 5000 MILES

(Z) PACK WITH FORD WHEEL BEARING GREASE M-544 IF REQUIRED.

(Y) DRAIN, FLUSH AND REFILL WITH GEAR OIL WINTER S.A.E. VISCOSITY 90 SUMMER S.A.E. VISCOSITY 140.

(X) ADD FORD SHOCK ABSORBER FLUID TO LEVEL OF FILLER PLUG

(W) REMOVE AND CLEAN SCREEN.

Fig. 12—LUBRICATION AN

CHART
NTENANCE · 1939 CARS

00 MILES

LEVEL
NG GEAR,
QUARTS
S.A.E. 30;
VE-10° F.-10W.
NE

(G) DRAIN SEDIMENT.

(H) ADD DISTILLED WATER

(J) UNIVERSAL JOINT GREASE (CYLINDER OIL SODA SOAP GREASE).

(K) FORD SPRING LUBRICANT M-4628

(L) ADD FORD BRAKE FLUID M-3833 TO FILL MASTER CYLINDER RESERVOIR

(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.

CER AND AIR CLEANER

ION

JOINT

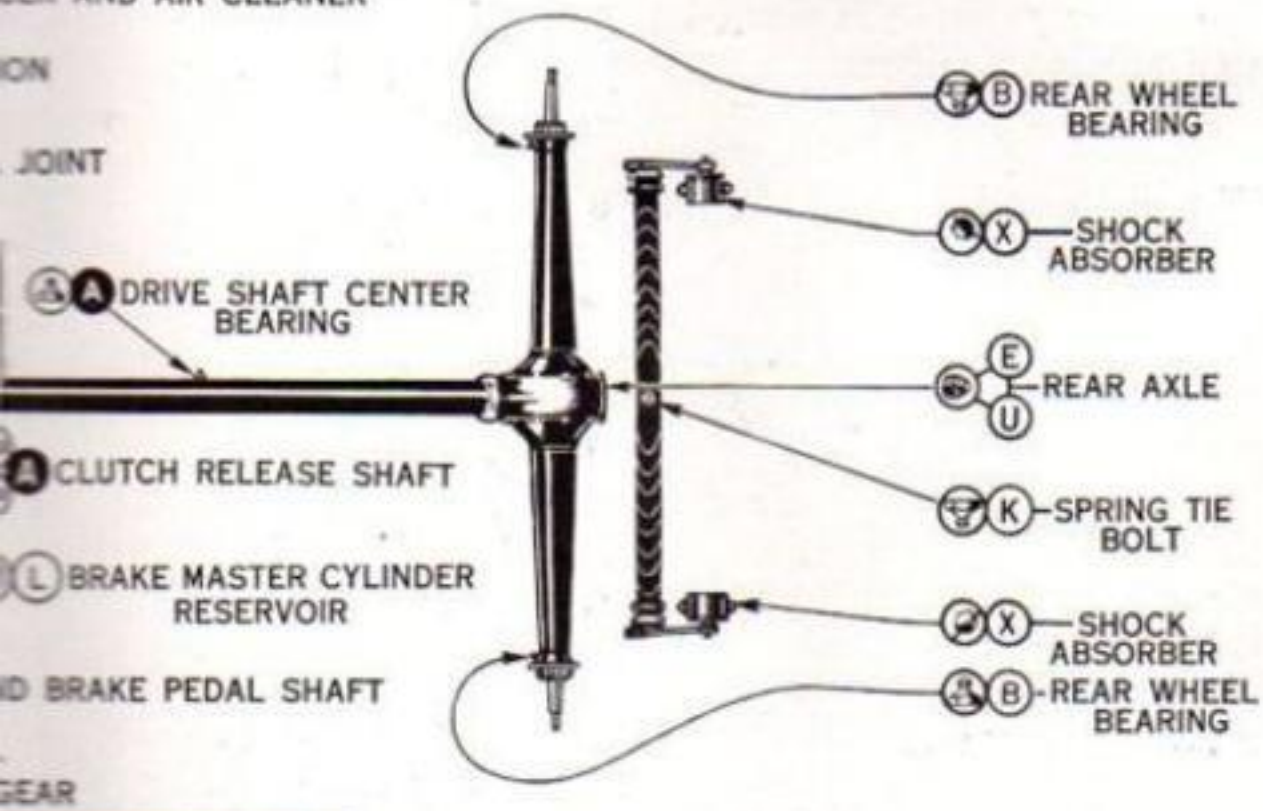
(A) DRIVE SHAFT CENTER BEARING

(A) CLUTCH RELEASE SHAFT

(L) BRAKE MASTER CYLINDER RESERVOIR

D BRAKE PEDAL SHAFT

GEAR



AND SPRING

WHICHEVER OCCURS FIRST)

(U) DRAIN, FLUSH AND REFILL WITH MILD EXTREME PRESSURE GEAR OIL: WINTER S.A.E. VISCOSITY 90, SUMMER S.A.E. VISCOSITY 140.

(S) FORD DISTRIBUTOR GREASE M-4601 ON CAM LOBES.

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. 11.)

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. 11.)

Oil Change

After running 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 (driving speed, temperature, etc., will affect oil consumption).

Oil Level Gauge

When the oil pan is full the oil level gauge will show "full." (See Fig. 13). 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. 13
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 90° F.	S.A.E. 40
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. 12)

TRANSMISSION

The transmission is of the synchronized gear type, providing for three speeds forward and reverse. Helical silent gears are used throughout. Figure 14 shows the gears in neutral position.

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

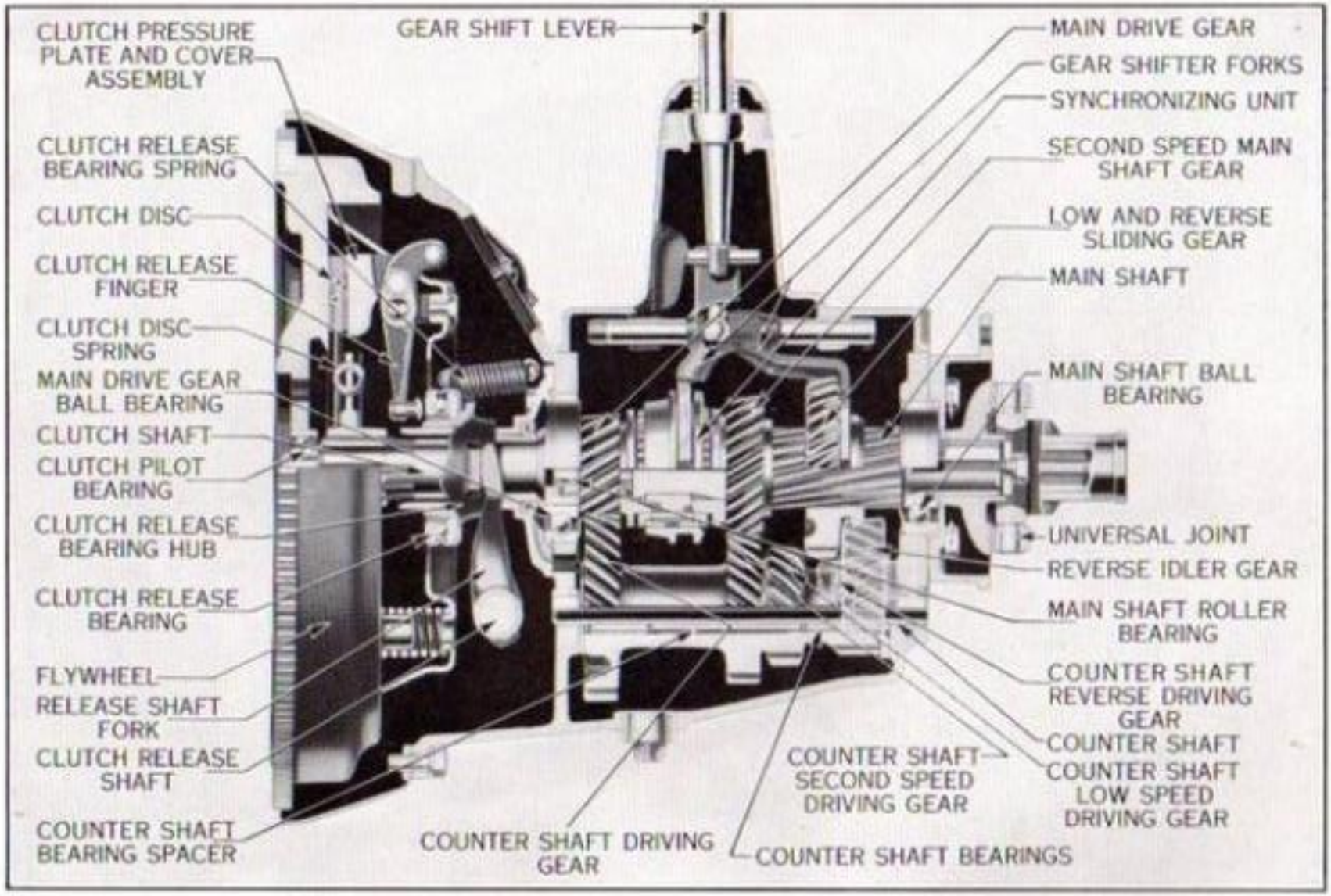


Fig. 14—Transmission

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. 14.)

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 position, 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. 14.)

Gear Synchronizing Unit

The "blocker type" gear synchronizing unit shown in Fig. 14 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 the unit by spring actuated plungers and is capable of sliding either forward or backward on the synchronizing unit to engage either the main drive gear or second speed main shaft gear at option. (See Fig. 14.)

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. 14.) 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. 140.

Winter lubricant should conform to S. A. E. 90.

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

2½ pints of lubricant are required to fill to level of filler plug on right side of transmission. (See Fig. 14.)

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 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 1/8 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-544, available at Mercury and Ford dealers. (See Fig. 12).

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. 15). 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.

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.

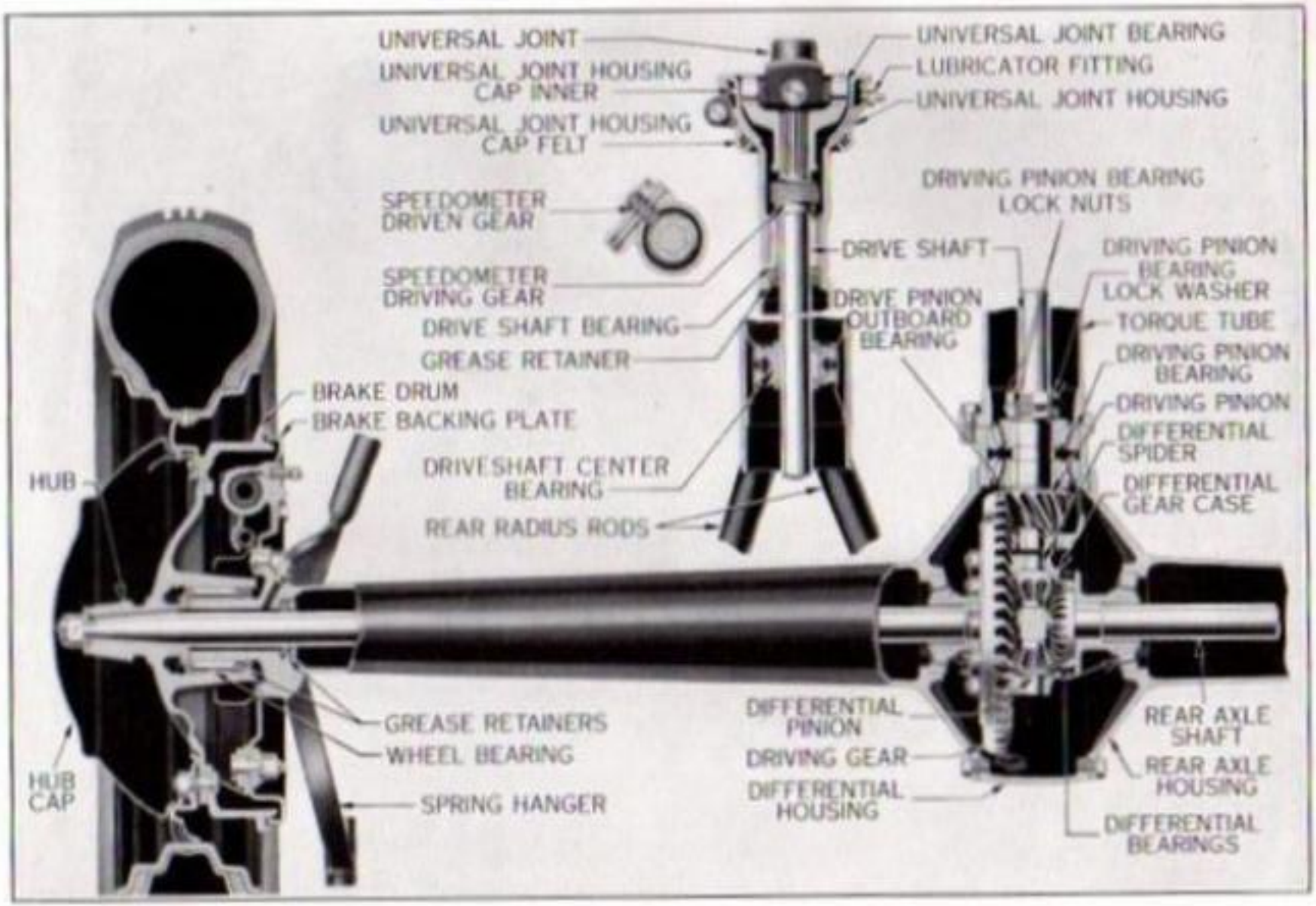


Fig. 15—Rear Axle

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 those for which they are primarily intended, carrying the load and absorbing road shocks.

Speedometer Drive Shafts

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. Also a similar bearing is located at the center of the propeller shaft. These bearings receive lubrication through pressure gun fittings in the torque tube. (See Fig. 12.)

Lubrication of Rear Wheels

Rear wheel bearings should be lubricated sparingly with Ford wheel bearing grease every 1000 miles. (See Fig. 12).

Universal Joint

Lubricate each 1000 miles. Use cylinder oil soda soap grease. See Fig. 12 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

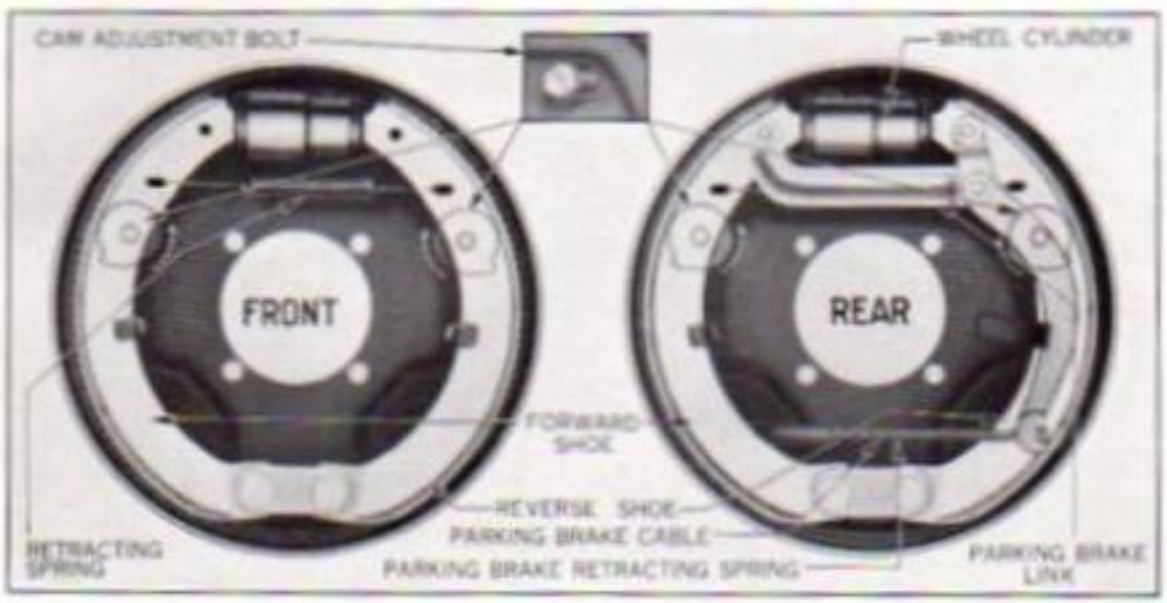


Fig. 16
Brake Shoe Assemblies

brakes as a parking brake. A woven type lining is used on the "forward" brake shoes and moulded on the "reverse" 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:

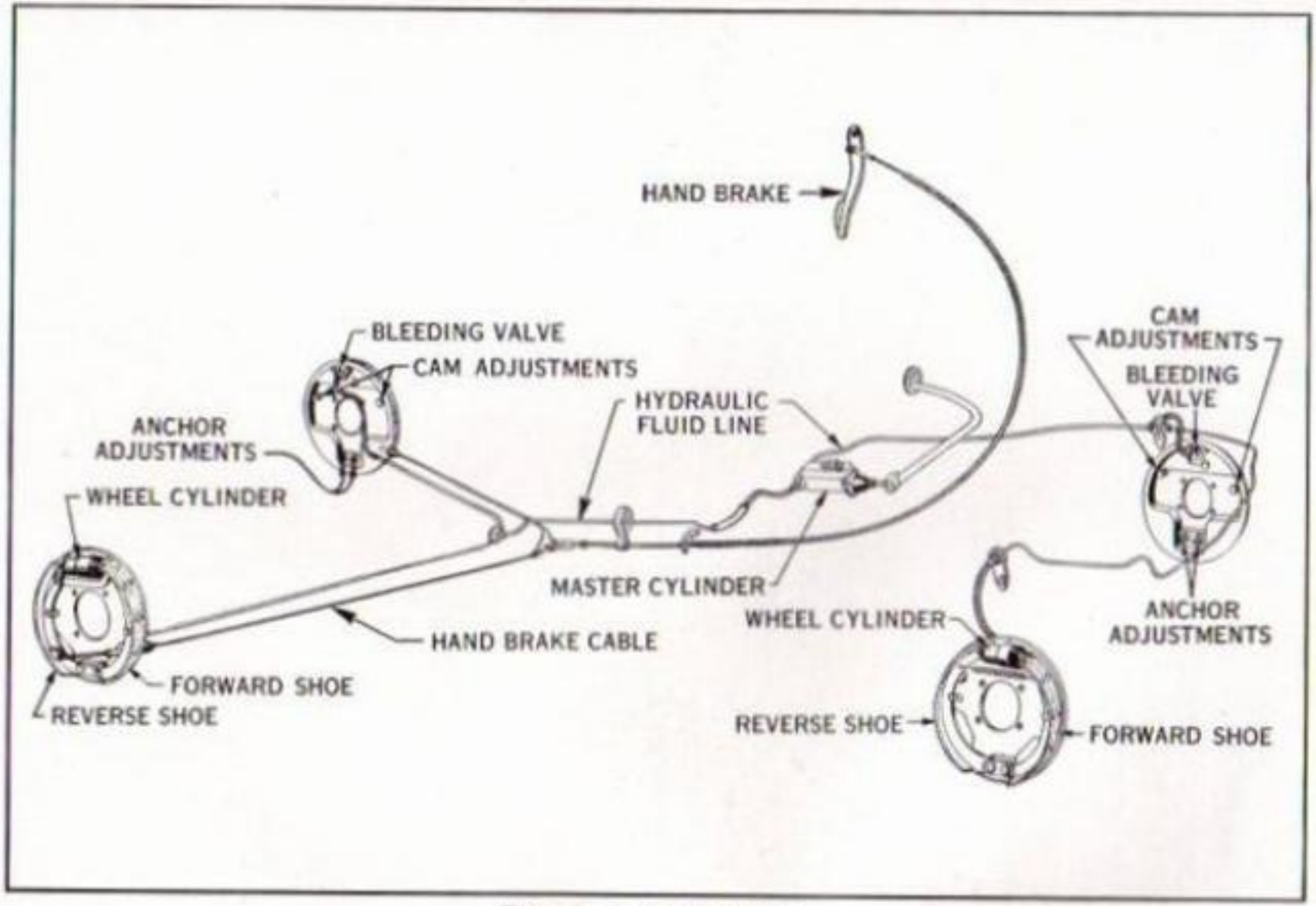


Fig. 17—Brake Hook Up

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. 16 until shoe is solid against the drum and wheel cannot be turned by hand. 2. Back off bolt 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. 16. 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. 17). Insufficient fluid in the reservoir will result in air getting into the system. This will cause the brakes to become "spongy" and ineffective, necessitating a "bleeding" operation 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. 18). 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.

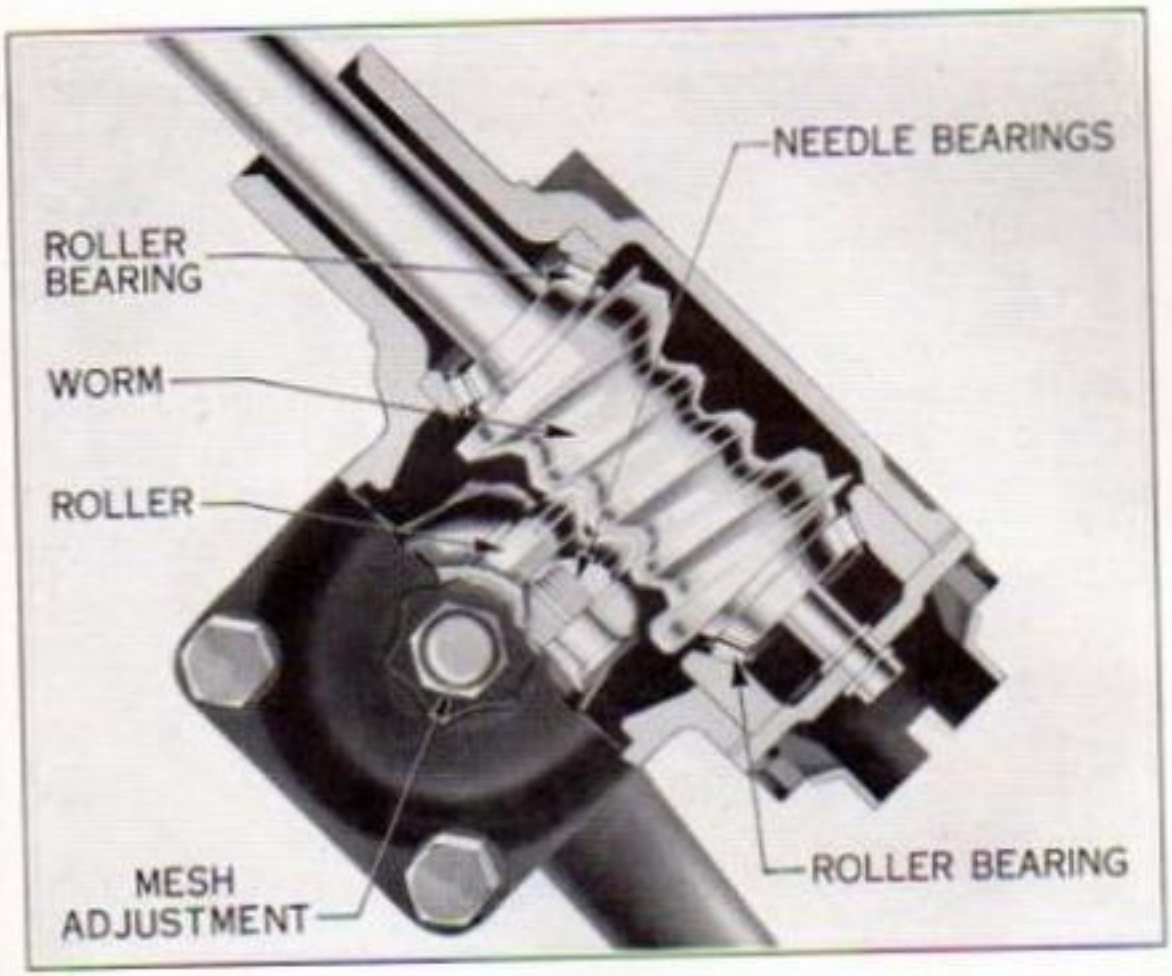


Fig. 18
Steering Gear

Lubrication

Add gear lubricant to level of steering gear filler plug every 1000 miles. Use gear oil, S. A. E. 90 in winter; S. A. E. 140 in summer.

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 100 ampere hours.

Every two weeks check the solution (electrolyte) to see it is at the proper level. Add only distilled water to maintain the level above the top of the plates.

After adding water to the battery in freezing weather, the engine should immediately be run for a short period to mix the water with the acid solution to prevent freezing.

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.

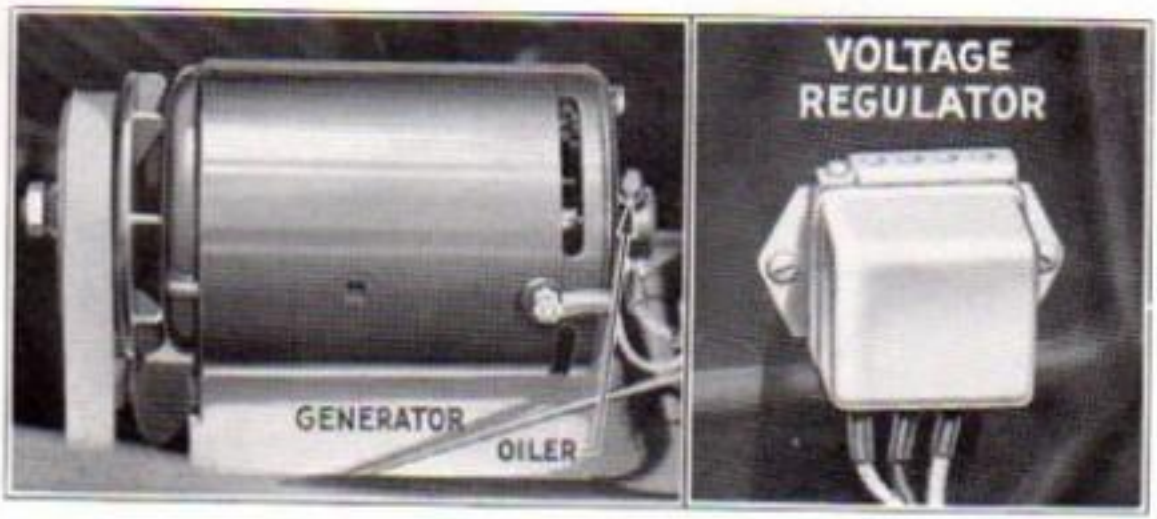


Fig. 19
Generator and Voltage Regulator

Generator

The generator delivers electrical energy for charging the storage battery which serves for operating the lights, ignitions, horns, etc. A two brush type generator is used and output is automatically controlled by a voltage regulator.

Relay and Voltage Regulator

This unit (See Fig. 19) is mounted on the engine side of the dash. The relay 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 voltage 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.

Battery Indicator

The Battery Indicator, located in the instrument group (See Fig. 1) is used in place of the conventional ammeter. This instrument shows the amount of charge in the battery at all times. "L" on the dial indicates a "low" condition, "N" normal and "H" high.

The indicator hand will be in the black sector under normal operating conditions. If the hand falls below the black sector during normal engine operation, this indicates the battery is not fully charged. If the hand goes above the black sector the cause will probably be traceable to improper operation of the voltage regulator. If such readings occur, it is advisable to consult a Mercury service station.

With the ignition switch "ON" and the engine not operating, the indicator hand will reach a position close to the line just below the black sector if the battery is in good condition. The hand will slowly rise to the black

sector as soon as the engine is started, which indicates the generator is charging.

Starting Motor

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

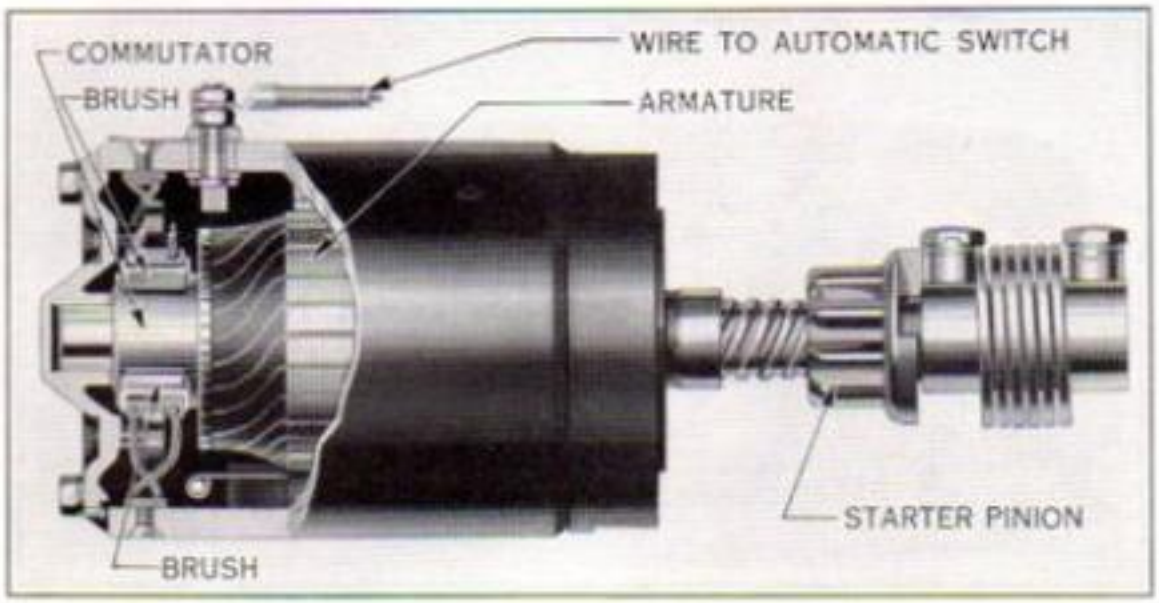


Fig. 20
Starting Motor

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

Rotation of the starter motor shaft causes the pinion of the Bendix 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 button is located at the center of the steering wheel and the beam control switch is on toe-board just below the brake and clutch pedals (See Fig. 21.)

Fig. 21
Light Switch and Beam Control Switch

When the control knobs are in the neutral or "up and down" position, lights are "OFF." Moving the control to the left position connects the parking, tail lights and instrument lights. Moving the control to the right to its definite stop connects the headlights through the beam control switch on the toe-board. Alternate pressing of the beam control switch lowers the headlight beam for city driving or passing other cars. A small red light appears in the instrument panel, above the starter button, when beam is "high." A rheostat switch located under the instrument panel, controls the instrument lights independent of the other lights. (See Fig. 1.) Turning the knob of this switch permits the operator to dim or brighten the instrument lights as desired.

Fuse for Light Circuits

The lighting system is protected by a 20 ampere fuse.

The fuse block is located on the inside of dash under the cowl. The normal demand for current does not affect the fuse 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 fuse burns out which cuts off the flow of current. The fuse thus protects the wiring from destruction, also the storage battery from being rapidly discharged. Before replacing a burned out fuse, the cause for circuit overload should be ascertained and corrected.

Headlamps

The headlamps have a double filament bulb. The two filaments are spaced above and below the center axis of the bulb and reflector. Lighting the lower filament gives the upper or "high" beam. (See Fig. 23.)

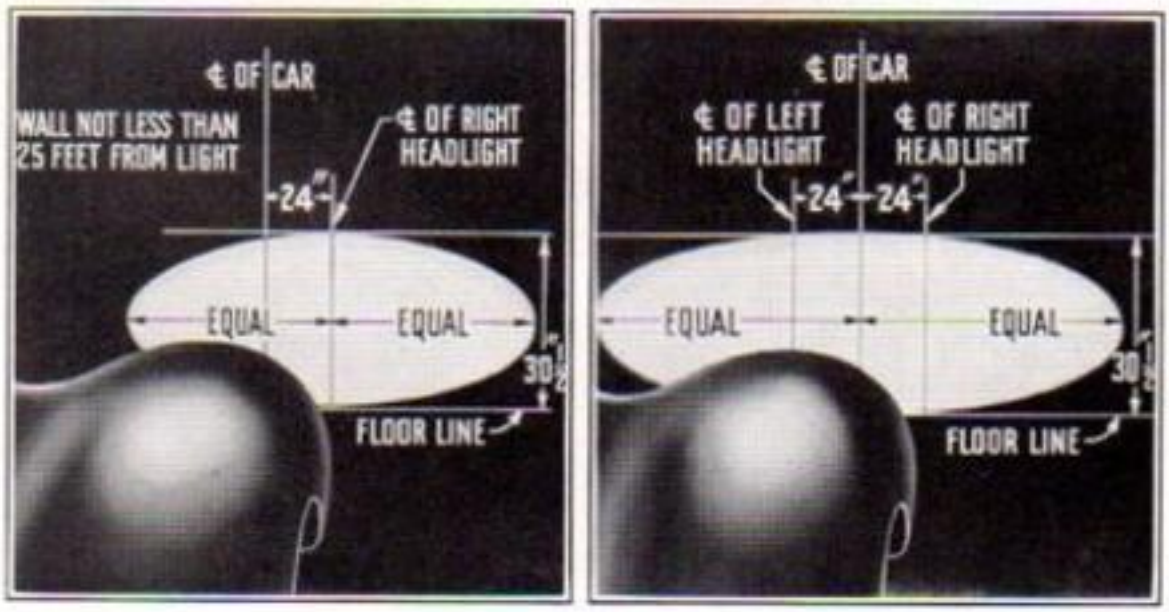


Fig. 22
Diagram for Headlight Adjustment

Lighting the upper filament produces the low beam for city driving or wherever the high beam might cause annoyance to others.

The center of the low beam is directed downward about 2½ degrees from the upper position, or about eight inches on a wall 25 feet from the lens. The filament for the upper and lower beam is 32 C. P. The parking light bulb is 1½ C. P.

Headlamp Adjustment

To remove the lens, loosen lens retainer clip screws holding the lens retainer. Turn lens slightly to remove.

Fig. 23 shows the three adjusting screws on the reflector. The top screw is for tilting the beam up or down and the screws on either side are for directing the beam to right or left.

To adjust headlamps, cover the left lamp and turn the light switch control to "high" beam position. Then aim the right reflector so that the center of the beam is 24" to right of the center-line of the car and the top of the beam is 30" from the floor (Fig. 22). Next cover the right lamp and proceed to aim the left reflector the same as right lamp, except the center of the beam should be 24" to the left of the center-line. With the reflectors set in this position the beam will be correct when beam control switch is changed to "low" beam. Make final check with lens on lamps.

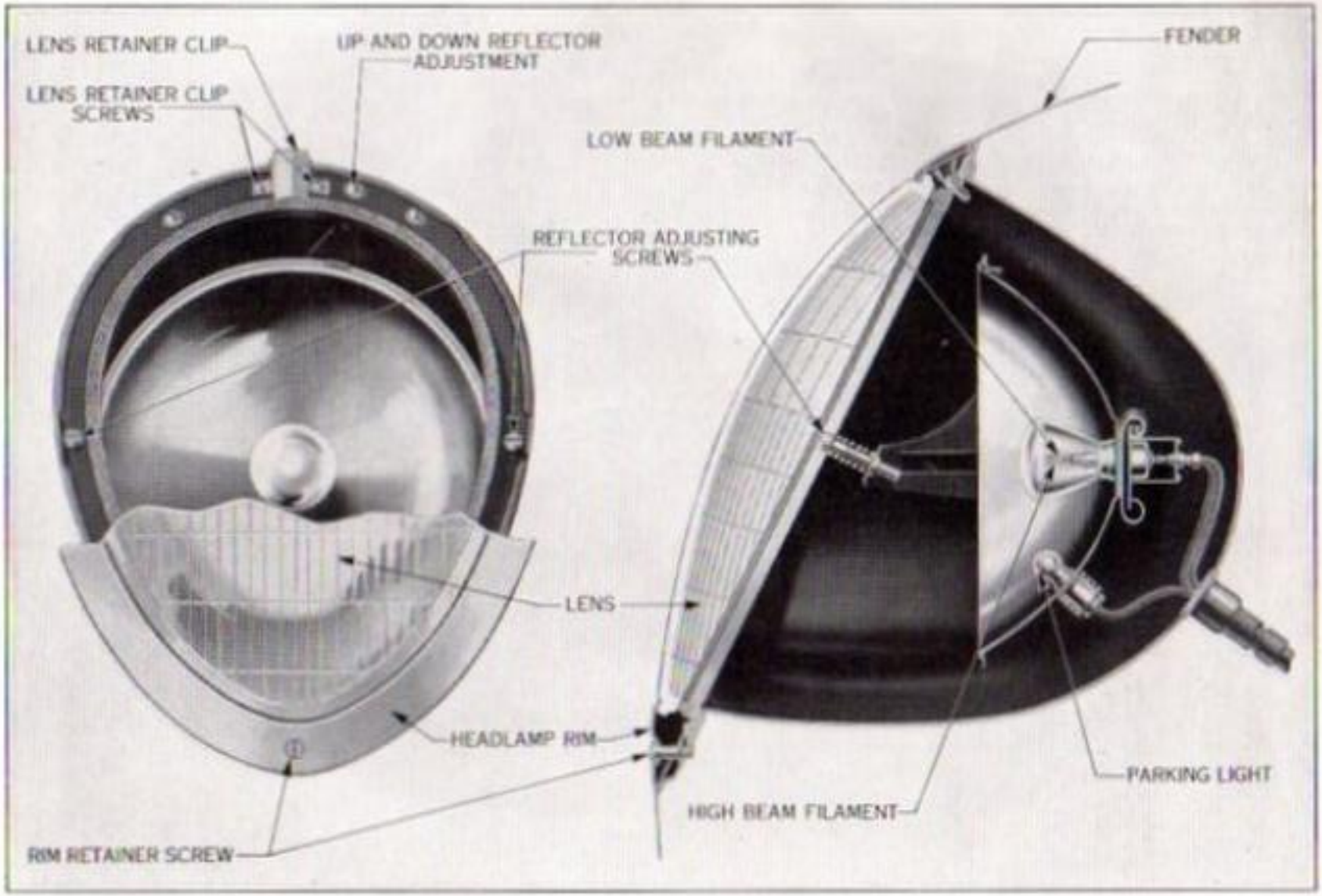


Fig. 23—Headlamps and Adjustments

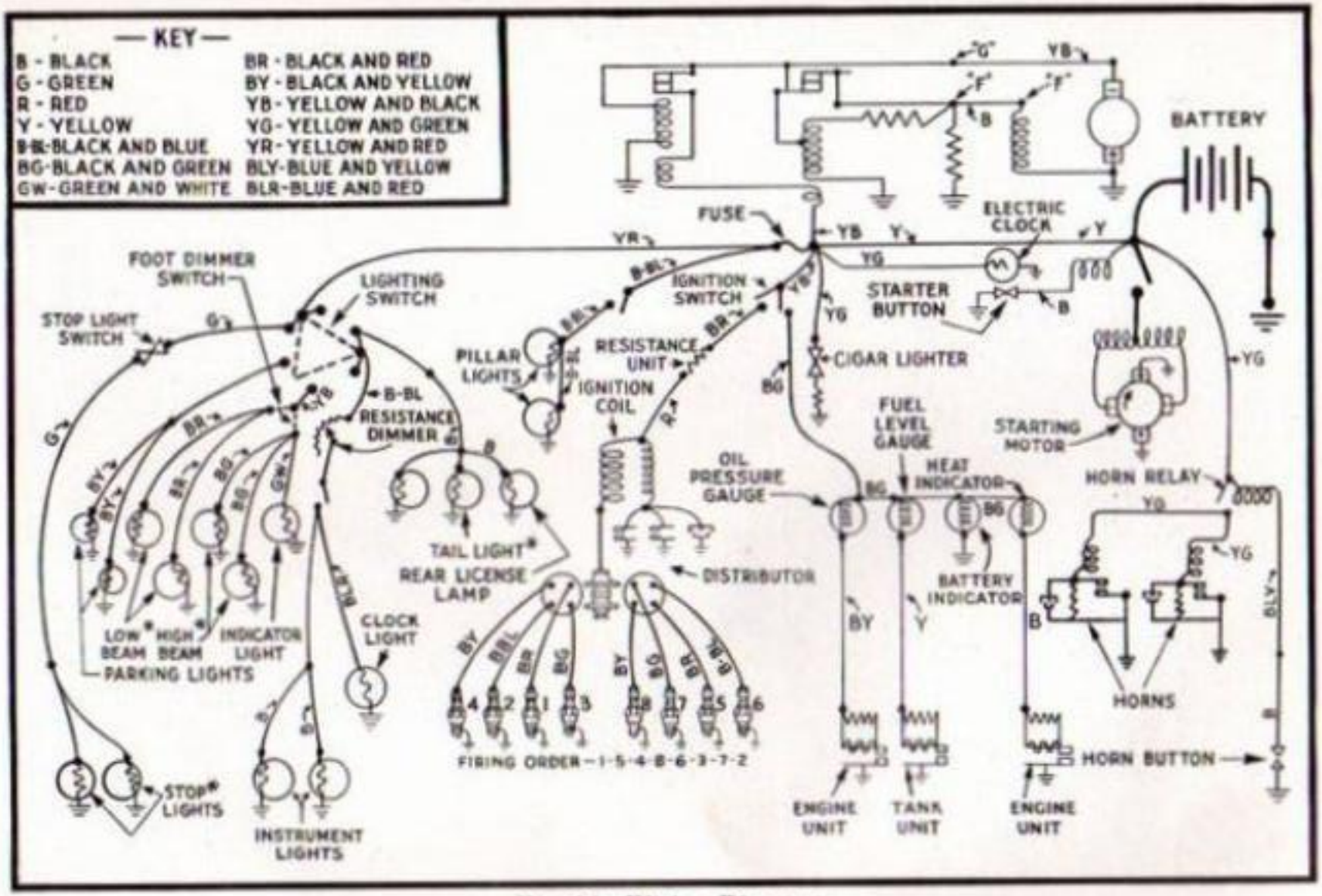


Fig. 24—Wiring Diagram

BODY

Lubrication of Body Parts

Oil door hinges at frequent intervals using penetrating dry type lubricant.

Door striker plates, dovetails, bumpers and check straps should be lubricated with an impregnated wax lubricant as oils or grease will soil clothing.

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.

When a "scum" develops on the finish which is not readily removed with plain water, use Zephyr or Lincoln cleaner and polish which are available from Mercury and Ford dealers.

EQUIPMENT

Speedometer

The speedometer indicates miles per hour, trip mileage and total mileage. A knob on the back of the instrument group, under instrument panel, 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.

Cigar Lighter

The cigar lighter is located below the instrument panel at right of grille (See Fig. 1).

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 this ***special 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 30 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. 25—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. 25).

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. 25)

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

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. 26.

Fig. 26—Removing Bottom Bead

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.

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.

Fig. 27—Applying Bottom Bead

A tire iron may be needed to pry the last portion of bead over the flange. (See Fig. 27).

Nig. 28—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. 28).

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

Figure 29 shows the locations, front and rear, for placing the car jack when raising a wheel, also position of the handle in the jack for raising and lowering. When lowering car press jack handle down GENTLY. The amount of pressure exerted controls the speed of lowering.

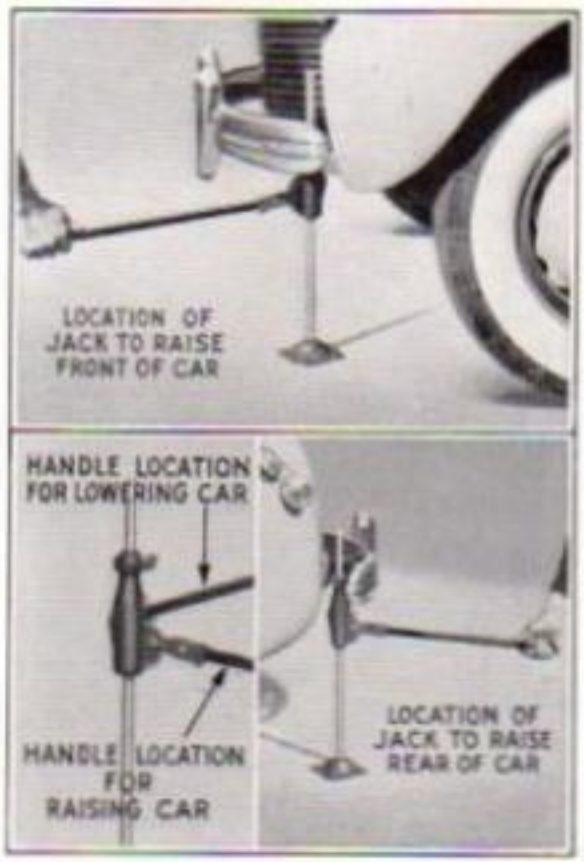


Fig. 29
Car Jack

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