70

CHRYSLER

Instruction Book

First Edition
July 1929

Chrysler Sales Corporation
Division of Chrysler Corporation
Detroit, Michigan
U. S. A.

CHRYSLER MOTORS
STANDARDIZED QUALITY

Chrysler "70"

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Detroit, Michigan
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Price Twenty-five Cents

PRINTED IN U. S. A.

License Data

Chrysler "70"

Car Serial Number.....

Theft protection system, symbol plate built into instrument panel. Chassis shipped without bodies have symbol plate built into frame right side member vertical section just forward of the rear end of the hood.

Engine Serial Number.. (Stamped on boss left side of cylinder block above water jacket cover between numbers 1 and 2 cylinders.)

Cylinder Bore—3 1/8"

Stroke—4 3/4"

Number of Cylinders—6

N. A. C. C. Horsepower Rating—23.43

Piston Displacement—218.6 cu. in.

KEYS

Keys are serially numbered and number should be noted so that in case of loss new keys may be obtained. There is no number apparent on the lock cylinder. Not more than two keys may be ordered and shipment will be made only to Chrysler dealers. These rules are required by the Board of Insurance Underwriters for the protection of Chrysler owners.

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A Personal Message to Chrysler Owners

IT IS our sincere desire that you obtain from your Chrysler "70" the service, comfort, enjoyment, and innumerable miles of low-cost travel that we have earnestly endeavored to build into it.

It is necessary only that you treat the vehicle with reasonable care and consideration in order that you and your family or friends may realize these qualities.

In the pages that follow we give much valuable information, without going into intricate detail, that you should have in order to give your car the careful attention which it merits.

For extensive repairs or adjustments, we request that you take your car to a Chrysler Service Station, where it will receive the particular attention of an organization devoted to your interests, with mechanics specially trained in the maintenance of Chrysler cars, using genuine Chrysler service materials.

Communications with reference to Chrysler cars should give serial number and mileage.

CHRYSLER SALES CORPORATION
Division of Chrysler Corporation

Theft Protection System

All Chrysler cars are equipped with the Fedco Numbering System, the most satisfactory system which has yet been devised for the prevention and detection of automobile thefts.

The number plate, which is located just above the instrument board, carries the coded serial number of the individual car.

This plate cannot be removed or altered without the evidence of tampering. Also, it cannot be successfully counterfeited. Even though the plate were entirely removed, it would be difficult to dispose of the car, because the absence of the plate indicates that the car has been stolen. This greatly minimizes the theft of Chrysler cars for resale purposes and affords the owner an added protection.

As part of the Fedco System, the William J. Burns Detective Agency has been retained to assist in the recovery of stolen Chrysler cars, without any expense to the owner. Immediately upon advice from the owner whose car has been stolen, this information is broadcast to the many Burns Agencies all over the country, to Police Departments, State Troopers, Federal Operators, as well as to an extensive list of garages, service stations and filling stations in every section of the country.

Under a recent ruling of the National Board of Insurance Underwriters, the theft rates hereafter on any particular make of car will be increased or decreased in accordance with the increase or decrease in the number of thefts of that particular make.

By the use of the Fedco System, approved locking devices and other agencies, Chrysler has effected a very remarkable experience which has, in turn, resulted in a material reduction in insurance theft rates on Chrysler cars. In addition, Chrysler owners have the protection and services of a nation-wide detective agency to assist in the recovery of all stolen Chrysler cars.

As an extra precaution, all owners are urged to always keep their cars locked when not in use.

Lock Your Car

The Chrysler "70" is equipped with a lock for the ignition. In addition to the ignition lock, cars with closed bodies are equipped with locks on all doors. The purpose of these locks is, obviously, to protect the owner of the car against theft.

Lock Your Car

Theft insurance on an automobile does not prevent theft. It is financial assistance to the car owner after the car is stolen. It does not cover the full value of the car from financial and service standpoints. The monetary loss is misfortune in an investment and the value of the service loss cannot be estimated.

Lock Your Car

Cars are generally stolen at a time when they are being used by the owner, either for business or pleasure. If stolen while being used for business, the loss of the car may mean the missing of very important business appointments.

Lock Your Car

The locks are provided as protection against theft. Perhaps a professional thief will steal a car regardless of the theft protection precautions which may be taken by the car owner or the car manufacturer, but, nevertheless, the petty thief, at least, will be stopped if the car is locked whenever it is not in use. Cars are stolen from garages as well as when they are parked by the roadside. It may be the car owner's intention to leave a car for only a few minutes, but that is generally just enough time for the thief, who is watching his chance, to steal the car.

Lock Your Car

The ignition switch on the Chrysler "70" is operated by a key so that when the ignition is shut off, for stopping the engine, it is a simple matter to lock the car by removal of the key. The door locks on closed cars are added protection and should also be used.

Lock Your Car

Keys are serially numbered and numbers should be noted so that in case of loss new keys may be obtained. Only two keys may be ordered and shipment will only be made to Chrysler dealers. These rules are required by the Board of Insurance Underwriters for the protection of the owners of Chrysler cars.

Lock Your Car

Chrysler cars are provided with practical theft protection. This protection should be used.

Lock Your Car

OPERATION AND CARE

Regular inspection, with adjustment or tightening when needed, goes far toward keeping low the maintenance expense and upholding the high standards of quietness, reliability and performance built into the vehicle at the factory.

Preparation for Use

When a new car or a car which has been in storage for some time is being prepared for use the fuel tank, radiator, crankcase, and hydraulic brake supply tank should be filled with the proper liquids. All parts of the car should be lubricated as indicated on chart. (See Center Insert.) The air pressure in the tires should be checked to make certain that it is correct. (Page 70.) The specific gravity of the electrolyte in the storage battery should be tested to see that it is properly charged and at the proper level. (Page 46.)

To Start Engine

The ignition switch key should be turned on and the spark control button pushed "in" to the fully advanced position. Except when cranking by hand the spark button should be set full advance. The throttle lever (above the steering wheel) should be moved down just far enough to cause the accelerator pedal to go down approximately quarter way. The clutch should be disengaged by pressing the left foot pedal down to the floor board. The starting motor pedal should then be pushed down (21, Fig. 1). If the engine is being started by use of the hand crank the spark button should be moved to the full retard position (pulled out as far as possible).

As soon as the engine starts to run under its own power, pressure should be released on starting pedal and clutch pedal. The throttle should be closed immediately and the spark button fully advanced if engine has been cranked by hand. (The throttle lever on top of the steering wheel.)

During cold or cool weather the manifold heat control may be used when starting a cold engine. Instructions for operating this device are on Page 62 and should be consulted.

CAUTION: The garage doors should always be opened before starting the engine. The exhaust gases from a gasoline engine contain carbon monoxide, which is a deadly poison.

If the starting motor cranks the engine 5 to 10 seconds without the engine starting under its own power, the starting pedal should be released and the cause of the engine not starting determined. (Page 71.) Prolonged use of the starting motor will soon discharge the storage battery. The starter should be released the moment the engine starts.

Driving the Car

The hand brake lever should be in the released position (forward as far as possible) and the clutch disengaged (pedal pressed down to the floor). Then the transmission gears should be shifted to the starting range position by tilting the gear-shifting lever to the left and rearward (or reverse position by tilting the gear-shifting lever to the left and forward, as is required) and the speed of the engine increased slightly by pressure

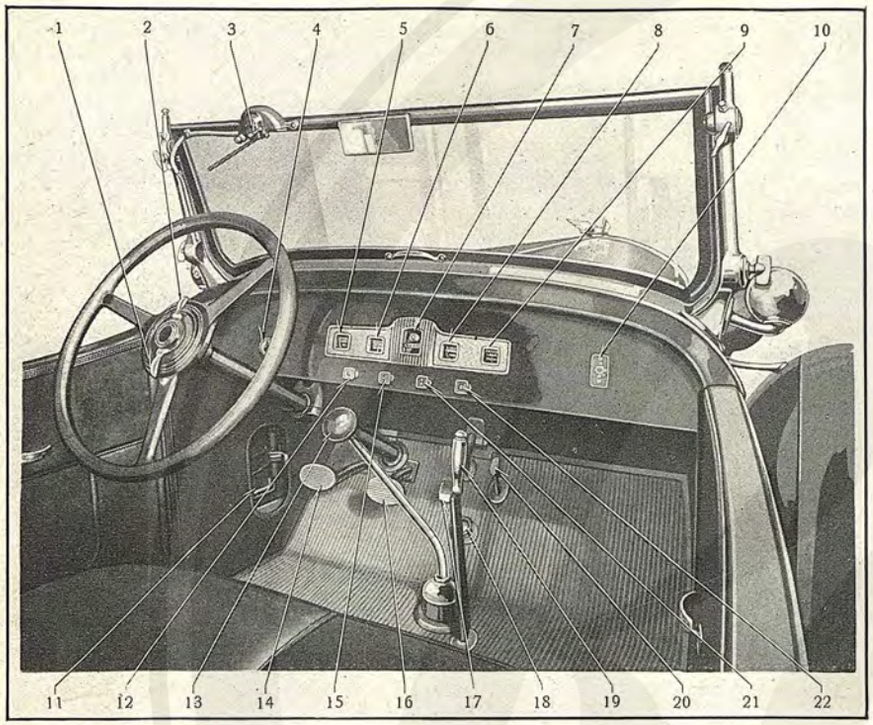


Fig. 1—Front Compartment

1—Light control hand lever
2—Throttle control hand lever
3—Windshield wiper control
4—Ignition lock and switch
5—Oil gauge
6—Ammeter
7—Speedometer
8—Fuel gauge
9—Thermometer
10—Car serial number plate
11—Ventilator
12—Instrument lamp switch
13—Gearshift lever
14—Clutch pedal
15—Spark control button
16—Brake pedal
17—Accelerator pedal
18—Accelerator foot rest
19—Transmission brake hand lever
20—Starter pedal
21—Manifold heat control button
22—Choke control button

on the accelerator pedal. Simultaneously with the increase of the engine speed, the clutch should be gradually engaged. If the car is being moved forward and when it has attained a speed of about ten miles per hour, the clutch should be disengaged, the accelerator released, and the gears shifted to the accelerating range position by moving the gear-shifting lever forward to neutral and tilting to the right, then forward again. As soon as the accelerating range gears are engaged, the clutch should be engaged again and the accelerator pressed until the car reaches a speed of about twenty to twenty-five miles per hour. Then the transmission gears should be shifted to the speed range position by moving the gear-shifting lever straight back past the neutral position and operating the clutch and accelerator pedals as before.

The gears should never be shifted while the clutch is engaged. The reverse gears should never be engaged while the car is moving forward nor the forward speed gears engaged while the car is moving backward.

Stopping the Car

If it is necessary to shift the gears from a higher to a lower speed while the car is moving, the clutch should be disengaged, the desired gears meshed, and the engine speed increased before engaging the clutch. This shift when necessary, due to conditions of traffic or load, should be done quickly so as to retain as much as possible of the momentum of the car. If the driver wishes to drive at a constant speed for any length of time, the throttle may be controlled by the hand lever at the top of the steering wheel and the foot removed from the accelerator pedal.

When it is desired to stop the car, the throttle should be closed and the clutch disengaged. Movement of the car may be stopped by use of the foot brake. When the car has stopped the gears should be shifted to the neutral position (central position of gear-shifting lever) and the hand brake applied. The clutch may then be engaged and the engine stopped, if desired, by removing the ignition switch key. (4, Fig. 1.)

Caution

At the insistent demand of the public for a greater measure of safety, four-wheel brakes are being placed on motor cars. In order to prove the efficiency of these brakes, demonstrators perform many hazardous feats far beyond the demands of ordinary driving. However, these stunts are for the professional. The average driver is urged to test and judge the brakes by the remarkable ease with which they quickly, safely and continuously perform the regular demands of every day's driving.

Chrysler cars are equipped with Chrysler four-wheel hydraulic brakes and if sharply applied will bring the car to a stop almost instantly. For this reason, except in case of emergency, the brakes should be applied gently.

Washing the Car

It is possible in many instances to clean the lacquer finish of the body and hood by wiping with a dry cloth, but it is usually best to wash the finish with water and a sponge, especially if there is grit in the mud or dirt. At times the finish may appear to be turning gray or white, which only indicates that cleaning and polishing are required. If alcohol is spilled on the finish it should be wiped off immediately to avoid spotting.

Varnish should not be used for touching up scratches in the lacquer finish. Lacquer only should be used for such purposes.

The undersides of the fenders and the running gear should be flooded with water and, after most of the mud is soaked off, a warm soapsuds will

Your brakes are vital to your safety. Chrysler brakes are extremely efficient. When adjustment or service is necessary have this done only in a Chrysler Service Station by Chrysler methods and with genuine Chrysler materials.

BE SURE OF YOUR SAFETY

take off the remainder. Then it should be thoroughly rinsed with running water. The same sponge should not be used on the body and running gear. After washing, the car should be thoroughly dried with a soft chamois skin.

After the car is clean, it should be polished with No. 7 Duco Polish or a comparable product.

The finish should be protected by an application of Simoniz Wax or Johnson's Liquid Wax. This is an important factor in the life of the finish.

Open Car Top

If it is desired to fold the top on an open car, care should be taken to avoid wrinkles in the top covering. Top rests and straps should be assembled to the body before the top is folded to furnish a support for the top bows when they are laid down. The side curtains should, of course, be removed from the top and placed in their compartment.

The forward ends of the rear curtains of Phaeton tops which are snapped to the sides of the rear bow of the top and the upper edge of the body should be unsnapped (on both sides of the car) and the loose ends of the curtain laid flat behind the rear stay straps. The top should then be released from the windshield and the top folded. When about two-thirds folded the side quarter pads should be pushed inside of the top and away from the bow sockets so that the top will lie flat. Care must be taken when folding the top to make certain that the top deck or covering is pulled loose and hangs down free from the bows so as to avoid creasing.

The top deck should then be rolled from the bottom up and laid between the top and bottom bows while the top boot is being slipped over the top. The boot should then be drawn taut and all the straps and fasteners clasped in place. The foregoing procedure applies to Phaeton and Roadster tops except that with the Roadster top the fasteners for the back curtain should be released all around and the top boot should be laid on the body deck before the hold-down straps are tightened.

While the top is damp it should never be folded or laid back. Dust or dirt on the outside of the top should be removed with a sponge and a mild soapsuds. A pure, high-grade, linseed oil soap should be used. Soapsuds should not be allowed to drip or spatter onto the finish of the car. If this does happen it should be rinsed off immediately with clear water. All lacquer and enamel work should be fairly wet before washing the top.

The top should be well rinsed with clear water and wiped dry with a chamois skin. Gasoline cleaners and most of the so-called top polishes are detrimental to the top material and should never be used. The inside of the top, as well as upholstered interiors of closed cars, should be cleaned with a stiff brush.

Side Curtains

The side curtains should be carried in the large compartments provided and laid flat without folding. Curtains should be thoroughly dry before being put away, otherwise they will mold.

Precautions for Summer

The cooling system should be thoroughly flushed and all water leaks stopped (new hose installed, if necessary). Fresh lubricant should be used in the transmission and rear axle after the interiors of these cases have been thoroughly cleaned by flushing with kerosene, and oil leaks stopped. The air cleaner shutter in the crankcase ventilator should be closed in summer. (Page 62.) The carburetor choke should be adjusted, if necessary, for full opening. The battery terminals should be cleaned and coated with vaseline and water replenished in each cell when necessary. It is possible that the generator charging rate will need to be reduced to prevent excessive evaporation of the battery water. The car should have a general inspection and lubrication throughout, including the grinding of valves and relining of brakes, if necessary. The engine oil should be changed every 1500 miles during normal operation in warm weather, but when the car is driven extremely fast or worked hard on heavy pulling in hot weather the oil should be changed every 500 miles.

Precautions for Winter

A non-freezing solution should be used in the cooling system after the first indication of cold weather. (Page 36.) If an alcohol solution is used, the specific gravity should be checked about once a week to make sure of it being the desired strength, because alcohol evaporates rapidly and raises the freezing point of the solution. The lower half of the radiator should be covered.

The carburetor should be drained to remove any water which may have collected there.

The engine oil pan should be removed and thoroughly cleaned, as well as the oil strainer, the parts then reinstalled and the pan filled with fresh oil. The air cleaner shutter in the crankcase ventilator should be opened in winter. (Page 62.) When refilling at temperatures approaching zero, an oil having a zero or below zero cold or pour test should be used which has a body or viscosity meeting S. A. E. viscosity number 10 or 20. The engine oil should be changed every 1000 miles during normal operation in cold weather, but if the car stands in the cold and is used principally for short runs the oil should be changed every 500 miles.

The lubricant in the transmission and rear axle should be drained and filled to the proper level with the lubricant specified on Lubrication Chart. This makes a slightly thinner lubricant for winter than for summer.

Tire chains should be adjusted loosely enough to allow them to creep around the tires.

Storage of Tires

If the car is not to be used for several months it should be jacked up until the tires clear the floor. The tires should be inflated only sufficiently to hold their normal shape. If convenient it is well for the tires to be removed from the rims and placed in a room with subdued light and a temperature of about 60 degrees Fahrenheit. Tires in storage or not being used frequently should be protected from strong sunlight.

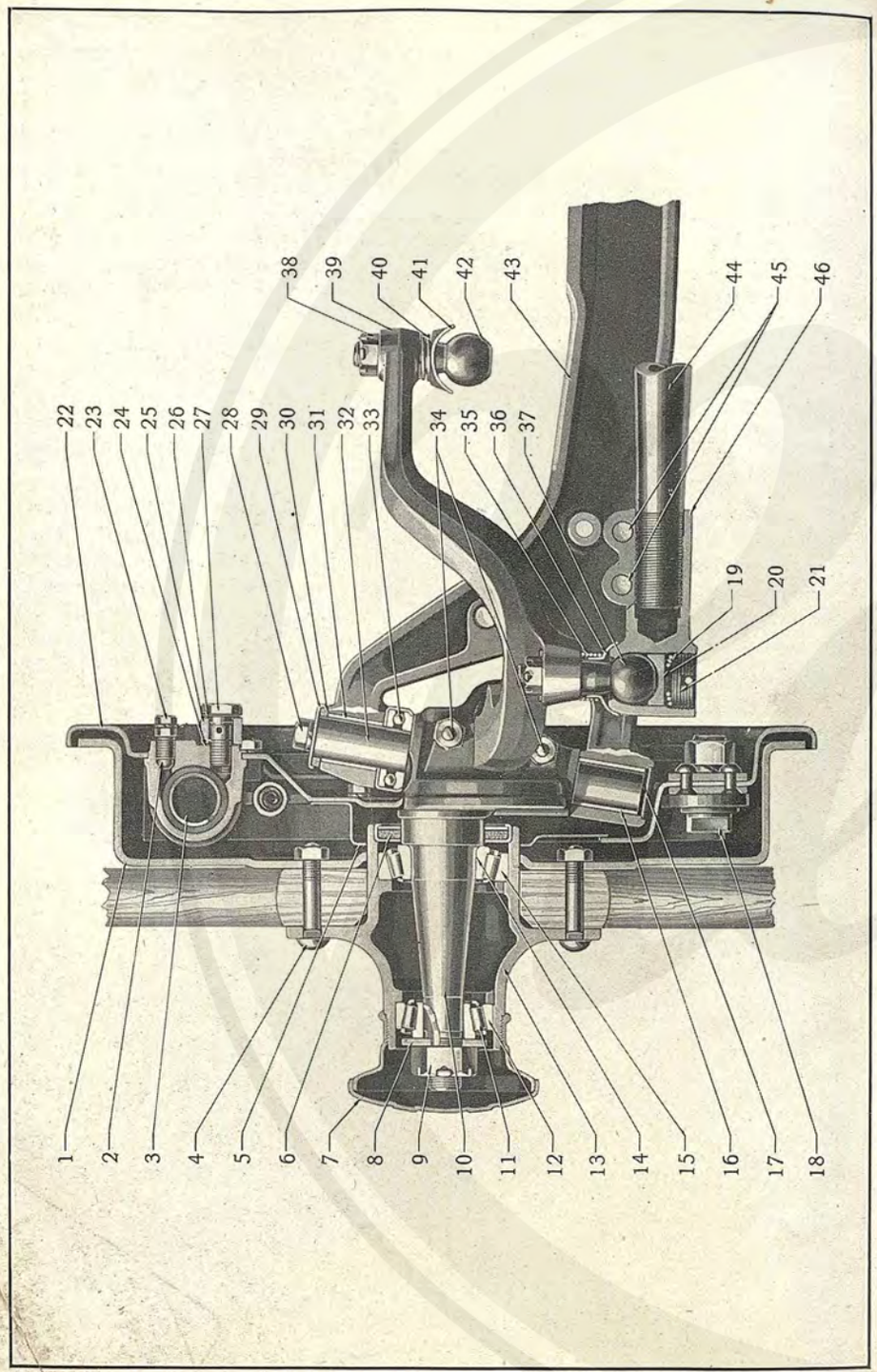


Fig. 2—Front Axle

Storing the Car

The car should be thoroughly washed and dried, also the curtains and top brushed before being stored. The wheels should be jacked up sufficiently for the tires to clear the floor. Unpainted metal parts should be coated with heavy oil to prevent rust and corrosion. The storage place should be dry and have as even a temperature as possible. Sudden changes of temperature and close proximity of steam pipes or other heating apparatus should be avoided. A subdued light evenly distributed will best preserve the finish. A car should never be stored in the same building with horses or other animals. The water should be drained from the radiator. The spark plugs should be removed and cleaned and a small quantity of engine oil poured into each cylinder through the spark plug holes. Then the spark plugs should be reinstalled and the engine cranked several times by hand. This operation should be repeated every sixty days while the car is in storage.

Partly disengaging the clutch and blocking the pedal in this position will prevent corrosion developing on the faces of the clutch plate. The hand brake should be released and the storage battery stored at a battery service station for proper attention during the storage period. (Page 46.)

ADJUSTMENTS AND REPAIR OPERATIONS

FRONT AXLE

The front axle center is a heavy steel forging of I section, with spring saddles and yokes forged integrally; the steering arms and steering knuckles are heavy drop forgings.

Fig. 2—Front Axle

1—Front wheel brake drum
2—Wheel brake cylinder bleeder screw
3—Front wheel brake cylinder assembly
4—Front wheel hub bolt
5—Front wheel brake grease shield
6—Front wheel hub dust washer
7—Hub cap
8—Front wheel bearing lockwasher
9—Front wheel bearing nut
10—Steering spindle or knuckle—left
11—Front wheel outer bearing cone and rollers
12—Front wheel outer bearing cup
13—Front hub
14—Front wheel inner bearing cone and rollers
15—Front wheel inner bearing cup
16—Steering spindle pivot pin bushing—lower
17—Steering spindle oil seal plug
18—Wheel brake shoe anchor bolt
19—Steering spindle tie rod bearing spring
20—Steering spindle tie rod bearing or ball seat
21—Steering spindle tie rod threaded plug
22—Front wheel brake support or dust shield
23—Wheel brake cylinder bleeder screw cap screw
24—Wheel brake cylinder inlet connection gasket
25—Front wheel brake cylinder inlet connection
26—Wheel brake cylinder inlet connection bolt gasket
27—Wheel brake cylinder inlet connection bolt
28—Steering spindle pivot pin dust cover screw
29—Steering spindle pivot pin dust cover
30—Steering spindle pivot pin dust washer
31—Steering spindle pivot pin bushing—upper
32—Steering spindle pivot pin or king pin
33—Steering spindle thrust bearing
34—Steering spindle pivot pin lock bolts or draw keys
35—Steering spindle tie rod ball dust cover spring
36—Steering spindle tie rod ball dust cover
37—Steering spindle tie rod ball
38—Drag link ball nut
39—Steering spindle arm—left
40—Drag link ball dust cover spring
41—Drag link ball dust cover
42—Drag link ball
43—Front axle "I" beam or center
44—Steering spindle tie rod body or tube
45—Steering spindle tie rod end clamp bolts
46—Steering spindle tie rod end—left

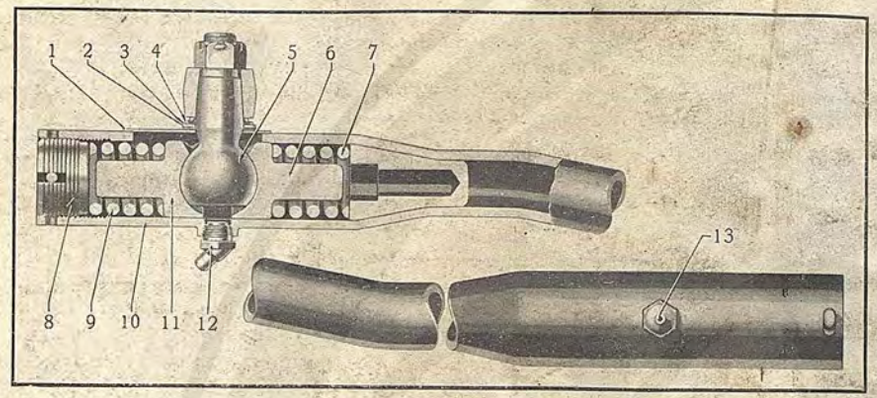


Fig. 3—Drag Link

1—Drag link dust cover
2—Drag link dust cover leather washer
3—Drag link dust cover steel washer
4—Drag link dust cover spring
5—Drag link ball
6—Drag link bearing
7—Drag link spring
8—Drag link end plug
9—Drag link spring
10—Drag link body
11—Drag link bearing
12—Lubricant nipple—front
13—Lubricant nipple—rear

It is of vital importance in the safe operation of a motor car that the front axle tie rod and wheels be kept well lubricated and properly adjusted. They should be inspected regularly as designated on Lubrication Chart.

Front Wheel Alignment and Tie Rod Adjustment

Correct alignment of front wheels must be maintained to assure continuous, easy steering and long tire mileage. The wheel bearings should be properly adjusted and tire pressures equal before taking measurements. The distance between the wheels when measured in front at the felloe, approximately 9 inches above the floor, and in rear from the same points should be equal or not greater at the rear than $\frac{1}{8}$ inch. Measurements should be taken in front, the felloe marked, and the car moved forward just far enough to measure from exactly the same points on the felloe bands in the rear, and at the same height from the floor. It is important to follow these instructions to get an accurate setting.

To change or adjust wheel alignment, loosen the clamp bolts which lock the cross tube to the end forgings. Adjust length of cross tie rod by revolving the cross tube similar to adjusting a turnbuckle, then securely lock clamp bolts.

The lubricant nipples in the tie rod ends face toward the rear of the car and should receive fluid gear lubricant from the high-pressure lubricant gun every 5000 miles.

The king pins should be lubricated every 500 miles with fluid gear lubricant by means of the high-pressure lubricant gun and the nipples provided in the side of the axle yokes toward the front of the car.

Drag Link

The drag link (Fig. 3) connects the steering gear with the front axle. In each end of the drag link tube are two heavy springs for cushioning

the road shocks of the front wheels which otherwise would be transmitted to the steering gear. The springs are adjusted by means of round slotted plugs threaded into each end of the drag link tube. Cotter pins are inserted through the ends of the tube, and slots in the outer ends of the round plugs, to prevent the plugs changing their adjustment.

When adjustment is being made of the drag link bearings and springs, all of the parts should be cleaned and oiled as well as the adjusting plugs and threads inside of the drag link tube. Standard springs should be used to replace any that do not measure from $1\frac{3}{16}$" to $1\frac{1}{4}$" free length. Any other worn parts should be replaced. When the parts are being assembled the adjusting plugs should be screwed "in" until the springs are compressed solid, then the plugs should be unscrewed two or two and one-half turns. A large screwdriver should be used for adjusting the plugs so as to overcome any binding in the threads. When the plugs are adjusted properly the position of their outside faces should be flush with the ends of the tube or slightly "in", *but must not protrude.*

The steering arm balls of the front axle and the steering gear arm in the drag link ends should be lubricated with fluid gear lubricant through the grease nipples at intervals of every 500 miles.

REAR AXLE

The rear axle is of the semi-floating type with the differential and pinion assembly mounted in a detachable carrier on the front side of the pressed steel axle housing. The rear side of the axle housing is provided with a cover, easily removed for inspection of the differential assembly.

The drive pinion and shaft are integral, having adjustable tapered roller bearings mounted at the front and rear ends of the shaft. The differential is fitted with adjustable tapered roller bearings mounted in the differential carrier on each side of the differential case. The bearings on the outer ends of the axle shafts are likewise adjustable.

The drive pinion shaft and its bearings are carried as an assembly in the differential carrier.

Differential side and pinion gears may be removed and installed without removal of the differential case.

A large pin (50, Fig. 4) is passed through the differential case, upon which the differential pinions are mounted. This pin is held in place by a long-pointed screw. By removing the pin (50) the pinion gears will fall out of place and can be lifted out of the case. One axle shaft should be pulled out of the housing about two inches so as to allow one differential side gear to drop off the shaft. The other side gear can then be removed by sliding it off the inner end of the other axle shaft.

Drive Pinion Adjustment

The drive pinion shaft (49, Fig. 4) and its bearings are carried as an assembly in the differential carrier. The pinion bearing cage is held in place by two cap screws on each side which thread into the carrier, and by nuts threaded onto two studs, one at the top and one at the bottom of the carrier at the front. Split shims (45) are placed between the forward face of

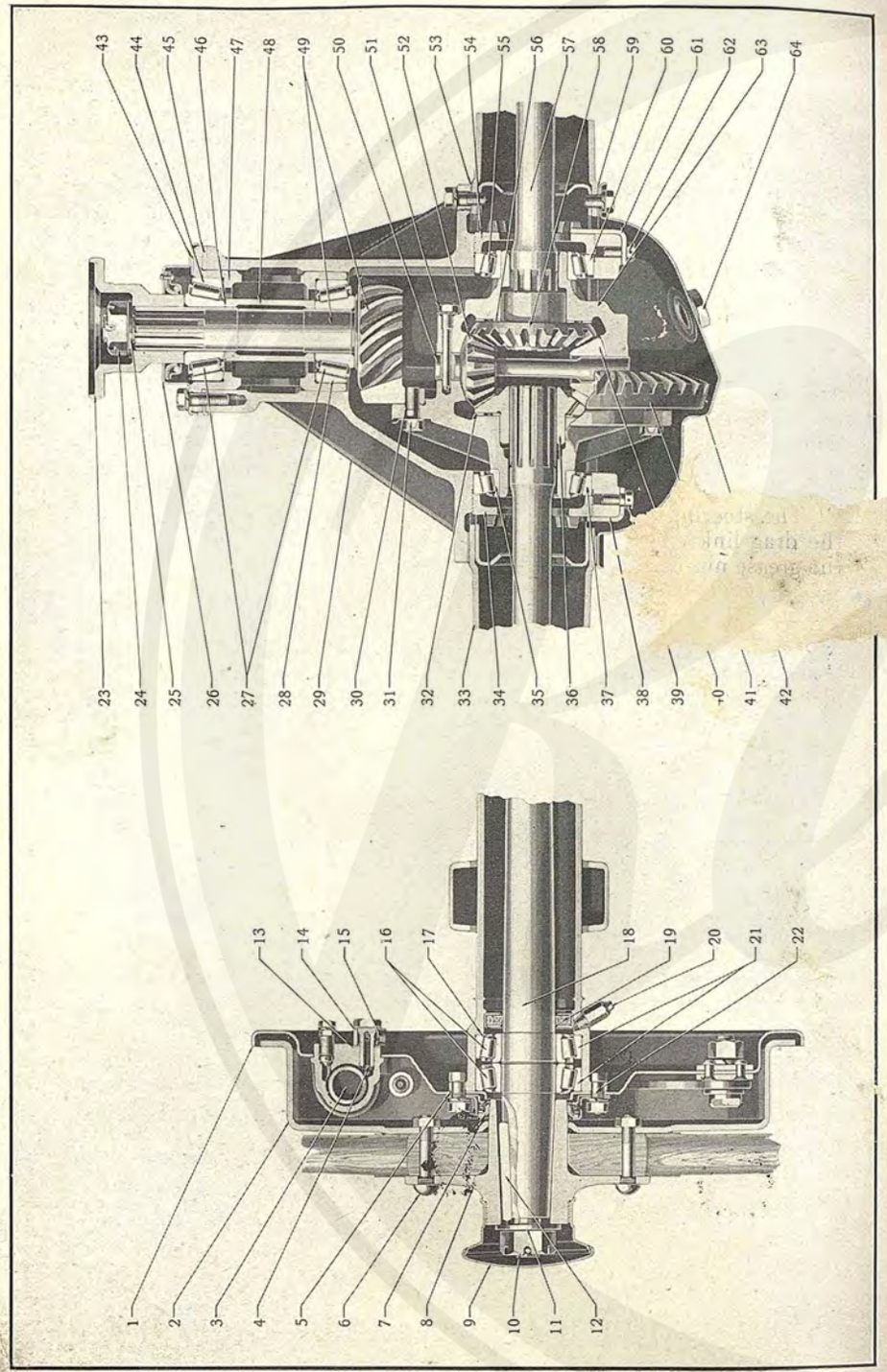


Fig. 4—Rear A

the differential carrier and the flange of the pinion bearing cage. These shims serve as an adjustment for the meshing of the drive pinion with the ring gear. This adjustment controls the forward and backward movement of the pinion, and since it is properly set at the factory it will seldom, if ever, be necessary to change the adjustment. In the event that adjustment is ever required at this point it may be made without removing the pinion bearing cage assembly from the carrier by removing the four cap screws and the two stud nuts which hold the cage into the carrier and then removing or installing the proper thickness of shims from the top and bottom between the cage and the carrier, taking care that the same thickness shims are removed or installed at the top as at the bottom.

If, for any reason, it becomes necessary to remove the pinion assembly it is important that the identical shims at the top and bottom be replaced when the pinion cage is reassembled. The pinion and cage assembly is removed by disconnecting the rear universal joint, dropping the propeller shaft, and removing the four cap screws and two stud nuts which hold the pinion bearing assembly into the differential carrier. The assembly is withdrawn from the differential carrier by pulling it straight

ıg Adjustment

ion shaft bearing rollers and cone are pressed onto the pinion shaft tightly against the front face of the pinion. The cup of this bearing is pressed into the bearing cage assembly. A long spacer cage is placed over the pinion shaft against the front face of the cone of the rear bearing. The cup of the front bearing is then pressed into the bearing cage. The roller and cone of the front bearing are fitted onto the pinion shaft and into their cup. Between the rear face of the cone of the front pinion bearing and the front face of the spacer is a set of shims (46) for the

Fig. 4—Rear Axle

1—Rear wheel brake support or dust shield
2—Rear wheel brake drum
3—Rear wheel brake cylinder assembly
4—Wheel brake cylinder inlet connection bolt
5—Rear wheel brake support to housing gasket
6—Rear hub bolt
7—Axle shaft bearing oil seal
8—Rear hub
9—Hub cap
10—Axle shaft nut
11—Axle shaft nut washer
12—Axle shaft hub key
13—Wheel brake cylinder inlet connection gasket
14—Wheel brake cylinder inlet connection bolt gasket
15—Rear wheel brake cylinder inlet connection
16—Axle shaft bearing cone and rollers
17—Axle shaft bearing shim
18—Axle shaft or drive shaft—left
19—Axle shaft oil washer
20—Axle shaft bearing lubricant nipple
21—Axle shaft bearing cups
22—Rear wheel brake support to housing bolt
23—Rear axle drive pinion companion flange
24—Rear axle drive pinion nut
25—Rear axle drive pinion nut washer
26—Rear axle drive pinion bearing oil seal assembly
27—Rear axle drive pinion bearing cone and rollers
28—Rear axle drive pinion bearing cup
29—Rear axle drive pinion carrier
30—Rear axle drive gear screw
31—Rear axle drive gear screw lock
32—Differential side gear thrust washer
33—Rear axle housing
34—Differential bearing adjuster
35—Differential bearing cone and rollers
36—Differential side gear
37—Differential bearing cup
38—Differential bearing cap
39—Differential bearing adjuster lock screw
40—Differential pinion
41—Rear axle drive gear or ring gear
42—Rear axle housing cover
43—Rear axle drive pinion bearing oil seal gasket
44—Rear axle drive pinion bearing cup
45—Rear axle drive pinion adjusting shim
46—Rear axle drive pinion bearing adjusting shim
47—Rear axle drive pinion bearing cage
48—Rear axle drive pinion bearing spacer
49—Rear axle drive pinion and shaft (integral)
50—Differential pinion shaft
51—Differential pinion shaft lock screw
52—Differential pinion
53—Rear axle drive pinion carrier gasket
54—Differential bearing adjuster
55—Differential bearing cone and rollers
56—Differential side gear thrust washer
57—Axle shaft or drive shaft—right
58—Differential side gear
59—Rear axle housing cover gasket
60—Differential bearing cup
61—Differential bearing adjuster lock
62—Differential bearing cap screw lock wire
63—Differential case
64—Rear axle lubricant plug

purpose of adjusting the pinion shaft bearings. After the front bearing is in place the universal joint flange is pressed onto the splines of the pinion shaft, the rear face of the flange bearing against the front face of the cone of the front bearing. The universal joint flange is then locked rigidly in place by the nut on the front end of the drive pinion shaft. If it should be necessary to adjust the drive pinion bearings the pinion shaft and bearing cage assembly must be removed from the differential carrier. The universal joint flange nut should then be removed. After this nut has been removed the pinion shaft may be pressed out of the universal joint flange and front pinion shaft bearing. It is then possible to remove the roller and cone assembly of the front pinion bearing and either add or remove shims at the front of the bearing spacer to obtain the required adjustment of the drive pinion shaft bearings. Before disassembling this unit to adjust the bearings the end play of the drive pinion shaft should be ch[illegible]. The correct end play is from .001″ to .002″ when the shaft is pushed forward and then backward by hand. If the end play is found to be incorrect the pinion shaft bearings should be adjusted to give the correct end play. A leather and steel oil seal assembly fits over the universal joint flange and is held in place by the same cap screws and stud nuts that hold the pinion shaft and bearing assembly into the differential carrier.

Differential Bearing Adjustment

The differential bearings are assembled to the hubs of the differential case and rest in suitable supports in the differential carrier. Caps over each of these bearings are held in place by means of cap screws which, in turn, are prevented from turning by wires passed through the heads of the cap screws. Bearing adjusting nuts (34, Fig. 4) are threaded into the bearing supports and caps which press against the outer ends of the bearing outer races. These adjusting nuts are made with notches into which the tongued ends of the adjusting nut locks are assembled, which prevent the adjusting nuts from turning. The locks are held in place on the bearing caps by cap screws which, in turn, are locked by wires passed through their heads.

Considerable care must be taken when adjustment of these bearings is being made so as to avoid changing the adjustment of the main drive gear and drive pinion. The best practice is to adjust both bearings exactly the same amount but when proper adjustment is once made it is seldom necessary to change it. However, if adjustment is ever necessary, the adjusting nuts should be turned so as to cause just a slight drag in the bearing and then the adjusting nuts should be backed off one notch.

Axle Shaft Bearing Adjustment

The axle shaft is mounted on two adjustable tapered roller bearings at the outer end of the shaft. The outer race of the inner bearing is pressed into the end of the axle housing. The inner race and roller assembly is put onto the shaft from the inner end of the shaft and pressed against the shoulder on the shaft. The inner race and roller assembly of the outer bearing is put onto the shaft from the outer end and pressed up against the shoulder on the shaft and the inner race of the inner bearing. The shaft and bearings are then put into the housing and the outer race of the outer bearing is pressed into the end of the housing. The entire assembly is held

in place by the brake support assembly. Held in place by the same bolts which hold the brake support assembly to the axle housing is an oil seal to prevent leakage of oil into the brake drum.

Between the outer race of the inner axle shaft bearing and the shoulder in the end of the axle housing is a series of shims (17, Fig. 4). These shims provide means of adjustment of the axle shaft bearings. These bearings should be so adjusted by adding or removing shims that the end play in the axle shaft is from .002″ to .003″. It is necessary that each shaft have its bearings adjusted for the proper end play as the two shafts are entirely independent of one another. In order to make this adjustment it is necessary to remove the axle shaft and bearings, including the outer race of the inner bearing. The shims may then be removed.

To Remove Axle Shaft

The wheel should be removed from the axle shaft first and then the bolts which hold the outer oil seal and the brake support assembly in place. Before removing the brake support and wheel cylinder assembly it will be necessary to disconnect the brake tube from the wheel cylinder. The outer oil seal and brake support assembly can then be removed. The axle shaft and its bearing can then be withdrawn from the housing. If the inner race of the outer bearing binds too tightly in the axle housing to withdraw the assembly by hand a suitable puller should be used on the axle shaft to avoid damage to the bearing races and rollers.

Lubrication

The differential and pinion bearings, as well as all axle gears should be lubricated with fluid gear lubricant. In temperatures below 0° Fahrenheit this lubricant should be diluted with one-half pint of colorless kerosene. Lubricant should be poured into the differential housing through the filler hole in the rear of the cover. This hole is located so as to serve as a guide in determining the proper amount to be put into the housing. Lubricant should be level with the bottom of this hole. (Lubrication Chart.)

The axle shaft bearings should be lubricated with fluid gear lubricant every 5000 miles by means of the high-pressure gun.

BRAKES

The Chrysler hydraulic four-wheel brakes are self-equalizing and their adjustment is easy. There are no operating rods or cross shafts, and, consequently, nothing to rattle and no joints to lubricate. Simple in construction, the brakes depend only upon the fundamental displacement principle of hydraulics for their operation and equalization, and when treated with a reasonable amount of consideration will need but little attention.

Operation

Connected to the brake pedal is a piston which operates in a master cylinder, bolted to the left hand side of the flywheel housing. Leading from this master cylinder to cylinders at each of the four brake drums are metal tubes and heavy non-expanding hose. In each wheel cylinder are two pistons, each of which presses against the upper ends of the brake shoes.

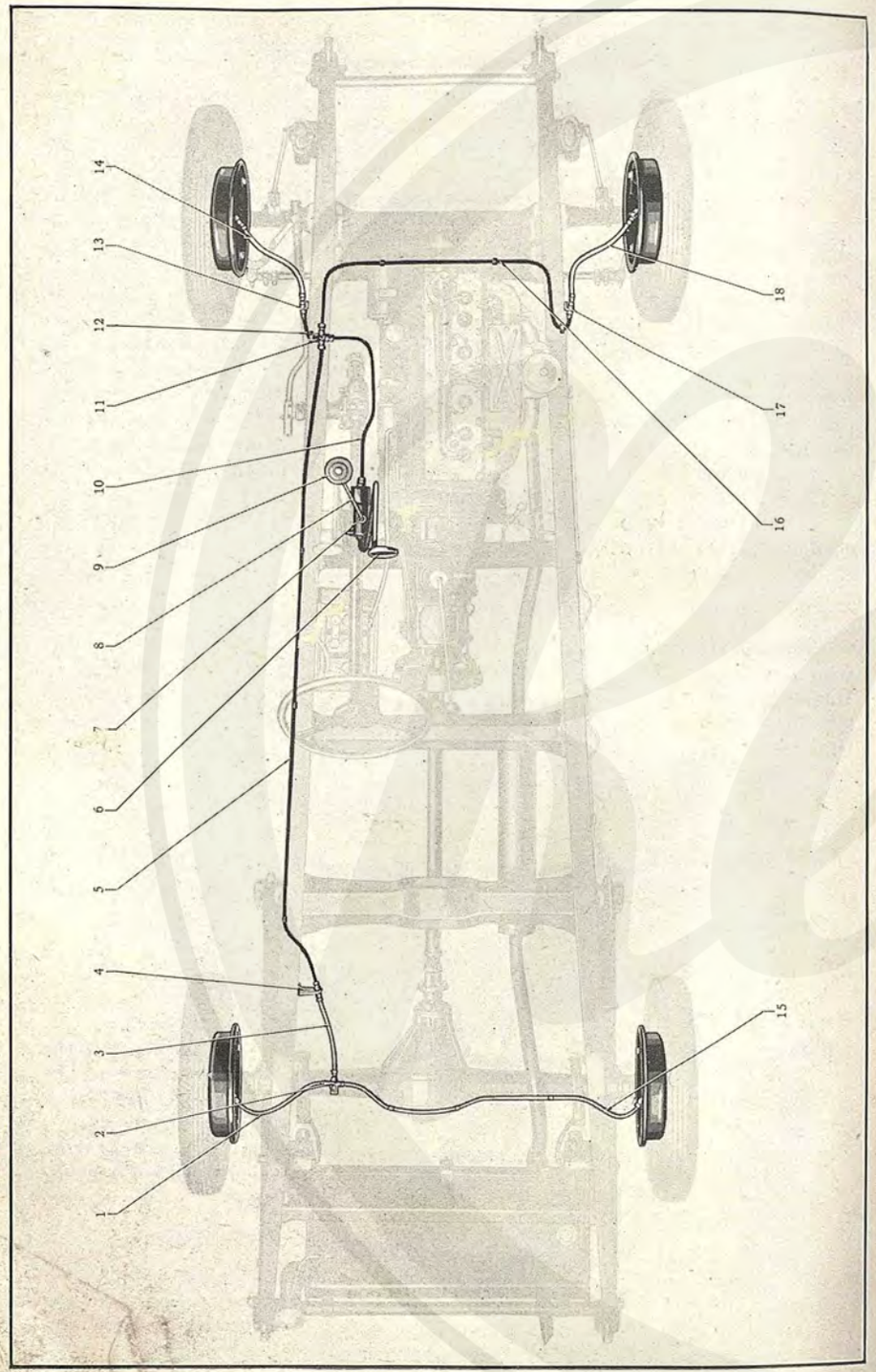


Fig. 5—Hydraulic Four-Wheel Brake System

The whole system (that is, all cylinders and lines) is full of liquid, all air having been expelled in the process of filling. There is no pressure in the system when the brakes are not in operation and the brake shoe facings are held clear of the drums by the brake return springs.

When the brake pedal is depressed, the piston in the master cylinder moves forward, expelling into the lines sufficient liquid to force out the pistons in each of the brake drum cylinders until the brake shoe facings come in contact with the drums.

There can be no braking pressure applied to any one drum until all facings are in contact with their drums. The greater force required to give braking pressure cannot be supplied until the resistance in all wheel cylinders is built up to that force. This is governed by the physical law that force or pressure exerted upon a column of liquid is expended equally in all directions. With the eight brake shoes at the point of braking, the additional pressure of the foot pedal is naturally transmitted equally to all brakes, giving a positive braking action, absolutely self-equalizing in its application.

When the brake pedal is released, the pistons in the wheel cylinders are returned to their stops by the brake return springs, forcing the liquid, used in displacing the pistons, through the lines back into the master cylinder.

General

The supply tank on the dash should never be above the three-quarters full point or below the half full point of the genuine Chrysler Hydraulic Brake Liquid, which is obtainable at any Chrysler Service Station. This should be used to the exclusion of all other liquids, but if for any reason the genuine liquid is not available for an immediate requirement a suitable substitute liquid may be made by thoroughly mixing equal parts of medicinal castor oil and No. 5 denatured alcohol free from acid (wood alcohol should never be used). This formula should only be used when the genuine Chrysler Hydraulic Brake Liquid is not available and it is important that the improvised liquid be entirely drained from the system as soon as possible and replaced with Chrysler Hydraulic Brake Liquid. Chrysler Hydraulic Brake Liquid is made in very much the same manner, but certain chemicals are added by a very lengthy, as well as difficult, process which neutralizes acids found in the formula prescribed above.

Supply Tank

The supply tank is mounted on the front side of the dash under the hood and is connected to the master cylinder by a copper tube. The supply tank must always be at least one-half full and never more than three-quarters full of fluid. The supply tank must be closed at all times except when inspecting, bleeding, or adding fluid in order to prevent evaporation

Fig. 5—Hydraulic Four-Wheel Brake System

1—Rear axle brake tube—left
2—Rear axle brake tube tee
3—Brake flexible hose
4—Rear brake flexible hose frame bracket
5—Brake tube, frame tee to rear flexible hose
6—Brake pedal
7—Brake master cylinder
8—Brake tube, supply tank to master cylinder
9—Brake master cylinder supply tank
10—Brake tube, master cylinder to frame tee
11—Brake tube frame tee
12—Brake tube, frame tee to front flexible hose—left
13—Front brake flexible hose frame bracket
14—Brake flexible hose
15—Rear axle brake tube—right
16—Brake tube, frame tee to front flexible hose—right
17—Brake tube to flexible hose union
18—Brake flexible hose

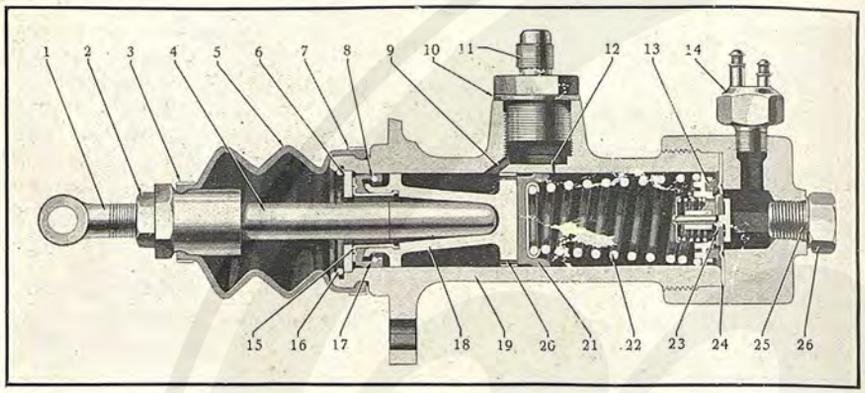


Fig. 6—Master Cylinder

1—Master cylinder piston push rod end
2—Push rod end check nut
3—Boot strap—small
4—Master cylinder piston push rod
5—Master cylinder boot
6—Master cylinder piston stop
7—Boot strap—large
8—Master cylinder secondary cup expander
9—Secondary liquid port
10—Master cylinder inlet connection gasket
11—Master cylinder inlet connection or fitting
12—Compensating relief port
13—Master cylinder inlet valve
14—Signal lamp switch
15—Master cylinder secondary cup retainer
16—Master cylinder piston stop lock wire
17—Master cylinder secondary cup
18—Master cylinder piston
19—Master cylinder body
20—Liquid port in piston
21—Master cylinder piston cup
22—Master cylinder piston return spring
23—Outlet valve
24—Master cylinder head inlet valve seat
25—Master cylinder outlet connection gasket
26—Master cylinder outlet connection

and the entrance of dirt into the tank. Cleanliness in this regard is of the utmost importance. The air above the liquid is at atmospheric pressure and when liquid is drawn from the supply tank into the master cylinder its volume is replaced with air. This is accomplished by the breather in the suppy tank filler cap. The supply tank is filled through the hole into which this filler cap (and breather) is screwed and care must be taken to make certain that the cap is tightened securely when the opening is not being used for filling, bleeding, or inspecting.

Master Cylinder

The master cylinder (Fig. 6) is mounted on the left side of the flywheel housing and is of the "compensator" type.

In the top of the master cylinder is a small hole (12, Fig. 6) which is uncovered when the piston cup is in its return position, so that fluid is free to pass between the master cylinder and supply tank.

In the outlet end of the master cylinder is a double-acting valve held in place by the master piston return spring. Application of the brake pedal forces the fluid through the inner valve (23) to the brake tubes and wheel cylinders. When the brakes are released the master piston is returned to its released position by the return spring in the master cylinder. The fluid is returned through the outer (larger) valve (13) from the wheel cylinders by the brake release springs. When the pressure of the release springs balances that of the master piston return spring the valve closes. The small compensating hole in the top of the master cylinder wall together with the inlet and outlet compensating valve assembly in the master cylinder compensate for expansion and contraction of the fluid due to temperature changes.

Should the fluid not be returned from the system fast enough or in sufficient quantity to equal the displacement by the master piston while being returned to its release position, a vacuum will cause the lip of the master piston cup to turn in, allowing fluid to pass from the supply tank to the master cylinder through a by-pass (20) in the piston. Fluid thus introduced into the system will allow the master cylinder to operate the brakes, even though all of the fluid displaced by previous operation of the brakes were not returned to the master cylinder. Any excess fluid thus introduced into the system will be returned to the supply tank through the small compensating hole in the top of the master cylinder when the master piston has reached its release position.

The foot pedal is set for clearance between the pedal and the floor board, on each individual car at the factory. Readjustment in the field will not be necessary and improper adjustment will result in decreasing the effective travel of the master cylinder piston.

Wheel Cylinders

The wheel or operating cylinders are bolted to the brake supports at each of the four wheels. They contain two opposed pistons and each piston presses against the upper end of a brake shoe. The brake liquid is forced (by pedal pressure) into the wheel cylinders between the pistons which, in turn, forces the pistons in opposite directions. The pistons, being against the ends of the brake shoes, force the brake shoe facings against the brake drums. Such is the action of the parts in the wheel cylinders when the brakes are applied and, when foot pressure on the pedal is relieved, the brake shoe return spring (15, Fig. 8) reverses the direction of travel of the shoes, pistons and liquid.

A bleeder valve is located at 3, Fig. 7, through which liquid and air are expelled when bleeding the system.

Bleeding the Lines

The cap screw (1, Fig. 7) should be removed and the bleeder nipple and hose attached (part of car tool equipment) to the bleeder valve in the wheel cylinder with a small open end wrench. The bleeder valve (3) should be opened from ½ to ¾ of a turn, but not completely removed. One end of the bleeder rubber tubing is fitted with a threaded nipple which is to be screwed into the bleeder valve and the other end of the tubing laid into a clean and dry container, preferably a pint bottle. The latter should be resting on the floor.

Liquid should then be pumped through the system by pressing the brake pedal slowly to the limit of its travel, but it is imperative that the supply tank be more than half full of liquid. The supply tank filler cap should be removed before starting to pump the liquid through the system so that the level of the liquid in the supply tank can be easily seen. This will also permit the addition of more liquid as soon as necessary.

When the supply tank is full the foot pedal can be given ten full strokes or pumping actions before it is necessary to refill the tank. The pumping action of the pedal will force liquid and air together out of the system. The pumping should be continued until it is observed that no air bubbles are coming out of the system with the liquid. Generally ten or fifteen full pumping strokes of the pedal will be sufficient for bleeding one cylinder.

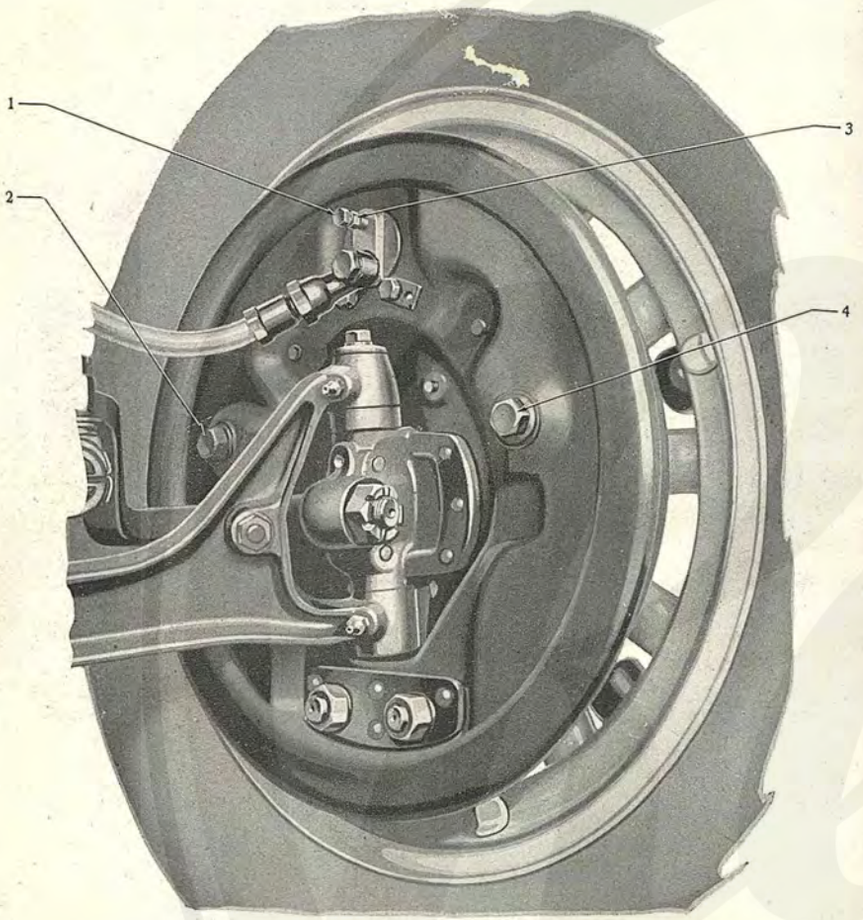


Fig. 7—Brake Shoe Cam Adjustments

1—Bleeder valve cap screw
2—Brake cam adjusting screw
3—Bleeder valve
4—Brake cam adjusting screw

When the bleeding operation of one cylinder has been completed the bleeder valve should be closed and the cap screw (1) returned to its place. Then another wheel cylinder should be bled in the same manner. It is best to only bleed one cylinder at a time.

Extreme care must be exercised at all times to not permit any brake liquid or grease from the hands or otherwise to come in contact with the brake shoe linings.

It will be necessary to bleed the lines to remove air from the system after disconnecting one of the brake drum cylinders for removal of axle parts, or if a connection or tube should break.

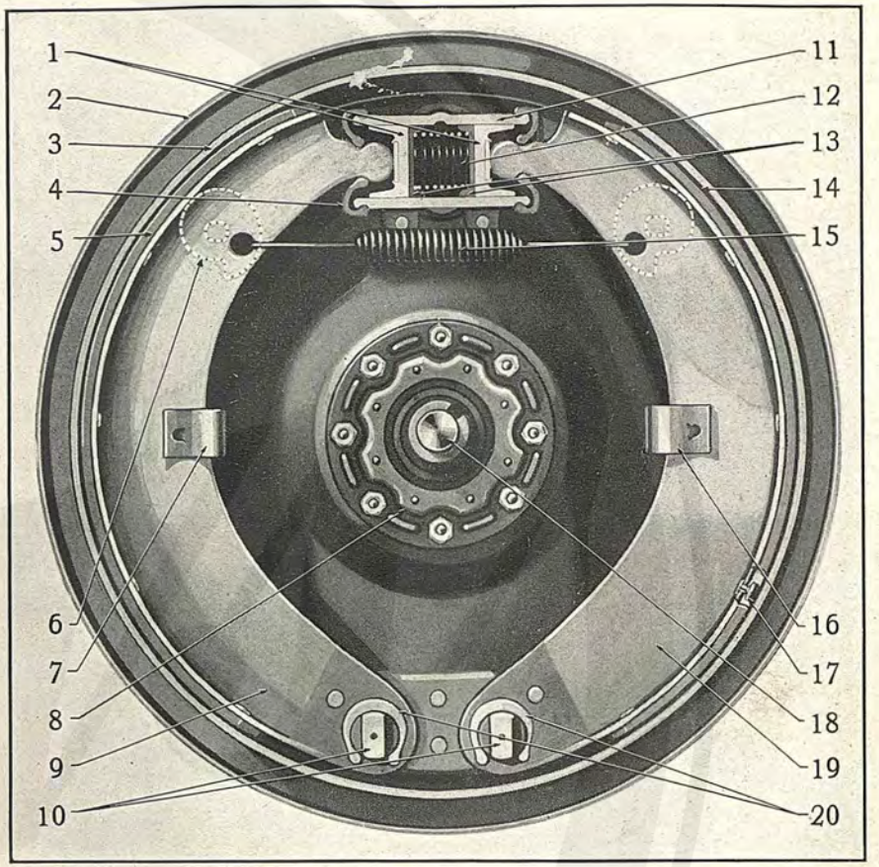


Fig. 8—Wheel Brake Shoe Adjustments

1—Wheel brake cylinder piston
2—Wheel brake support or dust shield
3—Wheel brake drum
4—Wheel brake cylinder boot
5—Brake shoe facing—long
6—Brake shoe adjusting cam
7—Brake shoe guide spring
8—Axle shaft bearing oil seal assembly
9—Brake shoe and facing assembly—front half
10—Brake shoe anchor bolts
11—Wheel brake cylinder body
12—Wheel brake cylinder piston cup expanding spring
13—Wheel brake cylinder piston cups
14—Brake shoe facing—short
15—Brake shoe return spring
16—Brake shoe guide spring
17—Brake shoe facing rivet
18—Axle shaft
19—Brake shoe and facing assembly—rear half
20—Brake shoe anchor bolt washer

Leaks

An excessive consumption of liquid denotes a leak in the system. This can easily be detected by applying very heavy pressure to the brake pedal while the car is standing still and then checking over the various connections to see the point of leakage.

CAUTION: Pistons or any other parts of the master cylinder or brake drum cylinders should never be removed. Special tools are required to correctly assemble these parts. There is nothing in these cylinders to

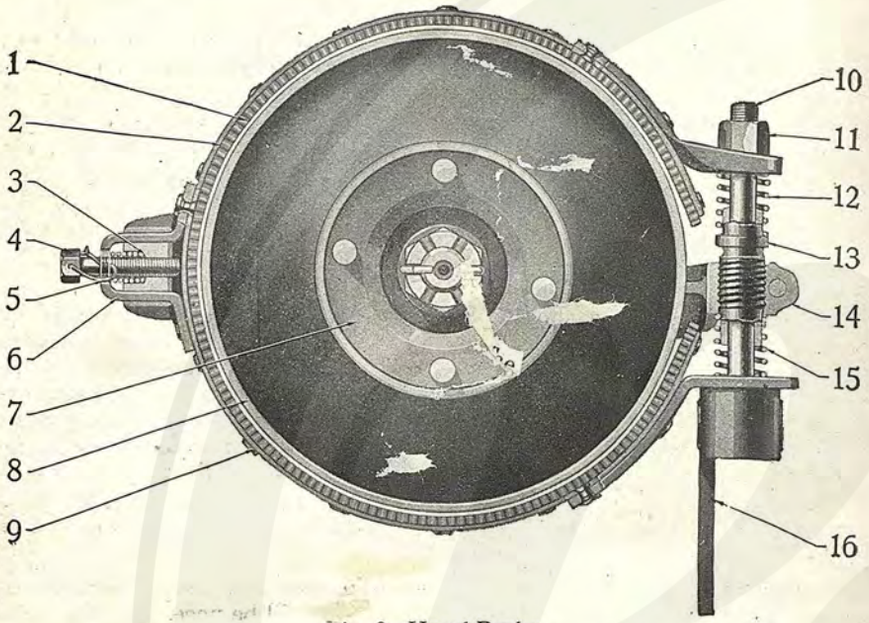


Fig. 9—Hand Brake

1—Brake band lining
2—Brake band
3—Brake [illegible]ng
4—Brake anchor adjusting screw
5—Anchor screw lock wire
6—Brake anchor clip
7—Universal joint flange
8—Brake drum
9—Brake lining rivet
10—Adjusting bolt
11—Adjusting bolt nut
12—Release spring
13—Adjusting screw
14—Adjusting screw bracket
15—Release spring
16—Brake cam

give trouble, but, if it should be necessary to make a service repair, a complete cylinder assembly should be used.

To Adjust Wheel Brakes

Adjustment of the brake shoes, to compensate for wear of the facing, is made by turning the brake shoe cams. This is accomplished by turning the nuts (2 and 4, Fig. 7). The car wheel should first be raised sufficiently to spin free from the floor. Then the nut (2) should be turned until it is observed that the brake shoe facing is just touching the drum. This can best be determined by spinning the wheel and at the same time turning the adjusting nut. Then, when the facing touches the drum, the adjusting nut should be turned in the opposite direction so that the facing is just free from the drum. The adjusting nut is held in position by a friction spring and does not require locking. When one brake shoe has been adjusted the other shoe should be adjusted by turning the other adjusting nut (4) and spinning the wheel in the same manner. There are two brake shoes for each wheel and each shoe has a separate adjusting nut.

Initial adjustments of new brakes (brakes on which new facings have been installed) are made in a different manner and the instructions given under "Refacing Brakes" should be followed.

Refacing Brakes

The surface of the brake shoes carrying the facing is very carefully machined to the proper shape. The facing is of moulded segments which are very carefully ground after being placed on the shoes.

In the event that it becomes necessary to reface the brakes due to facing wear, new shoe and facing assemblies should be installed. These shoe and facing assemblies are obtainable at Chrysler Service Stations and should be used to insure the satisfactory operation of the brakes.

The brake shoes can be removed after removing the brake shoe pull-back spring and the brake shoe anchor pins. The anchor pins are removed by taking off the anchor pin nut and pulling the anchor pin out.

After installing new shoes and facings it will be necessary to adjust the anchor pins (10, Fig. 9) which are eccentric, so that the proper clearance between the facing and the drum will be assured. To do this it will be necessary to have a dummy drum with openings in it so that adjustments can be made and clearances checked. The anchor pins and cam adjustments should be so set that the clearance between the bottom of the facing and the drum is .006" and the clearance at the top .012".

Due to the method of grinding the facing at the factory it will not be necessary to run the facings in, and under no condition should facings be burned.

The adjustment of the brake shoe anchor pin is a factory adjustment and should not be disturbed. The only time it will be necessary to change this adjustment is after the brake shoe has been removed for some reason.

Hand Brake

The hand brake is of the external contracting band type, hand-controlled, and operates on a drum mounted on the front flange of the front universal joint.

Adjustment is made by first jacking up the rear wheels and setting the brake hand lever in the extreme forward position. Then the brake anchor adjusting screw (4, Fig. 9) should be turned so as to give $\frac{1}{16}$" clearance between the drum and the lining, and it should be observed that the anchor clip moves freely on the anchor bracket while operating the brake. Next the adjusting screw (13) should be turned to give $\frac{1}{16}$" clearance throughout the remainder of the lower half of the drum. The adjusting screw clamping bolt should be tightened after this adjustment has been completed and then the adjusting nut (11) turned so as to give $\frac{1}{16}$" clearance between the upper half of the band and the drum. The band should conform to the drum at all points except at the ends as shown in the illustration.

Your brakes are vital to your safety. Chrysler brakes are extremely efficient. When adjustment or service is necessary have this done only in a Chrysler Service Station by Chrysler methods and with genuine Chrysler materials.

BE SURE OF YOUR SAFETY

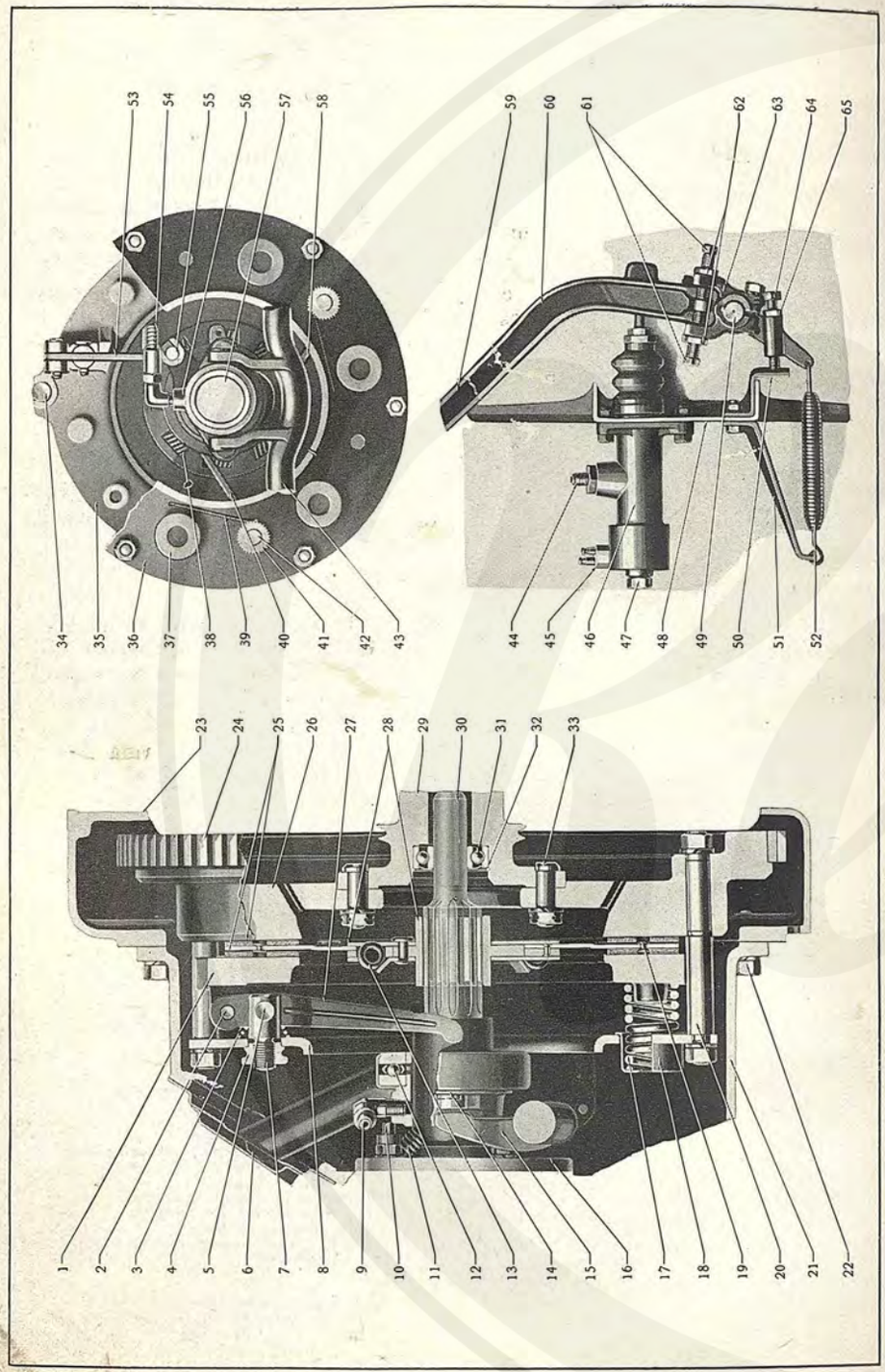


Fig. 10—Clutch and Pedal Adjustments

CLUTCH

The clutch is of the single dry plate type, comprising a pressure plate assembly having six pressure springs, three release levers that are provided with knurled nut adjustments spring-locked, and a drop-forged hardened steel splined hub. A spring-cushioned driving disc, having asbestos composition facing riveted to it, serves as the transmission driving member.

A sliding sleeve carries the clutch release bearing. This bearing should be filled with medium cup grease every 2000 miles. A tube is attached to the right hand side of the engine rear support and the exposed end is provided with a compression grease cup. The other end of the tube is connected to the release bearing oil passage. Lubricant should be forced through the tube by means of turning down the grease cup cap. The clutch should be released for a few seconds with the engine running and the operation repeated in order to pack the bearing thoroughly.

The clutch must be operated dry. A hole is drilled in the bottom of the housing to permit any small leakage of oil, from rear crankshaft bearing, clutch release bearing, or transmission, to drain off.

Adjustments

Fig. 10 illustrates the parts of the clutch assembly and should be referred to in connection with these instructions. The release bearing and pedal must be in their proper positions. This is accomplished by setting the clutch pedal stop screw (64) so that the rear face of the release bearing sleeve flange (14) is exactly $\frac{7}{16}$" (A) forward of the front face of the clutch release bearing sleeve guide; that is, the release bearing sleeve should be $\frac{7}{16}$" forward from its rear stop. Then the release fork (15) should be adjusted by the screw (No. 61) to locate the pedal as

Fig. 10—Clutch and Pedal Adjustments

1—Clutch pressure plate
2—Clutch release lever clevis pin
3—Clutch release lever spring
4—Clutch release lever adjusting pivot nut
5—Clutch release lever adjusting pivot clevis pin
6—Clutch hand hole cover
7—Clutch release lever adjusting pivot
8—Clutch back plate
9—Clutch release bearing grease tube
10—Clutch release bearing sleeve guide
11—Clutch release bearing sleeve pull-back spring
12—Clutch release bearing
13—Clutch driving disc torsion spring
14—Clutch release bearing sleeve
15—Clutch release fork
16—Transmission main drive pinion bearing retainer
17—Clutch spring
18—Clutch spring cup
19—Clutch driving disc facing rivet
20—Clutch driving stud
21—Transmission case
22—Transmission attaching screw
23—Cylinder block
24—Flywheel starter ring gear
25—Clutch driving disc facings
26—Flywheel
27—Clutch release lever
28—Clutch driving disc and hub assembly
29—Crankshaft
30—Clutch shaft or transmission main drive pinion
31—Transmission main drive pinion pilot bearing
32—Transmission main drive pinion pilot bearing retainer
33—Flywheel to crankshaft bolt
34—Clutch driving stud
35—Clutch pressure plate
36—Clutch back plate
37—Clutch spring cup
38—Clutch driving disc torsion spring
39—Clutch release lever pivot nut lock
40—Clutch release lever
41—Clutch release lever pivot nut
42—Clutch release lever pivot
43—Clutch release fork
44—Brake master cylinder inlet connection
45—Signal lamp switch
46—Brake master cylinder assembly
47—Brake master cylinder outlet connection
48—Engine rear support—left
49—Clutch release fork
50—Clutch and brake pedal stop
51—Clutch and brake pedal pull-back spring bracke
52—Clutch and brake pedal pull-back spring
53—Clutch release lever
54—Clutch release bearing grease tube
55—Clutch release bearing sleeve guide
56—Clutch release bearing sleeve
57—Clutch shaft or transmission main drive pinion
58—Clutch release lever
59—Brake pedal
60—Clutch pedal
61—Clutch pedal adjusting collar set screws
62—Clutch pedal adjusting collar set screws lock nuts
63—Clutch pedal adjusting collar
64—Clutch pedal stop screw
65—Clutch pedal stop screw lock nut

high as possible without interference with the floor board after the release bearing and pedal are in proper relation and engaged position. Next, the three release levers (27) should be adjusted to $\frac{5}{32}''$ (B) clearance at the release bearing and all fingers to make simultaneous contact with the release bearing. The clutch pedal should have from $1\frac{5}{16}''$ to $1\frac{7}{16}''$ of free movement before any resistance can be felt.

The pedal adjustment positively has no connection with the free movement of the clutch pedal, but is only provided to adjust for clearance at toe board and to change the angle of the pedal.

The clutch pedal adjusting collar set screw (No. 61) controls the clearance between the clutch pedal and the floor board. It is imperative, therefore, *to distinguish the difference between these two adjustments.*

The release levers are individually adjustable by turning the adjacent pivot adjusting nut (No. 41). Anti-clockwise turning of the adjusting nuts increases the clearance between release bearing and release levers and compensates for wear of frictional members.

The clutch springs should measure $1\frac{29}{32}''$ when compressed to 200 lbs. pressure.

The practice of continuously resting the foot on the clutch pedal, while driving, is harmful to the throwout bearing and should be avoided. The weight of the foot holds the clutch throwout yoke against the release bearing with consequent rapid wear and noise; reduces tension of the clutch springs, causing slippage and loss of power; causes rapid wear of the facings, producing sluggish clutch action, rattles and knocks, besides necessitating more frequent lubrication of the bearing.

The clutch shaft ball bearing in the crankshaft requires no attention except that it is good practice to pack it with vaseline whenever the clutch is removed from the car. The ball bearing at the rear of the clutch shaft receives its lubrication from the transmission.

COOLING SYSTEM

The radiator is of the cellular type, connected by short pieces of hose to the engine. The fan is driven by the crankshaft through a V-type belt. This belt also drives the generator. The water pump impeller in the cylinder block, just behind the fan, is driven by an extension of the fanshaft.

Thermometer

The temperature of the water in the cylinder block is indicated by the thermometer in the instrument panel. After 10 or 15 minutes of driving it should register between 150° and 200° Fahrenheit, depending upon load and temperature of the air. When driving at high speed for several miles and in very warm weather, the thermometer may register a higher temperature. If the clutch is disengaged and the engine stopped or its speed reduced considerably while traveling at high speed or during a long hard pull at lower speeds, there will be a strong tendency for the thermometer to indicate a rapid rise in the temperature. This is due to the reduced speed of water and air circulation through the radiator and does not indicate the necessity of attention to the cooling system. If, under such conditions, the car be stopped, the engine should be allowed to run slowly so as to maintain the water circulation. If, for any reason, the water is boiled,

some of it will be expelled from the system through the overflow pipe and should be replenished as soon as possible.

If the thermometer fails to register, the assembly should be replaced. Repairs or adjustments to this instrument should not be attempted.

While working on the engine care should be taken to avoid bending or straining the thermometer tube, especially while the cylinder head is being removed. The thermometer bulb is mounted in the cylinder head and must be removed before the cylinder head is removed.

A leak in the thermometer bulb may be detected by bubbles rising from the point of leakage, if the bulb and tube are immersed in hot water. Leaks cannot be repaired but can be prevented by an occasional inspection to see that the tube is not chafing or rubbing at any point and has no sharp kinks in it. If no leaks appear the difficulty, if any, may be due to the indicating hand binding in the gauge.

Care

The cooling system should be drained (drain cock at bottom of radiator) and flushed occasionally to remove dirt and sediment. If the radiator is removed from the car, the ideal way to flush the radiator is to invert it and force the water through the bottom connection to remove large particles collected in the top tank. Very hard or lime water should not be used in the system. Because of the scale-forming chemicals it contains, its use will cause scale to form on the walls of the inside of the radiator and cylinder water jackets, which, in a short time, will retard the circulation of water. The water passages in the radiator core are very small and, if care is taken to use soft water at all times, these small water passages will not become clogged with the scale, which is very difficult to remove.

Lead and oil paint should never be put on the radiator core because it forms an insulation that retards dissipation of heat.

Hose connections should be kept tight. Soft hose should be replaced with new, firm pieces. Mounting studs and the screws holding the core in the shell must be kept tight. Radiator compounds or other liquids should not be used for stopping small leaks because they generally block the passages in the radiator, which necessitates an overhauling.

Steaming

When steam comes out of the radiator it is an indication that the water is not circulating properly or that an insufficient supply of water is in the system. Very often if the water in the radiator is frozen, the radiator will emit steam, because ice has obstructed the circulation, and the water around the cylinders is being boiled. A frozen cooling system should be thawed as promptly as possible. There is a great possibility of ice causing much damage to the engine water jackets, pump, and radiator, especially if the overflow pipe in the radiator is clogged.

If an engine is run at a high temperature due to an insufficient supply of water or obstructed water circulation, care must be taken to allow the engine to cool before refilling the radiator. Cold water making contact with an extremely hot cylinder is likely to crack the cylinder casting.

Adjustments

The fan belt is adjusted by loosening the two bolts at the bottom of the generator, one at the front and the other at the rear, which hold the generator on its mounting. The bolt which locks the generator in place in the slotted segment at the front of the generator should then be loosened. The generator can then be swung outward on its bracket, thereby tightening the fan and generator drive belt. The belt should not be adjusted tightly; it should only be brought to a very slight tension.

The water pump packing nuts should be turned to the right or clockwise for tightening. Binding the pump shaft should be avoided by not tightening beyond the point of stopping the leak. However, the leak is not stopped by turning the adjusting nut, the packing should be replaced.

Non-Freezing Solutions

At the first indication of freezing weather the cooling system should be filled with a good non-freezing solution. Denatured alcohol and water in proper proportions make a very good solution, but care should be taken to prevent its spilling on the lacquer finish of the car. If this does happen, the solution should be quickly flushed off the lacquer finish with water so as to avoid spotting or bleaching the finish, because alcohol is a solvent of lacquer. Alcohol evaporates from water and, when refilling the radiator is necessary, it is generally best to refill with clear denatured alcohol instead of water. Such a solution should be tested about once a week to make certain that it will not freeze in the prevailing temperatures.

Under no circumstances should a calcium chloride solution be used. It has a chemical action on different metal parts of the entire system and in a short time will cause damage.

The following formula is dependable for a good non-freezing solution at all temperatures indicated:

Freezing Point Fahrenheit	Percentage of Alcohol	Amount of Alcohol	Amount of Water	Specific Gravity
20°	15%	2 qts.	16 qts.	.981
10°	25%	4½ qts.	13½ qts.	.971
0°	35%	6½ qts.	11½ qts.	.959
−10°	40%	7¼ qts.	10¾ qts.	.951
−20°	45%	8¼ qts.	9¾ qts.	.943
−30°	50%	9 qts.	9 qts.	.933

Note: The quantity indicated is proper for the Chrysler "70", which has a capacity of 4½ gallons or 18 quarts in the cooling system.

ELECTRICAL SYSTEM

The six-volt, one-wire system is used. The several units composing the system are: the starting motor, generator, relay, ignition timer, distributor and coil, storage battery, lights and horn.

Several of the above units are grounded; that is, the car frame serves as one conductor for the current. When disconnecting any unit from the system, the exposed terminals should be taped to prevent them from grounding (touching) on any metallic part of the car. Should this occur it would short-circuit either the generator or the storage battery, and would probably damage either or both of these units beyond repair. The cables and wires should be inspected occasionally to make sure that none is rubbing against a sharp edge, as such rubbing or chafing wears away the cable insulation and short-circuits the cable, with the attendant danger of fire or damage to the storage battery.

All terminals and terminal binding nuts should be kept tight and free from dirt and oil. An occasional inspection of the electrical equipment by an experienced automotive electrician is advisable because it reduces the chances of trouble on the road.

The engine, being insulated from the frame by a rubber mounting, requires a "ground" connection. This is located on the outside of the left hand side member of the frame under the nuts of the bolts holding the engine and steering gear.

Starting Motor

The starting motor is of the manual shift type and is mounted on the left side of the flywheel housing. It is held in place by a heavy set screw and lock nut. The starting motor pinion is shifted into mesh with the gear teeth on the flywheel by a foot-operated mechanism. In connection with this gear-shifting mechanism is a switch which closes the electric circuit for the starting motor just after the gears have been meshed.

The commutator should be kept clean and free from oil and grease; if it appears dirty or rough, it should be cleaned with number 00 sandpaper. Emery paper should never be used for this purpose. If this treatment does not smooth the commutator, the armature should be removed and the commutator turned in a lathe. The mica should not be undercut on motor commutator. The brushes should move freely in the brush holders and the full contact area should bear on the commutator. The locations of the brushes should never be changed as they are properly set when the instrument is built.

The oiler in the end of the starting motor housing should receive a few drops of light engine oil every 2000 miles. The commutator should never be oiled. The connection of the gear-shifting mechanism should receive a few drops of oil each 2000 miles to maintain free action.

The starting motor is removed by first disconnecting the cables. Then the cotter pin and clevis pin, connecting the gear-shifting lever with the foot rod, should be removed. The lock nut should be loosened and the set screw, entering the flywheel housing above the starting motor, removed. The starting motor may then be pulled straight out of the flywheel housing toward the front of the car.

Generator

The generator is mounted on the left side of the engine at the front and driven by the fan belt. It generates current for the entire electrical system and feeds it to the storage battery. The generator may be easily and quickly removed by removing the mounting bolts.

The oil reservoirs at each end of the armature shaft should be filled with light engine oil every 2000 miles.

The generator begins charging at 8 to 10 miles per hour and reaches its maximum output of 16 amperes (with cold generator) at 20 to 22 miles per hour. For ordinary driving the rate should never exceed 12 amperes. The

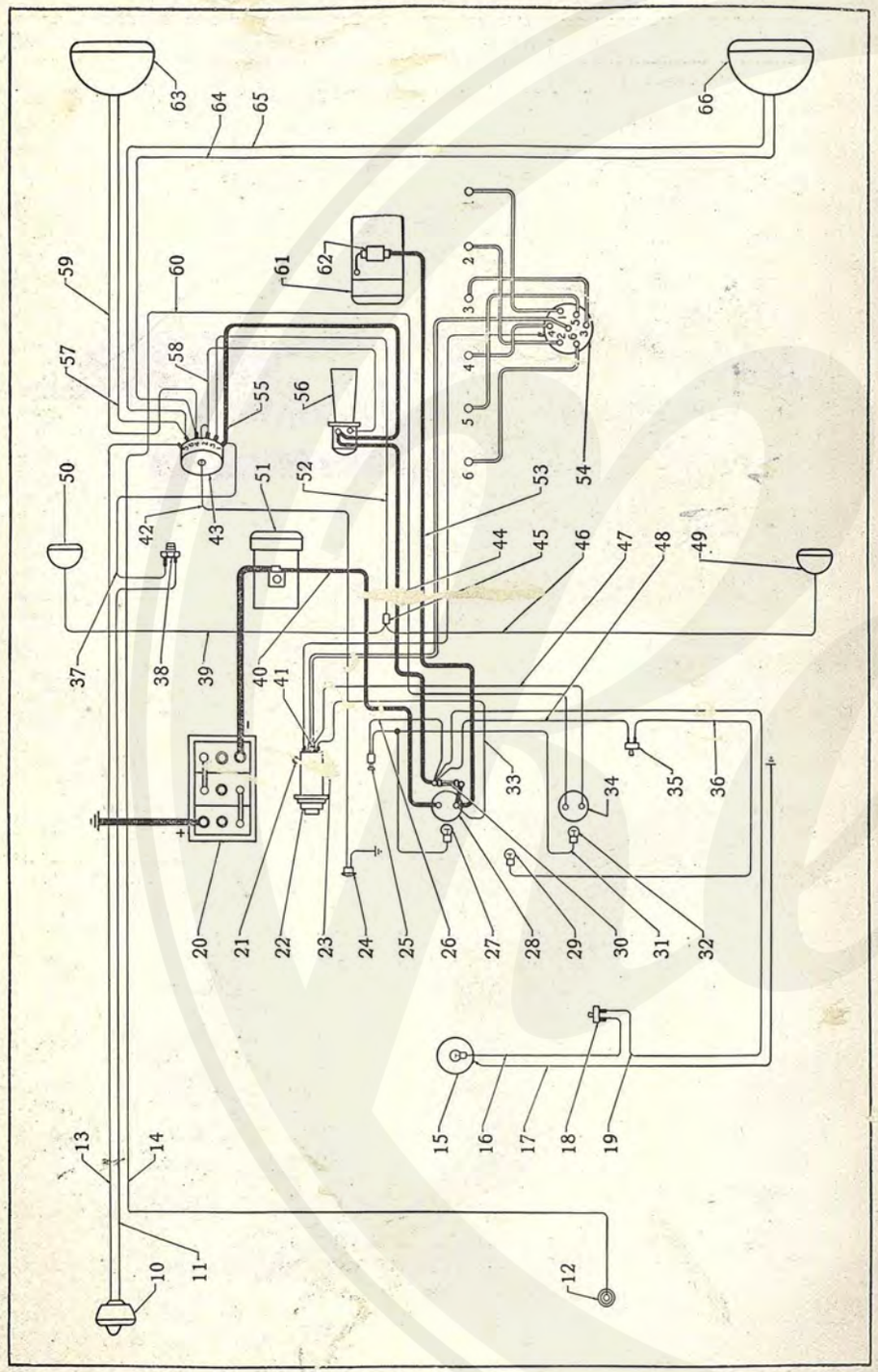


Fig. 11—Wiring Diagram

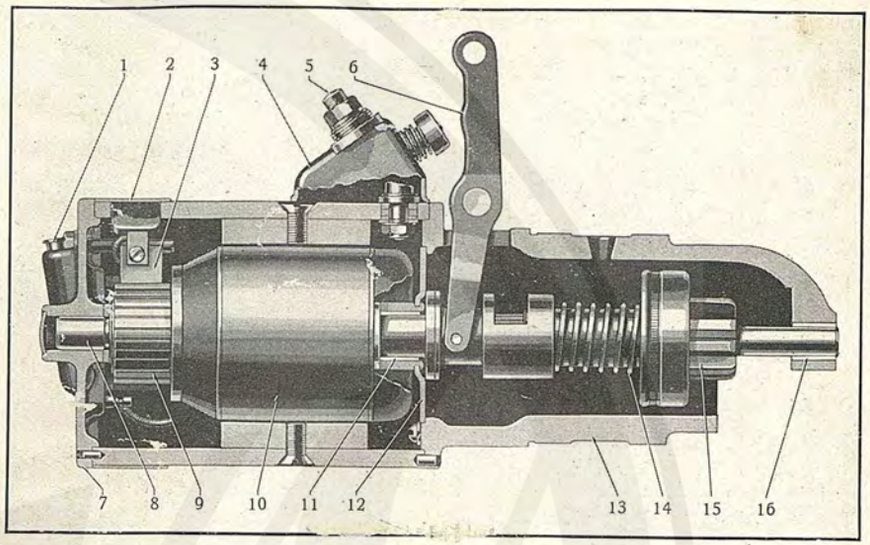


Fig. 12—Starting Motor

1—Oil cup
2—Inspection cover band
3—Commutator brush
4—Starter switch and plunger
5—Starter cable terminal post
6—Contact lever and shift yoke
7—Commutator end housing
8—Armature shaft
9—Commutator
10—Armature
11—Drive-end inner bushing
12—Drive-end inner bearing housing
13—Drive-end outer bearing housing or barrel
14—Shift spring
15—Pinion
16—Drive-end outer bushing

charging rate may be regulated by rotating the "third" brush holder. This is made accessible by removal of the commutator end cover band. The "third" brush rocker ring clamp screw may then be loosened and the

Fig. 11—Wiring Diagram

1-6—Spark plugs
10—Tail and signal lamps
11—Small red braid
12—Fuel gauge (tank unit)
13—Small black braid
14—Small blue braid
15—Dome lamp (closed cars)
16—Small red braid
17—Small black braid
18—Dome lamp switch
19—Small red braid
20—Battery
21—Timer terminal
22—Ignition coil and lock
23—Battery terminal
24—Horn push button
25—Instrument lamp switch
26—Small black braid
27—Instrument lamp
28—Ammeter
29—Reading lamp (closed cars)
30—Fuse
31—Small black braid
32—Instrument lamp
33—Small light brown braid
34—Fuel gauge (panel unit)
35—Reading lamp switch
36—Small black braid
37—Small red braid
38—Signal lamp switch
39—Small black braid
40—Medium red braid
41—Gauge terminal
42—Small black braid
43—Lighting switch
44—Medium green braid
45—Connector
46—Small black braid
47—Small blue braid
48—Small black braid
49—Parking lamp—right
50—Parking lamp—left
51—Starting motor
52—Small yellow braid
53—Medium black braid
54—Distributor
55—Medium green braid
56—Horn
57—Small black braid
58—Small black braid
59—Small red braid
60—Small blue braid
61—Generator
62—Relay
63—Headlamp—left
64—Small red braid
65—Small black braid
66—Headlamp—right

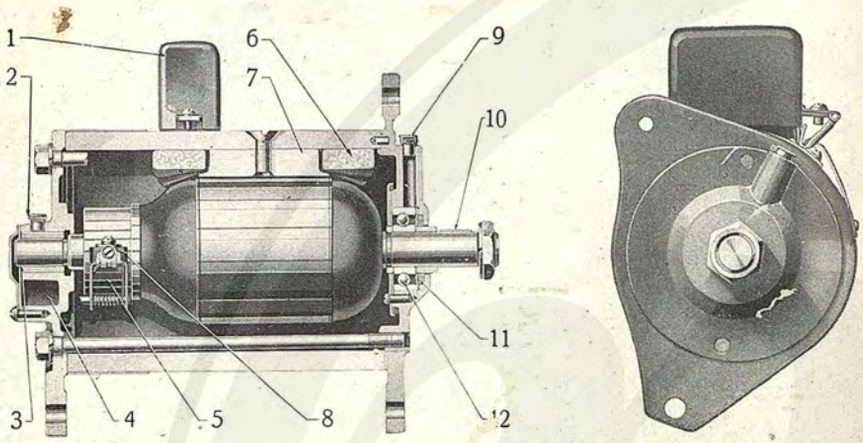


Fig. 13—Generator

1—Relay
2—Oiler
3—Bearing
4—Oil reservoir
5—Commutator
6—Field coil
7—Field pole
8—Brush
9—Oiler
10—Pulley key
11—Oil seal
12—Bearing

"third" brush holder rotated in the direction of armature rotation to increase the rate or against armature rotation to decrease.

If the generator charging rate is not up to the proper figure the difficulty may be due to a loose generator and fan drive belt. The belt should be adjusted as described under "Cooling System, Adjustment". (Page 36.)

Relay

The relay, assembled on the top of the generator body, automatically breaks the circuit between the generator and the battery when the engine speed is too low for the generator to charge the battery. It automatically closes the circuit at the proper engine speed so the generator can charge the battery.

The relay requires no lubrication or other attention. The adjustment of the movable arm should not be disturbed.

Distributor

The distributor, which is of the single breaker arm type with condenser on the outside of the base, is accessibly mounted on the cylinder head and driven through a vertical shaft from the camshaft. The opening of the breaker points by the cam on the distributor shaft interrupts the flow of primary current, which induces a high-tension current in the secondary winding of the coil, mounted on the dash. The high-tension current is delivered to the center terminal of the distributor cap, and thence through the rotor to the spark plugs. The cylinders are fired in the order 1-5-3-6-2-4.

Spark Advance

For all ordinary road driving the spark control button should be in the advanced position which is pushed "in" toward instrument board. When

Chrysler "70" Lubrication Chart

Steering Spindle
Fluid Gear Lubricant ★

Front Wheel Bearings ★
Medium Cup Grease ★
★

Drag Link Ball Joint
Fluid Gear Lubricant ★

Tie Rod Ball Joint
Fluid Gear Lubricant ★

Generator ★
Engine Oil (2 places) ★

Drag Link Ball Joint
Fluid Gear Lubricant ★

Steering Gear
Special Heavy Steering ★
Gear Lubricant ★
If Necessary, in Extremely Low Temperatures, Dilute with Engine Oil ★

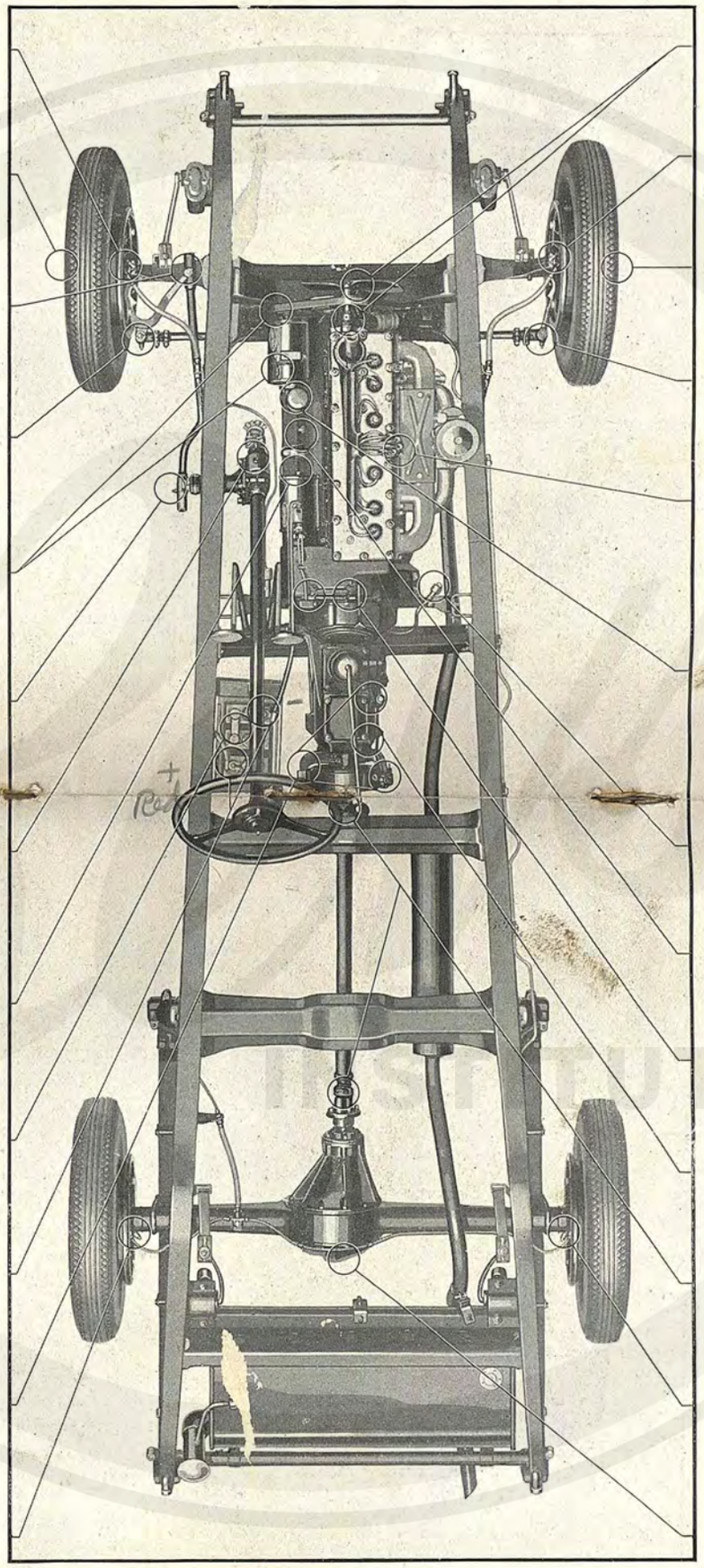
Starting Motor ★
Engine Oil ★
★

Battery ★
Distilled Water ½" Above Plates

Battery Terminals ★
Clean and Coat with Vaseline ★
★

Brake Lever Connections ★
Engine Oil ★

Rear Axle Shaft (Wheel) Bearings ★
Fluid Gear Lubricant ★
★



★ **Water Pump**
★ Engine Oil (2 places)

Steering Spindle
★ Fluid Gear Lubricant

★ **Front Wheel Bearings**
★ Medium Cup Grease
★

Tie Rod Ball Joint
★ Fluid Gear Lubricant

★ **Distributor—Grease Cup**
★ Refill with Medium Cup Grease

Engine
Summer—Medium or Heavy Body Engine Oil (S. A. E. Viscosity No. 30 or No. 40)—Change Every 1000 Miles
★ Winter—Medium Body Engine Oil (S. A. E. Viscosity No. 10 or 20)—Low Cold Test for Below Freezing Temperatures
Change Every 500 Miles

★ **Clutch Release Bearing—Grease Cup**
★ Refill with Medium Cup Grease

★ **Oil Level Indicator**

★ **Starter Pedal Connections**
★ Engine Oil
★ Each 10,000 Miles

Transmission
★ Engine Crankcase Oil Having a Low Cold
★ Test and the Body of a Heavy S. A. E.
★ Viscosity No. 50 or a Light S. A. E. Viscosity No. 60

★ **Universal Joints**
★ Special Universal Joint or Fibre Grease

★ **Rear Axle Shaft (Wheel) Bearings**
★ Fluid Gear Lubricant
★

Rear Axle
★ Fluid Gear Lubricant
★ For Winter Dilute with One-Half Pint
★ of Colorless Kerosene

★ **Lubricate every 500 miles**

★ ★ **Lubricate every 2000 miles**

★ ★ ★ **Lubricate every 5000 miles**
unless otherwise specified

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JULY 1929

(OVER)

Lubrication

Axle—Front

Use fluid gear lubricant every 500 miles on steering spindle, drag link and tie rod ball joints. Medium cup grease on wheel bearings every 5000 miles.

Axle—Rear

Rear Axle Shaft (Wheel) Bearings—lubricate with fluid gear lubricant every 5000 miles. Rear Axle Gears—lubricate with fluid gear lubricant every 5000 miles. For winter dilute with ½ pint of colorless kerosene.

Battery

Inspect every two weeks. Add distilled water so level is ½" above plates.

Brakes

Lubricate hand brake anchor and lever connections with engine oil every 2000 miles. Lubricate pump shaft bearings with engine oil every 2000 miles.

Cooling System

Lubricate pump shaft bearings with engine oil every 2000 miles.

Distributor

Grease Cup—lubricate with medium cup grease every 2000 miles.

Engine

Summer: Medium or heavy engine oil (S. A. E. Viscosity No. 30 or No. 40). Change every 1500 miles.
Winter: Medium body engine oil (S. A. E. Viscosity No. 10 or No. 20). Low cold test for below freezing temperatures. Change every 500 miles.

Generator

Lubricate shaft bearings with engine oil every 2000 miles.

Propeller Shaft and Universal Joint

Universal Joints—lubricate with special universal joint or fibre grease every 2000 miles.

Starting Motor

Lubricate with engine oil every 2000 miles. Plug—medium cup grease every 10,000 miles.

Steering Gear

Lubricate with special heavy steering gear lubricant every 5000 miles. If necessary, in extremely low temperatures, dilute with engine oil.

Transmission

Lubricate with engine oil (S. A. E. Viscosity Heavy No. 50 or Light No. 60).
CAUTION: It is important that engine oils be used as recommended and not the usual transmission gear lubricant.

Capacity

2 quarts 8 oz.

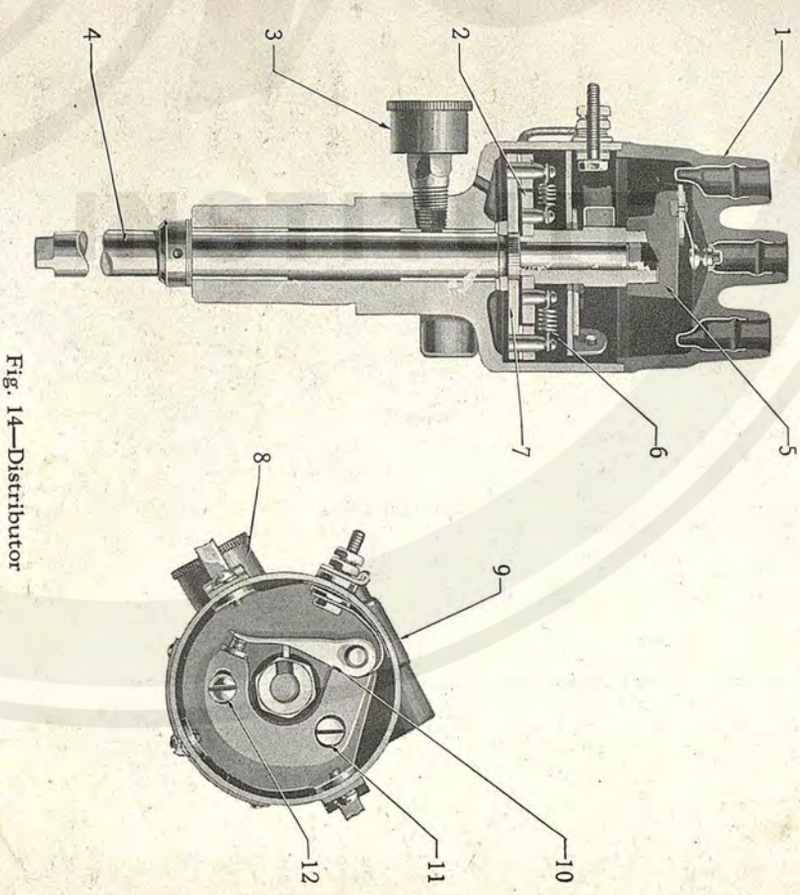

Fig. 14—Distributor

1—Distributor cap or cover
2—Governor weight
3—Grease cup
4—Distributor drive shaft
5—Rotor
6—Governor spring
7—Weight plate
8—Grease cup
9—Condenser
10—Breaker arm
11—Breaker point plate adjusting screw
12—Breaker point plate lock screw

cranking the engine by hand, the spark button should be pulled all the way out. The automatic advance will take care of all other conditions.

To Adjust Point Opening

The rotor should be removed and the engine turned until the breaker arm rests on a high point of the cam. The gap should be .020" and may be measured by standard feeler gauges. If necessary to correct the adjustment of the gap a screw on the contact plate should be loosened and the plate moved in or out as required. The breaker arm should move freely on its pivot and it is advisable to check the tension of the breaker arm spring.

To Set Ignition Timing

The breaker points should be adjusted to .020" opening and the manual spark control lever set in the fully advanced position. The ⅛" pipe plug should be removed from the cylinder head above No. 6 piston and a gauge

rod placed through the hole and in contact with the piston head. The crankshaft should be rotated until No. 6 piston is coming up on exhaust stroke and stopped when the piston is .035″ before top dead center. The screw which clamps the distributor timing lever to the distributor should be loosened and the distributor cap removed to see that the rotor brush is at No. 1 spark plug cable terminal. The distributor clamp screw should next be loosened and the distributor rotated in an anti-clockwise direction, as viewed from above, until No. 1 cam begins to separate the breaker points. When doing this the distributor rotor should be pressed against the direction of rotation to be certain that all backlash is removed. The clamp screw should then be tightened and the distributor cap reinstalled as well as the spark plug cables connected to the proper spark plugs and terminals on the distributor cap. The spark control hand lever should be checked for full advance and retard.

Firing Order

The firing order of the cylinders is 1-5-3-6-2-4. The wires from the spark plugs should be connected to the terminals on the distributor corresponding with the number of the cylinder in which the spark plugs are placed. Number 1 cylinder is nearest the radiator.

The wiring diagram (Fig. 11) indicates the location of the distributor terminals for the different spark plugs.

Ignition Coil

The ignition coil needs little attention other than to be kept clean, dry and well grounded. All terminals on the coil must be tight.

Spark Plugs

The gap between the spark plug points must be .027″ to .030″. Too wide a gap will cause misfire, especially at high speeds and when laboring with open throttle, while a small gap causes poor idling. Dirty or fouled spark plugs should be washed in gasoline. Uniform gap setting insures evenness of engine firing.

Present day engines develop high compression and very high speed. This severe duty imposed on the spark plugs causes erosion. It is, therefore, advisable to replace spark plugs at intervals of every 10,000 miles of service. The installation of new spark plugs, properly adjusted, will have a marked effect upon the performance of the engine and aid materially in keeping the engine in condition for smooth flowing maximum power.

The engine performs best with the spark plugs furnished with the car. These are obtainable from Chrysler Service Stations and should be used to the exclusion of all others. The use of so-called carbonproof spark plugs and others having smaller diameter electrodes should be avoided. Such spark plugs will cause the engine to miss on heavy pulls.

Suggestions

Ignition trouble will make itself known by the engine misfiring or refusing to start.

If the engine misses regularly on one cylinder, the trouble is usually due to the spark plug in that cylinder being dirty, broken or improperly adjusted. If misfiring is not limited to one cylinder, the cap should be removed from the distributor and the contact points examined to make certain that they make good contact with each other and are clean. The correct point opening is .020″.

If the contacts show a tendency to burn, the distributor may not be well grounded to its mounting bracket. Paint and dirt should be scraped off the bracket to insure a good ground. The condenser, which is on the distributor, should be tested and its connections from the coil should be tight.

When the engine will not start, the ignition should be checked as follows: The engine switch should be turned "on" and the cap removed from the distributor to see that the contact points are touching each other. Then the secondary wire should be disconnected from the coil on the instrument panel and a piece of wire or metal held against the engine or dash and about ⅛″ from the terminal of the coil from which the secondary wire was removed. The contact points should next be separated by moving the breaker arm with the fingers. A spark should jump between the coil terminal and the piece of wire or metal touching the instrument panel if the coil and its connections are in good condition.

If no spark is obtained at the coil under the preceding conditions, it should be determined whether current passes through the coil.

A quick check may be made on the primary circuit of the coil by closing the ignition switch and cranking the engine. If the ammeter needle moves back and forth between 0 and 3 or 4 amperes discharge, it indicates the primary circuit is all right. If ammeter needle does not move, the following procedure should be observed:

With the ignition switch turned "on" and the distributor contact points separated, a screwdriver should be rested over the edge of the distributor housing with the end of the screwdriver touching against the stationary contact point. There should be a flash or spark to indicate the flow of current. If current flows, the secondary winding of the coil is apparently damaged and a new coil should be installed.

If no current can be detected on this test, the small wire from the coil to the distributor should be examined for breaks, loose connections, or damaged insulation.

If the wiring is in good condition it should be determined whether the current reaches the coil. A screwdriver should be rested over the "Bat" terminal of the coil and at the same time touch some metal part of car with the end of screwdriver. If a flash or spark is obtained, the coil is faulty and a new one should be installed. If no current reaches the coil, the trouble is due to a loose connection, broken wire, defective switch, dead battery, or poor ground connection.

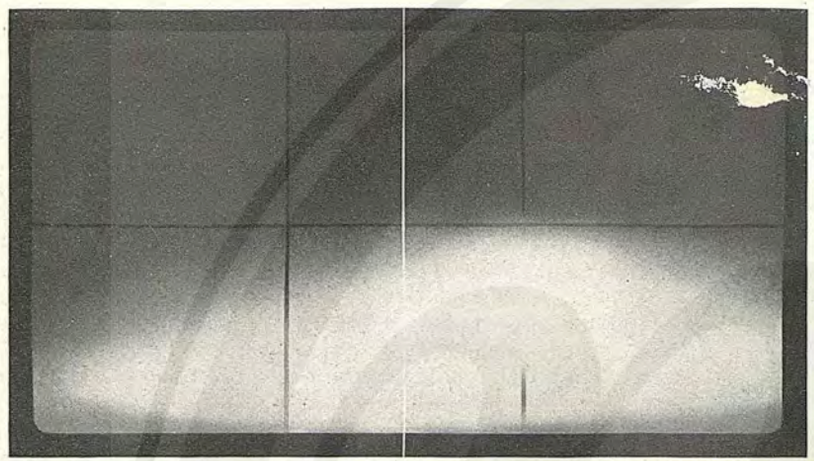

Fig. 15—Upper beam of right hand headlamp correctly focused and aimed

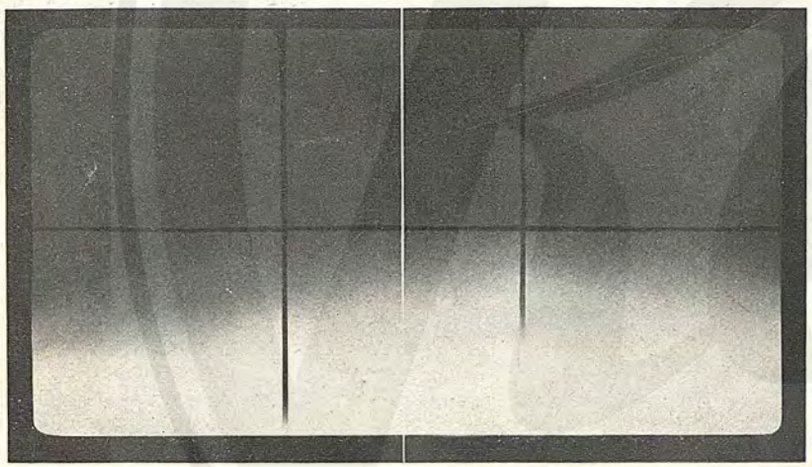

Fig. 16—Lower beam of headlamp shown in Fig. 15

Lights

The head, parking and tail lights are all controlled by the lower lever above the steering wheel. When the lever is in the vertical or central position, no connection is made. When the lever is turned to the right, the parking and tail lights are connected. When the lever is turned to the left one notch, the lower filaments of the headlamps and tail light are connected. The upper filaments of the headlamps are connected by moving the control lever one notch farther to the left. The instrument panel light is controlled by a separate switch on the instrument board.

Signal Light

An hydraulic switch assembled in the brake master cylinder completes the circuit for the rear signal lamp when the brake pedal is depressed.

Headlamp Adjustment

The car should be placed with normal passenger load on a level surface with the headlamps located twenty-five feet from a garage door or light-colored vertical wall.

A horizontal line should be drawn on this surface at a height of the lamp centers. A center point should be located on this line by sighting through the center of the rear window of the car and in line with the radiator cap. Equidistant from this center point two vertical lines should be drawn at a distance from each other equal to the distance between the centers of the headlamps. These two lines will be immediately ahead of and in line with the respective headlamps.

With the lighting switch lever above the steering wheel turned to the left ("high" position), one lamp should be adjusted (with lens in place) while the other is covered. The best driving light beam is obtained when there is a high intensity near the top of the beam. This is accomplished by turning the adjusting screw, accessibly located at the rear of the lamp. When properly adjusted, the light will be intense at the top and shallow in height, as well as quite widespread. By loosening a single nut, which fastens the lamp to its bracket, the light beam may be adjusted in both vertical and horizontal directions.

When one lamp has been properly adjusted, it should be covered and the other lamp uncovered, then the necessary adjustments made to the latter. The lower beams of light will not require further adjustment.

Flickering lights indicate a loose connection, usually at the light sockets or the terminals at the switch. The fuses should be inspected to see that they are tight in the fuse clips.

Battery

The battery is of a six-volt, three-cell type and is carried under the front floor board. When installing a battery, care must be taken to make certain that the positive terminal is grounded and that the negative terminal is connected to the starting and lighting cable before attempting to use any part of the electrical system. Damage may be done to the entire system if the wrong connections are made.

The starting motor pedal should never be depressed for a period to exceed 5 to 10 seconds. Continual cranking of the engine will discharge the battery until it is no longer able to supply sufficient current to turn the starting motor. If the engine fails to start, the procedure on Page 70 should be followed. The clutch should be disengaged when cranking the engine to reduce the load on the battery, especially during cold weather.

When storing the car for an extended period, the battery should be removed and delivered to a battery service station for attention during the period of car storage.

Care of Battery

The battery must be kept securely fastened in its rack. It should be cleaned and dried frequently. The terminals and connections should be coated with vaseline or grease. If the solution has been slopped or spilled, the surface of the battery should be wiped with a piece of waste, wet with ammonia.

If a sufficiently charged battery will not crank the engine it is probable that there is corrosion at the battery clamps and posts. In this case the clamps should be removed and all corrosion scraped from them, as well as the posts, to insure proper contact. The ground terminal and frame at the point of contact should also be scraped.

The electrolyte in the battery should always be maintained at the proper level and pure distilled water added to each cell of the battery until the solution is about ½" above the top of the plates. If distilled water is not available, clean rain water will be satisfactory. If one cell regularly requires more water than the others, it is probably due to a leak and should be repaired at once. Acid or electrolyte should only be added to a battery by an experienced battery repairman. The filling hole plugs should be screwed in by hand.

The specific gravity of the solution in each cell should be tested occasionally with a hydrometer before adding water. If the reading is above 1.200 the battery is more than half charged. If it is below 1.200 but above 1.150, the battery is less than half charged, and is a warning to use the lights sparingly until the specific gravity is restored to at least 1.250. If there is no leak and one cell shows a specific gravity markedly lower than the others, there is a short-circuit or some other trouble in that cell and it should have the prompt attention of a good battery repairman.

A fully charged battery will not freeze in temperatures ordinarily encountered. The electrolyte will freeze in a one-half discharged battery at about 20° below zero (specific gravity 1.210).

Horn

The horn is of the 6-volt motor-driven type and is adjustable for tone by movement of the flat-headed screw in the rear end of the horn cover at the top. The round-headed screw on the bottom of the cover fastens the cover in place and should be removed when lubrication is necessary.

When the cover fastening screw is removed the cover may be removed by pulling it straight backward. Two drops of very light machine oil should be put on the felt washers at each end of the armature shaft about once every three months.

ENGINE

The power plant of the Chrysler "70" is of the unit type, having a six-cylinder engine, of the L-head, four-cycle, poppet valve construction. The cylinder head and oil pan are removable.

Lubrication is accomplished by a full force feed system to all crankshaft, connecting rod, and camshaft bearings. The connecting rods have metering apertures drilled in their lower ends to spray the cylinder walls, piston pins, and the entire valve operating mechanism. An oil filter

mounted on the dash passes the oil through treated fabric which removes dirt and sediment and returns the oil, cooled and cleansed, to the oil pan.

The water pump, in the front of the cylinder block, draws cool water from the bottom of the radiator and, through a system of graduated outlets and large passages, forces circulation around each cylinder and valve seat.

The camshaft is driven by the crankshaft through a silent chain. The ignition distributor, which has single breaker points and semi-automatic spark advance, is accessibly mounted on the cylinder head and driven by a spiral gear on the camshaft.

Pistons and Rings

Each piston is of light weight, of special slotted skirt design. The rings are all above the piston pin which floats free in the piston and is clamped in the connecting rod. Special tongue and groove compression rings are assembled in the upper grooves of the piston. A special oil control ring is used in the bottom groove.

Pistons are fitted with .0015" to .002" clearance at skirt, .019" to .022" clearance at the head. Piston pins are fitted with .00025" to .00075" clearance which is a tight thumb push fit at normal room temperatures. This exact fit will allow proper lubrication at operating temperatures. When the pistons are being reassembled to an engine, the slot in the skirt should face toward the side of the engine opposite the valves.

All piston rings have a gap measure of .005" to .010". When assembling new parts the exact clearance must be allowed and the rings should move freely in the grooves when the piston is shaken. Piston and connecting rod assemblies should be removed from the top of the engine.

When connecting rod assemblies are being reassembled to an engine, the oil passages, through the big end bearing, should face toward the valve side of the engine.

Chrysler "70" pistons and rings were selected only after exhaustive tests proved them most efficient for this engine. Under no consideration should so-called troubleproof pistons and rings be installed. Chrysler pistons and rings are the results of very elaborate, painstaking and expensive research. These parts can be obtained directly through authorized Chrysler Service Stations. If for any reason it should ever be necessary to replace one or more pistons, care should be exercised when selecting them so that the variation in weight is not more than ¼ of an ounce in the entire set of six pistons. If this limit is not followed, excessive vibration may result. Chrysler owners should always insist upon the use of genuine parts.

Bearings

The crankshaft is of the counterweighted design, positively balanced dynamically and statically, and mounted in seven bronze-backed, babbitt-lined bearings. The crankshaft main bearings are a special interchangeable type, manufactured to such close limits that new bearings may be installed without reaming, scraping, or burnishing. The camshaft, driven by the crankshaft through a silent chain, is mounted in four large bearings; the front, a bronze, babbitt-lined bearing; the others are machined in the crankcase. The connecting rods are manufactured to exact size and are inter-

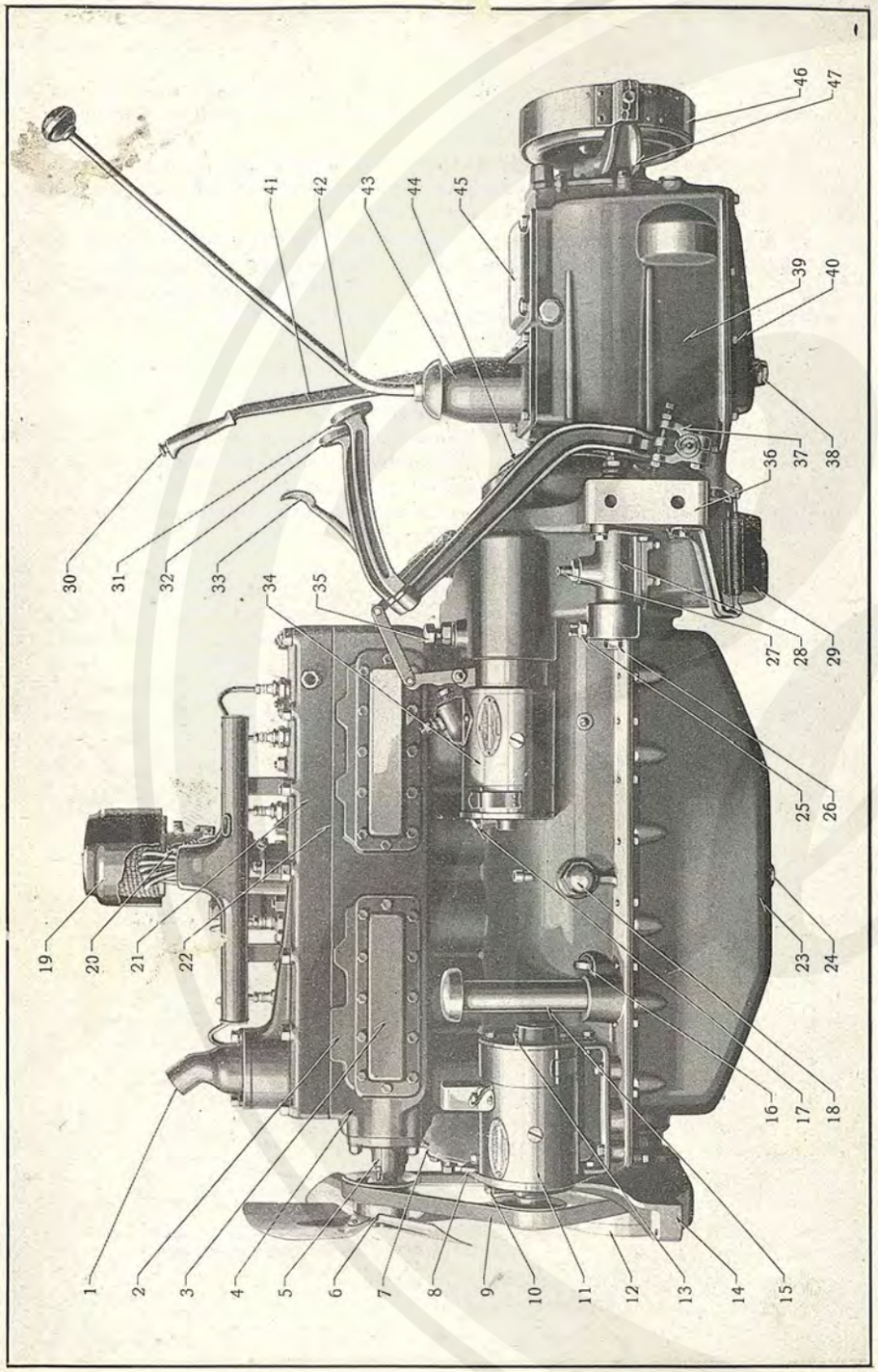

Fig. 17—Left Side View of Power Plant

changeable without fitting, having bearings of babbitt, cast integrally by a centrifugal process, thereby providing a perfect bond and a bearing free from flaw or foreign substance.

Due to the full force feed oiling system, all engine bearings are assembled with a clearance of .002″ so that there is always a film of oil under pressure as a cushion between the bearings and shaft.

Damaged bearings are positively and quickly repaired at small cost by installing new bearings, which restore the original factory alignment. Bearings are otherwise not adjustable. These bearings should not be tampered with in any way other than to replace them. *A bearing cap should never be filed.*

Valves and Valve Timing

Extra large valves are mounted along the right side of the cylinder block and are lifted by adjustable tappets of the mushroom type. The inlet valves are of chrome-nickel steel. The exhaust valves are of silcrome steel. Valve stems operate in cast iron guides, generously lubricated. The valve tappets are mounted in groups of six in cast iron brackets, easily removed.

To Set Valve Timing

The crankshaft should be turned until Nos. 1 and 6 pistons are at top dead center. The ⅛″ pipe plug should be removed from the cylinder head above No. 6 piston and a gauge rod placed through this hole and in contact with the piston head. Care must be taken to make certain that the gauge rod rests on the piston and not on an accumulation of carbon. This provides an easy means of determining the position of Nos. 1 and 6 pistons. When these pistons are at top dead center the timing marks on the crankshaft and camshaft sprockets should be opposite each other (Fig. 21) and checked with a straightedge to see that they are straight in line between the crankshaft and camshaft centers.

To Check Valve Timing

The ⅛″ pipe plug should be removed from the cylinder head above No. 6 piston and a gauge rod placed through this hole and in contact with the

Fig. 17—Left Side View of Power Plant

1—Cylinder water outlet elbow
2—Engine serial number
3—Cylinder water jacket cover
4—Cylinder block
5—Water pump
6—Fan and water pump driven pulley
7—Water pump drain plug
8—Generator adjusting strap
9—Fan, water pump and generator drive belt
10—Generator oil cup
11—Generator
12—Crankshaft impulse neutralizer
13—Generator oil cup
14—Chain case cover
15—Crankcase oil filler or breather pipe
16—Oil level indicator rod
17—Starting motor oil cup
18—Oil pressure relief valve cap
19—Air cleaner
20—Distributor
21—Cylinder head
22—Cylinder head gasket
23—Oil pan
24—Oil pan drain plug
25—Signal lamp switch
26—Brake master cylinder outlet connection
27—Brake master cylinder inlet connection
28—Brake master cylinder
29—Flywheel housing
30—Transmission brake hand lever button
31—Clutch pedal
32—Brake pedal
33—Starter pedal
34—Starting motor
35—Starting motor mounting screw
36—Engine rear support—left
37—Clutch pedal adjusting collar
38—Transmission drain plug
39—Transmission case
40—Transmission case cover—lower
41—Transmission brake hand lever
42—Gearshift lever
43—Gearshift housing or cover
44—Clutch hand hole cover
45—Transmission case cover—upper
46—Transmission brake band
47—Transmission brake support or mainshaft rear bearing retainer

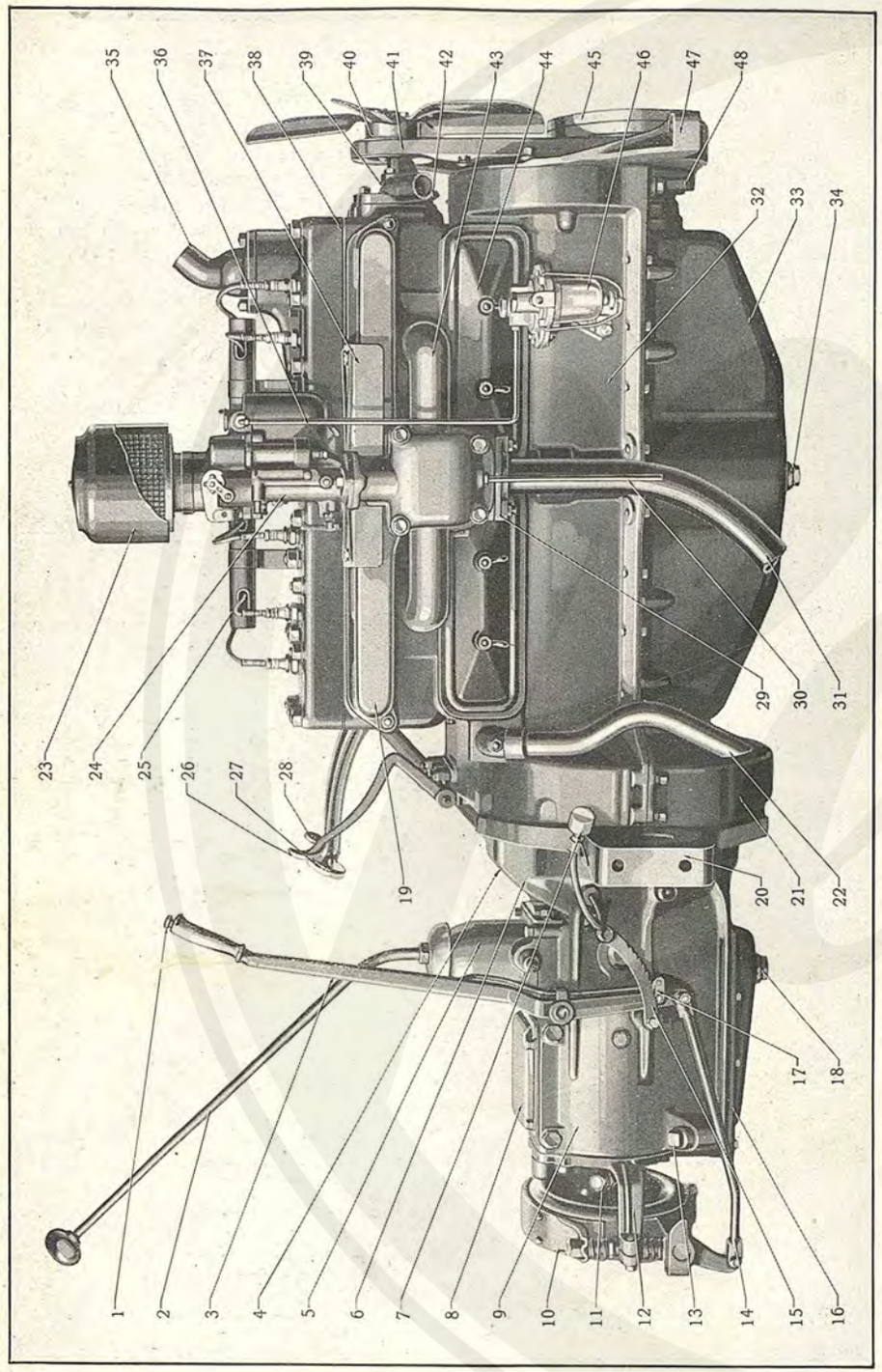

Fig. 18—Right Side View of Power Plant

piston head. The valve tappets should next be adjusted while the engine is cold with .008″ clearance for the intake and exhaust. This clearance is necessary when checking the valve timing but should be changed to .007″ for the exhaust and .005″ for the intake when the engine is warm and as soon as the checking is completed because the latter is the proper setting for quiet valve operation. The crankshaft should be rotated until No. 6 piston is coming up on compression stroke and stopped when the piston is .014″ past top dead center. The No. 1 intake valve tappet should be up just enough to be tight and the valve just about to open. No. 1 cylinder exhaust valve closes two degrees of crankshaft rotation later or with the piston .025″ past top dead center. The exhaust valves are Nos. 1-4-6-7-9-12.

Valve Grinding

There are a few precautions which should be observed when grinding the valves. Remove the thermometer connection at the cylinder head before attempting to remove the head. Do not compress the valve springs to a length of $2\frac{5}{16}$″ as there is the possibility of them taking a permanent set, which would result in valve spring flutter and poor performance at high speeds. The valves are of alloy steel, so hard that they are little affected by valve grinding compound. To save excessive grinding away of the seats, the valves should first be ground in a valve refacing grinder. The valves may then be lapped in with compound to produce a gas-tight seat.

Timing Chain

In the event that it should become necessary, for any reason, to remove the timing chain, this is very readily accomplished, after removing the chain case cover, by removing the three bolts holding the camshaft sprocket to its hub on the front end of the camshaft. The sprocket and chain may then be lifted off. The camshaft sprocket hub, which is keyed to the camshaft, may then be removed from the shaft if necessary.

When replacing the timing chain it should be assembled to the sprockets and the camshaft sprocket bolted to its hub after the hub is in place on the

Fig. 18—Right Side View of Power Plant

1—Transmission brake hand lever button
2—Gearshift lever
3—Transmission brake hand lever
4—Clutch hand hole cover
5—Gearshift housing or cover
6—Clutch housing and transmission case (integral)
7—Clutch release bearing grease cup
8—Transmission case cover—upper
9—Transmission case
10—Transmission brake band
11—Speedometer drive pinion sleeve
12—Transmission brake support or mainshaft rear bearing retainer
13—Transmission filler plug
14—Transmission brake pull rod
15—Transmission brake sector or ratchet
16—Transmission case cover—lower
17—Transmission brake hand lever latch
18—Transmission drain plug
19—Exhaust manifold
20—Engine rear support—right
21—Flywheel housing
22—Crankcase ventilator outlet pipe
23—Air cleaner
24—Carburetor
25—Spark plug cable tube
26—Starter pedal
27—Brake pedal
28—Clutch pedal
29—Exhaust pipe flange
30—Manifold drain tube
31—Exhaust pipe
32—Crankcase and cylinder block (integral)
33—Oil pan
34—Oil pan drain plug
35—Cylinder water outlet elbow
36—Fuel tube, pump to carburetor
37—Manifold heat shield
38—Cylinder head gasket
39—Water pump
40—Fan and water pump driven pulley
41—Fan, water pump and generator drive belt
42—Water pump drain plug
43—Intake manifold
44—Valve chamber cover plate
45—Crankshaft impulse neutralizer
46—Fuel pump
47—Chain case cover
48—Chain case

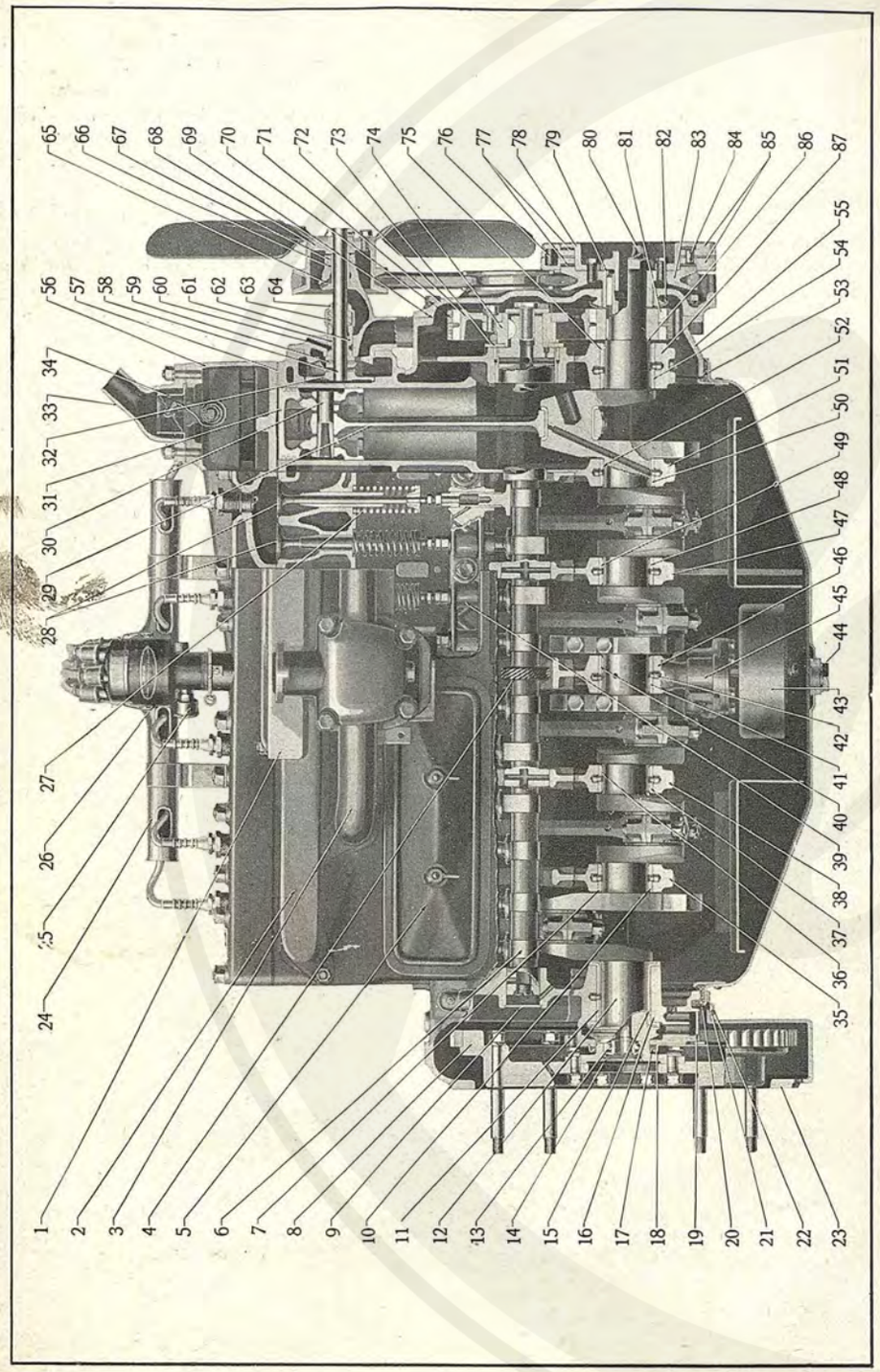

Fig. 19—Side Sectional View of Engine

front end of the camshaft. Care must be taken to see that the timing marks on the camshaft and crankshaft sprockets line up as described under "To Set Valve Timing" (Page 49). The bolt holes in the camshaft sprocket and its hub are so placed that the sprocket can be put on in only one position.

The timing should be carefully checked after performing any operation on the timing chain. (Pages 45 and 55.)

The timing chain must be assembled with the arrows pointing in the direction of rotation.

Repairs or adjustments to the timing chain should be entrusted to Chrysler Service Stations, as a variation of only one tooth on the sprocket will make a marked difference in the operation of the car.

ENGINE LUBRICATION

Proper lubrication is of vital importance. Lubricating with the best materials and with the utmost care will be repaid many times by long wear and good service.

Re-Refined Oil

The use of re-refined oil should be avoided. The process of re-refining engine oil requires considerable care and even the best re-refined oil is

Fig. 19—Side Sectional View of Engine

1—Manifold heat shield
2—Exhaust manifold
3—Intake manifold
4—Distributor and oil pump drive gear
5—Valve chamber cover plate
6—Camshaft
7—Crankshaft bearing, upper, No. 6
8—Flywheel
9—Camshaft rear bearing oil seal
10—Crankshaft bearing, lower, No. 6
11—Crankshaft bearing, upper, No. 7
12—Crankshaft
13—Clutch pilot bearing
14—Flywheel bolt
15—Crankshaft bearing, lower, No. 7
16—Bearing cap No. 7
17—Bearing oil seal (felt)
18—Bearing oil seal retainer
19—Rear main bearing oil drainage
20—Oil pan end gasket
21—Flywheel housing oil seal (felt)
22—Flywheel housing oil seal retainer
23—Flywheel housing
24—Ignition cable tube and bracket
25—Distributor grease cup
26—Distributor
27—Valve spring
28—Valves
29—Connecting rod
30—Piston pin
31—Piston
32—Water pump impeller
33—Cylinder water outlet elbow
34—Thermostat
35—Crankshaft bearing cap No. 6
36—Crankshaft bearing, upper, No. 5
37—Crankshaft bearing, lower, No. 5
38—Crankshaft bearing cap No. 5
39—Valve guide
40—Crankshaft bearing, upper, No. 4
41—Crankshaft bearing, lower, No. 4
42—Crankshaft bearing dowel
43—Oil pump strainer
44—Oil pan drain plug
45—Oil pump
46—Crankshaft bearing cap No. 4
47—Crankshaft bearing cap No. 3
48—Crankshaft bearing, lower, No. 3
49—Crankshaft bearing, upper, No. 3
50—Crankshaft bearing, lower, No. 2
51—Crankshaft bearing cap No. 2
52—Crankshaft bearing, upper, No. 2
53—Oil pan end gasket
54—Crankshaft bearing, lower, No. 1
55—Chain case
56—Cylinder head
57—Cylinder head gasket
58—Water pump and fan shaft
59—Water pump body thrust washer
60—Water pump rear bushing oiler
61—Water pump shaft rear bushing
62—Water pump shaft rear bushing retainer
63—Water pump packing
64—Water pump packing nut
65—Water pump front bushing oiler
66—Water pump shaft front bushing
67—Water pump body
68—Fan driven pulley
69—Chain case cover gasket
70—Timing chain
71—Chain case cover
72—Camshaft sprocket
73—Camshaft thrust plate
74—Camshaft sprocket hub
75—Crankshaft bearing, upper, No. 1
76—Neutralizer spring
77—Neutralizer friction disc
78—Neutralizer pressure plate
79—Starting crank jaw nut lockwasher
80—Starting crank jaw nut
81—Crankshaft sprocket
82—Crankshaft oil throw disc
83—Fan drive pulley
84—Neutralizer dowel
85—Neutralizer ring
86—Crankshaft bearing, lower, No. 1
87—Crankshaft bearing cap No. 1

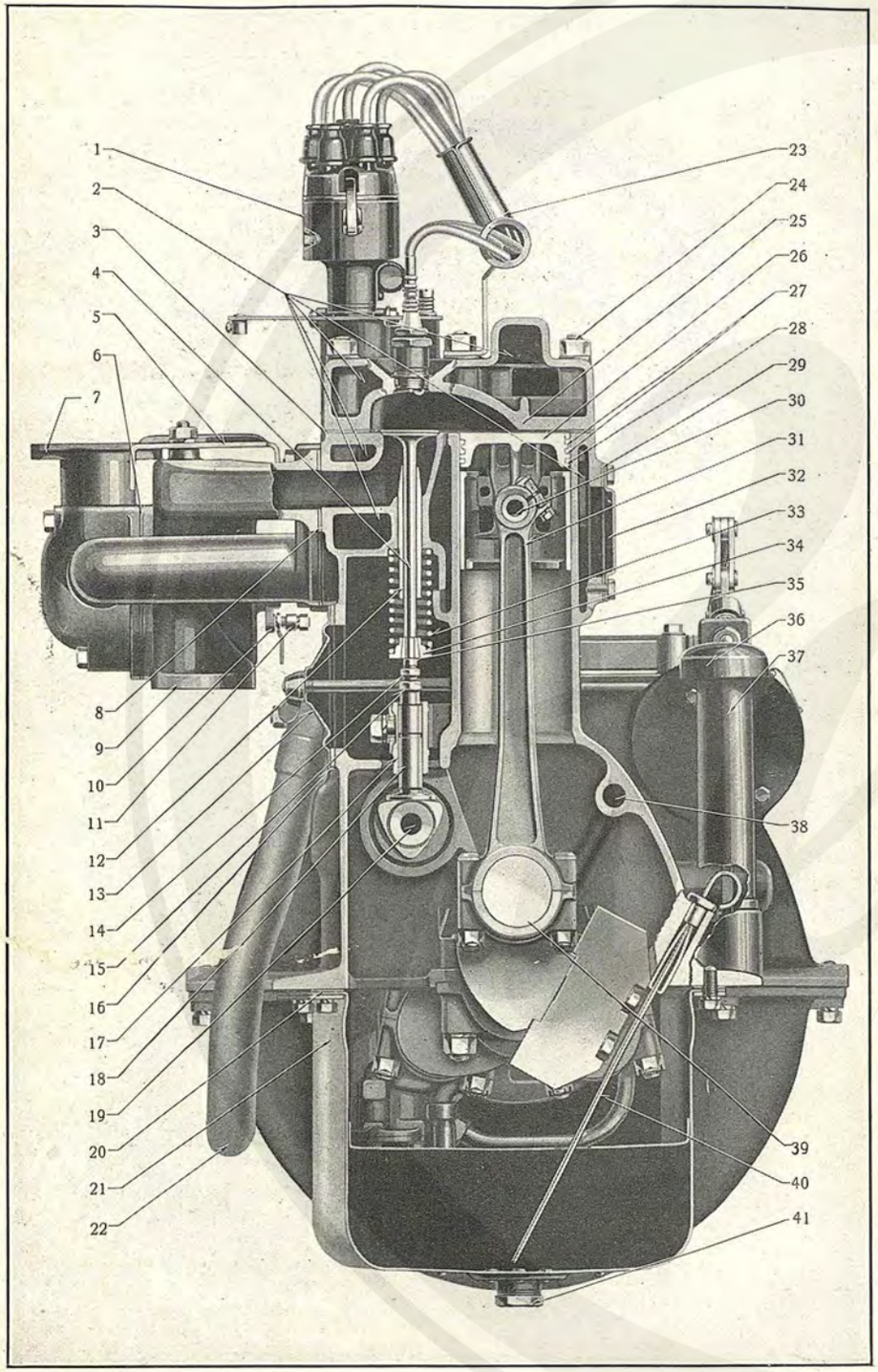

Fig. 20—Front Sectional View of Engine

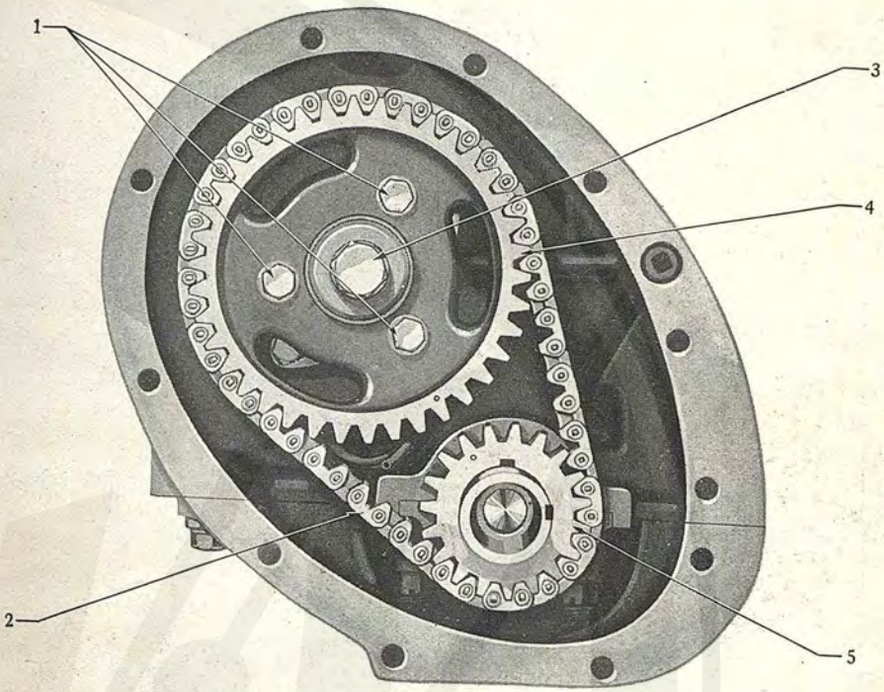

Fig. 21—Timing Chain and Sprockets

1—Camshaft sprocket screws
2—Drive chain
3—Camshaft sprocket hub screw
4—Camshaft sprocket
5—Crankshaft sprocket

not suitable for use in any automobile engine. This is a matter of vital importance and considerable care should be taken when selecting engine oil to make certain that it is of the highest quality.

Oil is put into the engine through the oil filler located on the left hand side of the crankcase. The oil level gauge is toward the rear of the engine from the oil filler. When a reading of this gauge is being taken, the

Fig. 20—Front Sectional View of Engine

1—Distributor
2—Water passages
3—Cylinder head gasket
4—Exhaust valve
5—Manifold heat shield
6—Intake to exhaust manifold gasket
7—Intake manifold
8—Intake manifold gasket
9—Exhaust manifold
10—Manifold heat control lever
11—Manifold heat control lever swivel clamp
12—Valve guide
13—Valve chamber cover plate
14—Valve tappet adjusting screw
15—Valve tappet adjusting screw nut
16—Valve chamber cover plate gasket
17—Valve tappet guide
18—Valve tappet
19—Oil passage
20—Oil pan gasket
21—Oil pan
22—Crankcase oil ventilator outlet pipe
23—Ignition cable tube and bracket
24—Cylinder head stud
25—Cylinder head
26—Piston
27—Piston ring Nos. 1 and 2
28—Piston ring No. 3
29—Cylinder water jacket cover gasket
30—Piston pin
31—Connecting rod
32—Cylinder water jacket cover
33—Valve spring
34—Valve spring retainer
35—Valve spring retainer lock
36—Oil filler or breather cap
37—Oil filler or breather pipe
38—Oil passage
39—Crankshaft
40—Oil level indicator rod
41—Oil pan drain plug

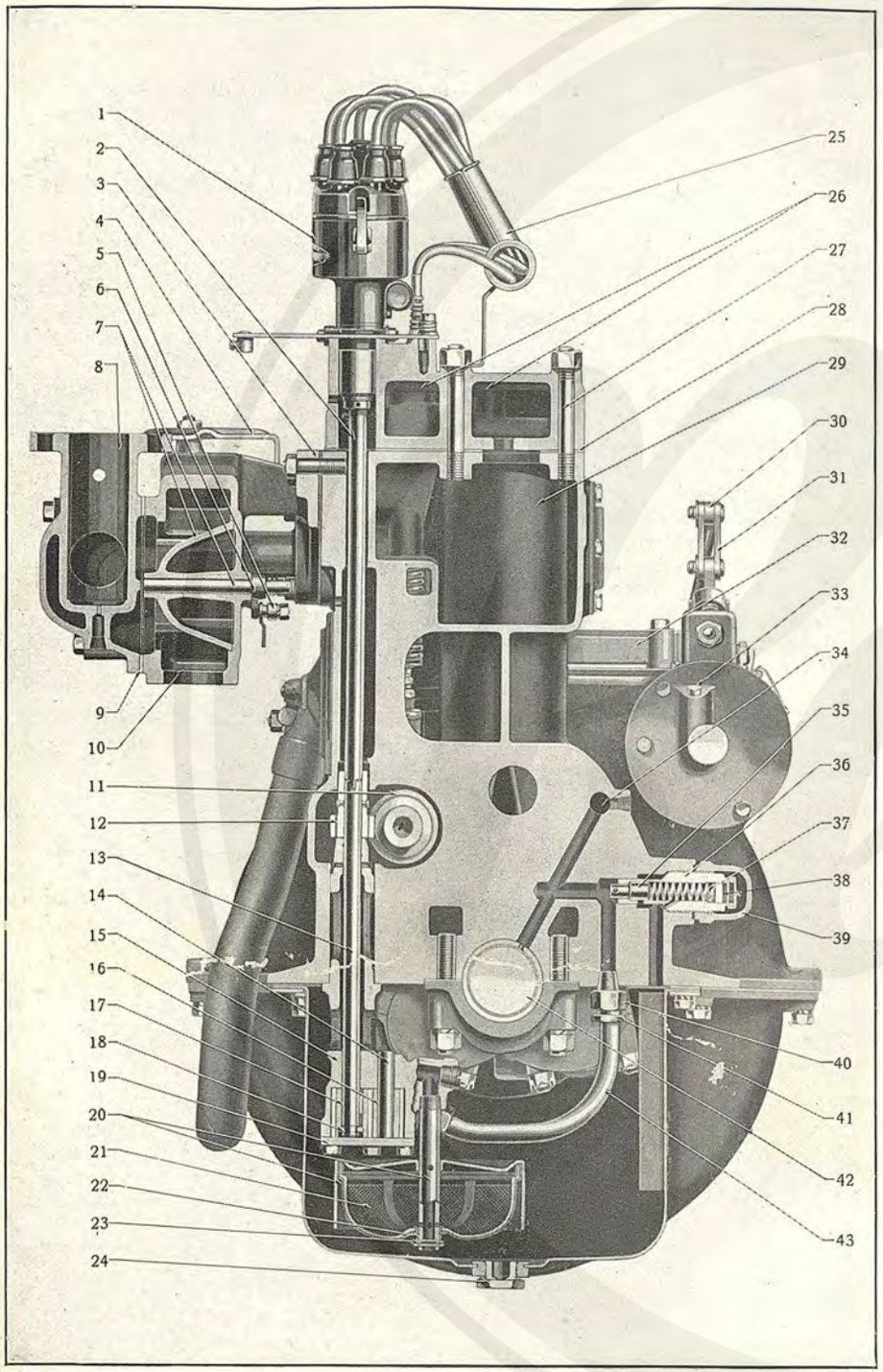

Fig. 22—Center Sectional View of Engine

engine should be stopped, the indicator removed and the oil wiped off the indicator rod. The indicator should then be inserted again and removed for a true reading. The engine should never be operated when the oil is below the lower mark of the indicator rod.

For correct engine lubrication a high-grade, well-refined oil is essential. As a guide to the proper viscosity or body of oil for summer and winter conditions, which vary for different territories, the lubrication charts of the reputable oil companies should be consulted. In general an oil having the body of S. A. E. viscosity number 30 is recommended for summer use except for continued high-speed driving, when the body of S. A. E. viscosity number 40 should be used. For winter use at temperatures below freezing and above zero an oil having the body of S. A. E. viscosity number 20 with a low cold test is recommended. At temperatures below zero an oil having the body of S. A. E. viscosity number 10 with a low cold test, or S. A. E. viscosity number 20 low cold test, diluted with 5% (½ pint for full oil pan) kerosene, is to be used.

The gear type oil pump draws the oil through a strainer and forces it through passages drilled in the cylinder block to the main bearings and camshaft front bearing and from the main bearings through passages in the crankshaft to the connecting rod bearings and also through the hollow camshaft to its bearings. The spray off the bearings and the streams of oil from oil holes in the connecting rods lubricate all other reciprocating and rotating parts of the engine. A tube from the front camshaft bearing delivers oil direct to the timing chain and sprockets. The overflow from the rear main bearing is conducted through a trap back into the oil pan.

An oil filter is mounted on the dash under the hood which passes the oil through a treated fabric, removing carbon and dirt too small to be caught by the strainer.

Oil Pressures

The oil pressure gauge, on the instrument board, at normal driving speeds with warm engine and oil will show approximately 25 to 30 lbs. pressure. Greater pressure compresses a spring in the oil pressure relief valve, allowing excess oil to pass back into the engine oil pump sump.

The oil gauge should be watched at all times, particularly in winter

Fig. 22—Center Sectional View of Engine

1—Distributor
2—Distributor drive shaft
3—Exhaust manifold gasket
4—Manifold heat shield
5—Manifold heat control lever swivel clamp
6—Manifold heat control lever
7—Manifold heat control valve and shaft
8—Intake manifold
9—Intake to exhaust manifold gasket
10—Exhaust manifold
11—Camshaft
12—Oil pump drive shaft coupling
13—Oil pump drive shaft
14—Oil pump idler gear shaft
15—Oil pump body
16—Oil pump idler gear
17—Oil pump drive gear
18—Oil pump drive gear retainer
19—Oil pump cover
20—Oil pump strainer cover and suction pipe
21—Oil pump strainer
22—Oil pump strainer spring
23—Oil pump strainer spring retainer
24—Oil pan drain plug
25—Ignition cable tube and bracket
26—Water passages
27—Cylinder head stud
28—Cylinder head gasket
29—Water passage
30—Starting motor clevis
31—Starting motor switch operating arm
32—Starting motor pedal bracket
33—Oiler—starting motor
34—Oil passage
35—Oil pressure relief valve plunger
36—Oil pressure relief valve body
37—Oil pressure relief valve spring
38—Oil pressure relief valve spring retainer
39—Oil pressure relief valve cover
40—Oil pipe nipple
41—Oil pipe nut
42—Crankshaft
43—Oil pipe

If at any time it should indicate no pressure, the engine should be stopped immediately. If there is plenty of oil in the pan, the oiling system should be carefully checked by a competent mechanic before starting.

The oil pressure relief valve may be adjusted to increase or decrease pressure on the gauge, but it should not be touched until the oiling system has been carefully checked by an experienced mechanic. If the gauge shows inadequate or too great pressure, it indicates trouble in the oiling system. Changing the position of relief valve to correct gauge reading removes the effect of the trouble, but does not remove the cause. If it becomes necessary to adjust the oil pressure relief valve, the cap nut adjacent to the oil filler should be removed and the locking wire withdrawn. The slotted plug should be turned clockwise to increase the pressure or anti-clockwise to decrease the pressure.

There are several conditions which may cause a reduction in the pressure registered on the gauge. They should always be carefully checked before any change is made in the adjustment of the pressure relief valve. Some of them are as follows:

Use of an oil with too heavy a body or with too high a cold or pour test at zero temperature or below; oil excessively thinned out by unvaporized and unburned fuel; loose bearings, the looseness may be due to wear and should be investigated; a leaky or broken oil tube; clogged oil screen; broken oil gauge.

Oil Filter

The engine oil filter on the dash of the car separates foreign substances from the engine oil, but it is not intended to separate fuel and acids which form in the engine oil due to natural service and improper use of the carburetor choke. When the engine is running fast enough to register about 10 lbs. pressure on the oil pressure gauge the bottom connection on the oil filter should be removed if it is desired to determine whether or not the oil is passing through the filter. A steady flow of clean oil should then be observed passing through the bottom of the filter. If a steady flow of oil cannot be observed at this point, the filter may have become clogged with foreign matter. In this case the filtering cartridge should be replaced. However, under normal conditions it should not be necessary to replace this filtering unit more frequently than 8000 to 10,000 miles of car travel.

Draining Crankcase Oil

Due to natural conditions, the engine oil, in use, is constantly being impregnated with fuel, water, and acid, depreciating the value of the oil as a lubricant. For this reason the oil should be replaced at regular intervals. (See Lubrication Chart—Center Insert.) Running the engine with the choke closed or partially closed increases the amount of fuel drawn into the cylinders. To reduce the amount of fuel which will work into the engine oil, the engine should be run with choke button pushed in as far as possible. The rapidity of accumulation of these damaging elements can be governed to a great extent by the driver of the car.

Fuel accumulates in the engine oil because of a certain excess of fuel in the combustion chambers not burning and working down the cylinder

walls into the crankcase. Only certain percentages of vaporized fuel and air when mixed will ignite and explode in the combustion chamber. If the mixture contains too much fuel the excess will not burn, but a certain amount of it will remain on the cylinder walls and work down into the crankcase by the action of the pistons.

Water vapor is a product of combustion. There is approximately as much water vapor formed by weight as fuel consumed. This accounts for the white vapors and water coming from the exhaust which is most noticeable in cold weather. A certain amount of this vapor condenses on the cylinder walls and is carried into the crankcase by action of the pistons. This water accumulates in the crankcase and under certain conditions forms an oil sludge. An excess of sludge or water may interfere with lubrication.

Acid forms in the combustion chamber also due to natural causes. Fuel contains varying percentages of sulphur which, when burned, changes to sulphur dioxide. The sulphur dioxide unites with water in the combustion chamber, making sulphurous acid.

The accumulation of these non-lubricating elements in the engine oil has very damaging effects on the wearing surfaces. Fuel thins the oil, reducing its lubricating ability. Water is a non-lubricant and is liable to freeze, causing stoppage of the oil circulation. The sulphurous acid attacks bearing surfaces and causes excessive wear. The rapidity of accumulation of these elements increases as the temperature decreases. The crankcase ventilator (Page 62) greatly reduces the formation of these elements which, in turn, reduces dilution of the crankcase oil. These elements can only be removed by draining the crankcase and the following instructions should be observed carefully:

To drain the oil, the drain plug in the bottom of the oil pan should be removed. The best time to drain is after a run when the engine is heated. The oil is thinner when it is hot and is also thoroughly mixed. It will, therefore, carry off sediment more completely.

Kerosene should never be used for flushing out the oil pan and lubricating system. A certain amount will remain in the system, collecting in pockets from which it cannot readily be drained and will dilute the oil.

Cleaning Oil Pan and Screen

At least once a year, preferably in the fall, the oil pan should be removed from the engine and thoroughly washed. The oil strainer should be removed and washed at this time.

FUEL SYSTEM

Fuel Tank

The fuel tank, carried at the rear of the frame, has a capacity of 19½ U. S. S. gallons. The vent in the filler cap must be kept open at all times to permit action of the fuel pump. Once a year draw the tank, by removing the drain plug in the sediment boss on the bottom, to remove any accumulation of water and dirt.

Fuel Gauge

The electrically operated fuel gauge on the instrument panel is connected to the ignition switch, hence it is not in operation when the switch

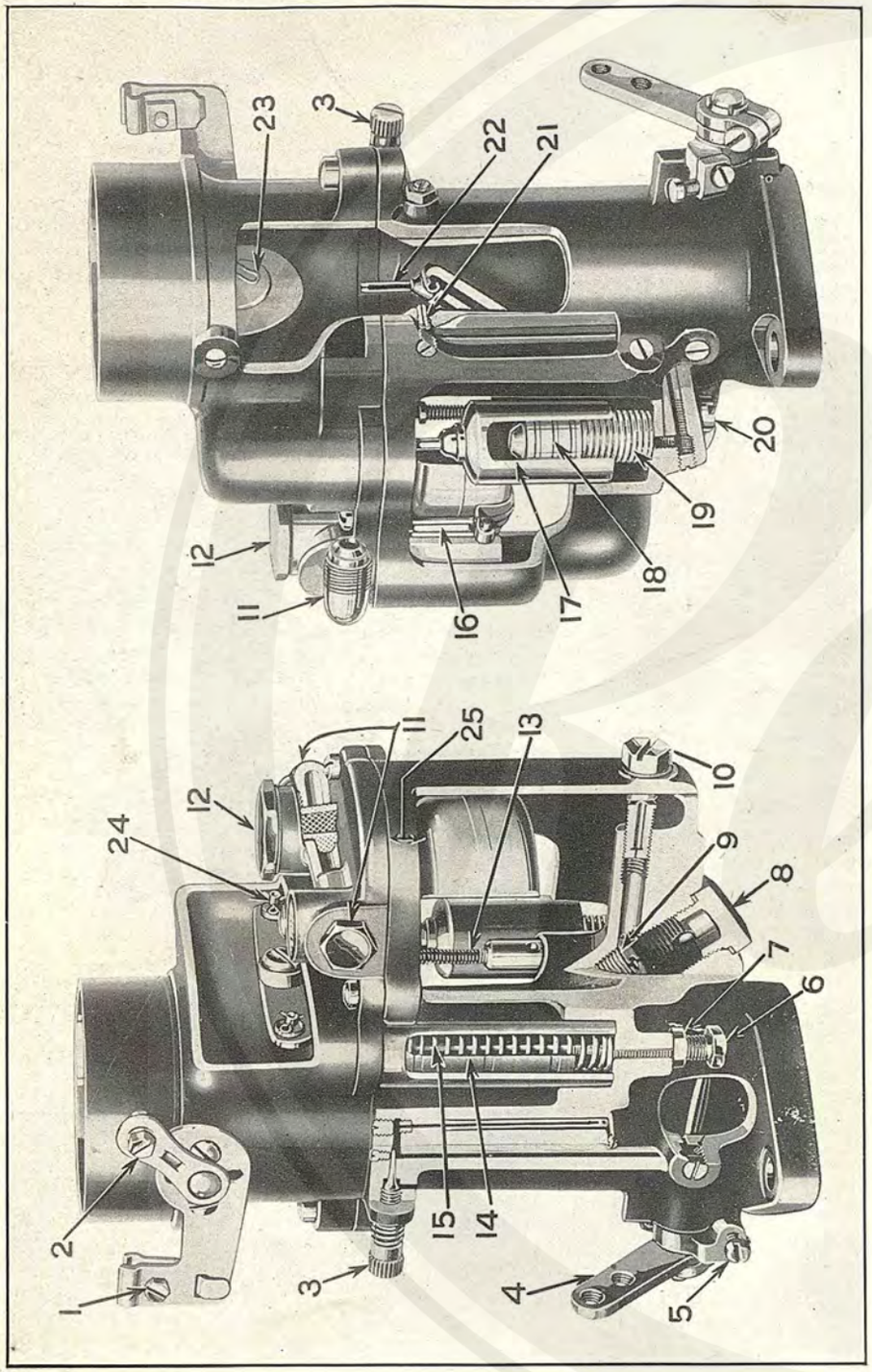

Fig. 23—Carburetor

is in the off position. The connections at the fuel tank, ignition coil and fuel gauge should be kept tight.

Fuel Pump

The fuel pump is mounted on the right side of the engine and is driven by an eccentric on the camshaft. It draws the fuel from the tank and forces it to the carburetor. It is automatic in its action, the fuel being delivered according to the requirements of the carburetor. The mounting bolts and the fuel connections of the fuel pump should be kept tight. Lubrication is not required.

Fuel Filter

The fuel filter consists of a strainer and sediment bowl, built as part of the fuel pump. Every three months, or oftener, if needed, remove and clean the strainer and bowl. When replacing the bowl see that its gasket is not broken, that it is in the proper place and the bowl is securely tightened.

Carburetor

The carburetor is of the plain tube down draft type; all orifices are fixed. The mixture of the operating range is determined by the diameter of the main metering screw (10, Fig. 8). If due to unusual weather conditions, a richer or leaner mixture is necessary, a metering screw having the passage of proper size can be obtained at a Chrysler Service Station.

The idling mixture and closed throttle running are controlled by the idle adjustment screw (3). This operates the air, so that by turning it clockwise results in a richer mixture. If, after adjusting the idling mixture, the engine idles too fast, the stop screw (5) should be turned to the left.

The mixture from the accelerating pump is adjustable and should be changed for winter and summer. In the winter a greater discharge from the pump is desirable; this can be altered by loosening the lock nut (7) and screwing up clockwise on the screw (6) cuts down the accelerator pump charge, and is the summer adjustment; screwing down or anti-clockwise on the screw (6) is the winter adjustment. Be sure to tighten the lock nut (7) after adjusting.

CAUTION: With choke on the instrument panel pushed "in", the choke butterfly valve should be inspected to see that it is wide open. It should also be inspected to see that it closes tightly when the choke button is pulled "out" for starting purposes, because, if the choke is open but slightly, starting may be difficult. The choke operating wire is held in place by the screw "2".

Fig. 23—Carburetor

1—Choke tube holder
2—Choke lever
3—Idling adjusting screw
4—Throttle lever
5—Stop screw
6—Pump adjusting screw
7—Pump adjusting screw lock nut
8—Drain plug
9—Main discharge jet lock nut
10—Main metering screw
11—Inlet elbow
12—Strainer plug
13—Economizer
14—Economizer syringe piston
15—Economizer syringe piston spring
16—Float needle valve
17—Pump piston sleeve
18—Pump piston
19—Pump piston spring
20—By-pass jet
21—Pump discharge jet
22—High-speed bleeder
23—Choke valve
24—Pump lever
25—Float

Cleaning

To clean the carburetor remove strainer plug (12) and remove strainer. Main metering jet (10) may also be removed for cleaning. If an accumulation of solid particles is found in the strainer a thorough cleaning of the fuel passages should be made by removing the metering jets Nos. 10 and 8. These jets can be easily cleaned by blowing through them.

Air Cleaner

The air drawn into the carburetor contains a certain amount of dust which is an abrasive, and if allowed to enter the cylinders will cause more rapid wear of the pistons, rings and cylinders, and it gradually works into the oil pan and is circulated through the engine. It is true that the oil filter on the dash will remove this foreign substance from the oil, but the air cleaner (23, Fig. 18) removes the dust from the air before it enters the carburetor.

The air cleaner, which is of wire mesh construction, should be cleaned periodically, depending on the conditions under which the car is operating. To clean the air cleaner it should be removed from the carburetor and slushed in gasoline to remove all dirt. The cleaner should then be dipped in used crankcase oil and allowed to drain.

The oil should not be wiped off, as this will impair the efficiency of the cleaner.

Crankcase Ventilation

Due to natural operating conditions of a gasoline engine, gasoline and water vapors form in the crankcase, which, under certain conditions, may cause an etching of the brightly finished steel bearing surfaces in the engine and dilution of the crankcase oil. These gases are expelled (before condensing) from the crankcase through the ventilator pipe connected to the upper right side of the crankcase between the cylinder block and the flywheel housing.

The forward motion of the car causes a vacuum at the outlet end of the ventilator pipe (below at the side of the engine) which draws the gases from the crankcase. The fresh air vent in the front end of the crankcase is through the oil filler pipe on the left side of the crankcase. This causes a complete ventilation or exhausting of crankcase gases.

The oil filler is provided with vanes similar to the air cleaner on the carburetor which starts the ingoing air whirling so as to prevent dust entering the crankcase with the ventilating air.

The air cleaning shutter should be closed during warm weather or when driving in a very dusty condition of roads and open in weather colder than 50 degrees Fahrenheit. The shutter is closed when the lug is at the extreme forward end of the slot in the top of the oil filler body. This can only be seen when the cover of the oil filler is removed.

Manifold Heat Control

Manifold heat control provides a quick means of heating the inlet manifold, thereby reducing the length of time that the choke must be used after starting a cold engine. It also makes the engine more flexible during the warming-up period, as well as reducing fuel consumption, carbon accumulation, and crankcase dilution.

The valve for this heater is operated by a button on the instrument panel. Pulling this button out closes the main exhaust passage and opens a manifold by-pass, thereby causing all of the exhaust gas to circulate through the inlet manifold heat jacket before going to the muffler. Pushing the button "in" closes the by-pass and opens the exhaust passage direct to the muffler, under which condition the inlet manifold is heated by the exhaust gas principally from the two center cylinders.

When starting and warming up a cold or cool engine, the manifold heat control button should be pulled "out" to its stop. After the engine is sufficiently warm to provide standard performance with the carburetor choke button pushed "in", the heat control button should be pushed "in" to its stop.

Primarily, the manifold heat control is designed for cold weather usage. In freezing weather, full heat can be used to good advantage for city driving below 30 miles per hour. For cross-country driving at speeds of 35 miles per hour or higher, even in freezing weather, the manifold heat control button should be pushed in all the way; manifold heat "on" under these conditions would cause a loss of power and efficiency.

CAUTION: The manifold heat control wire should be inspected at the point where it attaches to the valve control lever at the engine side of the manifold to see that it is not bent or kinked.

IMPORTANT—THE ENGINE SHOULD NOT BE RACED NOR WORKED HARD UNTIL IT IS WARMED UP AND RUNNING SMOOTHLY, AND WITH THE CABURETOR CHOKE BUTTON PUSHED "IN".

Decarbonizer

Special provision has been made on the Chrysler "70" to minimize the accumulation of carbon deposits in the engine combustion chambers.

At the right on the dash, underneath the hood, is mounted a device for holding a reservoir containing six ounces of "Carbosolve" solution. Attached to this device, and extending into the driver's compartment on the dash, is a button for the operation of the mechanism, which is as follows:

With the engine at normal operating temperature (approximately 160° F.) and running with the throttle approximately ⅓ open, the operating button on the decarbonizer should be pulled "out" and the throttle should be suddenly closed at the same time. This opens the primer valve to the reservoir and allows the six ounces of "Carbosolve" to be drawn into the engine combustion chambers. Due to the high vacuum in the inlet manifold under these conditions but a few seconds will be required to empty the reservoir of the "Carbosolve". As soon as the solution enters the combustion chambers the engine will stop.

CAUTION: THE IGNITION SWITCH SHOULD BE TURNED OFF AS SOON AS THE ENGINE STOPS.

After injecting the solution into the engine by means of the above operation, the engine should be allowed to stand without turning over, either under its own power or with the starter, for at least three or four hours, preferably overnight.

After emptying the reservoir of the six ounces of "Carbosolve", the reservoir may be unscrewed from the fixture and a new one containing

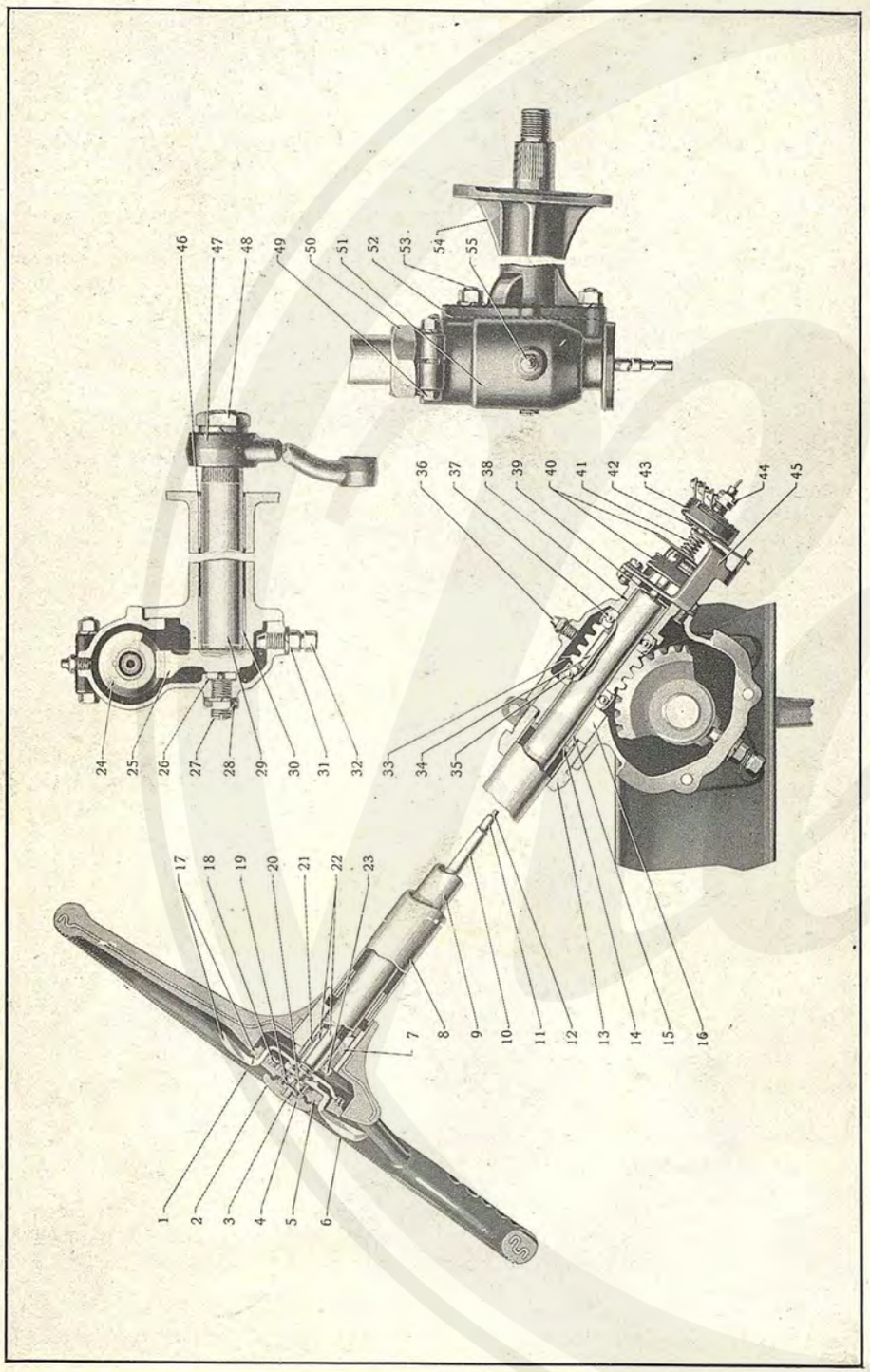

Fig. 24—Steering Gear

sufficient "Carbosolve" for another injection may be screwed into place. The supply of six ounces contained in the reservoir is sufficient for one injection into the engine. New reservoirs of "Carbosolve" may be obtained from any authorized Chrysler Service Station.

It is recommended that the injection of "Carbosolve" into the engine be made at regular intervals of approximately 500 miles.

CAUTION: "Carbosolve" is inflammable and should be handled with the same precaution as gasoline. Care should be used in handling the solution so that none of it will be spilled on the finished surfaces of the car, as it is a solvent of lacquer. To insure the use of genuine "Carbosolve", it should be obtained from authorized Chrysler Service Stations only.

SPRINGS

The chassis springs are semi-elliptic and mounted on rubber supports at each end, requiring no attention.

Spring breakage at or near the center is caused, in practically every instance, by loose spring clips (holding the springs to the axles), which throw the entire stress on the center tie bolts. They should be tightened at least three times during the first month and about once every month for the succeeding six months.

STEERING GEAR

The steering gear (Fig. 24) is of the semi-irreversible worm and sector type; the angle of the worm is great enough to allow the front wheels to follow slight deviations in the road, but does not permit jerking or turning of the wheels. There are three points of adjustment for excessive backlash of the steering wheel, namely: end play of steering arm (sector) shaft, end play of worm thrust bearing, and mesh of worm and sector teeth.

Fig. 24—Steering Gear

1—Steering wheel
2—Horn push button
3—Horn push button screw
4—Horn push button insert
5—Steering gear light control hand lever ring
6—Steering gear light control hand lever
7—Steering wheel key
8—Steering gear column jacket
9—Steering tube or main tube
10—Steering gear throttle control tube
11—Steering gear light control tube
12—Horn push button to light switch cable
13—Steering gear worm adjusting nut
14—Steering gear worm adjusting nut dust washer
15—Steering gear worm adjusting nut spacer bushing
16—Steering gear worm adjusting nut spacer
17—Steering gear throttle control hand lever, tube and ring assembly
18—Steering gear light control hand lever screw
19—Horn push button connector
20—Horn push button spring
21—Steering gear throttle control tube silencer—upper
22—Steering gear throttle control tube and sleeve
23—Steering wheel nut
24—Steering worm
25—Steering worm wheel
26—Steering worm wheel thrust screw washer
27—Steering worm wheel thrust screw
28—Steering worm wheel thrust screw lock nut
29—Steering worm wheel and shaft (integral)
30—Steering gear housing bracket bushing
31—Steering worm wheel adjusting screw lock nut
32—Steering worm wheel adjusting screw
33—Steering worm
34—Steering worm key
35—Steering worm thrust bearing
36—Lubricant nipple
37—Steering worm thrust bearing
38—Steering gear housing bushing
39—Steering gear housing oil seal and retainer
40—Steering gear throttle control lower lever and friction cone assembly
41—Steering gear throttle control lower lever and friction cone spring
42—Lighting switch spring washer
43—Lighting switch
44—Lighting switch mounting nut
45—Lighting switch control bracket
46—Steering gear housing bracket bushing
47—Steering gear arm
48—Steering gear arm nut
49—Steering gear housing clamp bolt
50—Steering gear worm adjusting nut
51—Steering gear housing
52—Steering gear housing bracket gasket
53—Steering gear housing bracket stud
54—Steering gear housing bracket
55—Lubricant nipple

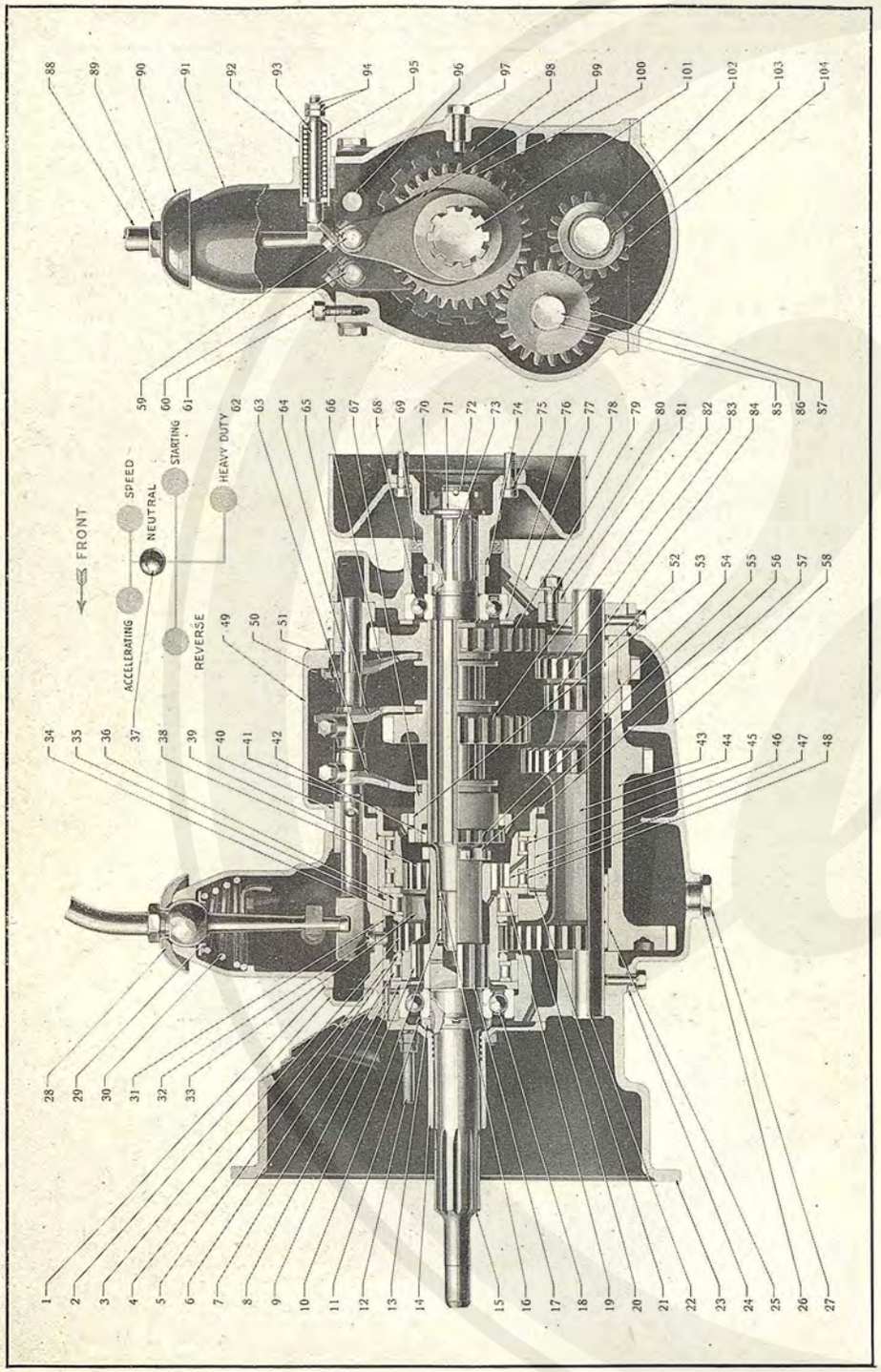

Fig. 25—Multi-Range Gearshift

Lubrication

Special heavy steering gear lubricant should be used for this steering gear. This lubricant should be diluted with engine oil in extremely low temperatures, if necessary. The housing should be filled with this lubricant by means of the high-pressure gun through the nipple in the top of the housing at intervals of every 5000 miles.

An oil cup with a spring cap is provided in the lower end of the steering column, just above the housing, into which a few drops of engine oil should be poured about every 2000 miles.

Adjustments

The worm thrust bearings are adjusted by means of the adjusting nut (35, Fig. 24). Before making this adjustment the front wheels should be jacked up and set in a straight ahead position. The clamping bolt in the steering post dash bracket should be loosened. The steering gear housing adjusting nut clamping bolt should next be loosened. The adjusting nut can now be turned. It should be turned down tightly enough to cause

Fig. 25—Multi-Range Gearshift

1—Gear shifter shaft cover gasket
2—Gear shifter shaft cover
3—Countershaft drive gear
4—Main drive pinion idler bearing race
5—Main drive pinion idler bearing spacer, front
6—Main drive pinion idler bearing, front
7—Main drive pinion idler thrust washer dowel
8—Main drive pinion idler thrust washer
9—Main drive pinion idler gear
10—Transmission mainshaft pilot bearing
11—Clutch shaft bearing nut lockwasher
12—Clutch release bearing sleeve guide
13—Clutch shaft bearing nut
14—Clutch shaft bearing retainer
15—Clutch shaft
16—Transmission mainshaft pilot bearing spacer
17—Main drive pinion
18—Clutch shaft bearing
19—Accelerating range idler thrust washer
20—Countershaft gear
21—Accelerating range idler thrust washer dowel
22—Countershaft
23—Transmission case
24—Transmission case lower cover gasket
25—Countershaft gear bushing
26—Transmission case drain plug gasket
27—Transmission case drain plug
28—Gearshift lever oil washer
29—Gearshift lever spring seat
30—Gearshift lever spring
31—Main drive pinion idler bearing race spacer
32—Main drive pinion idler bearing race spacer dowel
33—Main drive pinion idler assembly
34—Main drive pinion idler bearing spacer, rear
35—Main drive pinion idler bearing race
36—Main drive pinion idler bearing, rear
37—Gearshift lever in neutral position
38—Accelerating range idler assembly
39—Accelerating range idler drive gear
40—Transmission case upper cover gasket
41—Gear shifter shaft stop—starting and reverse
42—Sliding clutch internal teeth for direct speed
43—Countershaft gear bearing spacer
44—Countershaft gear set
45—Accelerating range idler bearing
46—Accelerating range idler bearing race
47—Accelerating range idler gear
48—Accelerating range idler bearing
49—Transmission case cover, upper
50—Gear shifter fork clamp bolt
51—Transmission case cover, upper
52—Countershaft gear bushing
53—Accelerating range clutch
54—Countershaft starting range gear
55—Sliding clutch external teeth for accelerating range
56—Direct drive clutch
57—Accelerating range idler bearing retainer
58—Transmission case cover, lower
59—Gear shifter shaft—starting and reverse
60—Gear shifter shaft—accelerating and direct speed
61—Gearshift housing stud
62—Gearshift lever positions
63—Gear shifter fork—accelerating and direct speed
64—Gear shifter shaft stop—starting and reverse
65—Gear shifter fork—starting and reverse
66—Gear shifter fork—heavy duty
67—Accelerating range and speed range sliding clutch
68—Transmission mainshaft rear bearing
69—Transmission mainshaft rear bearing oil retainer
70—Transmission mainshaft companion flange
71—Transmission mainshaft companion flange washer
72—Transmission mainshaft companion flange nut
73—Transmission mainshaft
74—Speedometer drive gear
75—Propeller shaft flange bolt
76—Transmission mainshaft rear bearing retainer plate
77—Transmission brake support
78—Transmission brake drum
79—Mainshaft sliding gear—heavy duty
80—Transmission brake support stud
81—Transmission brake support gasket
82—Mainshaft sliding gear—starting and reverse
83—Countershaft gear—heavy duty
84—Countershaft gear—reverse
85—Reverse idler gear bushing
86—Reverse idler gear shaft
87—Reverse idler gear
88—Gearshift lever
89—Gearshift lever dust cover nut
90—Gearshift lever dust cover
91—Gearshift housing
92—Gearshift heavy duty range stop plunger retainer
93—Gearshift heavy duty range stop plunger
94—Gearshift heavy duty range stop plunger check nuts
95—Gearshift heavy duty range stop plunger spring
96—Gear shifter shaft—heavy duty
97—Accelerating range idler bearing retainer lock screw
98—Accelerating range idler bearing retainer
99—Gear shifter fork—starting and reverse
100—Mainshaft sliding gear—starting and reverse
101—Transmission mainshaft
102—Countershaft
103—Countershaft gear bushing
104—Countershaft reverse gear

a slight drag when the steering wheel is turned, and should then be turned back ¼ turn. The clamping bolts in both the steering gear housing and dash bracket can now be tightened. Care must be taken when this adjustment is being made not to bind the bearings, which will cause rapid wear and stiff action of the steering gear.

Adjustment for end play of the sector shaft is made by loosening the lock nut on the adjusting screw in the steering gear housing at the end of the sector shaft. The adjusting screw (27) can then be turned as far as possible with light pressure. The lock nut should then be tightened.

Lost motion between the sector and worm teeth is taken up by moving the sector nearer to the worm by means of its adjusting bolt. Before making this adjustment the front wheels should be jacked up and set in their straight ahead position. Loosen the four studs that hold the adjusting plate to the housing and turn in the adjusting stud (42) until only a slight amount of bind is felt with the wheels in the straight ahead position when the steering wheel is turned in opposite directions. Slightly greater backlash will be observed when the steering wheel is turned to the extreme right or left positions, because the worm gear sector is manufactured so that its center section contacts closer with the worm when the front wheels point straight ahead.

Multi-Range Gearshift

The new Multi-Range Gearshift used on the "70" has the following gear arrangement (Fig. 25):

The main drive pinion (17) and the direct drive clutch (56) are integral with the clutch shaft (15). The pinion (17) is in constant internal mesh with the main drive pinion idler gear (9) which is an integral part of the main drive pinion idler assembly (33). The countershaft drive gear (3) and the accelerating range idler drive gear (39) are also integral parts of this assembly (33).

The countershaft drive gear (3) is in constant mesh with the countershaft gear (20) and the accelerating range idler drive gear (39) is in constant internal mesh with the accelerating range idler gear (47).

The accelerating range idler gear (47) is an integral part of the accelerating range idler assembly (38) which also carries, as an integral part, the accelerating range clutch (53).

Speed range is obtained by moving the accelerating range and direct drive sliding clutch (67) on the mainshaft forward into mesh with the direct drive clutch (56).

Accelerating range is obtained by moving the accelerating range and direct drive sliding clutch (67) on the mainshaft backward into mesh with the accelerating range clutch (53).

Starting range, heavy duty, and reverse are formed in the conventional way by sliding gears on the mainshaft into mesh with gears on the countershaft.

Gearshift

For all normal driving conditions, the gearshift (37) is standard. For starting range the gearshift lever should be moved to the left from neutral and backward. For accelerating range to the right from neutral and forward. For speed range to the right from neutral and backward. For

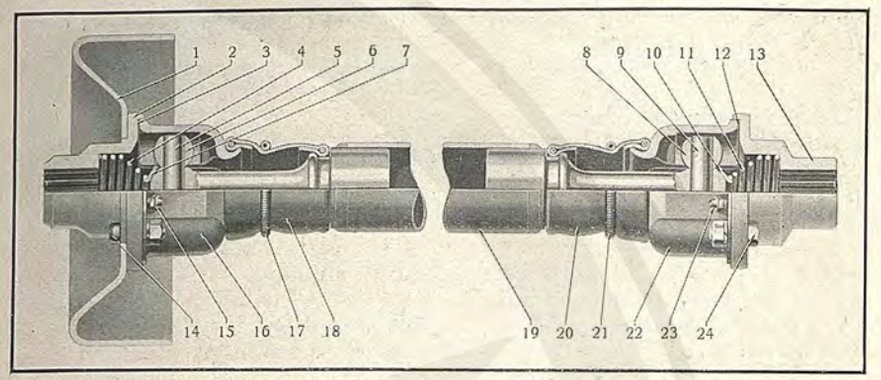

Fig. 26—Propeller Shaft and Universal Joints

1—Transmission brake drum
2—Transmission mainshaft flange
3—Universal joint body to flange gasket
4—Propeller shaft compensating spring
5—Universal joint pin
6—Universal joint ball
7—Compensating spring guide
8—Universal joint ball
9—Universal joint pin
10—Compensating spring guide
11—Propeller shaft compensating spring
12—Universal joint body to flange gasket
13—Rear axle drive pinion shaft flange
14—Transmission mainshaft flange bolt
15—Lubricant nipple
16—Universal joint body
17—Universal joint dust cover center spring
18—Universal joint dust cover
19—Propeller shaft
20—Universal joint dust cover
21—Universal joint dust cover center spring
22—Universal joint body
23—Lubricant nipple
24—Rear axle drive pinion shaft flange bolt

reverse to the left from neutral and forward. With this arrangement, the shift from neutral to starting, from starting to accelerating, and from accelerating to speed range is not unusual.

Heavy duty range is a forward speed which provides power at the rear wheels for starting and driving under unusual operating conditions such as extremely steep grades, or deep mud, sand, or snow. To engage this speed the gearshift lever must be moved to the extreme left against spring pressure (95) and then backward.

CAUTION: If at any time it becomes necessary to shift from the heavy duty range to the starting speed, care should be exercised not to shift into reverse while the car is moving forward.

Lubrication

The correct lubrication of the transmission is of the utmost importance to insure long life and satisfactory operation. It is recommended that an engine crankcase oil having a low cold test and the body of a heavy S. A. E. viscosity No. 50, or a light S. A. E. viscosity No. 60, should be used. Since S. A. E. viscosity numbers do not indicate the quality of the oil, but merely the body or weight of the oil, it is essential that only oil from the reputable refineries be used in order to be insured of the proper quality.

CAUTION: It is important that engine oils as recommended be used and NOT the usual heavy transmission lubricants.

It is recommended that the oil be changed in the transmission after the first 500 miles of driving and the transmission be thoroughly washed out with a flushing oil (not kerosene). The transmission should then be refilled to the level of the filler plug on the right side with the proper oil.

It is recommended that the oil in the transmission be removed, the transmission case flushed and new oil installed every six months thereafter.

Removal and Installation

If it becomes necessary to remove the transmission for any reason, care should be taken to keep it in perfect alignment with the engine while removing and installing in order to avoid springing the clutch driving disc or the clutch shaft. This is extremely important. To obtain perfect alignment, pilot studs should be used in the flywheel housing to aid in disassembling and assembling the transmission.

TIRES

Water and road dirt will work into cuts in tires and loosen the rubber from the carcass unless the cuts are promptly and properly sealed. It is also important that the air pressure in the tires be properly maintained at all times.

Tire Pressures

To insure smooth and steady steering operation at all speeds, the air pressure, in both front tires, should be exactly 40 pounds as measured with an accurate gauge for balloon tires and checked at least once each week. The air pressure in the rear tires should be 35 pounds.

UNIVERSAL JOINTS AND PROPELLER SHAFT

The universal joints are of the two-trunnion ball type. The joints are provided with suitable metal sleeves having channels to permit the trunnions to slide forward and backward, which relieves all strain caused by the action of the chassis springs.

Leather boots are provided to enclose and prevent dirt entering the interior of the joints. Care should be taken when lubricating the joints to not pack them full and cause the leather boots to swell. Too much lubricant in the joints will cause the leather to break because of the action of the trunnions. The joints should be about one-half full of lubricant and attention given to these points every 5000 miles. An oil nipple for the high-pressure lubricant gun is provided in the housings of the front and rear universal joints.

WHEELS

Each front wheel is supported by two adjustable roller bearings. The adjustment is made by first jacking up the axle until one wheel just clears the floor. The hub cap should then be removed as well as the spindle nut cotter pin. The wheel should then be spun slowly and the spindle nut turned tighter only until the bearings begin to bind slightly; then the nut should be backed off one notch. The cotter pin and hub cap should then be reinstalled. A two-ounce weight, at any one of the rim clamp nuts, should bring that part to a stop at the bottom of the wheel. The front wheel bearings must be free and have very slight end shake. The wheel bearings should be cleaned and packed with medium cup grease every 5000 miles.

IMPORTANT: It is of vital importance that the front wheels (complete with tires) be as near perfectly balanced at all times as is possible in order to avoid so-called "tramping" of front wheels at high speeds. The rapid revolutions of the wheels develop gyroscopic forces, which, combined with unbalanced wheel forces, will cause severe wobble and bounding motion of the front wheels. These forces reverse their direction very rapidly, and, because of this fact, heavy strains are developed in the steering mechanism. For similar reasons it is equally important to maintain uniform tire pressures. Unequal and low pressure in the two front tires will cause much annoyance when driving at high speeds.

The same condition is true with the rear wheels, as the strains are transmitted to the axle shafts and their bearings, but are not so apparent. Excessive tire wear also results from poorly balanced wheels when driven at high speeds.

Irregularities in wheel and tire balance caused by the weight of the tire valve stem and dust cap are offset by the manufacturer's method of tire construction.

On the side wall of each tire near the bead is a red dot marked on the rubber. When mounting the tire on the rim, the valve stem should be located at a point immediately adjacent to the red dot, thus permitting the distribution of weight in the tire to compensate for the weight of the valve stem and dust cap.

CORRECTIVE MEASURES

No adjustments should be made nor any parts tampered with until the cause of the trouble is known. Otherwise adjustments which are properly made may be destroyed. The problem should be analyzed.

Engine Fails to Start

1. Lack of fuel.
   Fuel line should be free of obstructions.
2. Lack of ignition current.
   May be due to failure to turn the switch or to a broken or disconnected wire. Ammeter needle will move when ignition current flows through breaker points.
3. Fouled spark plugs.
   Due to an excessive amount of oil in the engine and too long use, whereby the points become coated with carbon. Fouled spark plugs should be removed and cleaned or replaced with new.
4. Points improperly set. (No. 3 under "Engine Misses".)
5. The carburetor choke valve must be closed tightly.

Engine Stops

1. Lack of fuel.
2. Disconnected wires.
3. Lack of oil.
4. Carburetor flooding.

Engine Misses

1. Broken or disconnected wiring.
2. Fouled spark plugs.
   The spark plugs should be short-circuited one after another by touching a hammer or screwdriver from the metal of the cylinders to the terminals of the spark plugs. When one is reached which makes no difference in the running of the engine, this is probably the plug at fault.
   Remove and clean. Porcelain insulation may be cracked.
3. Points of spark plugs improperly set.
   Points too close together or too far apart may cause missing. Spark plug points should be set .027″ apart.
4. Loss of compression in any cylinder.
   Valve may be stuck or there may be dirt under it. Examine the valve tappet to see whether the valve seats properly. To locate cylinder that is weak on compression, the engine should be turned over by hand and each cylinder tested in turn. If engine misses when hot, tappet clearances should be checked. (Page 51.)
5. Water in fuel.
6. Overheating.
7. Carburetor adjustment should be checked.

Loss of Power

The engine will run, but will not pull the car under a heavy load. May be due to:

Too rich mixture.
Valves not seating.
Less than normal tappet clearance.
Ignition improperly timed.
Lack of oil or water.
Lack of fuel, due to obstruction in fuel pipe or carburetor.
Screen filled with dirt.
Dragging brakes.
Engine overheating.
Loss of compression.

Lack of Compression

Faulty cylinder head gasket.
Insufficient tappet clearance.
Valves or rings not seating.
One or more improperly fitted pistons or piston rings.

Popping Back Through Carburetor

This usually indicates too lean a mixture, but may be caused by:

Dirt in carburetor.
Inlet valves holding open.
Water in the fuel.
Air leak at intake manifold connections.
Incorrect ignition timing or limited spark advance.
Secondary wires connected to the incorrect plugs.
Improper kind or defective spark plugs.

Engine Overheats

Lack of proper lubrication.
Stoppage of water circulation or lack of water.
Slipping fan belt.
Imperfect gas mixture.
Ignition timed late or driving with retarded spark.
Limited spark advance.

Engine Knocks

Connecting rod bearing loose.
Crankshaft bearing loose.
Faulty engine lubrication or diluted oil.
Loose piston.
Broken piston ring.
Carbon in cylinders.
Overheating.
Incorrect ignition timing.

TOOLS

The following is a complete list of tool equipment furnished with the Chrysler "70". The tools are of first quality and carefully designed so as to take care of all work which an owner may wish to perform on the car:

1 Wheel rim wrench
1 Wheel hub cap wrench
1 Brake cylinder bleeder hose assembly
1 Brake cylinder bleeder hose connection gasket
1 High-pressure lubricant gun
1 Tire pump
1 Auto jack
1 Auto jack handle
1 Starting crank assembly
1 No. 1 wrench
1 No. 2 wrench
1 No. 3 wrench
1 No. 4 wrench
1 Pliers
1 Screwdriver
1 Hammer

ACCESSORY REPAIRS

All questions relative to the repairing or replacing of accessories for the Chrysler "70" should be taken up with their respective manufacturers, a list of whom follows:

Battery

The Willard Storage Battery Co., Cleveland, Ohio.

Carburetor

Stromberg Motor Devices Co., Chicago, Ill.

Ignition Coil, Distributor, Starting Motor, Generator, Shock Absorbers and Fuel Pump

United Motors Service, Inc., Detroit, Mich.

Speedometer, Horn

North East Service Inc., Rochester, N. Y.

Windshield Wiper

Trico Products Corp., Buffalo, N. Y.

DETAILED SPECIFICATIONS

Axle—Rear
Semi-floating, pressed steel housing $\frac{3}{16}$" thick. Drive gear and pinion spiral bevel type, nickel chrome-vanadium steel, heat-treated. Drive gear 10½" in diameter and $1\frac{7}{16}$" wide. Gear ratios—Roadster and Five-Passenger Phaeton 3.58 to 1; all other body types 4.10 to 1. Axle shafts: Forgings of high alloy, chrome-nickel steel, heat-treated, splined into differential side gears, keyed to wheel hub, $1\frac{5}{8}$" diameter at outer bearing end.

Axle—Front
Heat-treated, I-section drop forgings. Adjustable tapered roller wheel bearings. Yoke bushings: Bronze, ¾" inside diameter, $\frac{1}{16}$" thick, 1¼" long at the top and 1½" long at the bottom. Ball thrust bearings at steering knuckle head. Steering knuckles are of chrome-nickel steel forgings. Steering arms are of chrome-vanadium steel forgings.

Battery
Three-cell, 13-plate, six-volt, 100-ampere-hour capacity, located under front compartment floor board.

Bodies
Chrysler designed.

Brake—Service
Chrysler hydraulic, internal-expanding. Drums 14" inside diameter, brake shoes 1¾" wide.

Brake—Parking
External contracting on drum mounted at rear of transmission, hand-controlled. Drum 8" in diameter, dynamically balanced, brake band 2" wide.

Camshaft
Mounted on four bearings, front bearing 2¼" diameter, 1½" long, bronze-backed, babbitt-lined. Front center bearing $2\frac{1}{32}$" diameter by $\frac{11}{16}$" long. Rear center bearing 2" diameter by $\frac{11}{16}$" long. Rear bearing 1⅜" diameter by $1\frac{5}{32}$" long. Front center, rear center and rear bearings machined in crankcase. Oil pump and distributor drive gear and fuel pump eccentric integral with camshaft. Camshaft is drilled through the center and oil, under pressure, is forced through this passage, giving positive lubrication to all its bearings.

Carburetor
Down draft plain tube type, provided with idle speed adjustment, with fixed jets, covering all necessary ranges to compensate for variations of altitude, peak summer and winter conditions. Equipped with accelerator pump, also air cleaner.

Clutch
The clutch is of the single dry plate type. Driven disc 9⅞" in diameter and has asbestos composition facings riveted to each side.

Connecting Rods
I-beam section. Drop-forged alloy steel. 9½" between centers. Crankshaft bearing is babbitt cast in rod 2" diameter by ⅜" wide.

Control
Conventional left hand drive, center control. Headlight filament control, throttle lever and horn button at top of steering column. Stoplight operates with brake pedal. Other lights operated by separate switches.

Cooling System
Water capacity 4½ gallons, circulated by centrifugal pump driven by extension of fan shaft. Extra large water passages completely surround each cylinder and each valve. Cellular radiator with detachable shell. Four-blade 14¾" fan driven by V-belt with adjustment provided.

Crankshaft
Counterweighted, statically and dynamically balanced. Supported on 7 bronze-backed, babbitt-lined main bearings. Front bearing 2¼" in diameter, 1⅞" long. Nos. 2, 3, 5, 6 bearings 2¼" in diameter, 1" long. Center bearing 2¼" in diameter, $1\frac{53}{64}$" long. Rear bearing 2¼" in diameter, $2\frac{13}{32}$" long. Thrust taken on rear bearing. Crankshaft is drilled to permit oil under pressure (25 to 30 pounds) being forced to all bearings.

Curtains

Six on Phaeton. Four side and one (detachable) rear curtain on Roadster. Side curtains open with door. Phaeton curtains carried in compartment in rear of rear seat.

Cylinders

Six, cast en bloc, integral with crankcase, with heavy cross web construction of seven main bearing supports. Detachable cylinder head. Bore $3\frac{1}{8}$", stroke $4\frac{3}{4}$". Finish, reamed and honed. Oil passages are drilled through bosses integral with crankcase casting. Cover plates on left hand side provide easy access to water passages.

Drive

Hotchkiss type horizontal drive.

Engine

L-type, water-cooled, six cylinders, four-cycle. Bore $3\frac{1}{8}$", stroke $4\frac{3}{4}$", N. A. C. C. horsepower 23.43, developed horsepower 75, piston displacement 218.6 cubic inches. Suspension: Four-point, rear, brackets bolted to flywheel housing and frame side member; front bolted to frame cross member. Insulated with rubber front and rear. Unit type. Firing order 1-5-3-6-2-4. Full force feed lubrication to all crankshaft, camshaft and connecting rod bearings. Spray from small metered hole in connecting rod bearings lubricates cylinders. Seven-bearing crankshaft. Four-bearing camshaft.

Electrical System

Generator—Third-brush regulation, six-volt type. Starting Motor—Six-volt type with Manual drive. Battery—Six-volt, one hundred-ampere-hour capacity. Single wire system.

Fenders and Running Board

Fenders—Heavy sheet steel, baked enamel finish, assembled to car with fabric packing strips. Steel running board, rubber-covered.

Flywheel

Gray iron, dynamically and statically balanced. Steel starter gear shrunk on flywheel.

Frame

Pressed steel, wide flange. Channel 7" deep. Length $166\frac{1}{2}$". Thickness $\frac{1}{8}$". Flanges $2\frac{5}{8}$" wide. Seven cross members.

Fuel System

Fuel pump driven from camshaft, visible sediment trap. $19\frac{1}{2}$-gallon fuel tank mounted at rear of frame. Fuel supply tank of rustproof, Terne plate.

Horn

Electric motor-driven type with adjustable diaphragm for tone. Located under hood. Button on top of steering column.

Ignition

Top outlet waterproof distributor and coil. Semi-automatic advance. Six-volt battery ignition.

Lamps

Bowl type headlamps with double filament center bulbs, parking lamps, instrument panel lamp, tail and stop signal lamps on all cars; dome lamp on Sedan.

Lubrication—Engine

High pressure to all crankshaft, connecting rod and camshaft bearings. Pump located in oil pan, driven by timing shaft from spiral gear on camshaft. All other working parts lubricated by positive spray under pressure from metered hole in upper half of each connecting rod bearing, also from crankshaft and camshaft. Timing chain lubricated by direct oil leads. Oil-filtered, cleansed and cooled by circulation through oil filter mounted on dash. Oil capacity $1\frac{1}{2}$ gallons; pressure gauge on dash. Level indicator on left side of crankcase toward the rear from the filler.

Overall Length

$168\frac{3}{4}$" without bumpers, 182" with bumpers.

Pistons

Light alloy, ventilated bridge type. Length $3\frac{11}{16}$". Fitting clearance .002".

Piston Rings

Gray iron, 3 per piston, concentric, 2 upper compression rings, special tongue and groove design $\frac{9}{64}$" wide. Special oil-control ring in lower groove $\frac{1}{8}$" wide.

Piston Pins

Alloy steel, case-hardened and lapped, $\frac{13}{16}$" in diameter by $2\frac{13}{16}$" long, clamped in rod.

Propeller Shaft

Steel tubing, forged ends electrically welded, diameter 2".

Spark Plugs

Metric thread, heavy electrodes.

Shock Absorbers

Standard equipment on all models.

Springs

Semi-elliptic. Front: Length $39\frac{7}{16}$", width 2", 9 leaves, one auxiliary leaf. Rear: Length $57\frac{3}{4}$", width 2", 8 leaves all body types. Mounted in rubber shock insulators.

Steering Gear

Semi-irreversible worm and sector type. Adjustable for wear. Steering arm drop-forging heat-treated. 18" 3-spoke wheel. Steering column adjustable.

Timing Chain

Silent chain. Two sprockets.

Tires

Balloon cords, 6-ply non-skid tread on all wheels, size 5.50" x 18".

Top

One-man folding cape type. Waterproof material. Large glass in rear.

Transmission

Multi-range gearshift with double internal gear accelerating range. Main drive pinion (clutch shaft) supported by ball bearings in case and crankshaft. Mainshaft supported by ball bearings in case and roller bearing in main drive pinion. Countershaft gears mounted on bronze bushings on stationary countershaft. Idler pinions mounted on roller bearings.

Transmission Ratios		Final Drive	
		Open Cars	Closed Cars
Speed (Direct)	1 to 1	3.58	4.1
Accelerating	1.40 to 1	5.01	5.74
Starting	2.19 to 1	7.84	8.98
Heavy Duty	3.38 to 1	12.3	13.85
Reverse	3.49 to 1	12.49	14.3

Tread

$56\frac{1}{4}$ front, $58\frac{3}{4}$ rear (wood wheels).

Universal Joints

Two used. Ball and trunnion type.

Valve Tappets

Mushroom type. Chilled cast iron head welded to hollow steel stem. Mounted in groups of six in detachable brackets. Tappet clearance: Exhaust .007, intake .005.

Valves

Inlet, flat head chrome-nickel steel. Exhaust, silcrome steel. Location: Right side, enclosed. Clear diameter of opening: Inlet $1\frac{7}{16}$", exhaust $1\frac{5}{16}$", stem $\frac{11}{32}$", 45-degree seat. Lift $\frac{5}{16}$". Valve stem guides removable.

Wheels

Wood, artillery type. Demountable rims.

Windshield Wiper

Automatically operated by engine suction with control valve on instrument board.

GENUINE PARTS

If, for any reason, Chrysler parts are required, Chrysler owners should be sure to insist on *genuine* parts from the Chrysler Motors Parts Corporation. It is a matter of great importance to do this. If it is ever necessary to have a Chrysler car repaired at any except an authorized Chrysler Service Station, owners should insist upon the following notation being placed on the invoice rendered for the repair work:

"Genuine Chrysler Parts Used in Making These Repairs"

Parts from the Chrysler Motors Parts Corporation are of standard production quality, engineered, manufactured and *inspected* to afford in every respect the same high standard of quality as required in the building of Chrysler cars.

Chrysler *genuine* parts are priced in reasonable ratio to their costs, considering the quality and care exercised in their manufacture, as contrasted with non-genuine parts which are made and sold solely for profit.

Only the Chrysler Motors Parts Corporation could have the unfailing insistence that its parts should invariably be of the best quality.

Genuine Chrysler parts carry the same warranty as Chrysler cars. If a new part proves defective within ninety days, another will be furnished gratis.

INSIST ON

GENUINE CHRYSLER PARTS

ORDERING PARTS

Chrysler owners are kindly requested to purchase parts from Chrysler Service Stations, where adequate stocks of "Genuine Chrysler Parts" are carried. Should a dealer not have a desired part on hand, it can be quickly obtained from the Chrysler Motors Parts Corporation.

The car serial number, on plate built into instrument panel, should be mentioned in any orders or correspondence regarding the car to assist the dealer's service department to promptly and intelligently fill the orders or answer the correspondence. Chassis shipped without bodies have serial number plate built into frame right side member vertical section just forward of the rear end of the hood.

Parts of accessories to the car not manufactured by the Chrysler Sales Corporation should be ordered from the respective manufacturers or service stations. (See list, Page 74.) Chrysler Service Stations will assist in this service.

RETURNING PARTS

Chrysler Service Stations have been supplied with special forms and tags that greatly expedite the handling of parts returned to the factory for inspection and credit consideration. Owners are kindly requested to make all parts returns through Chrysler Service Stations.

Parts of accessories to the car not manufactured by the Chrysler Sales Corporation should be sent to the respective manufacturers or service stations. (See list, Page 74.) Chrysler Service Stations will gladly perform this service for Chrysler owners.

Any part sent to the Company with a request for free replacement is to be returned through a Chrysler Distributor or Chrysler Service Station for factory credit consideration. No charge is permissible to the owner by the Distributor or any Chrysler Service Station for handling the claim or the material.

WARRANTY

(Standard Warranty of the National Automobile Chamber of Commerce)

"We warrant each new motor vehicle manufactured by us, whether passenger car or commercial vehicle, to be free from defects in material or workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any parts or part thereof which shall within ninety (90) days after delivery of such vehicle to the original purchaser be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

"This warranty will not apply to any vehicle which shall have been repaired or altered outside of our factory in any way so as, in our judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence, or accident, nor to any commercial vehicle made by us which shall have been operated at a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity.

"We make no warranty whatsoever in regard to tires, rims, ignition apparatus, horns or other signaling devices, starting devices, generators, batteries, speedometers or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers."

CHRYSLER SALES CORPORATION
Division of Chrysler Corporation
Detroit, Michigan

The Chrysler Sales Corporation reserves the right to make changes in design or to make additions to or improvements in its product without imposing any obligation upon itself to install them on its product previously manufactured.

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